North Dakota Field Crop Plant Disease Management Guide

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DISCLAIMER
This plant disease management guide is based on the latest information available from the North Dakota Agricultural Experiment Station, U.S. Department of Agriculture, U.S. Environmental Protection Agency (EPA) and the agricultural chemical industry. The information conformed to federal and state regulations at the time of printing. The user should determine that the intended use is consistent with label directions. *Designation that a product is labeled for control of a crop disease does not imply endorsement by the authors of use of that product or the degree of efficacy of that product for that use.*

Always follow the label directions. See individual fungicide labels for important information on:

- Safety recommendations and worker protection requirements
- Guidelines for ground, irrigation or aerial application
- Mixing procedures and tank mixes allowed
- Rotational and grazing restrictions
- Resistance management statements
LABEL PRECAUTIONS, RESTRICTIONS

Field re-entry, handling and loading precautions
Most fungicide labels state that workers either should not enter a sprayed field until the sprays have dried or should not enter for 24 hours unless they wear appropriate protective clothing. Information on use of protective clothing during mixing and loading also is given on the label. See the label for details.

Replant restrictions
Labels for all formulations of Ridomil have restrictions on what crops can be planted in less than a year following application of the product. These restrictions may vary somewhat depending on the formulation. Check these and all other labels before application to determine if replant restrictions will cause problems when determining what crop to plant next season.

Dosages
All dosages given in this guide are stated as the amount of formulated product (lb., oz., fl. oz., quarts) to use.

Restricted-use fungicides are fluids that are not available to the general public and are to be purchased and used by a certified pesticide applicator.

Fungicides containing triphenyltin hydroxide are restricted-use fungicides. These include products such as Super Tin, Agri Tin and Super Tin 4L. These are designated as RUP and Restricted-Use Pesticide in the tables.

Disclaimer
The information given herein is for educational purposes only. North Dakota State University does not endorse commercial products or companies, even though reference may be made to trade names, trademarks or service names. Omission of labeled products is possible if information about the product was not available at the time of printing or if it had questionable efficacy. Products not normally available in North Dakota are omitted. Seed treatment chemicals that are primarily insecticides with subminimal amounts of fungicide also are omitted.

The plant pathology faculty at North Dakota State University assume no responsibility for property damage, personal injury or other loss due to the use of fungicides listed in this publication because they have no control over the use or misuse of these products.

FUNGICIDE FORMULATIONS

Most fungicides are solics that are not soluble in water. To use them, they must be made into a formulation (preparation). Some of the more common formulations are listed below. The common abbreviation for each formulation is given in parentheses following the name.

Wettable powders (WP)
Many fungicides are wettable powders consisting of solid fungicide and a wetting agent. When mixed with water, they form a suspension. Many of these suspensions settle out quickly, so an agitator is needed in the spray tank to keep the particles in suspension.

Water-soluble pouch (WSP)
Some fungicides are available in water-soluble pouch containers. These pouches dissolve in the mixing tank and release the fungicide. This reduces the exposure of mixer and loader personnel to dust from the fungicide.

Dusts (D)
Dusts are powders that are mixed with inert ingredients to form a product with a low percent of active material. These are used around the home garden, and a few formulations are used in commercial applications.

Granules (G)
The active ingredient is incorporated into small granules of inert material such as clay. Granules are incorporated into the soil.

Emulsifiable concentrates (EC)
A fungicide that is insoluble in water is dissolved in an organic solvent. An emulsifying agent is incorporated in the formulation so an emulsion is formed when the product is mixed with water. An emulsion is a suspension of very tiny drops of the solvent/fungicide in the water. It usually has a milky appearance (milk itself is an emulsion of fats in water).

Flowables (F)
Flowables are insoluble fungicides ground into a very fine product, usually by a wet-grinding process. These particles are nearly colloidal and are suspended in water to form a thick liquid. They remain suspended in water for relatively long periods of time but should be agitated before use. They are dust-free, easy to mix, remain in suspension longer than wettable powders and also may resist washing off the plant better than the wettable powders. Examples of flowables include Champ Flowable, Kocide 4.5 LF, Vitavax 200 and Dithane F-45. They need to be protected from freezing.

Dry flowable (DF)
See dispersible granules. (Next page)
Dispersible granules (DG)

Dispersible granules also are called dry flowable formulations. They are small granules that pour from a container like a liquid but do not stick to the sides of the container and do not need to be protected from freezing. They are virtually dust-free and disperse readily in water to form a suspension. Examples include Bravo Utrex DG, Dithane DF, Rainshield NT, Manzate 75 DF, and Penncroz DF.

Fumigants

Fumigants are liquids that turn into a gas after application. They generally are used for soil fumigation.

MODE OF ACTION OF FUNGICIDES

The action of most fungicides takes place outside the host and is called “protection.” A fungicide that acts outside the host is called a “protectant fungicide.” Most other fungicides sprayed on leaves and fruit are of this type. “Therapy” is chemical action inside the host. For example, fungicides are locally systemic and move into the plant at the site of deposition. Several triazole fungicides have several days of therapeutic action against wheat leaf rust and also reduce the production of viable spores, that is, spores capable of growing.

Most protectant fungicides are relatively stable by themselves. Generally, they are relatively insoluble in water and resist removal or chemical change by water, yet must be toxic to fungi. Often a chemical change is brought about by the fungus the host or the environment before toxicity occurs. Toxicity simply means the ability to damage the fungus cells.

Fungicides may act to produce a toxic reaction in the fungus in several different ways. (1) Some may inhibit (slow down or stop) cell wall formation. (2) Some affect the permeability of the cell wall, causing a leaking of nutrient materials from the cell. (3) Some fungicides may combine with essential metals in a way that they become unavailable for normal cell functions, including the functioning of essential enzymes. (4) Other fungicides may inhibit respiration or nuclear division, or may break dormancy of spores.

Some fungicides also may be toxic to plants if applied at rates too high or if applied under unfavorable environmental conditions. This is called phytotoxicity. Formulations of maneb + zine are less phytotoxic to many vegetables than formulations that contain only maneb. Sometimes the method of formulation may make a fungicide less phytotoxic.

TOXICITY OF FUNGICIDES

Effects of chemicals on humans

Fungicides have various levels of toxicity to humans. Human exposure (skin, eye, internal) to fungicides can result in mild to severe reaction. Due to high levels of toxicity, some fungicides are restricted-use only.

Symptoms associated with chemical poisoning are listed below. All symptoms are not associated with every pesticide. Some of these symptoms are described below, but consulting a physician always is wise. Avoid diagnosing the effects on yourself or others.

- Eyes watering excessively
- Stomach cramps
- Dizziness
- Vomiting
- Excessive sweating
- Pupils of the eye reduced in size
- Rapid heart beat
- Muscle tremors or convulsions
- Extreme nervousness
- Mental confusion, lack of coordination
- Uncontrolled drooling or Waterying at the mouth
- Severe burns of the skin
- Loss of ability to use muscles
- Difficulty in breathing
- Unconsciousness

First aid

The following list should be considered:

- Stop exposure
- Call a physician
- Remove contaminated and restrictive clothing
- Drench contaminated area with water; flush repeatedly
- Provide fresh air but prevent chilling and overheating
- Avoid giving alcohol
- Provide milk for patient to drink
- Antidote - to be administered only by a physician

North Dakota Poison Control Center
Toll-free: (800) 732-2200

Toxicity ratings of pesticides

Pesticides generally are categorized according to acute oral toxicity (the toxicity when taken through the mouth), but because users may absorb a significant quantity of the pesticide through their skin, dermal toxicity (toxicity when absorbed through the skin) is of equal or greater practical importance.

LD₅₀ values generally show relative toxicities among the chemicals and are not truly representative of effects on humans, especially since they usually are obtained on rats. Actual toxicities do not constitute the only hazards associated with exposure to the chemicals. For instance, a chemical with low toxicity may be hazardous due to concentration, high volatility, careless use or effects of long-term exposure.
LD₅₀ depends upon body weight. Thus, a given amount of chemical would have greater effect on a child than on an adult. LD₅₀ also is proportional to the percent of active ingredient. A material only 50 percent active requires twice as much to produce a toxic effect as 100 percent pure material.

The lower the LD₅₀ value, the greater the toxicity. A common standard for comparison is aspirin, which has an LD₅₀ of 1,200 mg/kg and is considered slightly toxic.

The following table illustrates the various toxicity classes:

<table>
<thead>
<tr>
<th>Oral Toxicity</th>
<th>Dermal (Skin) Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD₅₀ mg/kg</td>
<td>Toxicity Class</td>
</tr>
<tr>
<td>1-50</td>
<td>High</td>
</tr>
<tr>
<td>50-500</td>
<td>Moderate</td>
</tr>
<tr>
<td>500-5,000</td>
<td>Low</td>
</tr>
<tr>
<td>Over 5,000</td>
<td>Very Low</td>
</tr>
</tbody>
</table>

Information on the LD₅₀ of a specific fungicide and other toxicity information are available on the MSOS (Material Safety Data Sheet) for each product. These generally may be found at www.cdms.net.

PROTECTING GROUNDWATER

Pesticides differ in their persistence and mobility in soil. Those that are highly persistent or highly mobile are more liable to contaminate groundwater than those that are not. Areas of the state where groundwater is most at risk are areas with coarse-textured soils, are low in organic matter and have a high water table. Most fungicides are relatively immobile, especially in clay soils with high organic matter, because they are adsorbed on clay particles or on the organic matter.

A few fungicides are somewhat mobile. Take care in the use of these fungicides, particularly the application of these products through a sprinkler irrigation system in high-risk areas. Risks may be reduced by minimizing the amount of water used for application through a sprinkler system, more use of ground or aerial application instead of application through the sprinkler system, and use of a different fungicide that is less mobile.

The persistence and mobility of fungicides commonly used in North Dakota may be found in NDSU Extension Service publication EB-49, "Persistence and Mobility of Pesticides in Soil and Water."

HANDLING CHEMICALS

Avoid splashing and spilling. Wear a mask especially when handling dusts or powders. Some chemicals, when combined, have increased toxicity (potentiation).

Rinse containers several times after using chemicals. Pour rinsate into the spray tank when using the same chemical. Dispose of containers as indicated in the next section. Keep a record of plant disease control chemicals used and methods of handling.

FUNGICIDE LABELS

Fungicides are named according to their chemical composition or the chemical name. An example of a chemical name is a coordination production of zinc ion and manganese ethylene bisdithiocarbamate, the chemical names are required on the label. Since chemical names often are long, common names frequently are used; for example, the common name for the above chemical is mancozeb. Manufacturers use trade names to identify their specific products. For example, there are various trade names for mancozeb, such as Dithane, Manzate and Penncozeb.

In addition to the names on labels, various other required label information includes precautions in handling, antidotes or telephone contacts to use in case of accidental poisoning, recommendations for use, materials contained in the package and their percentages, the manufacturer's or distributor's name and address, and the EPA registration number.

Some fungicides are made up in various formulations for different uses or methods of application, such as wettable powders, dusts, emulsifiable concentrates, granules, flowables, dispersible granules or solutions. The nature of the chemical sometimes restricts it to one or a few of these formulations.

SEED TREATMENT

Cereals

Fungicidal seed treatment helps protect the seed from rotting and the emerging seedlings from damping off and seedling blight. These are caused by soil-borne pathogens. When seeds germinate under unfavorable soil conditions, the danger of seed and seedling attack from soil-borne pathogens is lessened unless seed is of poor quality. Treatment of seed with a protectant fungicide may help protect against soil-borne pathogens and thus help stand establishment when seeds are germinating under unfavorable conditions, such as cold, wet weather. Many products are available for protection against seedling blight.

Treating seeds with a fungicide also helps protect them from diseases that are seed-borne. These include the covered smuts, bunt, scab, black point and black semi-loose smut of barley, and loose smuts of wheat, barley and oats. Loose smuts of wheat and barley are internally seed-borne. Loose smut of oats is seed-borne as spores under the hulls. These smuts cannot be controlled by conventional protectant seed treatment fungicides, but are
controlled by systemic seed treatment products. The embryo test can be used by the North Dakota State Seed Department to determine if loose smut is present in barley seed. This test cannot be used for the loose smuts of oats or wheat or black semiloose smut of barley. All current barley varieties are susceptible to loose smut. An embryo test is recommended for barley seed; if infection is 2 percent or greater, seed treatment of barley with an effective fungicide seed treatment is advised.

Common (Bipolaris, Helminthosporium or Cochliobolus) root rot of wheat and barley is a chronic problem in North Dakota, causing average yield losses of 5 to 11 percent, with much greater losses in some fields in certain years. Several seed treatment products are labeled for suppression of common root rot. Some seed treatments are also labeled for suppression of Fusarium root rot and take all root rot.

**Chickpeas**

Treating chickpea seed to protect against *Pythium* is essential for good emergence. A seed treatment to protect against seed-borne *Ascochyta* is important because this is a common and serious disease.

**Dry beans and soybeans**

Treating seed may reduce seedling blight during weather that is unfavorable for emergence. Do not use streptomycin with *Rhizobium* inoculant. If using captan seed treatments, in-furrow inoculant is preferable because inoculant does not survive well on captan-treated seed. Several products can be used to reduce the root rot potential, and many newer products have a broad spectrum of activity.

**Flax**

Treating flax seed with a fungicide helps protect against seed rot, damping off and seedling blight. Seed treatment is especially important in cases where the seed coats are broken, allowing entry of pathogens. Seed from fields heavily infected with *Pasmo* (*Septoria linicola*) may be susceptible to seedling blight and should be seed treated.

**Potatoes**

Treatment of cut-seed pieces helps protect the cut surface against seed-piece decay. Most seed treatments are fungicides that will protect against fungi such as *Pythium, Rhizoctonia, Helminthosporium* and *Fusarium*. Fungicides do not protect against bacteria such as *Erwinia* or *Clavibacter*. However, control of fungi indirectly helps control *Erwinia* bacteria because seed decay is greater in seed infected with fungi. The addition of streptomycin to fungicide has limited value because it will control only bacteria contaminating cut surfaces and may inhibit wound healing. Seed treatment will reduce or help control new infections but will not cure existing decay, prevent lenticel infection or prevent infection of roots and stolons away from the seed piece due to soil or environmental inoculum. Seed treatment is no substitute for using good, sound, healthy seed. Seed should be stored at less than 40°F during the winter. In the spring, warm the seed to 50 to 60°F for 1 1/2 to two weeks before planting or until it just begins to sprout. Do not handle the seed until it is warm. Plant the cut seed in warm (50 to 58°F at planting depth), moist soil. If cut seed must be held, store in a well-ventilated area for suberization at 50 to 60°F with a relative humidity of 85 percent. Hold for one week, then lower the temperature to 50 to 60°F. Ideally, plant when seed and soil are the same temperature; the optimum is 50°F.

**Safflower**

Safflower rust is both seed-borne and soil-borne. The most devastating phase of the disease is a seedling blight, and root and foot rot. Typical rust pustules develop later on the leaves. Seed-borne safflower rust is controlled by seed treatment.

**Sunflower**

Soil-borne downy mildew infections were controlled with metalaxyl or mefenoxam seed treatment in the past. The downy mildew fungus, however, has developed insensitivity to metalaxyl and mefenoxam in much of North Dakota, South Dakota and Minnesota, so these fungicides are not effective. Several fungicides or fungicide-insecticide combinations have received state or federal labels for seed treatment of sunflower for seed rot and seedling blights.

**APPLICATION OF SEED TREATMENT**

Seed may be treated commercially or it may be treated on the farm. Commercial seed treatment may use a slurry treater or various automatic seed treaters. The various automatic seed treaters differ considerably, so they cannot be discussed here. Commercial seed treatment has become more common in recent years for many crops.

On-farm treatment may use various home-type or slurry mixers. Drill-box seed treatment is popular because no extra steps are required; the seed is treated in the drill-box at planting time. Good disease control depends on uniform fungicide coverage of the seed, but this is more difficult to accomplish in drill-box treatment because the means of mixing the seed and fungicide is inadequate. For effective drill-box treatment, fill the box with one-third the quantity of seed and fungicide and mix carefully with a paddle; repeat with the next third and then the final third. The paddle should not be used for any other purpose and should be stored in a safe place, out of reach of children and animals.

On-farm auger seed treatment methods are common. The fungicide is metered into the base of the auger used to fill the drill box. This method assures fairly good mixing and coverage.

All seed treatments have certain basic precautions. Use care in handling seed treatment products; many are irritating to the eyes, nose and skin. Treated seed usually is identified by the dye used in the chemical, and treated seed should not be fed to livestock or used for human food. Pesticide containers should be disposed of properly.
in a landfill or buried in an area with no surface drainage to nearby waterways. If seed treatment cannot be done outdoors, it should be done in a well-ventilated room. Commercial seed treaters should have an adequate air exhaust system for treatment rooms. Workers exposed to seed treatment chemicals for long periods of time should have an approved chemical mask. The filter should be changed frequently. Recommended rates of application should be followed carefully because higher rates may injure the seed and lower rates may not give satisfactory disease control.

Forage legume seed should be treated well in advance of planting and inoculated with nitrogen-fixing Rhizobia at planting time. If dry beans have been treated with streptomycin for control of externally borne blight bacteria, inoculating with Rhizobia is not available.

**FIELD CROP FOLIAR SPRAYS**

Foliar fungicides are used to control fungal disease organisms that attack the above-ground portions of plants. Fungicides are used to protect the potential yield and quality of a crop. Many fungicides protect foliage from infection; therefore, these fungicides must be on the foliage before the fungus spores germinate.

Several foliar fungicides act differently from the protectants described above. For example, benzimidazole fungicides thiabendazole and thiophanate methyl are absorbed by the plant and translocated up the plant by the conducting tissues. They are called systemic fungicides. They only move up the plant; they do not move down. Thus, to control white mold on dry beans, complete coverage of stems, lower leaves and blossoms is required. Spraying only the upper leaves is not satisfactory because the fungicide will not move down to the location where it is needed. Strobilurin and triazole fungicides are locally systemic; they have some upward mobility and translaminar movement and some limited therapeutic action. Metalaxyl will move down from potato foliage into tubers in limited amounts to provide tuber protection against metalaxyl-sensitive strains of the late blight fungus and pink rot infection.

Spray control programs to prevent disease have been developed from data through years of research. Because each disease develops in a distinct manner, the decision to use a disease prevention program is based on weather conditions, disease development, potential yield of the crop and the dollars returned to management with use of the fungicides.

Many fungicides are registered for application through a sprinkler irrigation system, as well as by a spray. If a fungicide can be applied through a sprinkler system (fumigation), this is noted under application.

Most fungicide labels contain information on field re-entry, handling and loading precautions. Most labels state that workers either should not enter a sprayed field until the sprays have dried or should not enter for 24 hours unless they wear appropriate protective clothing. Information on the use of protective clothing during mixing and loading also is given on the label. See the label for details.

**Spraying**

Spraying can be done with many different types of ground and air equipment. Getting good coverage is important. At least 5 gallons per acre (gal/A) should be used for aerial application and higher gallon amounts are required for ground equipment.

Droplet size for aerial application should be 200 to 400 microns (1/54 to 1/128 inch) in diameter. Generally, if nozzles are pointed back, appropriate nozzles are used and pressures do not exceed 30 or 35 pounds per square inch (psi), the correct droplet size will result. Application should be made with the boom 6 to 10 feet above the crop.

Some plant surfaces have a waxy or hairy coating, making good coverage difficult. The spray will collect in large, erect droplets, which then run off. Wheat and cabbage leaves are good examples. Frequently, using a wetting agent improves coverage. Usually this is a spreader-sticker. Certain fungicides may work better with certain spreader-stickers than others. This type of information usually can be found on the label or in supplemental brochures. Spreaders-stickers may be incorporated into some flowable formulations, so adding a spreader-sticker to the spray tank is not necessary. However, the label must be checked on each product for this use.

**RESISTANCE TO FUNGICIDES**

Fungi may develop tolerance or resistance to certain fungicides. Several examples where this occurs in North Dakota are described below.

The sugar beet leafspot fungus (Cercospora) has developed resistance to the systemic benzimidazole fungicides (benomyl, thiabendazole and thiophanate methyl) in the Red River Valley and southern Minnesota. These fungicides should not be used at all in the southern Red River Valley and no more than once a season in a tank mix with an unrelated fungicide in the northern Red River Valley.

Resistance to the benzimidazole fungicides thiabendazole (TBZ or Mertect) and thiophanate methyl (Topspin M) has developed recently in the potato Fusarium dry rot pathogen Fusarium sambucinum and the potato silver scurf pathogen Helminthosporium solani. This resistance is common throughout the United States and Canada.

Resistance to iprodione has been reported from other parts of the country. Cross-resistance to the chemically
related product vinclozolin is common when resistance to iprodione develops.

The A2 mating type of the late blight fungus, which is common in North Dakota and Minnesota, is resistant to metalaxyl and mefenoxam.

In North Dakota, reduced sensitivity to strebitrhub fungicides have been observed in populations of the early blight fungus Alternaria sp. on potato and to the Ascochya blight pathogen (Ascochya rabiei) on chickpeas (this does not cause Ascochya blight on lentils or field peas). Greater than 90% of the early blight fungus, Alternaria solani, are resistant to the Qu fungicides pyraclostrobin, fluoxastrobin, and azoxystrobin. Additionally, a very high proportion of the Ascochya rabiei population affecting chickpeas is resistant to pyraclostrobin. The A. solani population has also developed resistance to SDHI fungicides such as boscalid and penthiopyrad. Five mutations have been detected that convey resistance to this class of fungicide. Fluopyram, which is also a SDHI fungicide, is not affected by these mutations.

Tolerance of the leaf spot fungus to triphenyltin hydroxide was widespread in southern Minnesota and the southern Red River Valley in 1999 and common in the Northern Red River Valley. However, tin-tolerant isolates do not survive as well as sensitive isolates when alternative fungicides are used. With appropriate FRAC (Fungicide Resistance Action Committee) rotations, tin-tolerant isolates have largely disappeared.

In contrast, benzimidazole-resistant strains survive well when alternative fungicides are used and persist for a long time. The best way to combat resistance is to prevent or delay it by alternating the different classes of fungicides and by avoiding constant use of fungicides known to trigger development of resistant fungi. Using tank mixes of unrelated fungicides also is reported to retard the development of resistance.

**FUNGICIDE RESISTANCE MANAGEMENT STATEMENTS**

The following statements are recommendations for commonly used fungicides. Information from the FRAC is available at www.frac.info.

1. **Methyl benzimidazole carbamates (MBC; Group 1) – High risk.** Both mixtures and alternations with non-Group 1 fungicides are acceptable methods of preventing/managing resistance to Group 1 fungicides. For high-risk pathogens, mixtures are preferred to alternations.

2. **Dicarboximides (Group 2) – Medium to high risk.** Minimize the selection pressure by minimizing the number of applications. As a guide, do not apply more than two to three per crop per season. Maintain regular, prolonged times without exposure to Group 2 fungicides. When applying for Botrytis control, restrict applications to those times when Botrytis infection pressure is high. Where Botrytis resistance is well-established, use combinations to stabilize Botrytis control, but their application must follow the same rules as for Group 2 fungicides alone.

3. **Sterol biosynthesis inhibitors (SBI; Groups 3, 5, 17 and 18) – Low to medium risk.** Repeated applications of SBI fungicides alone should not be used on the same crop in one season against a high-risk pathogen in areas of high disease pressure for that particular pathogen. For crop/pathogen situations where repeated spray applications are made during the season, alternation or mixtures with an effective noncross-resistant fungicide are recommended. Where alternation or the use of mixtures is not feasible because of a lack of effective or compatible noncross-resistant partner fungicides, then input of SBIs should be reserved for critical periods of the season or crop growth stage. If SBI performance should decline and sensitivity testing has confirmed the presence of less sensitive forms, SBIs should be used only in mixture or alternation with effective noncross-resistant partner fungicides. The introduction of the new classes of chemistry offers new opportunities for more effective resistance management. The use of different modes of action should be maximized for the most effective resistance management strategies. Users must adhere to the manufacturers’ recommendations. In many cases, reports of “resistance” have, on investigation, been attributed to cutting recommended rates of use, or to poor or mistimed application. Fungicide input is only one aspect of crop management. Fungicide use does not replace the need for resistant crop varieties, good agronomic practice, plant hygiene/sanitation, etc.

4. **Phenylamides (PA; Group 4) – High risk.** The Group 4 fungicides should be used on a preventative and not curative or eradicative basis. For foliar applications, Group 4 fungicides should be used in prepacked mixes with an unrelated effective partner and used in a sound management program. Where using residual partners, use between three-fourths and full recommended rates. The Group 4 fungicide dosage in the mixture depends on the intrinsic activity and is defined by the respective company. The Group 4 fungicides should not be used as soil treatments against airborne diseases. When soil formulations are made available for soil use, strategies that prevent any possibilities for foliar applications must be implemented. For seed treatment, mixtures rather than straight Group 4 fungicides should be used whenever possible. The number of Group 4 fungicide applications should be limited (two to four consecutive applications per crop and year). The application intervals should not exceed 14 days and may be shorter in cases of high disease pressure. If rates and application intervals are reduced, the total amount of the Group 4 fungicide used per season should not exceed that of the full rate, and the total exposure time should remain the same. The rate of the mixing partners should remain the same for both intervals. Group 4 fungicide sprays are recommended early season during the period of active vegetative growth of the crop. The grower should switch to non-Group 4 products not later than the normal standard application interval of the non-Group 4 product.
5. Quinone outside inhibitors (QoI; Group 11) – High risk. When using a Group 11 fungicide as a solo product, the number of applications should be no more than one-third of the total number of fungicide applications per season. In programs with tank mixes or pre-mixes of a Group 11 fungicide, applications should be no more than one-half of the total number of fungicide applications per season. In programs in which applications of Group 11 fungicides are made with both solo products and mixtures, the number of Group 11 fungicide-containing applications should be no more than half of the total number of fungicide applications per season.

6. Succinate dehydrogenase inhibitor (SDHI; Group 7) - Medium to high risk. This group includes fungicides such as boscalid, benodamil, flutolanil, mepronil, fluropyram, florfen, carboxin, oxycarboxin, thifluzamide, bixafer, fluxapyroxad, furametpyr, isopyrazam, penflufen, penthiopyrad, sedaxane and boscalid. Laboratory and field studies have confirmed target site mutations to SDHI. Limit use of SDHI and rotate with other chemistries of different modes of action.

Recent research has indicated that >90% of the Alternaria solani (cause of early blight of potato) are resistant to the SDHI fungicide, boscalid. Currently, there are five known mutations in the early blight pathogen which convey resistance to boscalid that have been identified in ND isolates. However, these mutations may or may not affect other SDHI fungicides, such as fluropyram, fluxapyroxad and penthiopyrad. When selecting SDHI fungicides for management of early blight of potato, consult comments in the ‘Remarks’ column for more information on resistance.

**FUNGICIDE GROUPS**

The soil application and foliar sprays tables in this guide have a numerical or letter designation (in parentheses) for each chemical component of the listed commercial Fungicides. This number or letter code indicates the Code is developed by the Resistance Action Committee = (FRAC). The purpose of FRAC is to prolong the effectiveness of fungicides liable to encounter resistance problems and to limit crop losses should resistance appear. If field resistance is known to one member of the fungicide group, cross-resistance to other chemicals within that group may be present. This Fungicide Guide is providing information on fungicide groups so that users are aware of potential resistance problems with continued use of chemicals in the same fungicide group. The intrinsic risk for resistance to develop to a given fungicide group varies among chemistries; for example, resistance development among the strobilurins, Group 11, is much more likely than resistance development among the mancozeb or maneb, Group Y. For more information about fungicide resistance and the FRAC fungicide list, see the following Web site: www.frac.info.

The following tables (pages 9-20) are derived directly from the FRAC code, and they describe modes of action, chemical group names, common names, and FRAC Code number.

FRAC Code List© 2020 (Pages 9-21)
<table>
<thead>
<tr>
<th>MOA</th>
<th>TARGET SITE AND CODE</th>
<th>GROUP NAME</th>
<th>CHEMICAL OR BIOLOGICAL GROUP</th>
<th>COMMON NAME</th>
<th>COMMENTS</th>
<th>FRAC CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A1</td>
<td>PA – fungicides (PhenylAmides)</td>
<td>acylalanines</td>
<td>benalaxyl benalaxyl-M (=kiralaxyl) furalaxyl metalaxyl metalaxyl-M (=mefenoxam) oxazolidinones oxadixyl butyro lactones ofurace</td>
<td>Resistance and cross resistance well known in various Oomycetes but mechanism unknown. High risk. See FRAC Phenylamide Guidelines for resistance management</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>A2</td>
<td>adenosin- deaminase</td>
<td>hydroxy- (2-amino-) pyrimidines</td>
<td>hydroxy- (2-amino-) pyrimidines</td>
<td>bupirimate dimethirimol ethirimol</td>
<td>Medium risk. Resistance and cross resistance known in powdery mildews. Resistance management required.</td>
</tr>
<tr>
<td>A</td>
<td>A3</td>
<td>DNA/RNA synthesis (proposed)</td>
<td>heteroaromatics</td>
<td>isoxazoles</td>
<td>hymexazole</td>
<td>Resistance not known.</td>
</tr>
<tr>
<td></td>
<td>A4</td>
<td>DNA topoisomerase type II (gyrase)</td>
<td>carboxylic acids</td>
<td>carboxylic acids</td>
<td>oxolinic acid</td>
<td>Bactericide. Resistance known. Risk in fungi unknown. Resistance management required.</td>
</tr>
<tr>
<td>MOA</td>
<td>TARGET SITE AND CODE</td>
<td>GROUP NAME</td>
<td>CHEMICAL OR BIOLOGICAL GROUP</td>
<td>COMMON NAME</td>
<td>COMMENTS</td>
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<tr>
<td>B1</td>
<td>β-tubulin assembly in mitosis</td>
<td>MBC - fungicides (Methyl Benimidazole Carbamates)</td>
<td>benimidazoles</td>
<td>benomyl carbendazim fuberidazole thiabendazole</td>
<td>Resistance common in many fungal species. Several target site mutations, mostly E198A/G/K, F200Y in β-tubulin gene. Positive cross resistance between the group members. Negative cross resistance to N-phenyl carbamates. <strong>High risk.</strong> See FRAC Benzimidazole Guidelines for resistance management.</td>
<td>1</td>
</tr>
<tr>
<td>B2</td>
<td>β-tubulin assembly in mitosis</td>
<td>N-phenyl carbamates</td>
<td>N-phenyl carbamates</td>
<td>dethofercarb</td>
<td>Resistance known. Target site mutation E198K. Negative cross resistance to benimidazoles. <strong>High risk.</strong> Resistance management required.</td>
<td>10</td>
</tr>
<tr>
<td>B3</td>
<td>β-tubulin assembly in mitosis</td>
<td>benzamides</td>
<td>toluamides</td>
<td>zoxamide</td>
<td>Low to medium risk. Resistance management required.</td>
<td>22</td>
</tr>
<tr>
<td>B4</td>
<td>cell division (unknown site)</td>
<td>phenylureas</td>
<td>phenylureas</td>
<td>pencycuron</td>
<td>Resistance not known.</td>
<td>20</td>
</tr>
<tr>
<td>B5</td>
<td>delocalisation of spectrin-like proteins</td>
<td>benzamides</td>
<td>pyridinylmethyl-benzamides</td>
<td>fluopicolide</td>
<td>Resistant isolates detected in grapevine downy mildew. Medium risk. Resistance management required</td>
<td>43</td>
</tr>
<tr>
<td>B6</td>
<td>actin/myosin/fimbrin function</td>
<td>cyanacrylates</td>
<td>aminocyanocarbamates</td>
<td>phenamcaril</td>
<td>Resistance known in Fusarium graminearum. Target site mutations in the gene coding for myosin-5 found in lab studies. Medium to high risk. Resistance management required.</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>ary1-phenoxyketones</td>
<td>benzophenone</td>
<td>metralenone</td>
<td>Less sensitive isolates detected in powdery mildews (<em>Bumelia</em> and <em>Sphaerotheca</em>) Medium risk. Resistance management required.</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>benzoylpyridine</td>
<td>pyriflumene</td>
<td>Reclassified from U8 in 2018</td>
<td></td>
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<tr>
<td>MOA</td>
<td>TARGET SITE AND CODE</td>
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<td></td>
<td><strong>C1</strong> complex I NADH oxido-reductase</td>
<td>pyrimidinamines</td>
<td>pyrimidinamines</td>
<td>diflumetrom</td>
<td>Resistance not known.</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pyrazole-MET1</td>
<td>pyrazole-5-carboxamides</td>
<td>tolenpyrad</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Quinazoline</td>
<td>quinazoline</td>
<td>fenazaquin</td>
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<td></td>
<td></td>
<td></td>
<td>phenyl-benzamides</td>
<td>benodanil</td>
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<td></td>
<td></td>
<td>flutolanil</td>
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<td>mepronil</td>
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<td></td>
<td></td>
<td></td>
<td>phenyl-oxo-ethyl thiophene amide</td>
<td>isofetamid</td>
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<td>pyridinyl-ethyl-benzamides</td>
<td>fluopyram</td>
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<td>furan-carboxamides</td>
<td>fenfuram</td>
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<td>oxathiin-carboxamides</td>
<td>carboxin</td>
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<td>oxyo-carboxin</td>
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<td>thiazole-carboxamides</td>
<td>thifluzamide</td>
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<td></td>
<td>SDHI (Succinate-dehydrogenase inhibitors)</td>
<td>pyrazole-4-carboxamides</td>
<td>benzovindifluipyr</td>
<td>Resistance known for several fungal species in field populations and lab mutants. Target site mutations in ssh gene. e.g. HY (or H/L) at 257, 267, 272 or P225L, dependent on fungal species. Resistance management required.</td>
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<td>bixafen</td>
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<td>penfluifen</td>
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<td>pentaipyrod</td>
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<td>sedaxane</td>
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<td>N-cyclopropyl-N-benzyl-pyrazole-carboxamides</td>
<td>isoflucyram</td>
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<td>N-methoxy-phenyl-ethyl-pyrazole-carboxamides</td>
<td>pydiflumetol</td>
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<td>pyridine-carboxamides</td>
<td>boscalid</td>
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<td>pyrazine-carboxamides</td>
<td>pyraziflumid</td>
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<td>MOA</td>
<td>TARGET SITE AND CODE</td>
<td>GROUP NAME</td>
<td>CHEMICAL OR BIOLOGICAL GROUP</td>
<td>COMMON NAME</td>
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<td></td>
<td>C3</td>
<td>QoI-fungicides (Quinone outside Inhibitors)</td>
<td>methoxy-acrylates</td>
<td>azoxystrobin, coomoxystrobin, enoxastrobin, flufenoxystrobin, pcoxystrobin, pyraoxystrobin</td>
<td>Resistance known in various fungal species. Target site mutations in ( b ) gene (G143A, F129L) and additional mechanisms.</td>
<td>11</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>methoxy-acetamide</td>
<td>mandestrobin</td>
<td>Cross resistance shown between all members of the Code 11 fungicides.</td>
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<td></td>
<td></td>
<td></td>
<td>methoxy-carbamates</td>
<td>pyraclostrobin, pyrametostrobin, triclopyricarb</td>
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<td></td>
<td>oximino-acetates</td>
<td>kresoxim-methyl trifloxystrobin</td>
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<td></td>
<td>oximino-acetamides</td>
<td>dimoxystrobin, fenaminstrobin, metominostrobin, cysastrobin</td>
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<td></td>
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<td></td>
<td>oxazolidine-diones</td>
<td>famoxadone</td>
<td>See FRAC QoI Guidelines for resistance management.</td>
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<td></td>
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<td>dihydro-dioxazines</td>
<td>fluoxastrobin</td>
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<td></td>
<td>imidazolinones</td>
<td>fenamidone</td>
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<td></td>
<td></td>
<td></td>
<td>benzyl-carbamates</td>
<td>pyribencarb</td>
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<tr>
<td></td>
<td>QoI-fungicides (Quinone outside Inhibitors; Subgroup A)</td>
<td>tetrazolinones</td>
<td>methyltetraprole</td>
<td>Resistance not known. Not cross resistant with Code 11 fungicides on G143A mutants.</td>
<td>11A</td>
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<td></td>
<td>See FRAC QoI Guidelines for resistance management.</td>
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<tr>
<td>MOA</td>
<td>TARGET SITE AND CODE</td>
<td>GROUP NAME (Biological Group)</td>
<td>CHEMICAL OR BIOLOGICAL GROUP</td>
<td>COMMON NAME</td>
<td>COMMENTS</td>
<td>FRAC CODE</td>
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<tr>
<td>C4</td>
<td>complex III: cytochrome bc1 (ubiquinone reductase) at Qi site</td>
<td>QiI - fungicides (Quinone inside Inhibitors)</td>
<td>cyano-imidazole</td>
<td>cyazofamid</td>
<td>Resistance risk unknown but assumed to be medium to high (mutations at target site known in model organisms). Resistance management required.</td>
<td>21</td>
</tr>
<tr>
<td>C5</td>
<td>uncouplers of oxidative phosphorylation</td>
<td>dinitrophenyl-crotonates</td>
<td>binapacryl meptydinocap dinocap</td>
<td>fluazinam</td>
<td>Resistance not known. Also acaricidal activity.</td>
<td>29</td>
</tr>
<tr>
<td>C6</td>
<td>inhibitors of oxidative phosphorylation, ATP synthase</td>
<td>organo tin compounds</td>
<td>triphenyl tin compounds</td>
<td>fentin acetate fentin chloride fentin hydroxide</td>
<td>Some resistance cases known. Low to medium risk.</td>
<td>30</td>
</tr>
<tr>
<td>C7</td>
<td>ATP transport (proposed)</td>
<td>thiophene-carboxamides</td>
<td>thiophene-carboxamides</td>
<td>silthiofan</td>
<td>Resistance reported. Risk low.</td>
<td>38</td>
</tr>
<tr>
<td>C8</td>
<td>complex III: cytochrome bc1 (ubiquinone reductase) at Qo site, stigmatellin binding sub-site</td>
<td>QoStI fungicides (Quinone outside Inhibitor, stigmatellin binding type)</td>
<td>triazolo-pyrimiddinglamine</td>
<td>ametocridin</td>
<td>Not cross resistant to QiI fungicides. Resistance risk assumed to be medium to high (single site inhibitor). Resistance management required.</td>
<td>45</td>
</tr>
<tr>
<td>D1</td>
<td>methionine biosynthesis (proposed) (cgs gene)</td>
<td>AP - fungicides (Anilino-Pyrimidines)</td>
<td>anilino-pyrimidines</td>
<td>cyprodinil mepanipyrim pyrimethanil</td>
<td>Resistance known in Botrytis and Venturia, sporadically in Oculimacula. Medium risk. See FRAC Anilinopyrimidine Guidelines for resistance management.</td>
<td>9</td>
</tr>
<tr>
<td>D2</td>
<td>protein synthesis (ribosome, termination step)</td>
<td>enopyranuronic acid antibiotic</td>
<td>enopyranuronic acid antibiotic</td>
<td>blastidin-S</td>
<td>Low to medium risk. Resistance management required.</td>
<td>23</td>
</tr>
<tr>
<td>D3</td>
<td>protein synthesis (ribosome, initiation step)</td>
<td>hexopyranosyl antibiotic</td>
<td>hexopyranosyl antibiotic</td>
<td>kasugamycin</td>
<td>Resistance known in fungal and bacterial (P. gumae) pathogens. Medium risk. Resistance management required.</td>
<td>24</td>
</tr>
<tr>
<td>D4</td>
<td>protein synthesis (ribosome, initiation step)</td>
<td>glucopyranosyl antibiotic</td>
<td>glucopyranosyl antibiotic</td>
<td>streptomycin</td>
<td>Bactericide. Resistance known. High risk. Resistance management required.</td>
<td>25</td>
</tr>
<tr>
<td>D5</td>
<td>protein synthesis (ribosome, elongation step)</td>
<td>tetracycline antibiotic</td>
<td>tetracycline antibiotic</td>
<td>oxytetracycline</td>
<td>Bactericide. Resistance known. High risk. Resistance management required.</td>
<td>41</td>
</tr>
<tr>
<td>MOA</td>
<td>TARGET STEP AND CODE</td>
<td>GROUP NAME</td>
<td>CHEMICAL OR BIOLOGICAL GROUP</td>
<td>COMMON NAME</td>
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<tr>
<td>E: signal transduction</td>
<td>E1</td>
<td>aryloxyquinoline</td>
<td>quinoxyfen</td>
<td></td>
<td>Resistance to quinoxyfen known. Medium risk</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>signal transduction</td>
<td>aza-naphthalenes</td>
<td>quinazolinone</td>
<td>proquinazid</td>
<td>Resistance management required. Cross resistance found in <em>Erysiphe (Uncinula) nectar</em> but not in <em>Blumeria graminis.</em></td>
<td></td>
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<tr>
<td></td>
<td>(mechanism unknown)</td>
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<tr>
<td></td>
<td>E2</td>
<td>PP-fungicides (Pheny/Pyroles)</td>
<td>phenylpyroles</td>
<td>fenpiclonil</td>
<td>Resistance found sporadically. mechanism speculative. Low to medium risk.</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>MAP/histidine-</td>
<td></td>
<td></td>
<td>fludioxonil</td>
<td>Resistance management required.</td>
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<tr>
<td></td>
<td>Kinase in osmotic</td>
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<tr>
<td></td>
<td>signal transduction</td>
<td></td>
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<tr>
<td></td>
<td>(os-2, HOG1)</td>
<td></td>
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<tr>
<td></td>
<td>E3</td>
<td>dicarboximides</td>
<td>chlozolinate</td>
<td></td>
<td>Resistance common in <em>Bacillus</em> and some other pathogens. Several mutations in OS-1, mostly IS655. Cross resistance common between the group members. Medium to high risk. See FRAC Dicarboximide Guidelines for resistance management.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MAP/histidine-</td>
<td></td>
<td>dmethachione</td>
<td></td>
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<tr>
<td></td>
<td>Kinase in osmotic</td>
<td></td>
<td>iprodione</td>
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<tr>
<td></td>
<td>signal transduction</td>
<td></td>
<td>procymidone</td>
<td></td>
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<tr>
<td></td>
<td>(os-1, Dafl)</td>
<td></td>
<td>vinclozolin</td>
<td></td>
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<td>MOA</td>
<td>TARGET SITE AND CODE</td>
<td>GROUP NAME</td>
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<tr>
<td>F1</td>
<td>formerly dicarboximides</td>
<td>phosphorothioates</td>
<td>phosphorothioates</td>
<td>edifenphos</td>
<td>Resistance known in specific fungi. Low to medium risk. Resistance management required if used for risky pathogens.</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dithiolenes</td>
<td>dithiolenes</td>
<td>iprobenfos (IBP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td>phospholipid biosynthesis, methyltransferase</td>
<td>aromatic hydrocarbons</td>
<td>aromatic hydrocarbons</td>
<td>pyrazophos</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>heteroaromatics</td>
<td>1,2,4-thiadiazoles</td>
<td>isoprotiolane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td>cell peroxidation (proposed)</td>
<td>AH-fungicides (Aromatic Hydrocarbons) (chlorophenyls, nitroanilines)</td>
<td>aromatic hydrocarbons</td>
<td>biphenyl chloroneb disoran quintozene (PCNB) teclozene (TCNE) tolclofos-methyl</td>
<td>Resistance known in some fungi. Low to medium risk. Cross resistance patterns complex due to different activity spectra.</td>
<td>14</td>
</tr>
<tr>
<td>F4</td>
<td>cell membrane permeability, fatty acids (proposed)</td>
<td>Carbamates</td>
<td>carbamates</td>
<td>iodocarb propamocarb prothiocarb</td>
<td>Low to medium risk. Resistance management required.</td>
<td>28</td>
</tr>
<tr>
<td>F5</td>
<td>formerly CAA-fungicides</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>F6</td>
<td>microbial disrupters of pathogen cell membranes</td>
<td>formerly Bacillus amyloliquefaciens strains (FRAC Code 44); reclassified to BM02 in 2020</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F7</td>
<td>cell membrane disruption</td>
<td>plant extract</td>
<td>terpene hydrocarbons, terpene alcohols and terpene phenois</td>
<td>extract from Melaleuca alternifolia (tea tree)</td>
<td>Resistance not known.</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>plant oils (mixtures): eugenol, geraniol, thymol</td>
<td></td>
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</tr>
<tr>
<td>F8</td>
<td>ergosterol binding</td>
<td>Polyene</td>
<td>amphoteric macrolide antifungal antibiotic from Streptomyces natalensis or S. chattanoogensis</td>
<td>natamycin (pimaricin)</td>
<td>Resistance not known. Agricultural, food and topical medical uses.</td>
<td>48</td>
</tr>
<tr>
<td>F9</td>
<td>lipid homeostasis and transfer/storage</td>
<td>CSBPI oxysterol binding protein homologue inhibition</td>
<td>piperidinyl-thiazole-isoxazolines</td>
<td>oxathiapiprolin fluoxapiprolin</td>
<td>Resistance risk assumed to be medium to high (single site inhibitor). Resistance management required (Previously U15).</td>
<td>49</td>
</tr>
<tr>
<td>MOA</td>
<td>TARGET SITE AND CODE</td>
<td>GROUP NAME</td>
<td>CHEMICAL OR BIOLOGICAL GROUP</td>
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<tr>
<td>G1</td>
<td>C14- demethylase in sterol biosynthesis (erg11/cyp51)</td>
<td>DMI-fungicides (Demethylation Inhibitors) (SBI: Class I)</td>
<td>piperazines</td>
<td>triforine</td>
<td>There are big differences in the activity spectra of DMI fungicides.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>pyridines</td>
<td>pyrifl ox</td>
<td>Resistance is known in various fungal species. Several resistance mechanisms are known incl. target site mutations in cyp51 (erg 11) gene, e.g. V135A, Y137F, A379G, I381V; cyp51 promoter; ABC transporters and others.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>pyrimidines</td>
<td>pyriscxazole</td>
<td>generally wise to accept that cross resistance is present between DMI fungicides active against the same fungus.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>imidazoies</td>
<td>fenarimol</td>
<td>DMI fungicides are Sterol Biosynthesis Inhibitors (SBIs), but show no cross resistance to other SBI classes.</td>
<td></td>
</tr>
<tr>
<td>G2</td>
<td>Δ14-reductase and Δ9-Δ7-isomerase in sterol biosynthesis (erg24, erg2)</td>
<td>amines (&quot;morpholines&quot;) (SBI: Class II)</td>
<td>triazoles</td>
<td>azacarbazole, bitertanol, bromuconazole, cyproconazole, difenconazole, diniconazole, epoxiconazole, etaconazole, fenbuconazole, fluquinconazole, flusilazole, flutriafol, hexaconazole, imbenzonazole, ipconazole, metfenfluron, metconazole, myclobutanil, penconazole, propiconazole, simeconazole, tebuconazole, tetraconazole, triadimefon, triadimenol, trifonconazole, prothioconazole</td>
<td>Medium risk. See FRAC SBI Guidelines for resistance management.</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>morpholines</td>
<td>aldin morph, dodermorph, fenpropimorph, tridemorph</td>
<td>Decreased sensitivity for powdery mildews. Cross resistance within the group generally found but not to other SBI classes.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>piperidines</td>
<td>fenpropidin, piperalin</td>
<td>Low to medium risk. See FRAC SBI Guidelines for resistance management.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>spiroketal-amines</td>
<td>spiroxamine</td>
<td></td>
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</tr>
<tr>
<td>G3</td>
<td>3-keto reductase, C4-de-methylation (erg27)</td>
<td>KRI fungicides (KetoReductase Inhibitors) (SBI: Class III)</td>
<td>hydroxyanilides</td>
<td>fenhexamid</td>
<td>Low to medium risk. Resistance management required.</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>amino-pyrroizinone</td>
<td>fenpyrazamine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G4</td>
<td>squalene-epoxidase in sterol biosynthesis (erg1)</td>
<td>(SBI class IV)</td>
<td>thiocarbamates</td>
<td>pyributicarb</td>
<td>Resistance not known, fungicidal and herbicidal activity.</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>allylamines</td>
<td>naphine, terbinafine</td>
<td>Medical fungicides only.</td>
<td></td>
</tr>
<tr>
<td>MOA</td>
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<tr>
<td>H3</td>
<td></td>
<td></td>
<td>Formerly glucopyranosyl antibiotic (validamycin)</td>
<td></td>
<td>reclassified to U18</td>
<td>26</td>
</tr>
<tr>
<td>H4</td>
<td>chitin synthase</td>
<td>polyoxins</td>
<td>peptidyl pyrimidine nucleoside</td>
<td>polyoxin</td>
<td>Resistance known. Medium risk. Resistance management required.</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>cimamic acid amides</td>
<td>dimethomorph</td>
<td>Resistance known in <em>Plasmopara viticola</em> but not in <em>Phytophthora infestans</em>. Cross resistance between all members of the CAA group. Low to medium risk. See FRAC CAA Guidelines for resistance management.</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>vanilamid carbamates</td>
<td>benthiavalicarb</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>mandelic acid amides</td>
<td>iprovalicarb</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>mandelic acid amides</td>
<td>valifenalate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I1</td>
<td>reductase in melanin biosynthesis</td>
<td>MBI-R (Melanin Biosynthesis Inhibitors – Reductase)</td>
<td>isobenzofuranone</td>
<td>fthalide</td>
<td>Resistance not known.</td>
<td>16.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>pyrrol-o-quinolincne</td>
<td>pyroquilon</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>triazolobenzo-thiazole</td>
<td>tricyclazole</td>
<td></td>
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</tr>
<tr>
<td>I2</td>
<td>dehydratase in melanin biosynthesis</td>
<td>MBI-D (Melanin Biosynthesis Inhibitors – Dehydratase)</td>
<td>cyclopropane-carboxamide</td>
<td>carpropanid</td>
<td>Resistance known. Medium risk. Resistance management required.</td>
<td>16.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>carboxamide</td>
<td>diclopyrmet</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>propionamide</td>
<td>fenoxanil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I3</td>
<td>polyketide synthase in melanin biosynthesis</td>
<td>MBI-P (Melanin Biosynthesis Inhibitors – Polyketide sythase)</td>
<td>trifluoroethyl-carbamate</td>
<td>tolprocarb</td>
<td>Resistance not known. Additional activity against bacteria and fungi through induction of host plant defence</td>
<td>16.3</td>
</tr>
<tr>
<td>MOA</td>
<td>TARGET SITE AND CODE</td>
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<tr>
<td>P1</td>
<td>salicylate-related</td>
<td>benzo-thiadiazole (BTH)</td>
<td>benzo-thiadiazole (BTH)</td>
<td>acibenzolar-S-methyl</td>
<td>Resistance not known.</td>
<td>P 01</td>
</tr>
<tr>
<td>P2</td>
<td>salicylate-related</td>
<td>benzisothiazole</td>
<td>benzothiazole</td>
<td>probenazole (also antibacterial and antifungal activity)</td>
<td>Resistance not known.</td>
<td>P 02</td>
</tr>
<tr>
<td>P3</td>
<td>salicylate-related</td>
<td>thiadiazole-carboxamide</td>
<td>thiadiazole-carboxamide</td>
<td>tiadinil isothianil</td>
<td>Resistance not known.</td>
<td>P 03</td>
</tr>
<tr>
<td>P4</td>
<td>polysaccharide elicitors</td>
<td>natural compound</td>
<td>polysaccharides</td>
<td>laminarin</td>
<td>Resistance not known.</td>
<td>P 04</td>
</tr>
<tr>
<td>P5</td>
<td>anthraquinone elicitors</td>
<td>plant extract</td>
<td>complex mixture, ethanol extract (anthraquinone, resveratrol)</td>
<td>extract from <em>Reynoutria sachalinensis</em> (giant krotweed)</td>
<td>Resistance not known.</td>
<td>P 05</td>
</tr>
<tr>
<td>P6</td>
<td>microbial elicitors</td>
<td>bacterial Bacillus spp.</td>
<td></td>
<td></td>
<td>Resistance not known.</td>
<td>P 06</td>
</tr>
<tr>
<td>P7</td>
<td>phosphonates</td>
<td>ethyl phosphonates</td>
<td>fosetyl-Al</td>
<td></td>
<td>Few resistance cases reported in few pathogens. Low risk. Reclassified from U33 in 2018</td>
<td>P 07 (33)</td>
</tr>
<tr>
<td>MOA</td>
<td>TARGET SITE AND CODE</td>
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</tr>
<tr>
<td>unknown</td>
<td>cyanoacetamide-oxime</td>
<td>cyanoacetamides-oxime</td>
<td>cymoxanil</td>
<td>Resistance claims described. Low to medium risk. Resistance management required.</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>unknown</td>
<td>phthalamic acids</td>
<td>phthalamic acids</td>
<td>teclofalam (Bactericides)</td>
<td>Resistance not known.</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>unknown</td>
<td>benzotriazines</td>
<td>benzotriazines</td>
<td>triazoxide</td>
<td>Resistance not known.</td>
<td>35</td>
<td></td>
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<tr>
<td>unknown</td>
<td>benzenesulfonamides</td>
<td>benzenesulphonamides</td>
<td>fiesulfanamide</td>
<td>Resistance not known.</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>unknown</td>
<td>pyridazinoones</td>
<td>pyridazinoones</td>
<td>diclomezine</td>
<td>Resistance not known.</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>formerly methasulforcarb (FRAC code 42), reclassified to M 12 in 2018</td>
<td>unknown</td>
<td>phenyl-acetamide</td>
<td>phenyl-acetamide</td>
<td>cyfluenamid</td>
<td>Resistance in Sphaerotheca. Resistance management required</td>
<td>U 06</td>
</tr>
<tr>
<td>cell membrane disruption (proposed)</td>
<td>unknown</td>
<td>guanidines</td>
<td>guanidines</td>
<td>dodine</td>
<td>Resistance known in Venturia inaequalis. Low to medium risk. Resistance management recommended</td>
<td>U 12</td>
</tr>
<tr>
<td>unknown</td>
<td>thiazolidine</td>
<td>cyano-methylene-thiazolidines</td>
<td>flutanil</td>
<td>Resistance in Sphaerotheca. Resistance management required</td>
<td>U 13</td>
<td></td>
</tr>
<tr>
<td>unknown</td>
<td>pyrimidinone-hydrazones</td>
<td>pyrimidinone-hydrazones</td>
<td>ferimzone</td>
<td>Resistance not known (previously C5)</td>
<td>U 14</td>
<td></td>
</tr>
<tr>
<td>(U numbers not appearing in the list derive from reclassified fungicides)</td>
<td>complex III: cytochrome bc1, unknown binding site (proposed)</td>
<td>4-quinolyacetate</td>
<td>4-quinolyacetates</td>
<td>tebufloquin</td>
<td>Not cross resistant to QoI. Resistance risk unknown but assumed to be medium. Resistance management required</td>
<td>U 16</td>
</tr>
<tr>
<td>Unknown</td>
<td>tetrazoloxime</td>
<td>tetrazoloximes</td>
<td>picarbretoxax</td>
<td>Resistance not known. Not cross resistant to PA, QoI, CAA.</td>
<td>U 17</td>
<td></td>
</tr>
<tr>
<td>Unknown (Inhibition of trehalase)</td>
<td>glucopyranosyl antibiotic</td>
<td>glucopyranosyl antibiotics</td>
<td>validarnych</td>
<td>Resistance not known. Induction of host plant defense by trehalase proposed (previously H3)</td>
<td>U 18</td>
<td></td>
</tr>
<tr>
<td>MOA</td>
<td>TARGET SITE AND CODE</td>
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<td>COMMENTS</td>
<td>FRAC CODE</td>
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</tr>
<tr>
<td>NC: not classified</td>
<td>unknown</td>
<td>diverse</td>
<td>diverse</td>
<td>mineral oils, organic oils, inorganic salts, material of biological origin</td>
<td>Resistance not known.</td>
<td>NC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>inorganic (electrophiles)</td>
<td>inorganic</td>
<td>M 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>inorganic (electrophiles)</td>
<td>inorganic</td>
<td>M 02</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>dithiocarbamates and relatives (electrophiles)</td>
<td>dithiocarbamates and relatives</td>
<td>M 03</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>phthalimides (electrophiles)</td>
<td>phthalimides</td>
<td>M 04</td>
</tr>
<tr>
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<td></td>
<td>chloronitriles (phthalonitriles) (unspecifed mechanism)</td>
<td>chloronitriles (phthalonitriles)</td>
<td>M 05</td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td>sulfamides (electrophiles)</td>
<td>sulfamides</td>
<td>M 06</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>bis-guanidines (membrane disruptors, detergents)</td>
<td>bis-guanidines</td>
<td>M 07</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>triazines (unspecified mechanism)</td>
<td>triazines</td>
<td>M 08</td>
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<td></td>
<td>quinones (anthraquinones) (electrophiles)</td>
<td>quinones (anthraquinones)</td>
<td>M 09</td>
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<td></td>
<td></td>
<td></td>
<td>quinoxalines (electrophiles)</td>
<td>quinoxalines</td>
<td>M 10</td>
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<tr>
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<td></td>
<td></td>
<td>maleimide (electrophiles)</td>
<td>maleimide</td>
<td>M 11</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>thiocarbanate (electrophiles)</td>
<td>thiocarbamate</td>
<td>M 12</td>
</tr>
</tbody>
</table>

M: Chemicals with multi-site activity

multi-site contact activity
<table>
<thead>
<tr>
<th>MOA</th>
<th>TARGET SITE</th>
<th>GROUP NAME</th>
<th>CHEMICAL OR BIOLOGICAL GROUP</th>
<th>COMMON NAME</th>
<th>COMMENTS</th>
<th>FRAC CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>multiple effects on cell wall, ion membrane transporters; chelating effects</td>
<td>plant extract</td>
<td>polypeptide (lecitin)</td>
<td>extract from the cotyledons of lupine plantlets (&quot;BLAD&quot;)</td>
<td>Resistance not known (previously M12).</td>
<td>BM 01</td>
</tr>
<tr>
<td></td>
<td>affects fungal spores and germ tubes, induced plant defence</td>
<td>plant extract</td>
<td>Phenols, Sesquiterpenes, Triterpenoids, Coumarins</td>
<td>extract from Swinglea glutinosa</td>
<td>Resistance not known</td>
<td></td>
</tr>
<tr>
<td></td>
<td>multiple effects described (examples, not all apply to all biological groups): competition, mycoparasitism, antibiotics, membrane disruption by fungicidal lipopeptides, lytic enzymes, induced plant defence</td>
<td>microbial (living microbes or extract, metabolites)</td>
<td>fungal Trichoderma spp.</td>
<td>Trichoderma atroviride strain I-1237</td>
<td>Resistance not known</td>
<td>BM 02</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>fungal Clonostachys spp.</td>
<td>Trichoderma atroviride strain LU132</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Trichoderma atroviride strain SC1</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Trichoderma asperellum strain T34</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>bacterial Bacillus spp.</td>
<td>Gliocladium catenulatum strain J1446</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Clonostachys rosea strain CR-7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>bacterial Pseudomonas spp.</td>
<td>Bacillus amyloliquefaciens strain QST713</td>
<td>synonymous for Bacillus amyloliquefaciens are Bacillus subtilis and B. subtilis var. amyloliquefaciens (previous taxonomic classification). Bacillus amyloliquefaciens reclassified from F6, Code 44 in 2020</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>strain FZB24 strain MB600 strain D747 strain F727 Bacillus subtilis strain AFS032321</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>bacterial Streptomyces spp.</td>
<td>Pseudomonas chlororaphis strain AFS009</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Streptomyces griseovirides strain K61</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Streptomyces lydicus strain WYEC108</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Alfalfa - Clover - Small-seeded Legumes

## Seed Treatment

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Control² of Seeding Blights³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prothioconazole (3) + Penflufen (7) + Metalaxyl (4)</td>
<td>Slurry or mist</td>
<td>3.0 fl oz/cwt</td>
<td>X</td>
<td>For control of seed rot and damping-off caused by <em>Rhizoctonia</em>.</td>
</tr>
<tr>
<td>EverGoi Energy, 7.18%, 3.59%; 5.74%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mefenoxam (4)</td>
<td>Slurry</td>
<td>0.64 fl oz/cwt</td>
<td>X</td>
<td>For control of <em>Pythium</em> damping off and early season <em>Phytophora</em> only.</td>
</tr>
<tr>
<td>Apron XL, 33.3 %</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metalaxyl (4)</td>
<td>Slurry or mist</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td>For control of <em>Pythium</em> damping off and early season <em>Phytophora</em> only.</td>
</tr>
<tr>
<td>Allegiance FL, 28.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dyna-Shield, 28.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setring 318 FS, 28.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allegiance Dry Seed Protectant, 12.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belmont 2.7 FS, 28.98%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiram (M3)</td>
<td>Liquid or slurry</td>
<td>8 fl oz/cwt</td>
<td>X</td>
<td>For small-seeded legumes.</td>
</tr>
<tr>
<td>42-S Thiram, 42%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signet 480 FS, 42%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tolclofos-methyl (14)</td>
<td>Slurry or mist</td>
<td>0.3 fl oz/cwt</td>
<td>X</td>
<td>For control of <em>Rhizoctonia</em>, <em>Fusarium</em>, and other seed-borne and soil-borne diseases.</td>
</tr>
<tr>
<td>Rizolex, 42%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Dosage = amount of formulated product to apply.
²X = product labeled for crop and disease; Blank = product not labeled for specific disease.
³Seedling blights due to various fungal infections of seed.
# Alfalfa - Clover - Small-seeded Legumes
## Foliar Sprays

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application(^1)</th>
<th>Dosage(^2)</th>
<th>Disease Control(^3)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bacillus subtilis</strong> strain QST 713 (44) Serenade ASO, 1.34%</td>
<td>Spray or fungigation</td>
<td>2-6 qt/A</td>
<td>X</td>
<td>Begin application when environmental conditions and plant stage are conducive to disease development.</td>
</tr>
<tr>
<td><strong>Azoxytrobin (11)</strong> AZteroid FC 3.3, 34.3%</td>
<td>Spray or fungigation</td>
<td>3.9-9.7 fl oz/A</td>
<td>X</td>
<td>Begin applications prior to disease onset and continue throughout the year making no more than 3 consecutive applications of AZteroid FC 3.3 or other Group 11 fungicide before alternating to a fungicide with a different mode of action.</td>
</tr>
<tr>
<td><strong>Penthiopyrad (7)</strong> Fontolis, 20.4%</td>
<td>Spray or fungigation</td>
<td>14.24 fl oz/A for 16.24 fl oz/A for white mold</td>
<td>X</td>
<td>Begin applications prior to disease development and continue on a 7-14 day interval. Use higher rate and shorter interval when disease pressure is high. Do not exceed 48 fl oz/A/year. PHI = 14 days.</td>
</tr>
<tr>
<td><strong>Picoxytrobin (11)</strong> Aproach SC, 22.5%</td>
<td>Spray or fungigation</td>
<td>6-12 fl oz/A</td>
<td>X</td>
<td>Begin applications in the spring at green-up and when 1-3 new leaves have grown after each cutting. Do not apply more than 12 fl oz/A per cutting. Do not exceed 36 fl oz/A per year. PHI = 14 days.</td>
</tr>
<tr>
<td><strong>Pyraclostrobin (11)</strong> Headline EC, 23.6% Headline SC, 23.3%</td>
<td>Spray or fungigation</td>
<td>6-9 fl oz/A</td>
<td>X</td>
<td>For use in alfalfa. PHI = 14 days.</td>
</tr>
<tr>
<td><strong>Pyraclostrobin (11) + Fluxapyroxad (7)</strong> Pnaxor, 28.58%; 14.33%</td>
<td>Spray or fungigation</td>
<td>4-6.9 fl oz/A</td>
<td>X</td>
<td>Begin applications prior to onset of disease. Do not apply within 14 days of grazing or harvest. Do not apply more than 20.7 fl oz/A per year. Do not use on rangeland.</td>
</tr>
</tbody>
</table>

\(^1\) Spray = ground or aerial. Fungigation = application through sprinkler irrigation system.

\(^2\) Dosage = amount of formulated product to apply.

\(^3\) X = product labeled for crop and disease; Blank = product not labeled for specific disease.
## Barley-Oat-Rye-Wheat Seed Treatment

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Appl.</th>
<th>Dosage¹</th>
<th>Disease Control²</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Covered Smut</td>
<td>Loose Smut</td>
<td>Seedling Blight³</td>
</tr>
<tr>
<td><strong>Azoxystrobin (11)</strong> Dynasty, 9.6%</td>
<td>Slurry</td>
<td>0.153-0.382 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Saxony 100 FS, 9.67%</td>
<td>Slurry</td>
<td>0.1-3.75 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Carboxin (7)</strong> Vitavax-34, 34%</td>
<td>Slurry or mist</td>
<td>2-3 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Chenopodium quinoa saponins Heads Up Plant Protector</td>
<td>Slurry</td>
<td>0.16 oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Carboxin (7) + Ipconazole (3)</strong> Rancona V100 Pro, 35.52%; 2.22%</td>
<td>Slurry or mist</td>
<td>0.9-1.5 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Carboxin (7) + Thiram (M3)</strong> Vitafo-280, 15.59%; 13.25%</td>
<td>Slurry or mist</td>
<td>3.5-5 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Difenoconazole (3)</strong> Salient 372 FS, 33.3%</td>
<td>Slurry or mist</td>
<td>0.5-1 fl oz/cwt</td>
<td>X (bunt)</td>
<td>X</td>
</tr>
<tr>
<td><strong>Difenoconazole (3) + Metalaxyl (4) + Tebuconazole (3)</strong> Aprrise, 3.57%; 1.84%; 0.39%; Lancaster, 3.57%; 1.84%; 0.39%</td>
<td>Slurry or mist</td>
<td>5-7.5 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

¹Dosage = amount of formulated product to apply.
²X = product labeled for crop and disease; Blank = product not labeled for specific disease.
³Seedling blights due to fungal infections of the seed such as black point and scab.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Appl.</th>
<th>Dosage</th>
<th>Disease Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Difenconazole (3)</strong> + <strong>Mefenoxam (4)</strong></td>
<td>Slurry</td>
<td>1 fl oz/cwt common bunt, loose smut, <em>Fusarium</em> seed scab</td>
<td>X(bunt)</td>
<td>For barley, oats, rye, triticale, and spring wheat. See label for winter wheat recommendations. Registered on barley to suppress root rots and covered smut, and control seedling blight, at a rate of 2-4 fl oz/cwt.</td>
</tr>
<tr>
<td>Dividend Extreme, 7.73%: 1.93%</td>
<td></td>
<td>2-4 fl oz/cwt as above, plus seed-borne <em>Septoria, Penicillium</em> and <em>Aspergillus</em> seed rots, <em>Pythium</em> damping off, early season common root rot (<em>Cochliobolus</em> <em>Rhizoctonia</em> root rot, flag smut, early season take-all root rot</td>
<td>X(bunt)</td>
<td></td>
</tr>
<tr>
<td><strong>Ethaboxam (22)</strong></td>
<td>Slurry or mist</td>
<td>0.20-0.26 fl oz/cwt</td>
<td></td>
<td>For control of <em>Pythium</em>.</td>
</tr>
<tr>
<td>Intego Solo, 34.2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ethaboxam (22) + Metalaxyl (4) + Metconazole (3) + Clothianidin</strong></td>
<td>Slurry or mist</td>
<td>5.2 fl oz/cwt</td>
<td>X</td>
<td>For wheat, barley, and oats. Controls seed-borne and soil-borne diseases and insects. For commercial and on-farm application with mechanical, slurry, or mist-type seed treating equipment.</td>
</tr>
<tr>
<td>Intego SUITE Cereals OF: 1.4%; 0.84%, 0.42%; 2.81%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fludioxonil (12)</strong></td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td></td>
<td>For control of seed-borne and soil-borne fungi that cause seed decay, damping off and seedling blight. Cereal forage may be grazed 30 days after planting.</td>
</tr>
<tr>
<td>Maxim 4FS, 40.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spirato 480 FS</strong></td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Dyna-Shield Fludioxonil</strong></td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Fluxapyroxad (7) + Pyraclostrobin (11) + Triticonazole (3) + Metalaxyl (4)</td>
<td>Liquid or Slurry</td>
<td>4.6 oz/cwt</td>
<td>X</td>
<td>For commercial and on-farm use. Registered for barley, oats, rye, triticale, and wheat.</td>
</tr>
<tr>
<td>Stamina F4 Cereals 0.78%:1.57%:1.57%:0.94%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Dosage = amount of formulated product to apply.
2 X = product labeled for crop and disease; Blank = product not labeled for specific disease.
3 Seedling blights due to fungal infections of the seed such as black point and scab.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Appl.</th>
<th>Dosage</th>
<th>Disease Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ipcnazole (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rancona 3.8 FS, 40.7%</td>
<td>Mist or slurry</td>
<td>0.051-0.085 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Rancona Apex, 0.44%</td>
<td>Mist or slurry</td>
<td>5.0-8.73 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Ipcnazole (3) + Metalaxy (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rancona Pinnacle, 0.434%:0.57%</td>
<td>Mist or slurry</td>
<td>5.0-8.33 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Ipcnazole (3) + Metalaxy (4) + Imidacioprid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warden Cereals, 0.421%:0.552%:14.1%</td>
<td>Mist or slurry</td>
<td>5.0-8.33 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Rancona Crest, WR, 0.439%:0.585%:2.95%</td>
<td>Mist or slurry</td>
<td>5.0-8.33 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Rancona Crest, 0.421%:0.562%:14.1%</td>
<td>Mist or slurry</td>
<td>5.0-8.33 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mefenoxam (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apron XL, 33.3%</td>
<td>Mist or slurry</td>
<td>0.32-0.64 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mefentifluconazole (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reonya, 34.93%</td>
<td>Mist or slurry</td>
<td>0.2-0.4 fl oz/cwt</td>
<td>X (bunt)</td>
<td>X</td>
</tr>
</tbody>
</table>

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3Seedling blights due to fungal infections of the seed such as black point and scab.
### Barley-Oat-Rye-Wheat
#### Seed Treatment (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Appl.</th>
<th>Dosage¹</th>
<th>Disease Control²</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Covered Smut</td>
<td>Loose Smut</td>
</tr>
<tr>
<td><strong>Metalaxyl (4)</strong></td>
<td>Mist or slurry</td>
<td>0.375-0.75 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Allegiance FL, 28.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sebring 318 FS, 28.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dyna-Shield, 28.35%</strong></td>
<td>Slurry</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Berlont 2.7 FS, 28.98%</strong></td>
<td>Slurry or mist</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Sebring 460 FS, 44.08%</td>
<td>Slurry or mist</td>
<td>0.50 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Metalaxyl (4) + Metconazole (3)</strong></td>
<td>Mist or slurry</td>
<td>1.0-1.5 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Metlock CT, 4.51%: 2.25%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Metalaxyl (4) + Metconazole (3) + Clothankinidin</strong></td>
<td>Ready to apply</td>
<td>5-7.5 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Nipsit SUITE Cereals OF, 0.88%; 0.44%; 2.93%; Aprishe F, 0.88%; 0.44%; 2.93%; Lancaster Fin, 0.88%; 0.44%; 2.93%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Metconazole (3)</strong></td>
<td>Mist or Slurry</td>
<td>0.045-0.09 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Metlock, 40%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PCNB (Terraclor)</strong></td>
<td>Slurry</td>
<td>2.4 oz/bu barley, oats 2 oz/bu wheat</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>PCNB Seed Coat, 24%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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²X = product labeled for crop and disease; Blank = product not labeled for specific disease.
³Seedling blights due to fungal infections of the seed such as black point and scab.
### Barley-Oat-Rye-Wheat Seed Treatment (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Appl.</th>
<th>Dosage¹</th>
<th>Disease Control²</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prothioconazole (3) + Penflufen (7) + Metalaxyl (4) EverGol Energy, 7.18%; 3.59%; 5.74%</td>
<td>Slurry or mist</td>
<td>1 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Prothioconazole (3) + Tebuconazole (3) + Metalaxyl (4) + Imidacloprid Raxil Pro Shield, 1.47%; 0.29%; 0.59%; 8.59%</td>
<td>Slurry or mist</td>
<td>5.0 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Pyraclostrobin (11) Stamina, 18.4%</td>
<td>Slurry or mist</td>
<td>0.4-0.8 fl oz/cwt</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Pyraclostrobin (11) + Triticonzole (3) + Metalaxyl (4) Stamina F3 Cereals, 1.59%; 1.59%; 0.93%</td>
<td>Liquid or Slurry</td>
<td>4.5 oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Sedaxane (7) Vibrance, 43.7%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Sedaxane (7) + Difenconazole (3)+ Mefenoxyam (4) Vibrance Extreme 1.22%; 5.96%; 1.46% Warden Cereals, 1.22%; 5.96%; 1.46%</td>
<td>Slurry</td>
<td>2.8-5.6 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

¹Dosage = amount of formulated product to apply.
²X = product labeled for crop and disease; Blank = product not labeled for specific disease.
³Seedling blights due to fungal infections of the seed such as black point and scab
### Barley-Oat-Rye-Wheat Seed Treatment (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Appl.</th>
<th>Dosage&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Disease Control&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Covered Smut</td>
<td>Loose Smut</td>
<td>Seedling Blight&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>Sedaxane (7) + Difenoconazole (3) + Mefenoxam (4) + Thiamethoxam</td>
<td>Slurry</td>
<td>5-10 fl oz</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>(Cruiser Maxx Vibrance Cereals 0.72%; 3.34%; 0.86%; 2.78%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedaxane (7) + Difenoconazole (3) + Mefenoxam (4) + Fludioxonil (12) + Thiamethoxam</td>
<td>Slurry</td>
<td>5.0 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>(Warden Cereals WRII 1.44%; 3.45%; 0.96%; 0.72%; 5.75%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tebuconazole (3) + Metalaxyl (4)</td>
<td>Slurry or mist</td>
<td>3.4-5 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Sativa M RTU 0.48%; 0.64%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sativa IM RTU 0.46%; 0.615%</td>
<td>Slurry or mist</td>
<td>5-6.5 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Sativa IM Max 0.46%; 0.615%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dyna-Shield Foothold 0.499%; 0.668%</td>
<td>Slurry or mist</td>
<td>3.4-5.0 fl oz/cwt oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Dyna-Shield Foothold Extra 0.455%; 0.67%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup>Dosage = amount of formulated product to apply.

<sup>2</sup>X = product labeled for crop and disease; Blank = product not labeled for specific disease.

<sup>3</sup>Seedling blights due to fungal infections of the seed such as black point and scab.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Appl.</th>
<th>Dosage¹</th>
<th>Disease Control²</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Covered Smut</td>
<td>Loose Smut</td>
</tr>
<tr>
<td>Tebuconazole (3) + Metalaxyl (4) + Fludioxonil (12) + Imidacloprid</td>
<td>Slurry</td>
<td>3.4-5 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Footbald Virock, 0.45%; 0.60%; 0.36%; 11.16%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiabendazole (1)</td>
<td>Slurry</td>
<td>1.3 fl oz/cwt for seed-borne common bunt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Merect 340-F, 42.3%</td>
<td></td>
<td>2.6 fl oz/cwt for soil-borne common bunt</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.17 fl oz/cwt for Fusarium seed scab</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.95-3.9 fl oz/cwt for seedling diseases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiram (M3)</td>
<td>Slurry or mist</td>
<td>0.3 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42-S Thiram, 42%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signet 480 FS, 42%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiram 480 DP, 42%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toclofas-methyl (14)</td>
<td>Slurry or mist</td>
<td>0.3 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rizolex, 42%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tebuconazole (3) + Metalaxyl (4) + Fludioxonil (12) + Imidacloprid</td>
<td>Slurry or mist</td>
<td>3.4-5.0 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Salvia IMF Max, 0.45%; 0.6%; 0.36%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Dosage = amount of formulated product to apply.
²X = product labeled for crop and disease; Blank = product not labeled for specific disease.
³Seedling blights due to fungal infections of the seed such as black point and scab.
## Barley-Oat-Rye-Wheat Foliar Sprays

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage</th>
<th>Disease Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Bacillus pumilus</em> strain QST 2808 (44) Sonata, 1.38%</td>
<td>Spray or fungation</td>
<td>1-4 qt/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Hydrogen Peroxide + Peroxyacetic Acid OxiDate 5.0, 27%; 5%</td>
<td>Spray</td>
<td>50-128 fl oz/100 gallons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrogen Peroxide + Peroxyacetic Acid SaniDate 12.0, 18.5%, 12%</td>
<td>Chemigation</td>
<td>Dilution rate is 1:1000 to 20,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phosphoric Acid + Hydrogen Peroxide OxiPhos, 27.1%; 14.0%</td>
<td>Spray</td>
<td>2.5-5.0 qts/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Azoxystrobin (11) Quadris, 22.9% Saton, 22.9% Equation, 22.9% Tetraben, 22.9% Aframe, 22.9% AZteroid FC 3.3, 34.3%</td>
<td>Spray or fungation</td>
<td>6.0-12.0 fl oz/A (12.0 fl oz/A, powdery mildew) 3.9-9.7 fl oz/A (9.7 fl oz/A for powdery mildew)</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

1. Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
2. Dosage = amount of formulated product to apply.
3. X = product labeled for crop and disease; Blank = product not labeled for specific disease.
4. Leaf spot includes fungal leaf diseases such as tan spot, Septoria blotch and spot blotch on wheat, and spot blotch and net blot on barley.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Disease Control&lt;sup&gt;3&lt;/sup&gt;</th>
<th>Remarks&lt;sup&gt;5&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Leaf Spot</td>
<td>Leaf Rust</td>
<td>Stem Rust</td>
</tr>
<tr>
<td>Azoxyctrobicin (11) + Cyproconazole (3)</td>
<td>Spray or fungigation</td>
<td>3.5-6.8 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Azure Xtra, 18.2%; 7.3% RustEase, 18.2%; 7.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Azoxyctrobicin (11) + Propiconazole (3)</td>
<td>Spray or fungigation</td>
<td>7-14 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Quilt 7.0%; 11.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quilt Xcel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.5%; 11.7% Afarme Plus, 13.5%; 11.7%</td>
<td>Spray or fungigation</td>
<td>7-14 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Azoxyctrobicin (11) + Tebuconazole (3)</td>
<td>Spray or fungigation</td>
<td>6.4-8.6 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Custodia, 11.0%; 18.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Azoxyctrobicin (11) + Tebuconazole (3)</td>
<td>Spray or fungigation</td>
<td>6.4-8.6 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Benovindiflupyr (7) + Azoxyctrobicin (11) + Propiconazole (3)</td>
<td>Spray or fungigation</td>
<td>9.4-13.7 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Trivepro 2.9%; 10.5%; 11.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup>Spray = ground or aerial, Fungigation = application through sprinkler irrigation system.
<sup>2</sup>Dosage = amount of formulated product to apply.
<sup>3</sup>X = product labeled for crop and disease; Blank = product not labeled for specific disease.
<sup>4</sup>Leaf spot includes fungal leaf diseases such as tan spot, Septoria blotch and spot blotch on wheat, and spot blotch and net blot on barley.
<sup>5</sup>See fungicide resistance management statements on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper (M1) Champ DP, 57.6%</td>
<td>Spray or fumigation</td>
<td>1.1-1.33 lb/A</td>
<td>X</td>
<td>Most not registered on rye, unless otherwise noted.</td>
</tr>
<tr>
<td>Champ WG, 77%</td>
<td></td>
<td>1.5-2 lb/A</td>
<td>X</td>
<td>Make first application at early heading and follow with second spray 10 days later.</td>
</tr>
<tr>
<td>Champ Formula 2, Flowable, 37.5%</td>
<td></td>
<td>1-1.33 pt/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>ChampION++ 46.1%</td>
<td></td>
<td>0.5-0.75 lb/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cuprofix Ultra 40 Disperss 71.1%</td>
<td></td>
<td>1-1.25 lb/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Kocide 2000, DF 53.8%</td>
<td></td>
<td>1.25-1.5 lb/A</td>
<td>X</td>
<td>Kocide 3000 and ChampION++ can be applied as a foliar application for early season disease control and again at early heading and followed with another application 10 days later.</td>
</tr>
<tr>
<td>Kocide 3000, DF 46.1%</td>
<td></td>
<td>0.5-0.75 lb</td>
<td>X</td>
<td>Make a foliar application for early season disease control and again at early heading and followed with another application 10 days later.</td>
</tr>
<tr>
<td>Kocide 4.5 LF, 37.5%</td>
<td></td>
<td>1-1.33 pt/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>MasterCop, 21.46%</td>
<td></td>
<td>0.5-1.5 pt/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Badge SC 32.17%</td>
<td></td>
<td>0.5-1.8 pt/A</td>
<td>X</td>
<td>Labeled for rye.</td>
</tr>
<tr>
<td>Badge X2 45.31%</td>
<td></td>
<td>0.5-1.8 lb/A</td>
<td>X</td>
<td>Labeled for rye.</td>
</tr>
<tr>
<td>Cyproconazole (3) Alto, 8.9%</td>
<td>Spray or fumigation</td>
<td>1.5-5.5 fl oz/A</td>
<td>X</td>
<td>For wheat and triticale only. Low rate for early season leaf spot suppression. For 3.0 or 5.5 fl oz rate, apply between Feekes 8 and 10.51. PHI = 30 days.</td>
</tr>
</tbody>
</table>

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²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴Leaf spot includes fungal leaf diseases such as tan spot, Septoria blotch and spot blotch on wheat, and spot blotch and net blot on barley.
⁵See fungicide resistance management statements on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fluoxastrobin (11)</strong></td>
<td>Spray or fungigation</td>
<td>2.0-4 fl oz/A</td>
<td>X X X X</td>
<td>Resistance statement 5⁵. Do not apply more than 8.0 fl oz/yr. Begin applications preventively and continue as needed on a 14-21-day interval. Apply from Feekes 5 up to late head emergence (Feekes 10.5).</td>
</tr>
<tr>
<td>Evito 480SC, 40.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fluoxastrobin (11)</strong></td>
<td>Spray</td>
<td>2-6 fl oz/A</td>
<td>X X X X</td>
<td>Resistance statement 5⁵ &amp; 3⁵. For wheat only. Apply prior to disease development and up to Feekes 10.5. Do not exceed 12 fl oz/A per season. PHI = 40 days for grain, 15 days for hay and 7 days for forage. Do not tank mix with any bromoxynil product.</td>
</tr>
<tr>
<td>+ Flutriafol (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fortix, 14.84%;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preemptor, 14.84%;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Flutriafol (3)</strong></td>
<td>Spray or fungigation</td>
<td>10-14 fl oz/A</td>
<td>X X X X</td>
<td>Registered for use on wheat (spring and winter) only. Do not exceed 2 applications or 28 fl oz/year. PHI = 30 days.</td>
</tr>
<tr>
<td>Topguard 11.8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fluxapyroxad (7)</strong></td>
<td>Spray or fungigation</td>
<td>4-8 fl oz/A</td>
<td>X X X X</td>
<td>Resistant statement 5⁵ &amp; 6⁵. For barley and oats: apply no later than 50% head emergence (Feekes 10.3). For wheat, rye and triticale: apply no later than beginning of flowering.</td>
</tr>
<tr>
<td>+ Pyraclostrobin (11)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Priaxor, 14.33%; 28.58%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mancozeb (M3)</td>
<td>Spray or fungigation</td>
<td>2.1 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Dithane DF Rainshied NT, 75%</td>
<td>Spray or fungigation</td>
<td>1.6 qt/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Dithane F-45, 37%</td>
<td>Spray or fungigation</td>
<td>2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Dithane M-45, 80%</td>
<td>Spray or fungigation</td>
<td>2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Dithane WSP, 80%</td>
<td>Spray or fungigation</td>
<td>2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Koverall, 75%</td>
<td>Spray or fungigation</td>
<td>2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Manzate Max, 37%</td>
<td>Spray or fungigation</td>
<td>1.6 qt/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Manzate Pro-Stick, 75%</td>
<td>Spray or fungigation</td>
<td>2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Pennczeb, 80 WP, 80%</td>
<td>Spray or fungigation</td>
<td>1-2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Pennczeb 75 DF, 75%</td>
<td>Spray or fungigation</td>
<td>1.2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Roper DF Rainshied, 75%</td>
<td>Spray or fungigation</td>
<td>2.0 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mancozeb (M3) + Azoxystrobin (11)</td>
<td>Spray or fungigation</td>
<td>2.1 lbs/A</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
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⁵See fungicide resistance management statements on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Leaf Spot</td>
<td>Leaf Rust</td>
</tr>
<tr>
<td>Mancozeb (M3) + Copper (M1)</td>
<td>Spray or fungigation</td>
<td>2-2.5 lbs/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mankocide, 15%:46.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluxapyroxad (7) + Pyraclostrobin (11)</td>
<td>Spray or fungigation</td>
<td>4-8 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Priaxor, 14.33%: 28.58%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mancozeb (M3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dithane DF</td>
<td>Spray or fungigation</td>
<td>2.1 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Rainshield NT, 75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dithane F-45, 37%</td>
<td>Spray or fungigation</td>
<td>1.6 qt/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Dithane M-45, 80%</td>
<td>Spray or fungigation</td>
<td>2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Dithane WSP, 80%</td>
<td>Spray or fungigation</td>
<td>2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Koverall, 75%</td>
<td>Spray or fungigation</td>
<td>2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Manzate Max, 37%</td>
<td>Spray or fungigation</td>
<td>1.6 qt/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Manzate Pro-Stick, 75%</td>
<td>Spray or fungigation</td>
<td>2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Penncotezab, 80 WP, 80%</td>
<td>Spray or fungigation</td>
<td>1-2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Penncotezab 75 DF, 75%</td>
<td>Spray or fungigation</td>
<td>1-2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Roper DF Rainshield, 75%</td>
<td>Spray or fungigation</td>
<td>2.0 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage</th>
<th>Disease Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Leaf Spot</td>
<td>Leaf Rust</td>
</tr>
<tr>
<td>Mancozeb (M3) + Azoxystrobin (11)</td>
<td>Spray or fungigation</td>
<td>2.1 lbs/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Dexter Max, 70%; 5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mancozeb (M3) + Copper (M1)</td>
<td>Spray or fungigation</td>
<td>2-2.5 lbs/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mankocide, 15%:46.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metconazole (3)</td>
<td>Spray or fungigation</td>
<td>10-17 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Caramba, 8.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penthio.pyrid (7)</td>
<td>Spray or fungigation</td>
<td>10-24 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Vertisan, 20.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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5See fungicide resistance management statements on Pages 7-8
## Barley-Oat-Rye-Wheat
### Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Leaf Spot⁴</td>
<td>Leaf Rust</td>
</tr>
<tr>
<td>Picoxystrobin (11) Aproach, 22.5%</td>
<td>Spray or fungigation</td>
<td>2-12 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Picoxystrobin (11) + Cyproconazole (3) Aproach Prima, 17.04%; 7.17%</td>
<td>Spray or fungigation</td>
<td>3.4-6.8 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propiconazole (3) Tilt 3.6EC, 41.8%</td>
<td>Spray or fungigation</td>
<td>2-4 fl oz/A</td>
<td>X  X  X  X  X  X</td>
<td>A 2-4 fl oz/A application for early season leaf disease control. May be applied to wheat until Feekes 10.5. Do not apply more than 8 fl oz per season. Do not apply after Feakes 10.54.</td>
</tr>
<tr>
<td>Fitness, 41.8%</td>
<td>Spray or fungigation</td>
<td>2.4 fl oz/A</td>
<td>X  X  X  X  X  X</td>
<td></td>
</tr>
<tr>
<td>PropiMax EC, 41.8%</td>
<td>Spray or fungigation</td>
<td>2.4 fl oz/A</td>
<td>X  X  X  X  X  X</td>
<td></td>
</tr>
<tr>
<td>Topaz 41.8%</td>
<td>Spray or fungigation</td>
<td>2.4 fl oz/A</td>
<td>X  X  X  X  X  X</td>
<td></td>
</tr>
<tr>
<td>Bumper 41.8 EC 41.8%</td>
<td>Spray or fungigation</td>
<td>2.4 fl oz/A</td>
<td>X  X  X  X  X  X</td>
<td></td>
</tr>
<tr>
<td>Bumper ES, 40.85%</td>
<td>Spray or fungigation</td>
<td>2.4 fl oz/A</td>
<td>X  X  X  X  X  X</td>
<td></td>
</tr>
<tr>
<td>Propiconazole E-AG, 41.8%</td>
<td>Spray</td>
<td>2.4 fl oz/A</td>
<td>X  X  X  X  X  X</td>
<td></td>
</tr>
<tr>
<td>Propicure 3.8F, 41.8%</td>
<td>Spray or fungigation</td>
<td>2.4 fl oz/A</td>
<td>X  X  X  X  X  X</td>
<td></td>
</tr>
<tr>
<td>Prothioconazole (3) Proline 480 SC, 41%</td>
<td>Spray</td>
<td>4.3-5.7 fl oz/A</td>
<td>X  X  X  X  X  X</td>
<td>Registered for use in wheat (including durum), barley, oat and rye. Apply for Fusarium head blight (scab) when the main stems of barley plants are fully headed or when 15% of the main-stem plants of wheat have started flowering. Do not make more than 2 applications of Proline per year. For maximum disease control, tank mix with the lowest rate of a nonionic surfactant and then apply 15-20 gpa by ground or 5 gpa by air. Do not apply within 32 days of barley harvest or 30 days of wheat harvest.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application1</th>
<th>Dosage2</th>
<th>Disease Control3</th>
<th>Remarks5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prothioconazole + Tebuconazole (3)</strong>&lt;br&gt;Prosaro 421 SC, 19.0%; 19.0%</td>
<td>Spray</td>
<td>6.5-8.2 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Pydiflumetofen (7) + Propiconazole (3)</strong>&lt;br&gt;Miravis Ace, 13.7%; 11.4%</td>
<td>Spray or fungigation</td>
<td>13.7 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Pyraclostrobin (11)</strong>&lt;br&gt;Headline EC, 23.6%;&lt;br&gt;Headline SC, 23.3%</td>
<td>Spray or fungigation</td>
<td>6-9 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Pyraclostrobin (11) + Fluxapyroxad (7) + Propiconazole (3)</strong>&lt;br&gt;Nexcor, 18.76%; 2.81%; 11.73%</td>
<td>Spray or fungigation</td>
<td>3.5-13 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Sulfur (M)</strong>&lt;br&gt;Sulfur DF, 80%</td>
<td>Spray</td>
<td>6-15 lb/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tebuconazole (3), 38.7% Monsoon, Muscle, Onset, Orius 3.6F, Tebucon, Tebuslar, Teburol, and Toledo</td>
<td>Spray</td>
<td>4 fl oz/A</td>
<td>X</td>
<td>叶斑</td>
</tr>
<tr>
<td>Trifloxystrobin (11) + Propiconazole (3) Stratego 11.4%/11.4%</td>
<td>Spray or fungigation</td>
<td>10 fl oz/A (wheat)</td>
<td>X</td>
<td>rusty leaf</td>
</tr>
</tbody>
</table>

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# Canola (Rapeseed)
## Seed Treatment

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage $^1$</th>
<th>Disease Control $^2$</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azoxystrobin (11) Dendron, 9.6%</td>
<td>Slurry</td>
<td>0.10-3.75 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Saxony 100 FS, 9.67%</td>
<td>Slurry</td>
<td>0.1-3.75 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Carboxin (7) + Ipconazole (3)</td>
<td>Rencor Va RS, 6.78%; 0.73%</td>
<td>Slurry or mist</td>
<td>12.3 fl oz/cwt</td>
<td>X</td>
</tr>
<tr>
<td>Clofazinid + Penflutien (7) + Trifloxystrobin (11) + Metalaxyl (4) Prosper EverGol, 22.32%; 0.62%; 0.55%; 0.55%</td>
<td>Slurry or mist</td>
<td>21.5 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Difenoconazole (3)</td>
<td>Salient 372 FS, 33.3%</td>
<td>Slurry or mist</td>
<td>1 fl oz/cwt</td>
<td>X</td>
</tr>
<tr>
<td>Ethaboxam (22)</td>
<td>Intego Solo, 34.2%</td>
<td>Slurry or mist</td>
<td>0.2-0.3 fl oz/cwt</td>
<td>X</td>
</tr>
<tr>
<td>Fludioxonil (12) Maxim 4FS, 40.3%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Spiriot 480 FS</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Dyna-Shield Fludioxonil, 40.3%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Fluxapyroxad (7) + Pyraclostrobin (11) + Metalaxyl (4)</td>
<td>Obstrius, 1.58%; 1.58%; 1.26%</td>
<td>RTA Slurry</td>
<td>9.2 fl oz/cwt</td>
<td>X</td>
</tr>
</tbody>
</table>

$^1$Dosage = amount of formulated product to apply.
$^2$X = product labeled for crop and disease; Blank = product not labeled for specific disease.
$^3$Seedling bights due to various fungal infections of seed.
<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Disease Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mefenoaxm (4) Apron XL, 33.3 %</td>
<td>Slurry</td>
<td>0.32 fl oz/cwt</td>
<td>X</td>
<td>For suppression of Pythium.</td>
</tr>
<tr>
<td>Metalaxyl (4) Allegiance FL, 28.35% Sebring 318 FS, 28.35% Belmont 2.7 FS, 28.89% Sebring 480 FS, 44.08%</td>
<td>Mist or slurry</td>
<td>0.25-0.5 fl oz/cwt</td>
<td>X</td>
<td>For Pythium damping off only</td>
</tr>
<tr>
<td>Pydiflumetofen (7) Saltro, 41.7%</td>
<td>Slurry</td>
<td>1.23 fl oz/cwt</td>
<td>X</td>
<td>Control of seed- and air-borne blackleg.</td>
</tr>
<tr>
<td>Pyraclostrobin (11) Stamina, 18.4%</td>
<td>Slurry or mist</td>
<td>1.5-3.1 fl oz/cwt</td>
<td>X</td>
<td>Control of Rhizoctonia solani and suppression of Fusarium sp. and Pythium sp.</td>
</tr>
<tr>
<td>Sedaxane (7) Vibrance, 43.7%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt or 2.5-5 gal/100 kg seed</td>
<td>X</td>
<td>For seed decay, seedling blight and damping off caused by Rhizoctonia solani</td>
</tr>
<tr>
<td>Sedaxane (7) + Difenconazole (3) + Mefenoaxm (4) + Fludioxonil (12) + Thiamethoxam Helix Vibrance, 0.2%; 1.25%; 0.4%; 0.13%; 20.7%</td>
<td>Slurry</td>
<td>23 fl oz/cwt</td>
<td>X</td>
<td>For use in commercial seed treatment facilities with closed transfer systems. For seed decay, seedling blight and damping off caused by Pythium, Fusarium, and Rhizoctonia.</td>
</tr>
<tr>
<td>Thiram (M3) Thiram 480 DP, 42%</td>
<td>Mist or Slurry</td>
<td>6.4 fl oz/cwt</td>
<td>X</td>
<td>For use against seed decay, damping-off and seedling blights.</td>
</tr>
</tbody>
</table>

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³Seeding blights due to various fungal infections of seed.
### Canola (Rapeseed)

#### Soil Application

<table>
<thead>
<tr>
<th>Organism</th>
<th>Application</th>
<th>Dosage(^1)</th>
<th>White mold(^2) (Sclerotinia sclerotiorum)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Coniothyrium minitans</em></td>
<td>Soil incorporation</td>
<td>1-2 lb/A</td>
<td>X</td>
<td>Fungus attacks sclerotia of the fungus in the soil.</td>
</tr>
</tbody>
</table>

\(^1\)Dosage = amount of formulated product to apply.  
\(^2\)X = product labeled for crop and disease; Blank = product not labeled for specific disease.

#### Canola Foliar Sprays

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application(^1)</th>
<th>Dosage (^2)</th>
<th>Disease Control(^3)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Bacillus subtilis</em> strain QST 2808 (44) Serenade ASO, 1.34%</td>
<td>Spray or fungigation</td>
<td>2-6 qt/A</td>
<td>Alternaria Black Spot X</td>
<td>Begin applications when environmental conditions and plant stage are conducive to disease development. For disease suppression.</td>
</tr>
<tr>
<td><em>Pythium oligandrum</em> DV 74 (44) Polyversum, 1.0%</td>
<td>Spray or fungigation</td>
<td>1.5-3 fl oz</td>
<td>Black-leg X</td>
<td>Research at NDSU showed efficacy against white mold when applied at 1.5 fl oz, 30 days before flowering and at 3 fl oz at flowering. Do not mix with chemical fungicides.</td>
</tr>
<tr>
<td>Azoxystrubin (11) Quadris, 22.9%; Satori, 22.9% Equation, 22.9% Tetraben, 22.9% Aframe, 22.9% AZeitroid FC 3.3, 34.3%</td>
<td>Spray or fungigation</td>
<td>6.0-15.5 fl oz/A, 3.9-9.7 fl oz/A for AZeitroid FC</td>
<td>Alternaria Black Spot alone: 8.0 fl oz/A at pod stage (95% petal fall). Blackleg: 6.2 fl oz/A at 2-4 leaf stage Alternaria Black Spot or Sclerotinia Stem rot: 9.2-15.4 fl oz/A at 10-25% flowering (3-7 days after first flower).</td>
<td>Resistance statement 5(^4). Alternaria Black Spot alone: 8.0 fl oz/A at pod stage (95% petal fall). Blackleg: 6.2 fl oz/A at 2-4 leaf stage Alternaria Black Spot or Sclerotinia Stem rot: 9.2-15.4 fl oz/A at 10-25% flowering (3-7 days after first flower).</td>
</tr>
<tr>
<td>Azoxystrubin (11) + Benzovindiflupyr (7) Elatus, 30.0%; 15.0%</td>
<td>Spray or fungigation</td>
<td>7.3 fl oz/A</td>
<td>X</td>
<td>Resistance statement 5(^4). For blackleg, apply during rosette stage between 2(^{nd}) true leaf and bolting. For Alternaria, make an application at the end of flowering. Do not apply more than 7.3 fl oz/A per year and a maximum of one application per year. PHI = 30 days.</td>
</tr>
</tbody>
</table>

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## Canola
### Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boscalid (7)</strong></td>
<td>Spray or fungigation</td>
<td>5-6 oz/A</td>
<td>X</td>
<td>Apply at 20-50% flowering prior to the onset of disease. Apply a second application if conditions continue to be favorable for disease development.</td>
</tr>
<tr>
<td>Endura, 70%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fluopyram (7) + Prothioconazole (3)</strong></td>
<td>Spray or fungigation</td>
<td>13.6 fl oz/A</td>
<td>X</td>
<td>For optimum disease control, apply at early flowering. Do not apply more than 27.2 fl oz/A per year. Do not apply ProPulse within 36 days of harvest.</td>
</tr>
<tr>
<td>ProPulse 17.4%; 17.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fluxapyroxad (7) + Pyraclostrobin (11)</strong></td>
<td>Spray or fungigation</td>
<td>4-8 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Priaxor, 14.33% + 28.58%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Isoflutestic (7)</strong></td>
<td>Spray</td>
<td>10.25-12 fl oz/A</td>
<td>X</td>
<td>Begin applications at 20-40% flowering or prior to disease development. Use higher rate for extended disease control. A second application may be made if conditions continue to be favorable for disease development, at least 14 days later. Do not make more than 2 sequential applications before rotating to a fungicide with a different mode of action. Do not apply more than 2 applications/A/year.</td>
</tr>
<tr>
<td>Kenja, 36%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mefentrifluconazole (3)</strong></td>
<td>Spray</td>
<td>2.5-5 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Provysol, 34.93%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴See fungicide resistance management statements on Pages 7-8
## Canola
### Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage</th>
<th>Disease Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Alternaria Black Spot</td>
<td>Black Leg</td>
</tr>
<tr>
<td>Mefentri fluorazonol e (3) + Pyraclostrobin (11) Velyma, 17.56%; 17.56%</td>
<td>Spray</td>
<td>7-10 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Metconazole (3) Quash WDG, 50%</td>
<td>Spray</td>
<td>2-4 oz/A</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Penthiopyrad (7) Vertisan, 20.6%</td>
<td>Spray or fungigation</td>
<td>14-20 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Picoxystrobin (11) Aproach, 22.5%</td>
<td>Spray</td>
<td>6-12 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Prothioconazole (3) Proline 480 SC, 41%</td>
<td>Spray</td>
<td>4.3-5.7 fl oz/A</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

1Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
2Dosage = amount of formulated product to apply.
3X = product labeled for crop and disease; Blank = product not labeled for specific disease.
4See fungicide resistance management statements on Pages 7-8.
# Canola
## Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage</th>
<th>Disease Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pydifluometofen (7)</strong> + <strong>Azoxystrobin (11)</strong> + <strong>Propiconazole (3)</strong> Miravis Neo, 7.0%; 9.3%; 11.6%</td>
<td>Spray</td>
<td>13.7 oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Pyraclostrobin (11)</strong> Headline EC, 23.6%; Headline SC, 23.3%</td>
<td>Spray</td>
<td>6-12 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Thiophanate Methyl (1)</strong> Topsin M WSB, T-Methyl WSB 70W 70%</td>
<td>Spray or fungigation</td>
<td>1-2 lb/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Incognito 85 WDG</td>
<td>Spray or fungigation</td>
<td>0.8-1.6 lb/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Thiophanate Methyl, WDG 65%</td>
<td>Spray or fungigation</td>
<td>20-40 fl oz/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>T-Methyl 4.5F</td>
<td>Spray or fungigation</td>
<td>13.7 oz/A</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

1Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
2Dosage = amount of formulated product to apply.
3X = product labeled for crop and disease; Blank = product not labeled for specific disease.
4See fungicide resistance management statements on Pages 7-8.
# Chickpea (Garbanzo Bean)
## Seed Treatment

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage(^1)</th>
<th>Control(^2) of Seedling Diseases(^3)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azoxystrobin (11)</td>
<td>Slurry</td>
<td>0.153-0.765 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
<tr>
<td>Dynasty, 9.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saxony 100 FS, 9.67%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carboxin (7) + Thiram (M3)</td>
<td>Ready to use slurry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitafo-280, 15.59%; 13.25%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethaboxam (22)</td>
<td>Slurry</td>
<td>0.3-0.6 fl oz/cwt</td>
<td>X</td>
<td>For management of <em>Aphanomyces</em> and some metalaxyl resistant <em>Pythium</em> species.</td>
</tr>
<tr>
<td>Intego Solo, 34.2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fludioxonil (12)</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fung.</td>
</tr>
<tr>
<td>Maxim 4FS, 40.3%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Spirato 480 FS</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Dyna-Shield Fludioxonil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fludioxonil (12) + Mefenoxam (4)</td>
<td>Slurry</td>
<td>1.5 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Apron Maxx RFC 2.31%; 3.46%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fludioxonil (12) + Mefenoxam (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedaxane (7) + Mefenoxam (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibrance Trio, 2.32%; 2.32%, 13.95%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluxapyroxad (7) + Pyraclostrobin (11) + Metalaxyl (4)</td>
<td>RTA Slurry</td>
<td>4.6 fl oz/cwt</td>
<td>X</td>
<td>Control of <em>Rhizoctonia</em> sp., <em>Fusarium</em> sp., <em>Pythium</em> sp., <em>Botrytis</em> sp., <em>Colletotrichum</em> sp., and <em>Ascochyta</em> sp. (seed-borne).</td>
</tr>
<tr>
<td>Obvius, 1.58%; 1.58%; 1.26%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ipconazole (3)</td>
<td>Slurry or mist</td>
<td>0.085 fl oz/cwt</td>
<td>X</td>
<td>Does not provide control of <em>Pythium</em>.</td>
</tr>
<tr>
<td>Rancona 3.8 FS, 40.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) Dosage = amount of formulated product to apply.
\(^2\) X = product labeled for crop and disease; Blank = product not labeled for specific disease.
\(^3\) Seedling blights due to various fungal infections of seed.

Note: Some seed treatments may affect Rhizobia inoculants; read inoculant label for specific information.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ipconazole (3) + Metalaxyl (4)</td>
<td>Slurry or mist</td>
<td>1.53 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
<tr>
<td>Rancona Summit, 0.902%; 1.44%</td>
<td>Rancona CTS, 2.42%; 1.94%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mefenoxam (4)</td>
<td>Slurry or mist</td>
<td>0.32-0.64 fl oz/cwt</td>
<td>X</td>
<td>For <em>Pythium</em> damping off.</td>
</tr>
<tr>
<td>Apron XL, 33.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mefenoxam (4) + Fludioxonil (12) + Thiamethoxam</td>
<td>Slurry or mist</td>
<td>3 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi and insect.</td>
</tr>
<tr>
<td>Cruiser Maxx, 1.7%; 1.12%; 22.61%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metalaxyl (4)</td>
<td>Slurry or mist</td>
<td>0.75-1.0 fl oz/cwt</td>
<td>X</td>
<td>For <em>Pythium</em> damping off.</td>
</tr>
<tr>
<td>Allegiance FL, 28.35%</td>
<td>Sebring 318 FS, 28.35%</td>
<td>0.25-0.5 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Dyna-Shield, 28.35%</td>
<td>Belmont 2.7 FS, 28.98%</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Prothioconazole (3) + Penflufen (7) + Metalaxyl (4)</td>
<td>Slurry or mist</td>
<td>1 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi and seed rot and damping off caused by <em>Rhizoctonia</em>.</td>
</tr>
<tr>
<td>EverGol Energy, 7.18%; 3.59%; 5.74%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyraclostrobin (11)</td>
<td>Slurry or mist</td>
<td>0.4-1.5 fl oz/cwt</td>
<td>X</td>
<td>For soil-borne and seed-borne fungi and for control of seed and seedling disease caused by <em>Rhizoctonia solani</em>.</td>
</tr>
<tr>
<td>Stamina, 18.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedaxane (7)</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt or 2.5-5 g ai/100 kg of seed</td>
<td>X</td>
<td>For seed decay, seedling blights, and damping off caused by <em>Rhizoctonia</em>.</td>
</tr>
<tr>
<td>Vibrance, 43.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedaxane (7) + Mefenoxam (4) + Fludioxonil (12)</td>
<td>Slurry</td>
<td>1.54 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases caused by <em>Rhizoctonia</em>, <em>Pythium</em>, and <em>Fusarium</em>.</td>
</tr>
<tr>
<td>Vibrance Maxx, 4.69%; 3.52%; 2.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiabendazole (1)</td>
<td>Slurry</td>
<td>2.04 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne <em>Ascochyta, Phoma</em> and seedling diseases caused by <em>Fusarium</em>.</td>
</tr>
<tr>
<td>Merect 340-F, 42.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[^1]: Dosage = amount of formulated product to apply.
[^2]: X = product labeled for crop and disease; Blank = product not labeled for specific disease.
[^3]: Seedling blights due to various fungal infections of seed.

Note: Some seed treatments may affect Rhizobia inoculants; read inoculant label for specific information.
## Chickpea (Garbanzo Bean)
### Seed Treatment (continued)

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage</th>
<th>Control of Seedling Diseases</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiabendazole (1) + Schedaxane (7) + Mefenoxyam (4) + Fludioxonil (12) &lt;br&gt; Vibrate Maxx Puleses RTA, 4.3%; 1.43%; 1.07%; 0.71%</td>
<td>Slurry</td>
<td>5.0 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases caused by Ascochyta, Bctyris, Colletotrichum, Fusarium, Phoma, Phomopsis, Pythium and Rhizoctonia</td>
</tr>
<tr>
<td>Thiabendazole (1) + Schedaxane (7) + Mefenoxyam (4) + Fludioxonil (12) + Thiamethoxam &lt;br&gt; Cruiser Maxx Vibrance Pulses, 4.24%; 1.41%; 1.06%; 0.71%; 8.48%</td>
<td>Slurry</td>
<td>5.0 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases caused by Ascochyta, Phoma, Bctyris, Fusarium, Phomopsis, Pythium and Rhizoctonia</td>
</tr>
<tr>
<td>Thiophane-methyl (1) + Metalaxly (4) + Fluxapyroxad (7) + Pyraclostrobin (11) &lt;br&gt; Obvus Plus, 8.93%; 14.73%; 4.46%; 3.57%</td>
<td>Slurry</td>
<td>1.53 fl oz/cwt</td>
<td>X</td>
<td>Controls Rhizoctonia, Pythium, Fusarium, and anthracnose.</td>
</tr>
<tr>
<td>Tolclofos-methyl (14) &lt;br&gt; Rizolex, 42%</td>
<td>Slurry or mist</td>
<td>0.3 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases. Controls Rhizoctonia and Fusarium species.</td>
</tr>
<tr>
<td>Triloxystrobin (11) &lt;br&gt; Trilex, 22%</td>
<td>Slurry</td>
<td>0.32 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
<tr>
<td>Triloxystrobin (11) + Metalaxyl (4) &lt;br&gt; Trilex 2000, 7.12%; 5.69%</td>
<td>RTU or slurry or mist</td>
<td>1.0 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
</tbody>
</table>

1Dosage = amount of formulated product to apply.  
2X = product labeled for crop and disease; Blank = product not labeled for specific disease.  
3Seedling blights due to various fungal infections of seed.  
Note: Some seed treatments may affect Rhizobia inoculants; read inoculant label for specific information.
# Chickpea (Garbanzo Bean)  
## Foliar Sprays

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control Ascochyta³</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| **Bacillus subtilis**  
strain QST 713 (44)  
Serenade ASO, 1.34% | Spray or fungigation | 2-6 qt/A | | Begin applications when environmental conditions and plant stage are conducive to disease development. |
| **Hydrogen Peroxide**  
+ Peroxyacetic Acid  
OxiDate 5.0, 27%; 5% | Spray or fungigation | 50-128 fl oz/100 gallons | | Label suggests management of several fungal and bacterial diseases. |
| **Hydrogen Peroxide**  
+ Peroxyacetic Acid  
SaniDate 12.0, 18.5%, 12% | Chemigation | Dilution rate is 1:1,000-5,000 | | Label suggests management of several fungal and bacterial diseases. |
| **Phosphoric Acid**  
+ Hydrogen Peroxide  
OxiPhos, 27.1%; 14.0% | Spray | 2.5-5.0 qts/A | | Label suggests management of several fungal and bacterial diseases. |
| **Phosphorus Acid**  
Phostrol, 53.6% | Spray | 2-4 pts/A | | For downy mildew caused by *Phytophthora* spp and *Pythium* spp. |
| **Azoxyostrobin (11)**  
Quadris, 22.9%  
Satori, 22.9%  
Equation, 22.9%  
Terraban, 22.9%  
Aframe, 22.9%  
AZteroid FC 3.3, 34.3% | Spray or fungigation | 6.2-15.4 fl oz/A  
3.9-9.7 fl oz/A for AZteroid FC | X | Resistance Statement 5⁴  
NDSU has documented that *Ascochyta rabiei*, the pathogen that causes Ascochyta blight on chickpeas, is resistant to Qol fungicides in ND and neighboring states. As a result, Qol fungicide applications (including Headline, Quadris, and mixes with them) may not manage the disease. |
| **Azoxyostrobin (11)**  
+ Chlorothalonil (M5)  
Quadris Opti, 4.6%  
.46% | Spray | 1.6-2.4 pt/A | X | Resistance Statement 5⁴  
NDSU has documented that *Ascochyta rabiei*, the pathogen that causes Ascochyta blight on chickpeas, is resistant to Qol fungicides in ND and neighboring states. As a result, Qol fungicide applications (including Headline, Quadris, and mixes with them) may not manage the disease.  
Quadris Opti should not be tank mixed with CCC, MSO or silicon adjuvants. |

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³X = product labeled for crop and disease; Blank = product not labeled for specific disease.  
⁴See fungicide resistance management statements on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application(^1)</th>
<th>Dosage(^2)</th>
<th>Disease Control Ascochyta(^3)</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| Azoxyastrobin (11) + Difenconazole (3) Quadris Top, 18.2%:11.4% | Spray or fungigation | 8-14 fl oz/A | X | Resistance Statement 5\(^4\)  
NDSU has documented that *Ascochyta rabiei*, the pathogen that causes Ascochyta blight on chickpeas, is resistant to QoI fungicides in ND and neighboring states. As a result, QoI fungicide applications (including Headline, Quadris, and mixes with them) may not manage the disease.  
Maximum of 56 fl oz/A season. PHI = 14 days. Quadris Top should be used with an adjuvant such as a non-ionic based surfactant or crop oil concentrate or blend. |
| Azoxyastrobin (11) + Propiconazole (3) Quilt, 7.0%:11.7% | Spray or fungigation | 14 fl oz/A | X | Resistance Statement 5\(^4\)  
NDSU has documented that *Ascochyta rabiei*, the pathogen that causes Ascochyta blight on chickpeas, is resistant to QoI fungicides in ND and neighboring states. As a result, QoI fungicide applications (including Headline, Quadris, and mixes with them) may not manage the disease.  
Maximum of 42 fl oz/A season. PHI = 14 days. |
| Boscalid (7) Endura, 70% | Spray or fungigation | 5 oz/A | X | Labeled for control of *Botrytis* gray mold, *Sclerotinia* white mold and rust. Apply at the beginning of flowering, prior to the onset of disease. Make a second application at full blossom if conditions continue to be favorable for disease development. |
| Chlorothalonil (M5) Bravo Ultrex, or Equus DF 82.5% | Spray or fungigation | 1.25-1.8 lb/A | X | Slate label allows application to begin at onset of disease, with maybe 2-4 weeks before flowering. Repeat at 7-10- day intervals. Do not make more than 4 applications per growing season. Do not apply within 14 days of harvest. Do not apply more than 11.1 lbs/A per season. |
| Bravo WeatherStikZN, 51% | Spray or fungigation | 1.38-2 pt/A | X | |
| Bravo WeatherStik, 54% | Spray or fungigation | 1.38-2 pt/A | X | |
| Echo 720, 54.0% Bravo Ultrex | Spray or fungigation | 1.36-2 pt/A | X | |
| Chlorothalonil 720, 54% | Spray or fungigation | 1.36-2 pt/A | X | |
| Praiz, 54.0% | Spray or fungigation | 1.36-2 pt/A | X | |

\(^1\)Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.  
\(^2\)Dosage = amount of formulated product to apply.  
\(^3\)X = product labeled for crop and disease; Blank = product not labeled for specific disease.  
\(^4\)See fungicide resistance management statements on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage</th>
<th>Disease Control Ascochyta</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyprodinil (9) + Fludioxonil (12) Switch 62.5WG, 37.5%; 25.0%</td>
<td>Spray</td>
<td>11-14 fl oz/A</td>
<td></td>
<td>For suppression of white mold. Begin applications prior to or at the onset of disease. Make first application at 10-20% bloom. Do not apply more than 56 fl oz/A per season. PHI = 7 days.</td>
</tr>
<tr>
<td>Difenoconazole (3) + Benzovindiflupyr (7) Aprovia Top, 11.25%; 7.50%</td>
<td>Spray or fungigation</td>
<td>10.5-11 fl oz/A</td>
<td>X</td>
<td>Begin applications prior to disease onset when conditions are conducive for disease. Do not make more than two sequential applications before alternating to a fungicide from a different group. Do not apply more than 22 fl oz/A per year. PHI = 14 days.</td>
</tr>
<tr>
<td>Fluopyram (7) + Prothioconazole (3) ProPulse, 17.4%;17.4%</td>
<td>Spray</td>
<td>8.0-13.6 fl oz/A</td>
<td>X</td>
<td>Apply at early flower or at the first sign of disease, whichever occurs first. Do not make more than two sequential applications before rotating with a fungicide from a different group. Continue applications as needed on a 10-14 day interval. Do not apply within 7 days of cutting or swathing the crop for harvest or within 14 days of harvest.</td>
</tr>
<tr>
<td>Fluoxastrobin (11) Evito, 40.3%</td>
<td>Spray or fungigation</td>
<td>2.0-4.75 fl oz/A</td>
<td>X</td>
<td>Resistance Statement 5 For optimal disease control, begin applications prior to disease development. NDSU has documented that Ascochyta rabiei is resistant to QoI fungicides (FRAC 11) in ND and neighboring states, and that chemistries may not control Ascochyta blight.</td>
</tr>
<tr>
<td>Fluxapyroxad (7) + Pyraclostrobin (11) Prioxor, 14.33%;28.58%</td>
<td>Spray or fungigation</td>
<td>4-8 fl oz/A</td>
<td>X</td>
<td>Resistance statement 5 For optimal disease control, begin applications prior to disease development. NDSU has documented that Ascochyta rabiei is resistant to QoI fungicides (FRAC 11) in ND and neighboring states, and that chemistries may not control Ascochyta blight.</td>
</tr>
<tr>
<td>Isofetamid (7) Kenja, 36%</td>
<td>Spray</td>
<td>17 fl oz/A</td>
<td></td>
<td>For white mold caused by Sclerotinia and gray mold caused by Botrytis cinerea. Begin applications when plants are at 10-30% bloom. A second application may be applied 7-14 days later. Do not make more than 2 sequential applications before rotating to a fungicide with a different mode of action. Do not apply more than 2 applications/acre/year. PHI = 30 days.</td>
</tr>
<tr>
<td>Mefentrifluconazole (3) Provysol, 34.93%</td>
<td>Spray</td>
<td>2.5-5.0 fl oz/A</td>
<td>X</td>
<td>Controls Alternaria leaf and pod spot, Ascochyta blight; Cercospora leaf spot. Mycosphaerella blight, powdery mildew and rust. Do not apply more than 15 fl oz/A per year.</td>
</tr>
</tbody>
</table>

1Spray = ground or aerial; Fungigation = application through sprinkler irrigation system. 
2Dosage = amount of formulated product to apply. 
3X = product labeled for crop and disease; Blank = product not labeled for specific disease. 
4See fungicide resistance management statements on Pages 7-8.
## Chickpea (Garbanzo Bean)  
### Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage</th>
<th>Disease Control Ascochyta</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| Mefentrifluconazole (3) + Pyraclostrobin (11)  
Vertima, 17.56%;  
17.56% | Spray | 7-10 fl oz/A | X | Controls Alternaria leaf and pod spot, Ascochyta blight, 
Cercospora leaf spot, Mycosphaerella blight, powdery 
mildew and rust. Do not apply more than 20 fl oz/A per year. |

| Metconazole (3)  
Quash, 50% | Spray | 4.0 fl oz/A | X | Apply when conditions favor disease development and prior 
to infection. A second application may be made on a 7-10 day interval. Do not make more than 2 applications per year 
Do not apply more than 8 oz of product/A/year. PHI = 21 days. |

| Penthionyl (7)  
Vertisan, 20.6%  
Fontelis, 20.4% | Spray or fungigation | 14-20 fl oz/A | X | Begin applications prior to disease development. For white 
mold, make initial application at beginning bloom and follow 
with a second application at full bloom. Do not exceed 41 fl 
oz/A per year. PHI = 21 days. |

| Pyoxstrobins (11)  
Aproach, 22.5% | Spray or fungigation | 6-12 fl oz/A | X | Resistance Statement 5  
NDSU has documented that Ascochyta rabiei, the pathogen 
that causes Ascochyta blight on chickpeas, is resistant to 
QoI fungicides in ND and neighboring states. As a result, 
QoI fungicide applications (including Headline, Quadris, and 
mixes with them) may not manage the disease. 
Labeled for white mold when applied at beginning of bloom 
at 8-12 fl oz/A. Do not apply more than 24 fl oz/A per 
season. PHI = 14 days. |

| Prothiiconazole (3)  
Proline 48G SC, 41% | Spray | 5.0-5.7 fl oz/A | X | Apply at early flower or at the first sign of disease, 
whichever occurs first. Use the higher rate when conditions 
are favorable for severe disease pressure and/or when 
growing more disease susceptible varieties. Do not make 
more than three applications per year. Repeat applications 
as needed on a 10-14 day interval. Do not apply within 7 
days of cutting or swathing the crop for harvest. |

| Prothiiconazole (3)  
W + Trifloxistrobin (11)  
Delaro, 16.0%;  
13.7% | Spray or fungigation | 12 fl oz/A | X | Begin applications preventatively and continue as needed 
on a 10-14 day interval. Use shorter intervals when 
conditions are favorable for severe disease pressure. Do 
not make more than 2 applications of Delaro per season. 
Tank mix Delaro at 12 fl oz/A with Proline at 1.0 fl oz/A for 
resistance management. PHI = 30 days. Do not apply within 
7 days of cutting or swathing the crop for forage. |

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1 Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.  
2 Dosage = amount of formulated product to apply.  
3 X = product labeled for crop and disease; Blank = product not labeled for specific disease.  
4 See fungicide resistance management statements on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control Ascochyta³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pydilflumetofen (7) + Difenoconazole (3) Miravis Top, 6.9%; 11.5%</td>
<td>Spray</td>
<td>13.7 fl oz/A</td>
<td>X</td>
<td>Begin applications prior to disease development and continue on 14-day interval. Do not make more than two applications of Miravis Top before alternating to a fungicide that is not group 3 or 7. Maximum use rate is 56 fl oz/A/year. PHI = 14 days.</td>
</tr>
<tr>
<td>Pydilflumetofen (7) + Azoxytrobin (11) + Propiconazole (3) Miravis Neo, 7.0%; 9.3%; 11.6%</td>
<td>Spray</td>
<td>13.7 oz/A</td>
<td>X</td>
<td>First application should be applied before disease is established and no later than the onset of flowering. Do not make more than two applications of Miravis Neo before alternating to a fungicide that is not group 3, 7 or 11. Maximum use rate is 27.4 fl oz/A/year. PHI = 14 days.</td>
</tr>
<tr>
<td>Pyraclostrobin (11) Headline EC, 23.6% Headline SC, 23.3%</td>
<td>Spray or fungigation</td>
<td>6-9 fl oz/A</td>
<td>X</td>
<td>Resistance Statement 5⁴ NDSU has documented that Ascochyta rabiei, the pathogen that causes Ascochyta blight on chickpeas, is resistant to QoI fungicides in ND and neighboring states. As a result, QoI fungicide applications (including Headline, Quadris, and mixes with them) may not manage the disease. Maximum of 18 fl oz/A per season. PHI = 21 days.</td>
</tr>
<tr>
<td>Trifloxystrobin (11) + Prothioconazole (3) Stratego YLD, 32.3%;10.8% Protegam YLD, 32.3%;10.8%</td>
<td>Spray or fungigation</td>
<td>4.0-4.8 fl oz/A</td>
<td>X</td>
<td>Resistance Statement 5⁴ NDSU has documented that Ascochyta rabiei, the pathogen that causes Ascochyta blight on chickpeas, is resistant to QoI fungicides in ND and neighboring states. As a result, QoI fungicide applications (including Headline, Quadris, and mixes with them) may not manage the disease. Apply at early flower or at the first sign of disease, whichever occurs first. Do not exceed 0.28 lb of prothioconazole or 0.24 lb of trifloxystrobin per acre per year. Do not apply within 30 days of harvest. Do not apply within 7 days of cutting or swathing the crop for forage.</td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴See fungicide resistance management statements on Pages 7-8.
## Corn (Field) and Sorghum Seed Treatment

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage(^1)</th>
<th>Control(^2) of Seedling Blights(^3)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Azoxystrobin (11)</strong></td>
<td>Slurry</td>
<td>0.0688 fl oz/80,000 kernel count unit</td>
<td>X</td>
<td>Also controls seed-borne head smut. Use only in combination with labeled rates of Maxim and Apron XL products. For seed-borne and soil-borne fungi causing decay, damping-off, and seedling blight.</td>
</tr>
<tr>
<td>Dynasty, 9.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saxony 100 FS, 9.67%</td>
<td>Slurry</td>
<td>0.1-3.75 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Azoxystrobin (11) + Mefenoxam (4) + Fludioxonil (12) + Sedaxane (7) + Thiabendazole (1)</strong></td>
<td>Slurry</td>
<td>1.2 oz/cwt or 0.53 fl oz/80,000 kernels</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi causing decay, damping-off and seedling blight.</td>
</tr>
<tr>
<td>Vibrance Cinco, 1.13%; 2.25%; 2.83%; 5.67%; 22.70%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Captan (M4)</strong></td>
<td>See individual labels for rates of application, formulations, method of application and registered use</td>
<td>See individual labels for amounts of formulated product to apply.</td>
<td>X</td>
<td>Captan - Diazinon Seed Treater contains 25% diazinon insecticide. Kernel Guard contains 15% diazinon and 25% lindane. Sorghum Guard contains 16.6% lindane insecticide.</td>
</tr>
<tr>
<td>The following captan products are registered for seed treatment of corn and sorghum. Captan - Diazinon Seed Treater, 36.67% Methoxychlor, 70.9% Kernel Guard, 14.67% (corn only) Nu-Gro Captan 4000, 38.7% Sorghum Guard, 32.75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Carboxin (7)</strong></td>
<td>See individual labels for rates of application, formulations, method of application and registered use</td>
<td>See individual labels for amounts of formulated product to apply.</td>
<td>X</td>
<td>Captan - Diazinon Seed Treater contains 25% diazinon insecticide. Kernel Guard contains 15% diazinon and 25% lindane. Sorghum Guard contains 16.6% lindane insecticide.</td>
</tr>
<tr>
<td>Kernel Guard Supreme, 14%</td>
<td>Drill box</td>
<td>1.5 oz/42 lb</td>
<td>X</td>
<td>Kernel Guard contains 10.42% permethrin.</td>
</tr>
<tr>
<td><strong>Chenopodium quinoa saponins</strong></td>
<td>Slurry</td>
<td>0.32 oz/cwt</td>
<td>X</td>
<td>For protection against fungal and bacterial seed diseases of corn.</td>
</tr>
<tr>
<td>Heads Up Plant Protectant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ethaboxam (22)</strong></td>
<td>Slurry or mist</td>
<td>0.2-0.3 fl oz/cwt</td>
<td>X</td>
<td>For control of <em>Pythium</em>. Also registered for sweet corn, sorghum and grain (milo).</td>
</tr>
<tr>
<td>Intego Solo, 34.2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fludioxonil (12)</strong></td>
<td>Slurry</td>
<td>0.036-0.072 fl oz/80,000 kernel count unit</td>
<td>X</td>
<td>For control of seed-borne and soil-borne fungi which cause seed decay, damping off and seedling blight, and seed-borne head smut.</td>
</tr>
<tr>
<td>Maxim 4FS, 40.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spirato 480FS 40.3%</td>
<td>Slurry</td>
<td>0.08 fl oz/cwt for sweet corn</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Dyna-Shield Fludioxonil, 40.3%</td>
<td>Slurry</td>
<td>0.036-0.072 fl oz/80,000 kernel count unit</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

1Dosages for corn apply to field corn. Dosages for sweet corn vary with some products, and others are not registered for sweet corn, so consult the label for sweet corn information. Dosages are amount of formulated product to apply.

2X = product labeled for crop and disease; Blank = product not labeled for specific disease.

3Seedling blights due to various fungal infections of seed.
## Corn (Field) and Sorghum Seed Treatment (continued)

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage(^1)</th>
<th>Control(^2) of Seedling Blights(^3)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fludioxonil (12) + Mefenoxam (4) Maxim XL, 21% : 8.4%</td>
<td>Water-based slurry</td>
<td>0.071 fl oz/80,000 kernel count unit of seed</td>
<td>X</td>
<td>For field corn. Controls seedling blights and fungi causing seed decay and damping off.</td>
</tr>
<tr>
<td>Fludioxonil (12) + Mefenoxam (4) + Azoxystrobin (11) + Thiabendazole (1) Maxim Quattro, 3.32%:2.65%:1.33%:26.5%</td>
<td>Water-based slurry</td>
<td>0.46 fl oz/80,000 kernel count</td>
<td>X</td>
<td>Also controls seed-borne smut.</td>
</tr>
<tr>
<td>Ipconazole (3) Vortex, 40.7%</td>
<td>Water-based Slurry</td>
<td>0.044 fl oz/cwt</td>
<td>X</td>
<td>For protection against soil-borne and seed-borne diseases.</td>
</tr>
<tr>
<td>Mancozeb (M3) Dithane DF Rainshield NT, 75%</td>
<td>Slurry</td>
<td>1.6-3.2 oz/bu field corn 1.6-2.7 oz/bu sorghum</td>
<td>X</td>
<td>Dithane DF, F-45 and M-45 registered for seed treatment of field corn and sorghum but not for seed treatment of sweet corn.</td>
</tr>
<tr>
<td>Dithane M-45, 37%</td>
<td>Drill box or slurry</td>
<td>2.4-4.8 fl oz/bu field corn 2.4-4.0 fl oz/bu sorghum</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Dithane ST, 37%</td>
<td>Slurry or mist</td>
<td>2.4-4.8 fl oz/bu field corn 2.4-4.0 fl oz/bu sorghum</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Dithane M-45, 80% or Dithane WSP, 80%</td>
<td>Drill box or slurry</td>
<td>1.5-3.0 oz/bu field corn 1.5-2.5 oz/bu sorghum</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Grain Guard, 50%</td>
<td>Drill box</td>
<td>3 oz/bu</td>
<td>X</td>
<td>Grain Guard and Grain Guard Plus registered for sorghum only. Grain Guard Plus contains 18.75% Indane insecticide.</td>
</tr>
<tr>
<td>Grain Guard Plus, 50%</td>
<td>Drill box</td>
<td>3 oz/bu</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Manzate Pro-Stick, 75%</td>
<td>Slurry</td>
<td>1.5-3 oz/bu corn 1.5-2.5 oz/bu sorghum</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Manzate Max, 37%</td>
<td>Slurry</td>
<td>2.4-4.8 oz/bu corn 2.4-4.0 oz/bu sorghum</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Pennocezol 80 WP, 80%</td>
<td>Drill box or slurry</td>
<td>1.5-3.0 oz/bu field corn 1.5-2.5 oz/bu sorghum</td>
<td>X</td>
<td>Treated seed should be labeled &quot;must not be used for food, feed or oil purposes.&quot;</td>
</tr>
<tr>
<td>Pennocezol 75 DF, 75%</td>
<td>Drill box or slurry</td>
<td>1.6-3.2 oz/bu field corn 1.6-2.7 oz/bu sorghum</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mefenoxam (4) Apron XL, 33.3%</td>
<td>Liquid or slurry</td>
<td>0.32-0.64 fl oz/cwt</td>
<td>X</td>
<td>For control of <em>Pythium</em> damping off only.</td>
</tr>
</tbody>
</table>

\(^1\)Dosages for corn apply to field corn. Dosages for sweet corn vary with some products, and others are not registered for sweet corn. Consult the label for sweet corn information. Dosages are amount of formulated product to apply.

\(^2\)X = product labeled for crop and disease; Blank = product not labeled for specific disease.

\(^3\)Seedling blights due to various fungal infections of seed.
# Corn (Field) and Sorghum Seed Treatment (continued)

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Control² of Seedling Blights³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metalaxyl (4)</td>
<td>Mist or slurry</td>
<td>0.375-0.75 fl oz/cwt sorghum</td>
<td>X</td>
<td>For control of <em>Pythium</em> damping off only.</td>
</tr>
<tr>
<td>Allegiance FL, 28.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sebring 318 FS, 28.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dyna-Shield, 28.35%</td>
<td>Slurry</td>
<td>0.75 fl oz/cwt corn</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Sebring 480 FS, 44.08%</td>
<td>Slurry or mist</td>
<td>0.5 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Metalaxyl (4) + PCNB (14) + Carboxin (7)</td>
<td>Drill box</td>
<td>3 oz/bu</td>
<td>X</td>
<td>Not registered for sorghum. Controls early season <em>Pythium</em> and <em>Rhizoctonia</em>.</td>
</tr>
<tr>
<td>Preval, 3.12%;15%;15%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metalaxyl (4) + Metconazole (3)</td>
<td>Liquid or slurry</td>
<td>1.0-1.5 fl oz/cwt</td>
<td>X</td>
<td>Disease protection for <em>Rhizoctonia</em> damping-off, <em>Fusarium</em> seed/seedling dieback, seed decay fungi and head smut.</td>
</tr>
<tr>
<td>Metlock CT, 4.51%; 2.25%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metconazole (3)</td>
<td>Liquid or slurry</td>
<td>0.045-0.09 fl oz/cwt</td>
<td>X</td>
<td>Disease protection for <em>Rhizoctonia</em> damping-off, <em>Fusarium</em> seed/seedling dieback, seed decay fungi and head smut.</td>
</tr>
<tr>
<td>Metlock 40%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyraclostrobin (11)</td>
<td>Slurry or mist</td>
<td>0.4-0.8 fl oz/cwt</td>
<td>X</td>
<td>Controls seed and seeding diseases caused by <em>Rhizoctonia solani</em>, seed-borne fungi causing seed decay and seedling blight.</td>
</tr>
<tr>
<td>Slamina, 18.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedaxane (7)</td>
<td>Slurry</td>
<td>2.5-5 gal/100 kg of seed corn 2.5-5 gal/100 kg of seed sorghum</td>
<td>X</td>
<td>For seed decay, seedling blights, and damping off caused by <em>Rhizoctonia</em>.</td>
</tr>
<tr>
<td>Vibrance, 43.7%%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiram (M3)</td>
<td>Liquid or slurry</td>
<td>1.5 fl oz/bu field corn 5.0 fl oz/cwt sweet corn 2 fl oz/cwt sorghum</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>42-S Thiram, 42%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signet 480 FS, 42%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tolclofos-methyl (14)</td>
<td>Slurry or mist</td>
<td>0.3 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases. Controls <em>Rhizoctonia solani</em>.</td>
</tr>
<tr>
<td>Rizolex, 42%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trifloxystrobin (11) + Metalaxyl (4)</td>
<td>Slurry or mist</td>
<td>0.5 fl oz/cwt</td>
<td>X</td>
<td>Provides seed and seedling protection against seed-borne fungi.</td>
</tr>
<tr>
<td>Trilex 2000, 7.12%; 5.69%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Dosages for corn apply to field corn. Dosages for sweet corn vary with some products, and others are not registered for sweet corn, so consult the label for sweet corn information. Dosages are amount of formulated product to apply.
²X = product labeled for crop and disease; Blank = product not labeled for specific disease.
³Seedling blights due to various fungal infections of seed.
## Corn Nematicide

### Seed Treatment

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Control</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| **Abamectin + Thiamethoxam**  
Avicta Duo 250 Corn, 11.3%:14.2% | Commercially applied | Root nematodes (by abamectin) and various insects (by thiamethoxam) | Syngenta Crop Protection LLC has an Avicta Complete Corn commercial brand that recommends the combination of multiple separate seed treatment products. |
| **Abamectin + Thiamethoxam + Thiabendazole (1) + Fludioxonil (12) + Mefenoxam (4) + Azoxystrobin (11)**  
Avicta Complete Corn 250, 10.3%: 11.7%: 2.34%: 0.30%: 0.23%: 0.12% | Commercially applied | Root nematodes (by abamectin), various insects (by thiamethoxam), and various diseases (by thiabendazole, fludioxonil, mefenoxam, and azoxystrobin) | Syngenta Crop Protection LLC has a commercially treated blend of nematicide, insecticide, and fungicide seed treatment products. |
| **Bacillus amyloliquefaciens Strain PTA 4838**  
Aveo EZ, 16.5% | 0.1 fl oz/80,000 seeds | Dagger, lance, needle, pin, ring, root knot, root lesion, spiral, sting, stubby root, and stunt nematode. |
| **Clothianidin + Bacillus firmus**  
Poncho Votivo, 40.3% and 6.1% | Commercially applied | Provides early season protection of the corn plant against root nematodes and broad control of insect pests. | The Bacillus firmus bacterium creates a living barrier that prevents nematodes from reaching the roots. |
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage(^1)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Abamectin</strong>&lt;br&gt;Averland FC, 8.0%</td>
<td>In-furrow spray</td>
<td>4.6 fl oz/A</td>
<td>Restricted use pesticide. Provides early season protection of the corn plant against root nematodes. Do not exceed 6 fl oz/A/year. Do not exceed 0.033 lb abamectin/A/year as a soil application including seed and in-furrow treatments.</td>
</tr>
<tr>
<td><strong>Azoxystrobin (11)</strong>&lt;br&gt;Quadris, 22.9%&lt;br&gt;AZteroid FC 3.3, 34.3%</td>
<td>In-furrow spray</td>
<td>0.4-0.8 fl oz/1000 ft row&lt;br&gt;0.24-0.48 fl oz/1000 ft row for AZteroid FC</td>
<td>For soilborne and seedling diseases. Do not apply more than 123 fl oz of product/A per season. Do not apply more than 2.0 lbs azoxystrobin/A/year.</td>
</tr>
<tr>
<td><strong>Bacillus amyloliquefaciens strain D747 (44) + Bifenthrin</strong>&lt;br&gt;Ethos XB, 5.0%, 15.57%</td>
<td>In-furrow</td>
<td>4-17 fl oz/A</td>
<td>Restricted use pesticide. Suppression of seedling blights caused by <em>Pythium</em>, <em>Rhizoctonia</em> and <em>Fusarium</em>.</td>
</tr>
<tr>
<td><strong>Bacillus subtilis strain QST 713 (44)</strong>&lt;br&gt;Serenade ASO, 1.34%</td>
<td>In-furrow</td>
<td>2-6 fl qt/A</td>
<td>For control of <em>Pythium</em> and <em>Rhizoctonia</em>. Apply as directed. Spray in the seed furrow and onto the covering soil at planting. A 2 (ee) allows application of Serenade ASO at 1 fl qt/A.</td>
</tr>
<tr>
<td><strong>Flutriafol (3)</strong>&lt;br&gt;Xyway LFR, 20.9%&lt;br&gt;Xyway 3D, 26.4%</td>
<td>In-furrow spray</td>
<td>0.44-0.87 oz/1000 ft row&lt;br&gt;0.33-0.68 oz/1000 ft row</td>
<td>For season long control of Gray leaf spot, Southern corn leaf blight, Northern corn leaf blight, common rust, head smut, and common smut.</td>
</tr>
<tr>
<td><strong>Fluoxastrobin (11)</strong>&lt;br&gt;Evito 460 SC, 40.3%</td>
<td>In-furrow spray</td>
<td>0.11-0.16 fl oz/1000 ft row</td>
<td>For protection against soil-borne diseases. Do not exceed a maximum of 22.8 ounces/acre of fluoxastrobin per year.</td>
</tr>
<tr>
<td><strong>Pyraclostrobin (11)</strong>&lt;br&gt;Headline EC, 23.6%</td>
<td>In-furrow spray</td>
<td>0.1-0.8 fl oz/1000 ft row</td>
<td>For suppression of <em>Rhizoctonia</em>. Do not apply more than 12 fl oz/A of Headline.</td>
</tr>
</tbody>
</table>

\(^1\)Dosage = amount of formulated product to apply.

\(^2\)See fungicide resistance management statements on Pages 7-8.
## Corn (Field)
### Foliar Sprays

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bacillus pumilus</strong></td>
<td>Spray or</td>
<td>1-4 qt/A</td>
<td>X X</td>
<td>Begin applications when environmental conditions and plant stage are conducive to disease development.</td>
</tr>
<tr>
<td>strain QST 2808 Sonata, 1.33%</td>
<td>fumigation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bacillus subtilis</strong></td>
<td>Spray or</td>
<td>2-6 qt/A</td>
<td>X X</td>
<td>Begin applications when environmental conditions and plant stage are conducive to disease development.</td>
</tr>
<tr>
<td>strain QST 713 (44)</td>
<td>fumigation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serenade ASO, 1.34%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hydrogen Peroxide</strong></td>
<td>Spray</td>
<td>50-128 fl oz/100 gallons</td>
<td></td>
<td>Label suggests management of several fungal and bacterial diseases.</td>
</tr>
<tr>
<td><strong>Peroxyacetic Acid</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OxiDate 5.0, 27%; 5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hydrogen Peroxide</strong></td>
<td>Chemigation</td>
<td>Dilution rate is 1:1000 to 20,000</td>
<td></td>
<td>Label suggests management of several fungal and bacterial diseases.</td>
</tr>
<tr>
<td><strong>Peroxyacetic Acid</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SaniDate 12.0, 18.5%, 12%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Azoxyastrobin (11)</strong></td>
<td>Spray or</td>
<td>6.0-9.0 fl oz/A rust 6.0-15.5 fl oz/A leaf spots 3.9-9.7 fl oz/A for AZeroid FC</td>
<td>X X</td>
<td>Resistance statement 5⁵.</td>
</tr>
<tr>
<td>Quadris, 22.9%</td>
<td>fumigation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satori, 22.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equation, 22.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetrafan, 22.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aframe, 22.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AZeroid FC 3.3, 34.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Azoxyastrobin (11) +</strong></td>
<td>Spray</td>
<td>3.5-6.8 fl oz/A</td>
<td>X X</td>
<td>Resistance statement 3⁵. Begin applications when disease first appears. A second application may be made 7-14 days later. Maximum of 6.8 fl oz/A/year.</td>
</tr>
<tr>
<td>Cyproconazole (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RustEase, 18.2%, 7.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Azoxyastrobin (11) +</strong></td>
<td>Spray</td>
<td>7-14 fl oz/A</td>
<td>X X</td>
<td>Resistance statement 3⁵. For field corn and sweet corn: Applications prior to tasseling may impose stress on the plant that could inhibit proper kernel development, especially under stress conditions. Alternate applications of Quit or Quit Xcel with Tilt or another non-Group 11 fungicide. For best disease control, make applications after R1. PHI = 30 days.</td>
</tr>
<tr>
<td>Propiconazole (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quit 7.0%; 11.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quit Xcel 13.5%; 11.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aframe Plus, 13.5%; 11.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fumigation = application through sprinkler irrigation system.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴Leaf spots include fungal leaf diseases such as northern corn leaf blight.
⁵See fungicide resistance management statements on Pages 7-8.
## Corn (Field)
### Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Azoxyostrobin (11) + Tebuconazole (3)</strong>  &lt;br&gt; Custodia, 11.0%; 19.35%</td>
<td>Spray or fungigation</td>
<td>9-12.9 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Azoxyostrobin (11) + Tetraconazole (3)</strong>  &lt;br&gt; Affiance, 9.35%; 7.48%; Bri xen, 13.76%; 6.67%</td>
<td>Spray or fungigation</td>
<td>10.0-17.0 fl oz/A  &lt;br&gt; 13.0-19.0 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Benzovindiflupyr (7) + Azoxyostrobin (11) + Propiconazole (3)</strong>  &lt;br&gt; Trivapro, 2.9%; 10.5%, 11.9%</td>
<td>Spray or fungigation</td>
<td>13.7 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Chlorothalonil (M5)</strong>  &lt;br&gt; Equus 720 SST, 54.0%  &lt;br&gt; Bravo WeatherStik, 54.0%</td>
<td>Spray or fungigation</td>
<td>0.75-2.0 pts/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Equus DF, 82.5%  &lt;br&gt; Bravo Ultrex, 82.5%</td>
<td>Spray or fungigation</td>
<td>0.7-1.8 lbs/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Copper (M1)</strong>  &lt;br&gt; MasterCop, 21.46%</td>
<td>Spray or fungigation</td>
<td>0.5-1.5 pt/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fluazastrobin (11)</strong>  &lt;br&gt; Evito 480SC, 40.3%</td>
<td>Spray or fungigation</td>
<td>2.0-5.7 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Fluoxastrobin (11) + Fiuatrol (3)</strong>  &lt;br&gt; Fortix, 14.84%; 19.3%  &lt;br&gt; Preemptor, 14.64%; 19.3%</td>
<td>Spray or fungigation</td>
<td>4-6 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.

²Dosage = amount of formulated product to apply.

³X = product labeled for crop and disease; Blank = product not labeled for specific disease.

⁴Leaf spots include fungal leaf diseases such as northern corn leaf blight.

⁵See fungicide resistance management statements on Pages 7-8.
## Corn (Field)
### Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Rust</td>
<td>Leaf Spots⁴</td>
<td></td>
</tr>
<tr>
<td><strong>Fluoxastrobin (11) + Tetraconazole (3)</strong>&lt;br&gt;Zolera FX. 17.76%;&lt;br&gt;17.76%</td>
<td>Spray or furgitation</td>
<td>4.4-6.8 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Flutriafol (3)</strong>&lt;br&gt;Topguard. 11.8%</td>
<td>Spray</td>
<td>7-14 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Fluxapyroxad (7) + Pyraclostrobin (11)</strong>&lt;br&gt;Priaxor. 14.33%;&lt;br&gt;28.58%</td>
<td>Spray or furgitation</td>
<td>4-8 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Mancozeb (M3)</strong>&lt;br&gt;Koverall, 75%</td>
<td>Sprays or furgitation</td>
<td>1.5 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Manzate Pro-Stick, 75%</strong></td>
<td>Sprays or furgitation</td>
<td>1.5 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Penncozeb 75DF</strong></td>
<td>Sprays or furgitation</td>
<td>1-1.5 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Manzate Max, 37%</strong></td>
<td>Sprays or furgitation</td>
<td>1.2 qt/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Roper DF</strong>&lt;br&gt;Rainshield, 75%</td>
<td>Sprays or furgitation</td>
<td>1.5 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Mancozeb (M3) + Azoxystrobin (11)</strong>&lt;br&gt;Dexter Max. 70%;&lt;br&gt;5%</td>
<td>Spray or furgigation</td>
<td>1.6 lbs/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Mefentrifluconazole (3) + Pyraclostrobin (11)</strong>&lt;br&gt;Velyma, 17.56%;&lt;br&gt;17.56%</td>
<td>Spray</td>
<td>7-10 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Penthiopyrad (7)</strong>&lt;br&gt;Vertisan, 20.6%</td>
<td>Spray or furgitation</td>
<td>10-24 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Furgigation = application through sprinkler irrigation system.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴Leaf spots include fungal leaf diseases such as northern corn leaf blight.
⁵See fungicide resistance management statements on Pages 7-8.
## Corn (Field)
### Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application(^1)</th>
<th>Dosage(^2)</th>
<th>Disease Control(^3)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rust</td>
<td>Leaf Spots(^4)</td>
</tr>
<tr>
<td>Picoxystrobin (11) Aproach, 22.5%</td>
<td>Spray or fungigation</td>
<td>6-12 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Picoxystrobin (11) + Cyproconazole (3) Aproach Prima, 17.94%; 7.17%</td>
<td>Spray or fungigation</td>
<td>3.4-6.8 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Potassium Phosphate (33) + Tebuconazole (3) Viathon, 49%; 3.3%</td>
<td>Spray</td>
<td>2-3 pts/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Propiconazole (3) Tilt, Propimax, or Bumper 41.8 EC, Propiconazole E-AG, 41.8% Fitness, 41.8% Topaz 41.8% Bumper ES, 40.85% Propicure 3.6F, 41.8%</td>
<td>Spray or fungigation</td>
<td>2-4 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Prothiocconazole (3) Proline 480 SC, 41.0%</td>
<td>Spray or fungigation</td>
<td>5.7 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Prothiocconazole (3) + Trifloxystrobin (11) Delaro, 16.0%; 13.7%</td>
<td>Spray or fungigation</td>
<td>4.0-12.0 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

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\(^2\) Dosage = amount of formulated product to apply.
\(^3\) X = product labeled for crop and disease; Blank = product not labeled for specific disease.
\(^4\) Leaf spots include fungal leaf diseases such as northern corn leaf blight.
\(^5\) See fungicide resistance management statements on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application(^1)</th>
<th>Dosage(^2)</th>
<th>Disease Control(^3)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prothioconazole (3) + Trifloxystrobin (11) + Fluopyram (7) Delaro Complete, 14.9%:13.1%:10.9%</td>
<td>Spray or fungigation</td>
<td>4.0-12.0 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Pydiflumetofen (7) + Azoxystrobin (11) + Propiconazole (3) Miravis Neo, 7.0%, 9.3%: 11.6%</td>
<td>Spray</td>
<td>13.7 oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Pyraclostrobin (11) Headline EC, 23.6% Headline SC, 23.3%</td>
<td>Spray or fungigation</td>
<td>6-12 fl oz/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyraclostrobin (11) + Metconazole (3) Headline AMP, 13.64%:5.14%</td>
<td>Spray</td>
<td>10-14.4 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Tebuconazole (3) Onus 3.6F, 38.7% Tebucon 3.6F, Monsoon, Onset 3.6L</td>
<td>Spray or fungigation</td>
<td>4-6 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Tetroconazole (3) Domark, 20.5% Andiamo 230, 20.5%</td>
<td>Spray or fungigation</td>
<td>4-6 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Trifloxystrobin (11) + Prothioconazole (3) Stratego YLD, Protégam YLD, 32.3%:10.8%</td>
<td>Spray or fungigation</td>
<td>2.0-5.0 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

\(^1\) Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
\(^2\) Dosage = amount of formulated product to apply.
\(^3\) X = product labeled for crop and disease; Blank = product not labeled for specific disease.
\(^4\) Leaf spots include fungal leaf diseases such as northern corn leaf blight.
\(^5\) See fungicide resistance management statements on Pages 7-8.
## Crambe Seed Treatment

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Control² of Seedling Blight³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fludioxonil (12)</td>
<td>Slurry</td>
<td>0.08–0.16 fl oz/cwt</td>
<td>X</td>
<td>For Rhizoctonia and Fusarium.</td>
</tr>
<tr>
<td>Maxim 4FS, 40.3%</td>
<td>Slurry</td>
<td>0.08–0.16 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Dyna-Shield Fludioxonil, 40.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mefenoxam (4)</td>
<td>Slurry</td>
<td>0.32 fl oz/cwt</td>
<td>X</td>
<td>For suppression of Pythium.</td>
</tr>
<tr>
<td>Apron XL, 33.3 %</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pydifulmetofen (7)</td>
<td>Slurry</td>
<td>1.23 fl oz/cwt</td>
<td></td>
<td>For control of seed- and air-borne blackleg.</td>
</tr>
<tr>
<td>Saltro, 41.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyraclostrobin (11)</td>
<td>Slurry or mist</td>
<td>1.5–3.1 fl oz/cwt</td>
<td>X</td>
<td>For suppression of Rhizoctonia solani, Fusarium sp. and Pythium sp.</td>
</tr>
<tr>
<td>Stamina, 18.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Dosage = amount of formulated product to apply.  
²X = product labeled for crop and disease; Blank = product not labeled for specific disease.  
³Seedling blights due to various fungal infections of seed.  
Note: Some seed treatments may affect Rhizobia inoculants; read inoculant label for specific information.
# Dry Edible Bean Seed Treatment

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage(^1)</th>
<th>Control(^2) of Seedling Blights(^3)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Azoxystrobin (11)</strong>&lt;br&gt;Dynasty, 9.6%&lt;br&gt;Saxony 100 FS, 9.67%</td>
<td>Slurry</td>
<td>0.153-0.765 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
<tr>
<td><strong>Carboxin (7)</strong>&lt;br&gt;Vitavax-34, 34%</td>
<td>Slurry or mist</td>
<td>3-4 fl oz/cwt</td>
<td>X</td>
<td>For <em>Rhizoctonia</em> seed rots, damping off and seedling blight.</td>
</tr>
<tr>
<td><strong>Carboxin (7) + Thiram (M3)</strong>&lt;br&gt;Vitaflo-280.&lt;br&gt;15.59%; 13.25%</td>
<td>Slurry or mist</td>
<td>4 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases including <em>Rhizoctonia</em>, <em>Fusarium</em> and <em>Pythium</em>.</td>
</tr>
<tr>
<td><strong>Captan (M4)</strong>&lt;br&gt;Captan 400, 38.4%</td>
<td>See label for rates of application, formulations and registered use</td>
<td>See label for amounts of formulated product to apply</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Cheno-Quoia saponins</strong>&lt;br&gt;Heads Up Plant Protectant</td>
<td>Slurry</td>
<td>5-8 fl oz/cwt</td>
<td>X</td>
<td>Signaling plant activator for protection against <em>Rhizoctonia</em>.</td>
</tr>
<tr>
<td><strong>Chloroneb (14)</strong>&lt;br&gt;Chloroneb 65W, 65%</td>
<td>Slurry</td>
<td>4 oz/cwt</td>
<td>X</td>
<td>May be used as a supplemental seed treatment for improved suppression of <em>Rhizoctonia</em> and <em>Pythium</em>.</td>
</tr>
<tr>
<td><strong>Fludioxonil (12)</strong>&lt;br&gt;Maxim 4FS, 40.3%&lt;br&gt;Sprato 480 FS, 40.3%&lt;br&gt;Dyna-Shield Fludioxonil, 40.3%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi. Registered for control of <em>Rhizoctonia</em> and <em>Fusarium</em>.</td>
</tr>
<tr>
<td></td>
<td>Slurry</td>
<td>Slurry</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Fludioxonil (12) + Mefenofox (4)</strong>&lt;br&gt;Apron Maxx RFC 2.31%; 3.46%</td>
<td>Slurry</td>
<td>1.5 fl oz/cwt</td>
<td>X</td>
<td>For <em>Fusarium</em> and <em>Rhizoctonia</em> control.</td>
</tr>
<tr>
<td><strong>Fludioxonil (12) + Sedaxane (7) + Mefenofox (4)</strong>&lt;br&gt;Vibrance Trio, 2.32%; 2.32%; 13.95%</td>
<td>Slurry</td>
<td>1.55 fl oz/cwt</td>
<td>X</td>
<td>For seed and seedling diseases including <em>Ascochyta</em>, <em>Botrytis</em>, <em>Fusarium</em>, <em>Phomopsis</em>, <em>Phytophthora</em>, <em>Pythium</em> and <em>Rhizoctonia</em>.</td>
</tr>
</tbody>
</table>

\(^1\) Dosage = amount of formulated product to apply.
\(^2\) X = product labeled for crop and disease; Blank = product not labeled for specific disease.
\(^3\) Seedling blights due to various fungal infections of seed.

Note: Some seed treatments may affect Rhizobia inoculants; read inoculant label for specific information.
## Dry Edible Bean
### Seed Treatment (continued)

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage$^1$</th>
<th>Control$^2$ of Seedling Blights$^3$</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluxapyroxad (7) + Pyraclostrobin (11) + Metalaxyl (4)</td>
<td>RTA Slurry</td>
<td>4.6 fl oz/cwt</td>
<td>X</td>
<td>Control of <em>Rhizoctonia</em> sp., <em>Fusarium</em> sp., <em>Pythium</em> sp., <em>Botrytis</em> sp. and <em>Colletotrichum</em> sp. (seed-borne).</td>
</tr>
<tr>
<td>Ipconazole (3)</td>
<td>Slurry or mist</td>
<td>0.085 fl oz/cwt</td>
<td>X</td>
<td>Does not provide control of <em>Pythium</em></td>
</tr>
<tr>
<td>Ipconazole (3) + Metalaxyl (4)</td>
<td>Slurry or mist</td>
<td>4.0 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mefenoxam (4)</td>
<td>Slurry or mist</td>
<td>0.32-0.64 fl oz/cwt</td>
<td>X</td>
<td>For <em>Pythium</em> control. For both commercial and on-farm use.</td>
</tr>
<tr>
<td>Mefenoxam (4) + Fludioxonil (12) + Thiamethoxam</td>
<td>Slurry or mix</td>
<td>3 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi and insects. Contains thiamethoxam for insect control.</td>
</tr>
<tr>
<td>Mefenoxam (4) + Fludioxonil (12) + Sedaxane (7) + Thiamethoxam</td>
<td>Slurry or mix</td>
<td>3.22 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi and insects. Contains thiamethoxam for insect control.</td>
</tr>
<tr>
<td>Metalaxyl (4)</td>
<td>Mist or slurry</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td>Metalaxyl is only for <em>Pythium</em> damping off control. For use only with commercial seed treatment equipment.</td>
</tr>
<tr>
<td>Metalaxyl (4) + PCNB (14) + Carboxin (7)</td>
<td>Drill box</td>
<td>4 oz/cwt</td>
<td>X</td>
<td>Anaprop Dry Seed Protectant is for drill box application to seed not previously treated with Anaprop; thorough mixing of fungicide and seed is essential for good control.</td>
</tr>
<tr>
<td>Metalaxyl (4) + PCNB (14) + Carboxin (7)</td>
<td>Slurry or mist</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td>Controls early season <em>Pythium</em> and <em>Rhizoctonia</em>.</td>
</tr>
<tr>
<td>Prothioconazole (3) + Penflufen (7) + Metalaxyl (4)</td>
<td>Slurry or mist</td>
<td>1 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi and seed rot and damping off caused by <em>Rhizoctonia</em>.</td>
</tr>
<tr>
<td>Pyraclostrobin (11)</td>
<td>Slurry or mist</td>
<td>0.4-1.5 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
</tbody>
</table>

$^1$Dosage = amount of formulated product to apply.

$^2$X = product labeled for crop and disease. Blank = product not labeled for specific disease.

$^3$Seedling blights due to various fungal infections of seed.

Note: Some seed treatments may affect Rhizobia inoculants; read inoculant label for specific information.
## Dry Edible Bean Seed Treatment (continued)

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Control² of Seeding Blights³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sedaxane (7) Vibrance, 43.7%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt or 2.5-5 gal/100 kg of seed</td>
<td>X</td>
<td>For seed decay, seedling blights, and damping off caused by <em>Rhizoctonia</em></td>
</tr>
<tr>
<td>Sedaxane (7) + Mefenoxam (4) + Fludioxonil (12)</td>
<td>Slurry</td>
<td>1.54 fl oz/cwt</td>
<td>X</td>
<td>For seed borne and soil-borne diseases caused by <em>Rhizoctonia, Pythium</em> and <em>Fusarium</em></td>
</tr>
<tr>
<td>Thiabendazole (1) Mertect 340-F, 42.3%</td>
<td>Slurry</td>
<td>0.30-0.68 fl oz/cwt</td>
<td>X</td>
<td>For seedling diseases caused by <em>Fusarium</em> spp. For seed decay, seedling wilt, and damping-off caused by <em>Phomopsis</em></td>
</tr>
<tr>
<td>Thiabendazole (1) + Sedaxane (7) + Mefenoxam (4) + Fludioxonil (12)</td>
<td>Slurry</td>
<td>5.0 fl oz/cwt</td>
<td>X</td>
<td>For seed borne and soil-borne diseases caused by <em>Ascochyta, Botrytis, Colletotrichum, Fusarium, Phoma, Phomopsis, Pythium</em> and <em>Rhizoctonia</em></td>
</tr>
<tr>
<td>Thiabendazole (1) + Sedaxane (7) + Mefenoxam (4) + Fludioxonil (12) + Thiamethoxam</td>
<td>Slurry</td>
<td>5.0 fl oz/cwt</td>
<td>X</td>
<td>For seed borne and soil-borne diseases caused by <em>Ascochyta, Phoma, Botrytis, Fusarium, Phomopsis, Pythium</em> and <em>Rhizoctonia</em></td>
</tr>
<tr>
<td>Thiram (M3) 42-S Thiram, 42% Signet 480 FS, 42%</td>
<td>Liquid or slurry</td>
<td>2 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Thiram 50WP Dyed, 50%</td>
<td>Drill box or slurry</td>
<td>2 oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Toclofos-methyl (14) Rizolex, 42%</td>
<td>Slurry or mist</td>
<td>0.3 fl oz/cwt</td>
<td>X</td>
<td>For seed borne and soil-borne diseases. Controls <em>Rhizoctonia</em> and <em>Fusarium</em> species.</td>
</tr>
</tbody>
</table>

¹Dosage = amount of formulated product to apply.
²X = product labeled for crop and disease. Blank = product not labeled for specific disease.
³Seeding blights due to various fungal infections of seed.

Note: Some seed treatments may affect *Rhizobia* inoculants; read inoculant label for specific information.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage(^1)</th>
<th>Control(^2) of Rhizoctonia</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azoxystrobin (11) + Metalaxyl (4) Uniform, 28.2%/10.9%</td>
<td>In-furrow</td>
<td>0.34 fl oz/1,000 linear feet of row</td>
<td>X</td>
<td>Apply in a 7-inch band. One application per season.</td>
</tr>
<tr>
<td>Azoxystrobin (11) A2teroid FC 3.3, 34.3%</td>
<td>In-furrow</td>
<td>0.24-0.48 fl oz/1,000 ft. row</td>
<td>X</td>
<td>Apply as a 7-inch band over the seed.</td>
</tr>
<tr>
<td>Bacillus amyloliquefaciens strain D747 (44) + Bifenthrin Ethos XB, 5.0%; 15.67%</td>
<td>In-furrow</td>
<td>4-17 fl oz/A</td>
<td>X</td>
<td>Restricted use pesticide. Suppression of seedling bights.</td>
</tr>
<tr>
<td>Bacillus subtilis strain QST 713 (44) Serenade ASO, 1.34%</td>
<td>In-furrow</td>
<td>2-6 fl qt/A</td>
<td>X</td>
<td>Apply as directed. Spray in the seed furrow and covering soil at planting.</td>
</tr>
<tr>
<td>Coniothyrium minitans Contans WG, 5.3%</td>
<td>Soil incorporation</td>
<td>1-4 lb/A</td>
<td></td>
<td>Fungus attacks sclerotia of the white mold fungus in the soil. Can spray stubble post-harvest on field with previous history of white mold.</td>
</tr>
<tr>
<td>PCNB (14) Terraclor FL, 40%</td>
<td>In-furrow spray</td>
<td>2.2-3.3 fl oz/1,000 linear feet of row</td>
<td>X</td>
<td>Spray planting furrow and covering soil at planting. Do not apply to seed. Use lower rates on lighter soils.</td>
</tr>
<tr>
<td>Terraclor 75 WP, 75%</td>
<td>In-furrow spray</td>
<td>1.4-2.2 oz/1,000 linear feet of row</td>
<td>X</td>
<td>Apply as a directed spray in the seed furrow and covering soil at planting.</td>
</tr>
<tr>
<td>Terraclor EC, 23.8%</td>
<td>In-furrow spray</td>
<td>4.4-6.6 fl oz/1,000 linear feet of row</td>
<td>X</td>
<td>Spray planting furrow and covering soil at planting. Do not apply directly to seed. Use lower rates on lighter soils.</td>
</tr>
<tr>
<td>PCNB 2 Spray, 24%</td>
<td>In-furrow spray</td>
<td>8.8 fl oz/1,000 linear feet of row</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Terraclor 10G, 10%</td>
<td>In-furrow granules</td>
<td>0.75-1 lb/1,000 linear feet of row</td>
<td>X</td>
<td>Apply in planting furrow and covering soil at planting.</td>
</tr>
</tbody>
</table>

\(^1\)Dosage = amount of formulated product to apply.  
\(^2\)X = product labeled for crop and disease; Blank = product not labeled for specific disease.  
\(^3\)See fungicide resistance management statements on Pages 7-8.
### Dry Edible Bean
#### Soil Application (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Control&lt;sup&gt;2&lt;/sup&gt; of Rhizoctonia</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCNB (14) + Metalaxyl (4)</td>
<td>In-furrow granules</td>
<td>0.75 lb/1,000 linear feet of row</td>
<td>X</td>
<td>Resistance statement&lt;sup&gt;3&lt;/sup&gt;. Adjust application equipment so granules are mixed with soil surrounding seed. See label for planting restrictions within 12 months of application.</td>
</tr>
<tr>
<td>Probation (11) Headline EC, 23.6%</td>
<td>In-furrow</td>
<td>0.1-0.6 fl oz/1,000 linear feet of row</td>
<td>X</td>
<td>For suppression of <em>Rhizoctonia</em>. Do not apply more than 9 fl oz/A of Headline.</td>
</tr>
</tbody>
</table>

<sup>1</sup>Dosage = amount of formulated product to apply.
<sup>2</sup>X = product labeled for crop and disease; Blank = product not labeled for specific disease.
<sup>3</sup>See fungicide resistance management statements on Pages 7-8.

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### Dry Edible Bean
#### Foliar Sprays

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Dosage&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Disease Control&lt;sup&gt;3&lt;/sup&gt;</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Bacillus subtilis</em> strain QST 713 (44) Serenade ASO, 1.34%</td>
<td>Spray or fungigation</td>
<td>2-6 qt/A</td>
<td>X, X</td>
<td>Begin applications when environmental conditions and plant stage are conducive to disease development.</td>
</tr>
<tr>
<td>Hydrogen Peroxide + Peroxyacetic Acid</td>
<td>Spray</td>
<td>50-126 fl oz/100 gallons</td>
<td></td>
<td>Label suggests management of several fungal and bacterial diseases.</td>
</tr>
<tr>
<td>Hydrogen Peroxide + Peroxyacetic Acid SaniDate 12.0, 18.5%, 12%</td>
<td>Chemigation</td>
<td>Dilution rate is 1:1000 to 20,000</td>
<td></td>
<td>Label suggests management of several fungal and bacterial diseases.</td>
</tr>
<tr>
<td>Phosphoric Acid + Hydrogen Peroxide Ox-PHOS, 27.1%, 14.0%</td>
<td>Spray</td>
<td>2.5-5.0 qts/A</td>
<td></td>
<td>Label suggests management of several fungal and bacterial diseases.</td>
</tr>
</tbody>
</table>

<sup>1</sup>Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
<sup>2</sup>Dosage = amount of formulated product to apply.
<sup>3</sup>X = product labeled for crop and disease; Blank = product not labeled for specific disease.
<sup>4</sup>See fungicide resistance management statements on Pages 7-8.
## Dry Edible Bean
### Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application(^1)</th>
<th>Dosage(^2)</th>
<th>Disease Control(^3)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Anthracnose</td>
<td>Rust</td>
</tr>
<tr>
<td>Phosphorus Acid</td>
<td>Spray</td>
<td>4 pts/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phostrol, 53.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Azoxystrcin (11)</td>
<td>Spray or fungigation</td>
<td>6.0 fl oz/A for rust</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Quadris, 22.9%</td>
<td></td>
<td></td>
<td>6.0-15.5 fl oz/A for other leaf diseases</td>
<td>X</td>
</tr>
<tr>
<td>Satori, 22.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equation, 22.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetrabon, 22.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aframe, 22.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Azteroid FC 3.3, 18.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Azoxystrcin (11)</td>
<td>Spray</td>
<td>1.6-2.4 pt/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>+ Chlorothalonil (M5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quadris Opti, 4.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aries Adv, 11.6%, 44.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Azoxystrcin (11)</td>
<td>Spray or fungigation</td>
<td>14 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>+ Propiconazole (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quilt, 7.0%, 11.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boscadil (7)</td>
<td>Spray or fungigation</td>
<td>6-11 oz/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Endura, 70%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.

\(^2\) Dosage = amount of formulated product to apply.

\(^3\) X = product labeled for crop and disease; Blank = product not labeled for specific disease.

\(^4\) See fungicide resistance management statements on Pages 7-8.
## Dry Edible Bean
### Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage$^2$</th>
<th>Disease Control$^3$</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Anthracnose</td>
<td>Rust</td>
</tr>
<tr>
<td><strong>Chlorothalonil</strong> (M5)</td>
<td>Spray or fungigation</td>
<td>1 3/8-2 pt/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Bravo Weather/Stik Echo, Echo 720, Chlorothalonil 720, Equis 720 SST, 54%</td>
<td>Spray or fungigation</td>
<td>1.25-1.8 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Bravo Ultre DG, or Equis DF, 82.5%</td>
<td>Spray or fungigation</td>
<td>2-3 pt/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Echo Zn, Bravo ZN or Terralni Zn, 38.5%</td>
<td>Spray or fungigation</td>
<td>1.13-1.63 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Echo 90 DF, 90%</td>
<td>Spray or fungigation</td>
<td>1 3/8-2 pt/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Praiz, 54%</td>
<td>Spray or fungigation</td>
<td>2-4 lbs/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Copper (M1)</strong> Basicop WP, 53%</td>
<td>Spray</td>
<td>0.66-2 pt/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Champ DP, 57.6%</td>
<td>Spray or fungigation</td>
<td>0.66-2 pt/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Champ Formula 2 Flowable, 37.5%</td>
<td>Spray or fungigation</td>
<td>0.5-1.25 lb/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>ChampION++ 46.1%</td>
<td>Spray or fungigation</td>
<td>0.75-2 lbs/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cuprofix Ultra 40 Dispers 71.1%</td>
<td>Spray or fungigation</td>
<td>0.75-2.25 lb/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Kocide 2000, 53.8%</td>
<td>Spray or fungigation</td>
<td>0.5-1.25 lb/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Kocide 3000, 46.1%</td>
<td>Spray or fungigation</td>
<td>0.66-2 pt/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Kocide 4.5 LF, 37.5%</td>
<td>Spray or fungigation</td>
<td>0.5-1.0 ptA</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>MasterCop, 21.46%</td>
<td>Spray or fungigation</td>
<td>0.5-2.0 lbs/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Badge X2, 45.31%</td>
<td>Spray or fungigation</td>
<td>0.5-2.0 pt/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Badge SC, 32.17%</td>
<td>Spray or fungigation</td>
<td>0.5-2.0 pt/A</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

$^1$Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.

$^2$Dosage = amount of formulated product to apply.

$^3$X = product labeled for crop and disease; Blank = product not labeled for specific disease.

$^4$See fungicide resistance management statements on Pages 7-8.
# Dry Edible Bean
## Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Anthracose</td>
<td>Rust</td>
</tr>
<tr>
<td>Cypredinil (9)+ Fludioxonil (12)</td>
<td>Spray</td>
<td>11-14 oz/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Switch 62.5 WG, 37.5%/25.0%</td>
<td>Spray or fungigation</td>
<td>10.5-11 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Difenoconazole (3) + Benovindiflupyr (7)</td>
<td>Spray or fungigation</td>
<td>0.5-0.85 pt/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Aprovia Tcp, 11.25%/7.50%</td>
<td>Spray or fungigation</td>
<td>7 fl oz/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Fluazinam (25)</td>
<td>Spray or fungigation</td>
<td>8.0-13.6 fl oz/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Omega 500F, 40%</td>
<td>Spray or fungigation</td>
<td>0.5-0.85 pt/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Fludioxonil (12)</td>
<td>Spray or fungigation</td>
<td>7 fl oz/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cannonball WP, 50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluoptyram (7) + Prothioconazole (3)</td>
<td>Spray or fungigation</td>
<td>8.0-13.6 fl oz/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>ProPulse, 17.4%/17.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴See fungicide resistance management statements on Pages 7-8.
# Dry Edible Bean
## Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application Type</th>
<th>Dosage</th>
<th>Disease Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Anthracnose</td>
<td>Rust</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Fluxastrobin (11)</td>
<td>Spray or fungigation</td>
<td>2.0-4.75 fl oz/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evito, 40.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluxapyroxad (7) + Pyraclostrobin (11)</td>
<td>Spray or fungigation</td>
<td>4-8 oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Praxor, 14.33%; 28.58%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ipodione (2)</td>
<td>Ground spray or fungigation</td>
<td>1.5-2.0 pt/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rovral 4F, 41.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nevaco 4F, 41.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meteor, 41.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isofetamid (7)</td>
<td>Spray</td>
<td>17 fl oz/A</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Kerja, 36%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup>Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.

<sup>2</sup>Dosage = amount of formulated product to apply.

<sup>3</sup>X = product labeled for crop and disease; Blank = product not labeled for specific disease.

<sup>4</sup>See fungicide resistance management statements on Pages 7-8.
## Dry Edible Bean
### Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mefentrifluconazole (3)</td>
<td>Spray</td>
<td>2.5-5.0 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Provysol, 34.93%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mefentrifluconazole (3) + Pyraclostrobin (11)</td>
<td>Spray</td>
<td>7-10 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Veltyma, 17.56%; 17.56%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metconazole (3)</td>
<td>Spray</td>
<td>4.0 fl oz/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Quash, 50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penthioptazin (7)</td>
<td>Spray or fungition</td>
<td>14-20 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Vertisan, 20.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fontels, 20.4%</td>
<td>Spray or fungition</td>
<td>14-20 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Picoxystrobin (11)</td>
<td>Spray or fungition</td>
<td>6-12 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Aproach, 22.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴See fungicide resistance management statements on Pages 7-8.
## Dry Edible Bean
### Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application 1</th>
<th>Dosage 2</th>
<th>Disease Control 3</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium Phosphite (33) + Tebuconazole (3) Viathon, 49%; 3.3%</td>
<td>Spray</td>
<td>2-3 pts/A</td>
<td>Anthracnose Rust Halo Bight White Mold</td>
<td>Apply on a protective spray schedule or when weather is conducive for rust. Repeat applications on a 10-14 day interval, or as necessary to maintain control.</td>
</tr>
<tr>
<td>Prothioconazole (3) Proline 480 SC, 41%</td>
<td>Spray</td>
<td>5.7 fl oz/A</td>
<td>X</td>
<td>Apply Proline prior to disease onset or at 15-25% flowering when conditions are favorable for disease development. Do not make more than 3 applications per year. Repeat applications as needed on a 5-14 day interval. For maximum disease control, apply in 20 or more gpa by ground. Do not apply within 7 days of cutting or swathing for harvest.</td>
</tr>
<tr>
<td>Prothioconazole (3) + Trifloxystrobil (11) Delaro, 16%;13.7%</td>
<td>Spray or fungigation</td>
<td>12 fl oz/A</td>
<td>X</td>
<td>Apply preventatively at flower initiation and continue as needed on a 10-14 day interval. GPA = 10 or greater by ground and 5 or greater by air. REI = 12 hrs. Rainfast = when dry on the surface. PHI = 30 days.</td>
</tr>
<tr>
<td>Pydiflumetofen (7) + Difenconazole (3) Miravis Top, 6.9%; 11.5%</td>
<td>Spray</td>
<td>13.7 fl oz/A (suppression)</td>
<td>X</td>
<td>Begin applications prior to disease development and continue on 14-day interval. Do not make more than two applications of Miravis Top before alternating to a fungicide that is not group 3 or 7. Maximum use rate is 56 fl oz/A/year. PHI = 14 days.</td>
</tr>
</tbody>
</table>

1Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
2Dosage = amount of formulated product to apply.
3X = product labeled for crop and disease; Blank = product not labeled for specific disease.
4See fungicide resistance management statements on Pages 7-8.
# Dry Edible Bean
## Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pydilumetofen (7) + Azoxystrobin (11) + Propiconazole (3)</td>
<td>Spray</td>
<td>13.7 oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Miravis Neo, 7.0%; 9.3%; 11.6%</td>
<td>Spray or fungigation</td>
<td>6-9 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Pyraclostrobin (11)</td>
<td>Spray or fungigation</td>
<td>6-9 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Headline EC, 23.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headline SC, 23.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfur (M)</td>
<td>Spray</td>
<td>7 lb/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Microthiol Disperss, 80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tebuconazole (3), 38.7%</td>
<td>Spray or fungigation</td>
<td>4-6 fl oz/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Octir 3.6F, Tebucon 3.5F, Monson, Onset 3.6F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴See fungicide resistance management statements on Pages 7-8.
## Dry Edible Bean
### Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| Thiophanate-methyl (1)    | Spray or fungigation | 1.5-2 lb/A - 1 application or 1-1.5 lb/A - 2 applications | X | Resistance statement 1⁴.  
Apply 1.5-2 lb once when 70-100% of the plants have at least 1 open blossom. Or apply 1-1.5 lb twice, with the first application when 10-30% of the plants have at least 1 open blossom and the second application 4-7 days later. Complete coverage of all parts of plant is essential for control of white mold. Do not apply more than 4 lbs product/acre/season. Do not apply thiophanate-methyl within 14 days of harvest. |
| Tospin M WSB, T-Methyl WSB 70W T-Methyl WSB E-AG, Cercobin | Spray or fungigation | | X | |
| Tospin or T-Methyl 4.5F or Incognito, 46.2% or Tospin 4.5 FL, 45% | Spray or fungigation | 30-40 fl oz/A - 1 application or 20-30 fl oz/A - 2 applications | X | |
| Thiophanate Methyl 85 WDG, 85% Incognito 85 WDG, 85% | Spray or fungigation | 0.8-1.6 lb/A | X | |

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³X = product labeled for crop and disease; Blank = product not labeled for specific disease.  
⁴See fungicide resistance management statements on Pages 7-8.
# Flax Seed Treatment

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Control² of Seedling Blight³</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| **Captain (M4)**  
Captain 400, 37.4% | Slurry | 2.0-3.75 fl oz/cwt | | X |
| **Fludioxonil (12)**  
Maxim 4FS, 40.3% | Slurry | 0.08-0.16 fl oz/cwt | | X |
| Spirato 480 FS, 40.3% | Slurry | 0.08-0.16 fl oz/cwt | | X |
| Dyna-Shield Fludioxonil | Slurry | 0.08-0.16 fl oz/cwt | | X |
| **Fluxapyroxad (7) + Pyraclostrobin (11) + Metalaxyl (4)**  
Obvius, 1.58%; 1.58%; 1.26% | RTA Slurry | 4.5 fl oz/cwt | | X |
| **Mancozeb (M3)**  
Dithane DF Rainshield NT, 75% | Slurry | 2.1-4.3 oz/bu | | X |
| Dithane F-45, 37% | Drill box or slurry | 3.2-6.4 fl oz/bu | | X |
| Dithane VSP or Penncozeb 80 WP, 80% | Drill box or slurry | 2.4 oz/bu | | X |
| Penncozeb 75 DF, 75% | Drill box or slurry | 2.1-4.3 oz/bu | | X |
| Marzate Pro-Stick, 75% | Slurry | 2.4 oz/bu | | X |
| Marzate Max, 37% | Slurry | 3.2-6.4 fl oz/bu | | X |
| **Thiram (M3)**  
42-S Thiram, 42%  
Signet 480 FS, 42%  
Thiram 480 DP, 42% | Liquid or slurry | 3 fl oz/bu | | X |

¹Dosage = amount of formulated product to apply.
²X = product labeled for crop and disease; Blank = product not labeled for specific disease.
³Seedling blights due to various fungal infections of seed.
## Flax
### Foliar Sprays

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Pasmo (Septoria linicola) Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azoxystrobin (11)</td>
<td>Spray or fungigation</td>
<td>6-15.5 fl oz</td>
<td>X</td>
<td>Resistance statement ⁵. Controls downy mildew and <em>Alternaria</em> leaf spot. Make Quadris applications preventatively for best results. Additional applications may be required under favorable environmental conditions. Do not apply more than 27 fl oz/A/year. PHI = 30 days, mid-flowering 7-14 days after flower initiation. Do not apply more than 0.45 lbs azoxystrobin/A/year.</td>
</tr>
<tr>
<td>Fluxapyroxad (7) + Pyraclostrobin (11)</td>
<td>Spray or fungigation</td>
<td>4-8 fl oz/A</td>
<td>X</td>
<td>Resistance statement ⁵ and ⁶. For optimal disease control, apply prior to disease development and continue 7-14 days later if conditions are conducive. Do not apply more than 2 applications and 16 fl oz/A per season. PHI = 21 days.</td>
</tr>
<tr>
<td>Picoxystrobin (11)</td>
<td>Spray or fungigation</td>
<td>6-12 fl oz/A</td>
<td></td>
<td>Begin applications prior to disease development and make a second application on a 7-14 day interval depending on the targeted disease. For <em>Sclerotinia</em> stem rot: Begin application at 20-50% bloom prior to disease development and continue on 7-14 day interval depending on disease pressure. Do not apply more than 24 fl oz/season. PHI = 28 days.</td>
</tr>
<tr>
<td>Prothioconazole (3) + Trifloxystrobin (11)</td>
<td>Spray or fungigation</td>
<td>12 fl oz/A</td>
<td>X</td>
<td>Controls Pasmo (<em>Septoria linicola</em>). Apply preventatively when the flax is in the 20-50% bloom stage. The lowest labeled rate of a NIS may be added. GPA = 10 by ground and 5 by air. Only apply once per year. PHI = 30 days.</td>
</tr>
<tr>
<td>Pydiflumetofen (7) + Azoxystrobin (11) + Propiconazole (3)</td>
<td>Spray or fungigation</td>
<td>13.7 fl oz/A</td>
<td></td>
<td>Apply at first sign of disease. PHI = 30 days.</td>
</tr>
<tr>
<td>Pyraclostrobin (11)</td>
<td>Spray or fungigation</td>
<td>6-12 fl oz/A</td>
<td>X</td>
<td>Resistance statement ⁵. For optimal disease control, apply Headline before disease onset. Apply at early to mid-flowering (4-7 days after flower initiation). Make second application if disease persists. Do not apply more than 24 fl oz/season. PHI = 21 days.</td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴Leaf spot includes fungal leaf diseases such as tan spot, Septoria blotch and spot blotch on wheat, and spot blotch and net blot on barley.
⁵See fungicide resistance management statements on Pages 7-8.
## Grasses (Forage)
### Seed Treatment

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Control&lt;sup&gt;2&lt;/sup&gt; of Seedling Blights&lt;sup&gt;3&lt;/sup&gt;</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fludioxonil (12)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maxim 4 FS, 40.3%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
<tr>
<td>Spirato 480 FS, 40.3%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mefenoxam (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apron XL LS, 32.3%</td>
<td>Slurry or mist</td>
<td>0.32-0.64 fl oz/cwt</td>
<td>X</td>
<td>Apron XL LS controls only Pythium. For both commercial and on-farm use.</td>
</tr>
<tr>
<td>Metalaxyl (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allegiance FL, 28.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sebring 318 FS, 28.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allegiance Dry Seed Prtectant, 12.5%</td>
<td>Drill box</td>
<td>3-4 oz/cwt</td>
<td>X</td>
<td>Acquire and Allegiance controls only Pythium.</td>
</tr>
<tr>
<td>Dyna-Shield, 28.35%</td>
<td>Slurry</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td>Allegiance Dry Seed Prtectant is for drill box application to seed not previously treated with Apron; thorough mixing of fungicide and seed is essential for good control.</td>
</tr>
<tr>
<td>Belmont 2.7 FS</td>
<td>Slurry or mist</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>28.98%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sebring 480 FS, 44.08%</td>
<td>Slurry or mist</td>
<td>0.5 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Thiram (M3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>42-S Thiram, 42%</td>
<td>Liquid or slurry</td>
<td>8 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Thiram 50WP Dyed, 50%</td>
<td>Drill box or slurry</td>
<td>8 oz/swt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Signet 480 FS, 42%</td>
<td>Liquid or slurry</td>
<td>8 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup>Dosage = amount of formulated product to apply.
<sup>2</sup>X = product labeled for crop and disease. Blank = product not labeled for specific disease.
<sup>3</sup>Seedling blights due to various fungal infections of seed.
## Lentils
### Seed Treatment

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage(^1)</th>
<th>Control(^2) of Seedling Blights(^3)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azoxystrin (11)</td>
<td>Slurry</td>
<td>0.153-0.765 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi. Not for <em>Pythium</em> if used alone.</td>
</tr>
<tr>
<td>Fludioxonil (12)</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
<tr>
<td>Fludioxonil (12) + Sedaxane (7) + Mefenoxam (4)</td>
<td>Slurry</td>
<td>1.55 fl oz/cwt</td>
<td>X</td>
<td>For seed and seedling diseases including <em>Ascochyta</em>, <em>Botrytis</em>, <em>Fusarium</em>, <em>Phomopsis</em>, <em>Phytophthora</em>, <em>Pythium</em> and <em>Rhizoctonia</em>.</td>
</tr>
<tr>
<td>Fluxapyroxad (7) + Pyractostrobin (11) + Metalaxyl (4)</td>
<td>RTA Slurry</td>
<td>4.6 fl oz/cwt</td>
<td>X</td>
<td>Control of <em>Rhizoctonia</em> sp., <em>Fusarium</em> sp., <em>Pythium</em> sp., <em>Botrytis</em> sp., <em>Colletotrichum</em> sp., and <em>Ascochyta</em> sp. (seed-borne).</td>
</tr>
<tr>
<td>Ipconazole (3)</td>
<td>Slurry or mist</td>
<td>0.085 fl oz/cwt</td>
<td>X</td>
<td>Does not provide control of <em>Pythium</em>.</td>
</tr>
<tr>
<td>Ipconazole (3) + Metalaxyl (4)</td>
<td>Slurry or mist</td>
<td>4.0 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mefenoxam (4)</td>
<td>Slurry or mist</td>
<td>0.32-0.64 fl oz/cwt</td>
<td>X</td>
<td>Use 0.32-0.64 fl oz/cwt for <em>Pythium</em> damping off. For early season <em>Phytophthora</em>, use 0.64 fl oz/cwt.</td>
</tr>
<tr>
<td>Mefenoxam (4) + Fludioxonil (12)</td>
<td>Slurry</td>
<td>5 fl oz/cwt</td>
<td>X</td>
<td>For protection against damping-off and seed rots</td>
</tr>
</tbody>
</table>

\(^1\)Dosage = amount of formulated product to apply. 
\(^2\)X = product labeled for crop and disease; Blank = product not labeled for specific disease. 
\(^3\)Seedling blights due to various fungal infections of seed. 
**Note:** Some seed treatments may affect Rhizobia inoculants; read inoculant label for specific information.
### Lentils

#### Seed Treatment (continued)

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<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Control² of Seedling Blights³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mefenoxam (4) + Fludioxonil (12) + Thiamefoxam</strong></td>
<td>Slurry or mist</td>
<td>3 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cruiser Maxx; 1.7%:1.12%:22.61%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Metalaxyl (4)</strong></td>
<td>Slurry or mist</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td>Metalaxyl controls only <em>Pythium</em>.</td>
</tr>
<tr>
<td>Allegiance FL, 28.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sebring 318 FS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allegiance Dry Seed Protectant, 12.5%</td>
<td>Drill box</td>
<td>4 oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Dyra-Shield, 28.35%</td>
<td>Slurry</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Belmont 2.7 FS, 28.98%</td>
<td>Slurry or mist</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Prothiocarbazole (3) + Penflufen (7) + Metalaxyl (4)</strong></td>
<td>Slurry or mist</td>
<td>1.0 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi and seed rot and damping off caused by <em>Rhizoctonia</em>.</td>
</tr>
<tr>
<td>EverGo! Energy; 7.18%:3.59%:5.74%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pyraclostrobin (11)</strong></td>
<td>Slurry or mist</td>
<td>0.4-1.5 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
<tr>
<td>Stamina, 18.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sedaxane (7)</strong></td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt or 2.5-5 gai/100 kg of seed</td>
<td>X</td>
<td>For seed decay, seedling blights, and damping off caused by <em>Rhizoctonia</em>.</td>
</tr>
<tr>
<td>Vibrance, 43.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sedaxane (7) + Mefenoxam (4) + Fludioxonil (12)</strong></td>
<td>Slurry</td>
<td>1.54 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases caused by <em>Rhizoctonia, Pythium</em> and <em>Fusarium</em>.</td>
</tr>
<tr>
<td>Vibrance Maxx; 4.69%; 3.52%; 2.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Thiabendazole (1)</strong></td>
<td>Slurry</td>
<td>1.05 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne <em>Ascochyta, Phoma</em> and seedling diseases caused by <em>Fusarium</em>.</td>
</tr>
<tr>
<td>Mertect 340-F, 42.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Dosage = amount of formulated product to apply.
²X = product labeled for crop and disease; Blank = product not labeled for specific disease.
³Seedling blights due to various fungal infections of seed.

**Note**: Some seed treatments may affect Rhizobia inoculants; read inoculant label for specific information.
# Lentils
## Seed Treatment (continued)

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Control² of Seedling Blights³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiabendazole (1) + Sedaxane (7) + Mefenoxam (4) + Fludioxonil (12)</td>
<td>Slurry</td>
<td>5.0 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases caused by <em>Ascocytta</em>, <em>Botrytis</em>, <em>Colletorichum</em>, <em>Fusarium</em>, <em>Phoma</em>, <em>Phomopsis</em>, <em>Pythium</em> and <em>Rhizoctonia</em></td>
</tr>
<tr>
<td>Thiabendazole (1) + Sedaxane (7) + Mefenoxam (4) + Fludioxonil (12) + Thiamethoxam</td>
<td>Slurry</td>
<td>5.0 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases caused by <em>Ascocytta</em>, <em>Botrytis</em>, <em>Fusarium</em>, <em>Phoma</em>, <em>Phomopsis</em>, <em>Pythium</em> and <em>Rhizoctonia</em></td>
</tr>
<tr>
<td>Thiram (M3)</td>
<td>Slurry</td>
<td>8 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases.</td>
</tr>
<tr>
<td>Tolclofos-methyl (14)</td>
<td>Slurry or mist</td>
<td>0.3 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases. Controls <em>Rhizoctonia</em> and <em>Fusarium</em> species.</td>
</tr>
<tr>
<td>Trifloxystrobin (11)</td>
<td>Slurry</td>
<td>0.32 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
</tbody>
</table>

¹Dosage = amount of formulated product to apply.<br>
²X = product labeled for crop and disease; Blank = product not labeled for specific disease.<br>
³Seedling blights due to various fungal infections of seed.<br>

**Note:** Some seed treatments may affect Rhizobia innoculants; read inoculant label for specific information.
## Lentils
### Foliar Sprays

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage</th>
<th>Ascochyta Control</th>
<th>Anthracnose Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Bacillus subtilis</em> strain QST 713 (44)</td>
<td>Spray or fumigation</td>
<td>2-6 qt/A</td>
<td></td>
<td></td>
<td>Begin applications when environmental conditions and plant stage are conducive to disease development.</td>
</tr>
<tr>
<td>Phosphorus Acid</td>
<td>Spray</td>
<td>2-4 pt/A</td>
<td></td>
<td></td>
<td>For downy mildew caused by <em>Phytophthora</em> spp. and <em>Pythium</em> spp. Apply diluted solution to thoroughly wet foliage. Apply with normal irrigation schedule. Apply at 2-3 week intervals and repeat as needed.</td>
</tr>
<tr>
<td>Azoxytrobin (11)</td>
<td>Spray or fumigation</td>
<td>6.0-15.5 oz/A</td>
<td>X</td>
<td>X</td>
<td>Resistance Statement 5. Begin applications prior to disease development and continue on a 7-14 day interval. Do not apply more than 2.86 qt/A/season for Quadris.</td>
</tr>
<tr>
<td>Bosalid (7)</td>
<td>Spray or fumigation</td>
<td>8-11 oz/A</td>
<td>X</td>
<td></td>
<td>Resistance Statement 6. Also controls white mold. Begin applications prior to disease development and repeat on a 7-14 day interval. Do not make more than 2 applications per season (22 oz/A/season).</td>
</tr>
<tr>
<td>Chlorothalonil (M5)</td>
<td>Spray or fumigation</td>
<td>1.0-1.5 pts/A</td>
<td>X</td>
<td>X</td>
<td>Begin applications prior to disease development. Repeat applications at 7-10 day intervals. Do not apply more than 8.0 pts/A/year. PHI = 14 days.</td>
</tr>
<tr>
<td>Difenconazole (3) + Benzoindiflupyr (7)</td>
<td>Spray or fumigation</td>
<td>10.5-11 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Begin applications prior to disease onset when conditions are conducive for disease. Do not make more than two sequential applications before alternating to a fungicide from a different group. Do not apply more than 22 fl oz/A per year. PHI = 14 days.</td>
</tr>
</tbody>
</table>

1 Spray = ground or aerial; Fumigation = application through sprinkler irrigation system.
2 Dosage = amount of formulated product to apply.
3 X = product labeled for crop and disease; Blank = product not labeled for specific disease.
4 See fungicide resistance management statements on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage</th>
<th>Ascochyta Control</th>
<th>Anthracnose Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluopyram (7) + Prothioconazole (3) ProPulse, 17.4%; 17.4%</td>
<td>Spray or fungigation</td>
<td>8.0-10.3 fl oz/A</td>
<td>X</td>
<td></td>
<td>Apply at early flower or at the first sign of disease, whichever occurs first. Do not make more than two sequential applications before rotating with a fungicide from a different group. Continue applications as needed on a 10-14 day interval. Do not apply within 7 days of cutting or swathing the crop for harvest or within 14 days of harvest.</td>
</tr>
<tr>
<td>Fluoxastrobin (11) Evito, 40.3%</td>
<td>Spray or fungigation</td>
<td>2.0-4.75 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Resistance Statement 5. Begin applications preventively. Do not apply more than 4.75 fl oz/A/season. PHI = 7 days.</td>
</tr>
<tr>
<td>Fluxapyroxad (7) + Pyraclostrobin (11) Priaxor, 14.33%; 28.58%</td>
<td>Spray or fungigation</td>
<td>4.8 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Resistance statement 5 and 6. Begin applications prior to disease development and continue on a 7-14 day interval if conditions are conducive to disease development. Maximum applications per season = 2. PHI = 21 days.</td>
</tr>
<tr>
<td>Isofetamid (7) Kerja, 36%</td>
<td>Spray</td>
<td>17 fl oz/A</td>
<td></td>
<td></td>
<td>For gray mold caused by Botrytis cinerea and white mold caused by Sclerotinia. Begin applications when plants are at 10-30% bloom. A second application can be applied 7-14 days later. Do not make more than 2 sequential applications before rotating to a fungicide with a different mode of action. Do not apply more than 2 applications/year. PHI = 30 days.</td>
</tr>
<tr>
<td>Mefentrifluconazole (3) Provysol, 34.93%</td>
<td>Spray</td>
<td>2.5-5.0 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Controls Alternaria leaf and pod spot, Ascochyta blight, Cercospora leaf spot, Mycosphaerella blight, powdery mildew and rust. Do not apply more than 15 fl oz/A per year</td>
</tr>
<tr>
<td>Mefentrifluconazole (3) + Pyraclostrobin (11) Veltyma, 17.56%; 17.56%</td>
<td>Spray</td>
<td>7-10 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Controls Alternaria leaf and pod spot, Ascochyta blight, Cercospora leaf spot, Mycosphaerella blight, powdery mildew and rust. Do not apply more than 20 fl oz/A per year</td>
</tr>
</tbody>
</table>

1 Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
2 Dosage = amount of formulated product to apply.
3 X = product labeled for crop and disease; Blank = product not labeled for specific disease.
4 See fungicide resistance management statements on Pages 7-8.
## Lentils
### Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Dosage&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Ascocytta Control&lt;sup&gt;3&lt;/sup&gt;</th>
<th>Anthracnose Control&lt;sup&gt;3&lt;/sup&gt;</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metconazole (3) Quash, 50%</td>
<td>Spray</td>
<td>4.0 fl oz/A</td>
<td>X</td>
<td></td>
<td>Also suppresses white mold. Apply when conditions favor disease development and prior to infection. A second application may be made on a 7-10 day interval. Do not make more than 2 applications per year. Do not apply more than 8 oz of product/A/year. PHI = 21 days.</td>
</tr>
<tr>
<td>Penthio pyramid (7)</td>
<td>Spray or fungigation</td>
<td>14-20 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Begin applications prior to disease development. For white mold, make initial application at beginning bloom and follow with a second application at full bloom. Do not exceed 41 fl oz/A per year. PHI = 21 days.</td>
</tr>
<tr>
<td>Vertisan, 20.6%</td>
<td>Spray or fungigation</td>
<td>14-20 fl oz/A</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Fontelis, 20.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Picoxystrobin (11) Aproach, 22.5%</td>
<td>Spray or fungigation</td>
<td>6-12 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Resistance Statement 5&lt;sup&gt;4&lt;/sup&gt;. Begin applications prior to disease development and continue on a 7-14 day interval when disease pressure is high. Apply no more than 24 fl oz/A per season. PHI = 14 days.</td>
</tr>
<tr>
<td>Prothioconazole (3) Proline 480 SC, 41%</td>
<td>Spray</td>
<td>5.0-5.7 fl oz/A</td>
<td>X</td>
<td></td>
<td>Resistance Statement 3&lt;sup&gt;4&lt;/sup&gt;. Apply at early flowering or at the first sign of disease. Use the higher rate when conditions are favorable for severe disease pressure and/or when growing more susceptible varieties. Do not make more than 3 applications per year. Repeat applications as needed on a 10-14 day interval. Do not apply within 7 days of cutting or swathing the crop for harvest.</td>
</tr>
<tr>
<td>Prothioconazole (3) + Trifloxystrobin (11) Delaro, 16.0%; 13.7%</td>
<td>Spray or fungigation</td>
<td>12.0 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Begin fungicide applications preventatively and continue as needed on a 10-14 day interval. Use shorter intervals when conditions favor severe disease pressure. Do not make more than 2 applications per season. PHI = 30 days. Do not apply within 7 days of cutting or swathing the crop for forage.</td>
</tr>
</tbody>
</table>

<sup>1</sup>Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
<sup>2</sup>Dosage = amount of formulated product to apply.
<sup>3</sup>X = product labeled for crop and disease; Blank = product not labeled for specific disease.
<sup>4</sup>See fungicide resistance management statements on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application(^1)</th>
<th>Dosage(^2)</th>
<th>Ascochyta Control(^3)</th>
<th>Anthracnose Control(^3)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pydifenofen (7) + Difenconazole (3) Miravis Top, 6.9%; 11.5%</td>
<td>Spray</td>
<td>13.7 fl oz/A</td>
<td>X</td>
<td>X (suppression)</td>
<td>Begin applications prior to disease development and continue on 14-day interval. Do not make more than two applications of Miravis Top before alternating to a fungicide that is not group 3 or 7. Maximum use rate is 56 fl oz/A/year. PHI = 14 days.</td>
</tr>
<tr>
<td>Pyraclostrobin (11) Headline EC, 23.6%; Headline SC, 23.3%</td>
<td>Spray or fungigation</td>
<td>6.9 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Resistance Statement 5(^4). Begin applications prior to disease development and repeat on a 7-14 day interval if conditions are conducive for disease development.</td>
</tr>
<tr>
<td>Trifloxystrobin (11) + Prothioconazole (3) Stratego YLD, Protegam YLD, 32.3%; 10.8%</td>
<td>Spray or fungigation</td>
<td>4.0-4.8 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Resistance Statement 5(^4). Apply at early flower or at the first sign of the disease, whichever occurs first. Do not exceed 0.28 lb prothioconazole or 0.24 lb of trifloxystrobin per acre per year. Do not apply within 30 days of harvest. Do not apply within 7 days of cutting or swathing the crop for forage.</td>
</tr>
</tbody>
</table>

\(^1\) Spray = ground or aerial; Fungigation = application through sprinkler irrigation system. 
\(^2\) Dosage = amount of formulated product to apply. 
\(^3\) X = product labeled for crop and disease; Blank = product not labeled for specific disease. 
\(^4\) See fungicide resistance management statements on Pages 7-8.
## Pea (Field) Seed Treatment

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage</th>
<th>Control of Seedling Blight</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Azoxystrobin (11)</strong></td>
<td>Slurry</td>
<td>0.153-0.765 fl oz/A</td>
<td>X</td>
<td>Does not control seed-borne Ascochyta.</td>
</tr>
<tr>
<td>Dynasty, 9.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saxony 100 FS, 9.67%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Captan (M4)</strong></td>
<td>See label for directions</td>
<td>1 oz/bu</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Captan, 75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ethaboxam (22)</strong></td>
<td>Slurry</td>
<td>0.3 fl oz/cwt</td>
<td>X</td>
<td>For management of Aphanomyces and some metalaxyl resistant Pythium species</td>
</tr>
<tr>
<td>Intego Solo, 34.2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fludioxonil (12)</strong></td>
<td>Slurry</td>
<td>0.06-0.18 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
<tr>
<td>Maxim 4FS, 40.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spirato 480FS, 40.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dyna-Shield Fludioxonil, 40.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fludioxonil (12) + Sedaxane (7) + Mefenoxam (4)</strong></td>
<td>Slurry</td>
<td>1.55 fl oz/cwt</td>
<td>X</td>
<td>For seed and seeding diseases including Ascochyta, Botrytis, Fusarium, Phomopsis, Phytophthora, Pythium and Rhizoctonia.</td>
</tr>
<tr>
<td>Vibrance Trio, 2.32%; 2.32%, 13.95%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fluxapyroxad (7) + Pyraclostrobin (11) + Metalaxyl (4)</strong></td>
<td>RTA Slurry</td>
<td>4.6 fl oz/cwt</td>
<td>X</td>
<td>Control of Rhizoctonia sp., Fusarium sp., Pythium sp., Botrytis sp., Coletotrichum sp., and Ascochyta sp. (seed-borne).</td>
</tr>
<tr>
<td>Obvius, 1.58%; 1.58%; 1.26%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ipconazole (3)</strong></td>
<td>Slurry or mist</td>
<td>0.085 fl oz/cwt</td>
<td>X</td>
<td>Does not provide control of Phytophthora.</td>
</tr>
<tr>
<td>Rancosa 3.8 FS, 40.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ipconazole (3) + Metalaxyl (4)</strong></td>
<td>Slurry or mist</td>
<td>4.0 fl oz/cwt</td>
<td>X</td>
<td>For seed rot, damping off and seedling blight.</td>
</tr>
<tr>
<td>Rancona Summit, 0.902%; 1.443%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rancona CTS, 2.42%; 1.94%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mefenoxam (4)</strong></td>
<td>Slurry or mist</td>
<td>0.32-0.64 fl oz/cwt</td>
<td>X</td>
<td>Use 0.32-0.64 fl oz/cwt for Phytophthora damping off. For early season Phytophthora, use 0.64 fl oz/cwt.</td>
</tr>
<tr>
<td>Apron XL, 33.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Dosage = amount of formulated product to apply.
2 X = product labeled for crop and disease; Blank = product not labeled for specific disease.
3 Seedling blights due to various fungal infections of seed.

**Note:** Some seed treatments may affect Rhizobia inoculants; read inoculant label for specific information.
### Pea (Field) Seed Treatment (continued)

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage</th>
<th>Control of Seedling Blight</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mefenoxam (4) + Fludioxonil (12)</td>
<td>Slurry</td>
<td>5 fl oz/cwt</td>
<td>X</td>
<td>For control of seed rots due to <em>Pythium</em>, <em>Phytophthora</em>, <em>Fusarium</em>, <em>Rhizoctonia</em>.</td>
</tr>
<tr>
<td>Apron Maxx RTA, 1.1%:0.73%</td>
<td>Slurry</td>
<td>1.5 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Apron Maxx RFC, 2.31%:3.46%</td>
<td>Slurry</td>
<td>0.167-0.334 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Maxim XL, 8.4%:21%</td>
<td>Slurry</td>
<td>1.5 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi and insects. Contains thiamethoxam for insect control.</td>
</tr>
<tr>
<td>Mefenoxam (4) + Fludioxonil (12) + Thiamethoxam</td>
<td>Slurry or mist</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cruiser Maxx, 1.7%:1.12%:22.61%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metalaxyl (4)</td>
<td>Mist or slurry</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td>For <em>Pythium</em> damping off. See labels for higher rates for systemic downy mildew.</td>
</tr>
<tr>
<td>Allegiance FL, 28.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sebring 318 FS, 28.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allegiance Dry Seed Protectant, 12.5%</td>
<td>Drill box</td>
<td>4 fl oz/cwt</td>
<td>X</td>
<td>Apron Dry Seed Protectant for drill box application to seed not previously treated with Apron. Thorough mixing of fungicide and seed is essential for good control.</td>
</tr>
<tr>
<td>Dyna-Shield, 28.35%</td>
<td>Slurry</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Belmont 2.7 FS, 28.98%</td>
<td>Slurry or mist</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Prothioconazole + Penflufen + Metalaxyl</td>
<td>Slurry or mist</td>
<td>1.0 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi and seed rot and damping off caused by <em>Rhizoctonia</em>.</td>
</tr>
<tr>
<td>EverGol Energy, 7.18%:3.59%:5.74%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyraclostrobin (11)</td>
<td>Slurry or mist</td>
<td>0.4-1.5 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
<tr>
<td>Stamina, 18.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedaxane (7)</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt or 2.5-5 gai/100 kg of seed</td>
<td>X</td>
<td>For seed decay, seedling blights, and damping off caused by <em>Rhizoctonia</em>.</td>
</tr>
<tr>
<td>Vibrance, 43.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedaxane (7) + Mefenoxam (4) + Fludioxonil (12)</td>
<td>Slurry</td>
<td>1.54 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases caused by <em>Rhizoctonia</em>, <em>Pythium</em>, and <em>Fusarium</em>.</td>
</tr>
<tr>
<td>Vibrance Maxx, 4.69%; 3.52%; 2.35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiabendazole (1)</td>
<td>Slurry</td>
<td>1.02 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne Ascochyta, <em>Phoma</em> and seedling diseases caused by <em>Fusarium</em>.</td>
</tr>
<tr>
<td>Merlot 340-F, 42.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1Dosage = amount of formulated product to apply.
2X = product labeled for crop and disease; Blank = product not labeled for specific disease.
3Seedling blights due to various fungal infections of seed.

**Note:** Some seed treatments may affect Rhizobia inoculants; read inoculant label for specific information.
# Pea (Field)
## Seed Treatment (continued)

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage$^1$</th>
<th>Control$^2$ of Seedling Blight$^3$</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiabendazole (1) + Sedaxane (7) + Mefenoxam (4) + Fludioxonil (12) &lt;br&gt; Vibrance Maxx Pulses RTA, 4.3%; 1.43%; 1.07%; 0.71%</td>
<td>Slurry</td>
<td>5.0 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases caused by Ascochyta, Botrytis, Colletotrichum, Fusarium, Phoma, Phomopsis, Pythium and Rhizoctonia</td>
</tr>
<tr>
<td>Thiabendazole (1) + Sedaxane (7) + Mefenoxam (4) + Fludioxonil (12) + Thiamethoxam &lt;br&gt; Cruiser Maxx Vibrance Pulses, 4.24%; 1.41%; 1.06%; 0.71%; 8.48%</td>
<td>Slurry</td>
<td>5.0 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases caused by Ascochyta, Phoma, Botrytis, Fusarium, Phomopsis, Pythium and Rhizoctonia</td>
</tr>
<tr>
<td>Thiram (M3) &lt;br&gt; Thiram 480 DP, 42%</td>
<td>Slurry or mist</td>
<td>3 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases.</td>
</tr>
<tr>
<td>Tolclofos-methyl (14) &lt;br&gt; Rizolex, 42%</td>
<td>Slurry</td>
<td>0.3 fl oz/cwt</td>
<td>X</td>
<td>For management of Rhizoctonia and Fusarium species.</td>
</tr>
<tr>
<td>Trifloxystrobin (11) + Metalaxyl (4) &lt;br&gt; Trilex 2000, 7.12%; 5.69%</td>
<td>Slurry or mist</td>
<td>1.0 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
</tbody>
</table>

$^1$Dosage = amount of formulated product to apply.  
$^2$X = product labeled for crop and disease; Blank = product not labeled for specific disease.  
$^3$Seedling blights due to various fungal infections of seed.  

**Note:** Some seed treatments may affect Rhizobia inoculants; read inoculant label for specific information.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Control³ of Powdery Mildew</th>
<th>Control³ of Ascochyta Blight</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Bacillus subtilis</em> strain GST 713 (44) Serenade ASO, 1.34%</td>
<td>Spray or fungigation</td>
<td>2-5 qt/A</td>
<td>x</td>
<td>x</td>
<td>Begin applications when environmental conditions and plant stage are conducive to disease development.</td>
</tr>
<tr>
<td>Hydrogen Peroxide + Peroxyacetic Acid OxiDate 5.0, 27%, 5%</td>
<td>Spray</td>
<td>50-128 fl oz/100 gallons</td>
<td>x</td>
<td>x</td>
<td>Label suggests management of several fungal and bacterial diseases.</td>
</tr>
<tr>
<td>Hydrogen Peroxide + Peroxyacetic Acid SaniDate 12.0, 18.5%, 12%</td>
<td>Chemigation</td>
<td>Dilution rate is 1:1000 to 20,000</td>
<td>x</td>
<td>x</td>
<td>Label suggests management of several fungal and bacterial diseases.</td>
</tr>
<tr>
<td>Phosphoric Acid + Hydrogen Peroxide OxiPhos, 27.1%; 14.0%</td>
<td>Spray</td>
<td>2.5-5.0 qts/A</td>
<td>x</td>
<td>x</td>
<td>Label suggests management of several fungal and bacterial diseases.</td>
</tr>
<tr>
<td>Phosphorus Acid Phostrol, 53.6%</td>
<td>Spray</td>
<td>2-4 pts/A</td>
<td>x</td>
<td>x</td>
<td>For downy mildew caused by <em>Phytophthora</em> spp. and <em>Pythium</em> spp. Apply diluted solution to thoroughly wet foliage. Apply with normal irrigation schedule. Apply at 2-3 week intervals and repeat as needed.</td>
</tr>
<tr>
<td>Azoxystrobin (11) Cuadrail, 22.9% Satori, 22.9% Equation, 22.9% Tetraban, 22.9% Aframe, 22.9% AZTeroid FC 3.3, 34.3%</td>
<td>Spray or fungigation</td>
<td>6.0-15.5 fl oz/A</td>
<td>x</td>
<td>x</td>
<td>Resistance statement ⁵: Products also control many other fungal leaf diseases. Make applications preventatively for best results. Additional applications may be required under favorable environmental conditions. PHI = 14 days for Cuadrail.</td>
</tr>
<tr>
<td>Difenconazole (3) + Benzoixindiflupyr (7) Aprovia Top, 11.25%, 7.50%</td>
<td>Spray or fungigation</td>
<td>10.5-11 fl oz/A</td>
<td>x</td>
<td>x</td>
<td>Begin applications prior to disease onset when conditions are conducive for disease. Do not make more than two sequential applications before alternating to a fungicide from a different group. Do not apply more than 22 fl oz/A per year. PHI = 14 days.</td>
</tr>
</tbody>
</table>

¹Dosage = amount of formulated product to apply.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴See fungicide resistance management statement on Pages 7-8.
### Pea (Field)
#### Foliar Sprays (Continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage</th>
<th>Control&lt;sup&gt;3&lt;/sup&gt; of Powdery Mildew</th>
<th>Control&lt;sup&gt;3&lt;/sup&gt; of Ascochyta Blight</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoxastrobin (11) Evitio, 40.3%</td>
<td>Spray or fungigation</td>
<td>2.0-4.75 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Resistance statement 5&lt;sup&gt;4&lt;/sup&gt;. May also control many other fungal leaf diseases. Make applications preventively for best results. Additional applications may be required under favorable environmental conditions. PHI = 7 days.</td>
</tr>
<tr>
<td>Fluxapyroxad (7) + Pyraclostrobin (11) Priaxor, 14.33%;28.58%</td>
<td>Spray or fungigation</td>
<td>4-3 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Resistance statement 5 and 6&lt;sup&gt;4&lt;/sup&gt;. Begin applications prior to disease development and continue on a 7-14 day interval if conditions are conducive to disease development. Maximum applications per season = 2. PHI = 21 days. Pea hay may be fed no sooner than 14 days after last application.</td>
</tr>
<tr>
<td>Isofetamid (7) Kenja, 36%</td>
<td>Spray</td>
<td>17 fl oz/A</td>
<td></td>
<td></td>
<td>For gray mold caused by <em>Botrytis cinerea</em> and white mold caused by <em>Sclerotinia</em>. Begin applications when plants are at 10-30% bloom. A second application can be applied 7-14 days later. Do not make more than 2 sequential applications before rotating to a fungicide with a different mode of action. Do not apply more than 2 applications/A/year. PHI = 30 days.</td>
</tr>
<tr>
<td>Mefentriflunconazole (3) Provysol, 34.93%</td>
<td>Spray</td>
<td>2.5-5.0 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Controls Alternaria leaf and pod spot, Ascochyta blight, Cercospora leaf spot, Mycosphaerella blight, powdery mildew and rust. Do not apply more than 15 fl oz/A per year.</td>
</tr>
<tr>
<td>Mefentriflunconazole (3) + Pyraclostrobin (11) Veltyma, 17.58%; 17.56%</td>
<td>Spray</td>
<td>7-10 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Controls Alternaria leaf and pod spot, Ascochyta blight, Cercospora leaf spot, Mycosphaerella blight, powdery mildew and rust. Do not apply more than 20 fl oz/A per year.</td>
</tr>
<tr>
<td>Metconazole (3) Cuash, 50%</td>
<td>Spray</td>
<td>4.0 fl oz/A</td>
<td></td>
<td>X</td>
<td>Also suppresses white mold. Apply when conditions favor disease development and prior to infection. A second application may be made on a 7-16 day interval. Do not make more than 2 applications per year. Do not apply more than 8 oz of product/A/year. PHI = 21 days.</td>
</tr>
</tbody>
</table>

<sup>2</sup>Dosage = amount of formulated product to apply.

<sup>3</sup>X = product labeled for crop and disease; Blank = product not labeled for specific disease.

<sup>4</sup>See fungicide resistance management statement on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Control³ of Powdery Mildew</th>
<th>Control³ of Ascochyta Blight</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penthioptery (7)</td>
<td>Spray or fungigation</td>
<td>14-20 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Begin applications prior to disease development. For white mold, make initial application at beginning bloom and follow with a second application at full bloom. Do not exceed 41 fl oz/A per year. PHI = 21 days.</td>
</tr>
<tr>
<td>Vertisar, 20.6%</td>
<td>Spray or fungigation</td>
<td>14-20 fl oz/A</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Fortelis, 20.4%</td>
<td>Spray or fungigation</td>
<td>14-20 fl oz/A</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Picoxostrobin (11)</td>
<td>Spray or fungigation</td>
<td>6-12 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Resistance statement 5⁴ May also control many other fungal leaf diseases. Make applications preventively for best results. Additional applications may be required under favorable environmental conditions. PHI = 14 days.</td>
</tr>
<tr>
<td>Aproach, 22.5%</td>
<td>Spray or fungigation</td>
<td>6-12 fl oz/A</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Prothioconazole (3)</td>
<td>Spray or fungigation</td>
<td>12.0 fl oz/A</td>
<td>X</td>
<td></td>
<td>Begin applications preventatively and continue as needed on a 10-14 day interval. Use shorter intervals when conditions are favorable for severe disease pressure. Do not make more than 2 applications of Delaro per season. PHI = 30 days. Do not apply within 7 days of cutting or swathing the crop for forage.</td>
</tr>
<tr>
<td>+ Trifloxystrobin (11)</td>
<td>Spray or fungigation</td>
<td>12.0 fl oz/A</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delaro, 16.0%; 13.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prothioconazole (3)</td>
<td>Spray</td>
<td>5.7 fl oz/A</td>
<td>X</td>
<td></td>
<td>Apply at early flowering or at the first sign of disease. Use higher rate when conditions are favorable for severe disease pressure and/or when growing more susceptible varieties. Do not make more than 3 applications per year. Repeat applications as needed on a 5-14 day interval. Do not apply within 7 days of cutting or swathing the crop for harvest.</td>
</tr>
<tr>
<td>Proline 480 SC, 41%</td>
<td>Spray</td>
<td>5.7 fl oz/A</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pydiflumetofen (7) +</td>
<td>Spray</td>
<td>13.7 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Begin applications prior to disease development and continue on 14-day interval. Do not make more than two applications of Miravis Top before alternating to a fungicide that is not in group 3 or 7. Maximum use rate is 56 fl oz/A/year. PHI = 14 days.</td>
</tr>
<tr>
<td>Difenconazole (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miravis Top, 6.9%; 11.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴See fungicide resistance management statement on Pages 7-8.
# Pea (Field)  
## Foliar Sprays (Continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage$^2$</th>
<th>Control$^3$ of Powdery Mildew</th>
<th>Control$^3$ of Ascochyta Blight</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyraclostrobin (11)</td>
<td>Spray or fungigation</td>
<td>6-9 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Resistance statement 5$^4$. Products also control many other fungal leaf diseases. Make applications preventatively for best results. Additional applications may be required under favorable environmental conditions. PHI = 21 days.</td>
</tr>
<tr>
<td>Headline EC, 23.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headline SC, 23.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfur (M)</td>
<td>Spray or fungigation</td>
<td>3-5 lb/A</td>
<td>X</td>
<td></td>
<td>Sulfur has been used in Wisconsin and the Prairie Provinces of Canada. Its economic return has not been determined for North Dakota.</td>
</tr>
<tr>
<td>Kumulus DF, 80%</td>
<td>Spray or fungigation</td>
<td>3-4 pt/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquid Sulfur Six, 52%</td>
<td>Spray or fungigation</td>
<td>3-5 lb/A</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Micro Sulf, 80%</td>
<td>Spray or fungigation</td>
<td>3-5 lb/A</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microthiol Disperss, 80%</td>
<td>Spray or fungigation</td>
<td>7 lb/A</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tea Tree Oil (46) + Difenconazole (3)</td>
<td>Spray</td>
<td>4-6.5 fl oz/A</td>
<td>X</td>
<td>Make applications in the early stages of plant growth when conditions favor disease. Use the higher rate under increased disease pressure. PHI = 14 days.</td>
<td></td>
</tr>
<tr>
<td>Regev, 40.6%.20.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trifloxystrobin (11) + Prothioconazole (3)</td>
<td>Spray or fungigation</td>
<td>4.0-4.8 fl oz/A</td>
<td>X</td>
<td>Apply at early flower or at the first sign of the disease, whichever occurs first. Do not exceed 0.28 lb prothioconazole or 0.24 lb of trifloxystrobin per acre per year. Do not apply within 30 days of harvest. Do not apply within 7 days of cutting or swathing the crop for forage.</td>
<td></td>
</tr>
<tr>
<td>Stratego YLD, Protegam YLD</td>
<td></td>
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</tr>
<tr>
<td>32.3%; 10.8%</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

$^1$Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.  
$^2$Dosage = amount of formulated product to apply.  
$^3$X = product labeled for crop and disease; Blank = product not labeled for specific disease.  
$^4$See fungicide resistance management statement on Pages 7-8.
## Potato Seed Treatment

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Disease Control²</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Azoxystrobin (11)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynasty. 9.6%</td>
<td>Water-based slurry</td>
<td>0.10-3.75 fl oz/cwt</td>
<td>X</td>
<td>For suppression of black scurf and stem canker and seed-borne black dot, and for protection against silver scurf.</td>
</tr>
<tr>
<td>Saxony 100 FS, 9.67%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Chenopodium quinoa saponins</strong></td>
<td>See label for rates of application, formulation and use.</td>
<td>See label for mixing instructions.</td>
<td>X</td>
<td>Preplant seed treatment for prevention of fungal and bacterial diseases.</td>
</tr>
<tr>
<td>Heads Up Plant Protectant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hydrogen Peroxide + Peroxyacetic Acid</strong></td>
<td>Spray or Dip</td>
<td>See label for use instructions</td>
<td></td>
<td>Label suggests management of several fungal and bacterial diseases.</td>
</tr>
<tr>
<td>StorOx 2.0, 27%, 2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Difenconazole (3)</strong></td>
<td>Slurry or mist</td>
<td>0.103 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Salient 372 FS, 33.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fludioxonil (12)</strong></td>
<td>Dust</td>
<td>8.0 oz/cwt</td>
<td>X</td>
<td>Maxim and Maxim MZ are formulated as dusts to be applied to cut or single-drop seed before planting. Maxim products effectively suppress Fusarium dry rot seed decay, stem cankers and tuber black scurf caused by seed-borne Rhizoctonia solani and seed-borne Helminthosporium solani, the causal agent of silver scurf disease. Half rates are recommended for processing (fries).</td>
</tr>
<tr>
<td>Maxim, 0.5%</td>
<td>Liquid</td>
<td>0.04-0.08 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Maxim 4FS</td>
<td>Slurry</td>
<td>0.08 fl oz</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Spirato 480FS, 40.3%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Dyna-Shield</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fludioxonil, 40.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fludioxonil (12) + Mancobez (M3)</strong></td>
<td>Dust</td>
<td>0.5 lb/cwt</td>
<td>X</td>
<td>To aid in control of certain insects and Fusarium dry rot and other fungal diseases.</td>
</tr>
<tr>
<td>Maxim MZ, 0.5%:9.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fludioxonil (12) + Thiamethoxam</strong></td>
<td>Liquid</td>
<td>0.19-0.27 fl oz/cwt rate depends on seeding rate</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cruiser Maxx Potato, 7.0%:26%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fludioxonil (12) + Difenconazole (3) + Sedaxane (7) + Thiamethoxam</strong></td>
<td>Slurry or mix</td>
<td>0.5 fl oz/cwt</td>
<td>X</td>
<td>To aid in control of Rhizoctonia, Fusarium, Helminthosporium and certain insects.</td>
</tr>
<tr>
<td>CruiserMaxx Vibrance Potato, 3.34%; 6.69%; 6.69%; 13.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ Dosage = amount of formulated product to apply.
² X = product labeled for crop and disease; Blank = product not labeled for specific disease.
³ Fusarium, Rhizoctonia solani and Helminthosporium solani. These fungi cause dry rot, Rhizoctonia stem canker and silver scurf.
⁴ Includes Erwinia, cause of soft rot decay, and Clavibacter, cause of ring rot.
# Potato
## Seed Treatment (continued)

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Disease Control&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mancozeb (M4)</td>
<td>Slurry</td>
<td>1.25 lb/50 gal water</td>
<td>X</td>
<td>For suppression of <em>Fusarium</em> dry rot, <em>Rhizoctonia</em>, seed-borne common scab and silver scurf. Only Mancozeb will reduce the spread of <em>Phytophthora infestans</em>, the cause of late blight, during seed-cutting operations.</td>
</tr>
<tr>
<td>Mancozeb M4</td>
<td></td>
<td>1 qt/50 gal water</td>
<td>X</td>
<td>Dip seed pieces into mixture.</td>
</tr>
<tr>
<td>Manzate Max, 37%</td>
<td>Dust</td>
<td>1.25 lbs/50 gal water</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Manzate Pro-Stick, 75%</td>
<td>Dust</td>
<td>1 lb/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>PSP 6%</td>
<td>Dust</td>
<td>1 lb/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>PST Plus Bark 6%</td>
<td>Dust</td>
<td>1 lb/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Pencozeb 75%</td>
<td>Slurry</td>
<td>1.25 lbs/50 gal water</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Pencozeb 80 WP, 80%</td>
<td>Slurry</td>
<td>1.25 lb/50 gal water</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Roper DF Rainshield, 75%</td>
<td>Slurry</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mancozeb (M4) + Flutolanil (7)</td>
<td>Dust</td>
<td>0.75-1 lb/cwt</td>
<td>X</td>
<td>For suppression of <em>Rhizoctonia</em> and <em>Fusarium</em> dry rot seed decay. MZ added to suppress <em>Fusarium</em> dry rot seed decay.</td>
</tr>
<tr>
<td>Moncoat MZ 6.0%: 1.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandipropamid (40)</td>
<td>Slurry</td>
<td>0.2-0.4 fl oz/cwt</td>
<td>X</td>
<td>For protection against the infection or spread of seed borne <em>Phytophthora infestans</em> (late blight). Do not apply more than 32 fl oz of product/acre/year. Use only on potatoes intended for seed. Do not use on potatoes intended for consumptions. Do not exceed 0.4 fl oz per 100 lbs seed.</td>
</tr>
<tr>
<td>Revus, 23.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandipropamid (40) + Difenoconazole (3) + Sedaxane (7)</td>
<td>Slurry</td>
<td>0.5 fl oz/cwt</td>
<td>X</td>
<td>Provides early-season protection against seed-borne silver scurf, <em>Fusarium</em> dry rot, seed-borne blight scurf, seed-borne late blight and suppression of pink rot.</td>
</tr>
<tr>
<td>Vibrance Ultra Potato, 14.10%; 7.06%; 7.06%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penflufen (7) + Prothioconazole (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ernesto Silver, 9.35%: 1.68%</td>
<td>Diluted Spray Slurry</td>
<td>0.31 fl oz-cwt</td>
<td>X</td>
<td>For suppression of <em>Rhizoctonia solani</em>, black scurf, stem and stolon canker caused by seed-borne and soil-borne <em>Rhizoctonia</em>, silver scurf caused by <em>Helmintosporium solani</em> and seed piece rot caused by <em>Fusarium</em>. For added <em>Fusarium</em> protection, apply a MZ product designed for potatoes. Do not apply more than 2.5 fl oz of total slurry per 100 lbs of seed.</td>
</tr>
<tr>
<td>Sedaxane (7)</td>
<td>Slurry</td>
<td>0.05-0.08 fl oz/cwt</td>
<td>X</td>
<td>For suppression of black scurf, stem and stolon canker, and seed-borne silver scurf.</td>
</tr>
<tr>
<td>Vibrance, 43.7%</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Thiophanate methyl (1)</td>
<td>Slurry</td>
<td>0.5-0.7 fl oz/cwt</td>
<td>X</td>
<td>For aiding the control of dry rot, black scurf and stem canker, and silver scurf.</td>
</tr>
<tr>
<td>ST-Methyl 540 FS, 46.2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup> Dosage = amount of formulated product to apply.<br>
<sup>2</sup> X = product labeled for crop and disease; Blank = product not labeled for specific disease.<br>
<sup>3</sup> *Fusarium*, *Rhizoctonia solani* and *Helmintosporium solani*. These fungi cause dry rot, Rhizoctonia stem canker and silver scurf.<br>
<sup>4</sup> Includes Erwinia, cause of soft rot decay, and *Clavibacter*, cause of ring rot.
# Potato Soil Application

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage(^1)</th>
<th>Control of Rhizoctonia(^2)</th>
<th>Pythium Leak</th>
<th>Pink Rot</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bacillus subtilis</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strain QST 713 (44)</td>
<td>In-furrow at planting</td>
<td>2-6 fl qt/A</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serenade ASO, 1.34%</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Minuet, 9.89%</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bacillus subtilis</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Strain QST 713 (44)</td>
<td>In-furrow at planting</td>
<td>2-6 fl qt/A</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serenade ASO, 1.34%</td>
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<td></td>
</tr>
<tr>
<td>Minuet, 9.89%</td>
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</tr>
<tr>
<td><strong>Streptomyces lydicus WV EC 108 (44)</strong></td>
<td>In-furrow or side-dressing</td>
<td>3-12 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Actinovate AG, 0.04%</td>
<td></td>
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</tr>
<tr>
<td><strong>Azoxystrobin (11)</strong></td>
<td>In-furrow spray</td>
<td>0.4-0.6 fl oz/1,000 ft. of row (5.8-8.7 fl oz/A with 36&quot; rows)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quadris, 22.9%</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Satori, 22.9%</td>
<td></td>
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</tr>
<tr>
<td>Equation, 22.9%</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Tetraban, 22.9%</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Aframe, 22.9%</td>
<td></td>
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</tr>
<tr>
<td>AzTeronoid FC 3.3, 34.3%</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Azoxystrobin (11) + Benzovindiflupyr (7)</strong></td>
<td>In-furrow spray</td>
<td>0.34-0.5 oz/1,000 ft. of row</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elatus, 30.0%; 15.0%</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Azoxystrobin (11) + Metenoxam (4)</strong></td>
<td>In-furrow spray</td>
<td>0.82 fl oz/1,000 ft. of row</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Quadris Ridomil Gold SL</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Cyazofamid (21)</strong></td>
<td>In-furrow</td>
<td>0.42 fl oz/1,000 ft. row 2.75 fl oz/A in minimum of 20 gallons of finished spray solution</td>
<td>X</td>
<td></td>
<td></td>
<td>For additional control of Pink Rot.</td>
</tr>
<tr>
<td>Ranman, 34.5%</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) Dosage = amount of formulated product to apply.

\(^2\) X = product labeled for crop and disease; Blank = product not labeled for specific disease.

\(^3\) See fungicide resistance management statement on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage$^1$</th>
<th>Control of Rhizoctonia$^2$</th>
<th>Pythium Leak</th>
<th>Pink Rot</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethaboxam (22) Elumin, 42.5%</td>
<td>6-8 inch band, in furrow or side-dress.</td>
<td>8 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Apply in a 6-8 inch band directly over the seed piece, or in the furrow where the seed piece will be dropped prior to furrow closure. Make a banded side dressing application between hilling and tuber initiation. Make applications at least 25 days apart. Do not make more than 2 applications per year. Do not exceed 16 fl oz/A/yr.</td>
<td></td>
</tr>
<tr>
<td>Fluazinam (23) Omega 500F, 40%</td>
<td>In-furrow spray</td>
<td>1.5-3.0 pts/A</td>
<td></td>
<td></td>
<td>For suppression of Powdery Scab. Apply in-furrow over the seed piece immediately prior to covering over the seed piece with soil using at least 5 to 10 gpa. Use 1.5 pint per acre rate on fields with a history of low levels of powdery scab or with low numbers of spore balls present in the soil. Apply 3 pints per acre rate to fields with a history of moderate to heavy disease pressure or with moderate to high numbers of spore balls present in the soil. 24c labels for use in Minnesota and North Dakota.</td>
<td></td>
</tr>
<tr>
<td>Fluoxastrobin (11) Evito, 40.3%</td>
<td>In-furrow spray</td>
<td>0.16-0.24 fl oz/1,000 ft of row</td>
<td>X</td>
<td></td>
<td>Resistance statement 5. For control of black scurf, silver scurf and black dot. Do not use more than 22.8 fl oz/acre per year.</td>
<td></td>
</tr>
<tr>
<td>Flutolanil (7) Moncut, 70%</td>
<td>In-furrow</td>
<td>0.79-1.18 oz/1,000 ft row of a 36 in row</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluxapyroxad (7)+ Pyraclostrobin (11) Priaxor, 14.33%; 28.58%</td>
<td>In-furrow spray</td>
<td>0.48-0.6 fl oz/1,000 ft row.</td>
<td>X</td>
<td></td>
<td>Resistance statement 5 and 6. For 34-inch rows or less, use a maximum of 0.48 fl oz product per 1000 row feet.</td>
<td></td>
</tr>
<tr>
<td>Mefenoxam (4) Ridomil Gold EC or SL, 48%</td>
<td>6-8 inch band, in furrow or impregnated on dry fertilizer</td>
<td>0.42 fl oz/100 ft. of row</td>
<td>X</td>
<td>X</td>
<td>Resistance statement 4. For postharvest control of Pythium leak and pink rot caused by Phytophthora erythroseptica.</td>
<td></td>
</tr>
<tr>
<td>Ultra Flourish, 25 1%</td>
<td></td>
<td>0.84 fl oz/100 ft. of row</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platinum Ridomil Gold, 0%</td>
<td></td>
<td>2.2 fl oz/1,000 ft row.</td>
<td>X</td>
<td>X</td>
<td>Platinum Ridomil Gold contains 4.5% thiamethoxam for control of various potato insects.</td>
<td></td>
</tr>
</tbody>
</table>

$^1$Dosage = amount of formulated product to apply.
$^2$X = product labeled for crop and disease; Blank = product not labeled for specific disease.
$^3$See fungicide resistance management statement on Pages 7-8.
### Potato Soil Application (Continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Control of Rhizoctonia²</th>
<th>Pythium Leak</th>
<th>Pink Rot</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metalaxyl (4) Xyler FC, 31.3%</td>
<td>In-furrow</td>
<td>1.2 fl oz/1000 ft. row</td>
<td>X</td>
<td>X</td>
<td>For postharvest control of Pythium leak and pink rot.</td>
<td></td>
</tr>
<tr>
<td>Oxathiapiprolin (49) Orondis Gold 200, 18.7%</td>
<td>6-8 inch band in-furrow</td>
<td>4.8-9.6 fl oz/A</td>
<td></td>
<td>X</td>
<td>Apply no more than 9.6 fl oz/A/year. PHI = 5 days.</td>
<td></td>
</tr>
<tr>
<td>Oxathiapiprolin (49) + Mefenoxyam (4) Orondis Gold, 3.29%; 9.69%</td>
<td>6-8 inch band in-furrow</td>
<td>27.8 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Do not follow soil applications of Orondis Gold with foliar applications of Orondis Gold. PHI = 14 days</td>
<td></td>
</tr>
<tr>
<td>Pentiopyrad (7) Vertisan, 20.6%</td>
<td>In-furrow</td>
<td>0.7-1.6 fl oz/1,000 ft. row</td>
<td>X</td>
<td></td>
<td>Maximum rate per acre per application is 24 fl oz.</td>
<td></td>
</tr>
<tr>
<td>Phospshites (33) Sodium (mono - and - dibasic) Potassium, and Ammonium Phospshites (33). Several products</td>
<td>check label</td>
<td></td>
<td>X</td>
<td></td>
<td>Apply in a band at planting directly over the seed pieces. For Pythium leak control, apply in combination with mefenoxyam fungicide. Soil applications have not been shown to be efficacious with this fungicide. Foliar applications are recommended.</td>
<td></td>
</tr>
<tr>
<td>Phosphorus Acid Phostrol, 53.6%</td>
<td>In-furrow band</td>
<td>3.75-10 pts/A</td>
<td>X</td>
<td>X</td>
<td>For the suppression of storage rot diseases such pink rot and Pythium leak.</td>
<td></td>
</tr>
<tr>
<td>Pyraclostrobin (11) Headline EC, 23.6% Headline SC, 22.3%</td>
<td>In-furrow spray</td>
<td>0.4-0.8 fl oz/1,000 ft. of row</td>
<td>X</td>
<td></td>
<td>Resistance statement 5³. Maximum application rate is 0.73 fl oz/1,000 feet of row.</td>
<td></td>
</tr>
</tbody>
</table>

¹Dosage = amount of formulated product to apply.
²X = product labeled for crop and disease; Blank = product not labeled for specific disease.
³See fungicide resistance management statement on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Bacillus subtilis</em> strain QST 713 (44)</td>
<td>Spray or fungigation</td>
<td>2-6 qt/A</td>
<td>Late Blight</td>
<td>Include in a multiple spray program for management of early blight.</td>
</tr>
<tr>
<td>Serenade ASO, 1.34%</td>
<td></td>
<td></td>
<td>Early Blight</td>
<td>X</td>
</tr>
<tr>
<td><em>Hydrogen Peroxide + Peroxyacetic Acid</em></td>
<td>Spray</td>
<td>50-128 fl oz/100 gallons</td>
<td>Late Blight</td>
<td>Label suggests management of several fungal and bacterial diseases</td>
</tr>
<tr>
<td>OxiDate 5.0, 27%; 5%</td>
<td></td>
<td></td>
<td>Early Blight</td>
<td>X</td>
</tr>
<tr>
<td><em>Hydrogen Peroxide + Peroxyacetic Acid</em></td>
<td>Chemigation</td>
<td>Dilution rate is 1:1000 to 20,000</td>
<td>Late Blight</td>
<td>Label suggests management of several fungal and bacterial diseases</td>
</tr>
<tr>
<td>SaniDate 12.0, 18.5%, 12%</td>
<td></td>
<td></td>
<td>Early Blight</td>
<td>X</td>
</tr>
<tr>
<td><em>Phosphoric Acid + Hydrogen Peroxide</em></td>
<td>Spray</td>
<td>2.5-5.0 qts/A</td>
<td>Late Blight</td>
<td>Label suggests management of several fungal and bacterial diseases</td>
</tr>
<tr>
<td>OxiPhos, 27.1%; 14.0%</td>
<td></td>
<td></td>
<td>Early Blight</td>
<td>X</td>
</tr>
<tr>
<td><em>Phosphorus Acid</em></td>
<td>Spray</td>
<td>2.5-10 pts/A</td>
<td>Late Blight</td>
<td>Apply every 4-14 days depending on disease conditions. Integrate with other products labeled for late blight in a spray rotation program appropriate for disease conditions.</td>
</tr>
<tr>
<td>Phostrol, 53.6%</td>
<td></td>
<td></td>
<td>Early Blight</td>
<td>X</td>
</tr>
<tr>
<td><em>Azoxyostrobin (11)</em></td>
<td>Spray or fungigation</td>
<td>6.0-15.5 fl oz/A</td>
<td>Late Blight</td>
<td>Resistance statement 5⁵. For all Early blight: 6.2 fl oz/A on a 7-day interval or 12.4 fl oz/A on a 14-day interval. Late blight: 6.2 fl oz/A on a 7-day interval as a preventive, 12.4-15.4 fl oz/A on a 5-day interval when late blight is present. Do not make more than 6 applications per acre per year. Do not apply within 14 days of harvest. Also labeled for black dot control. See label for application instructions.</td>
</tr>
<tr>
<td>Quadrin, 22.9%</td>
<td></td>
<td></td>
<td>Early Blight</td>
<td>X</td>
</tr>
<tr>
<td>Satori, 22.9%</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Equation, 22.9%</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Tetraben, 22.9%</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Aframe, 22.9%</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>AZteroid FC 3.3, 34.3%</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><em>Azoxyostrobin (11) + Chlorothalonil (M5)</em></td>
<td>Spray</td>
<td>1.6 pt/A</td>
<td>Late Blight</td>
<td>Resistance statement 5⁵. Also labeled for black dot and powdery mildew.</td>
</tr>
<tr>
<td>Quadrin Opti, 4.6%; 48%</td>
<td></td>
<td></td>
<td>Early Blight</td>
<td>X</td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴Check the NDSU blight hotline, (888) 462-7286, for information on infection potential of early blight and late blight. Whenever late blight is severe, vine killing is extremely important and should be done at least 2 weeks before harvest to prevent tuber infections. Hilling of soil around the vines should be done just before killing them. ⁵See fungicide resistance management statement on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Azoxystrobin (11) + Difenconazole (3)</strong>&lt;br&gt;Quadris Top&lt;br&gt;18.2%;11.4%&lt;br&gt;Amistar Top, 18.2%;11.4%</td>
<td>Spray or fungigation</td>
<td>8-14 fl oz/A</td>
<td>X</td>
<td>Resisance statement 5². Also controls black dot, brown spot, powdery mildew and Septoria leafspot. Apply on a 7-14 day interval; do not make more than 2 sequential applications before rotating to an alternate MOA. Quadris Top should be used with an adjuvant such as a non-ionic based surfactant or crop oil concentrate or blend. Do not exceed 55.3 oz/A/season. PHI = 14 days.</td>
</tr>
<tr>
<td><strong>Boscalid (7)</strong>&lt;br&gt;Endura, 70%</td>
<td>Spray or fungigation</td>
<td>2.5-4.5 oz/a (EB)&lt;br&gt;5.5-10 oz/A (white mold)</td>
<td>X</td>
<td>Resisance statement 5⁵. Recent NDSU Research has indicated that &gt;90% of A. solani isolates are resistant to boscalid. PHI = 10 days. Also controls Sclerotinia white mold and Botrytis. For white mold control, apply prior to infection generally just prior to row closure. For early blight control, apply prior to disease onset. Do not exceed 20 oz/A per season.</td>
</tr>
<tr>
<td><strong>Chlorothalonil (M6)</strong>&lt;br&gt;Bravo WeatherStik, Equus 720, Echo 720, Prair. or Chloranil 720, 54%&lt;br&gt;Bravo Ultrex DG, 82.5%&lt;br&gt;Bravo Zn, Echo Zn or Terranil Zn, 38.5%&lt;br&gt;Equus DF, 82.5%&lt;br&gt;Echo 90 DF, 90%</td>
<td>Spray or fungigation</td>
<td>0.75 pt/ A 1st application.&lt;br&gt;1.0-1.5 pt/A subsequent applications</td>
<td>X</td>
<td>Do not apply more than 11.25 lb ai of chlorothalonil per acre per season (23 pt of 40.4%, 16 pt of 54%, 14.5 lb of 62.5%, 13 lb of 90%). Do not apply within 7 days of harvest. A 24 (C) state label has been granted to Echo 720, Echo ZN to allow up to 16 lb ai per acre per season for late blight control.</td>
</tr>
<tr>
<td></td>
<td>Spray or fungigation</td>
<td>0.7-1.4 lb/A</td>
<td>X</td>
<td>Do not apply more than 16 lb ai of Bravo Zn, Bravo WeatherStik or Bravo ZN per season (30.5 pt Bravo Zn, 21.5 pt of Bravo WeatherStik or Bravo WeatherStik Zn).</td>
</tr>
<tr>
<td></td>
<td>Spray or fungigation</td>
<td>1.0-2.13 pt/A</td>
<td>X</td>
<td>Bravo Ultrex has a maximum 10-day interval between applications for potato late blight control.</td>
</tr>
<tr>
<td></td>
<td>Spray or fungigation</td>
<td>0.7 lb/A first application.&lt;br&gt;0.9-1.38 lb/A subsequent applications</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spray or fungigation</td>
<td>0.63-1.25 lb/A</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴Check the NDSU blight hotline (888) 432-7286 for information on infection potential of early blight and late blight. Whenever late blight is severe, vine killing is extremely important and should be done at least 2 weeks before harvest to prevent tuber infections. Hilling of soil around the vines should be done just before killing them.
⁵See fungicide resistance management statement on Pages 7-8.
## Potato
### Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control²</th>
<th>Remarks³</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Late Blight</td>
<td>Early Blight</td>
</tr>
</tbody>
</table>
| Chlorothalonil (M5) + Zoxamide (22)  
Zingl, 40%, 6.8% | Spray or fungigation | 32-34 fl oz/A | X | X | Apply on preventative schedule. Do not make more than 2 sequential applications before alternating with a fungicide that has a different mode of action. Do not make more than 8 applications or apply more than 1.5 lb zoxamide and 8.8 lb chlorothalonil1 per acre per season. Do not apply within 7 days of harvest. |
| Copper (M1) Basicop WP, 53% | Spray | 3-6 lbs/A | X | X | Do not apply Basicop through irrigation system. |
| Champ DP, 57.6% | Spray or fungigation | 0.66-2.66 lb/A | X | X | Coppers are not effective under high disease pressure. |
| Champ WG, 77% | Spray or fungigation | 1-1 ½ lbs/A | X | X | Control will be improved by tank mixing with other compatible registered fungicides. |
| Champ Formula 2 Flowable, 37.5% | Spray or fungigation | 0.66-2.66 pt/A | X | | |
| ChampON++ 46.1% | Spray or fungigation | 0.5-1.75 lb/A | X | | |
| Cuprofix Ultra 40 Dispers 71.1% | Spray or fungigation | 0.75-3.0 lb/A | X | X | |
| Kocide 2000, 53.3% | Spray or fungigation | 1.25-6lb/A | X | X | |
| Kocide 3000, 46.1% | Spray or fungigation | 0.5-1.75 lb | X | X | |
| Kocide 4.5 LF, 37.5% | Spray or fungigation | 0.66-2.66 pt/A | X | X | |
| MasterCop, 21.46% | Spray or fungigation | 0.5-1.5 pt/A | X | X | |
| Badge X2, 45.31% | Spray or fungigation | 1-4 lbs/A | X | X | |
| Badge SC, 32.17% | Spray or fungigation | 1-4 pt/A | X | X | |
| Copper Sulfate (M1) Blue Viking Star Glow Powder or Triangle Brand Copper Sulfate Instant Powder | Spray | 10 lb/A | | | For application with Diquat desiccant to enhance vine desiccation and suppress late blight. |

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²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴Check the NDSU blight hotline, (888) 462-7286, for information on infection potential of early blight and late blight. Whenever late blight is severe, vine killing is extremely important and should be done at least 2 weeks before harvest to prevent tuber infections. Hilling of soil around the vines should be done just before killing them.
⁵See fungicide resistance management statement on Pages 7-8.
# Potato Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyazofamid (21) Ranman, 34.5%</td>
<td>Spray or fungigation</td>
<td>0.42 fl oz/1,000 linear ft. row or 1.4-2.75 fl oz/A as broadcast spray</td>
<td>X</td>
<td>Also for pink rot and Pythium leak control. Do not apply more than 27.5 fl oz per season. Alternate sprays of Ranman with a fungicide from a different chemistry class.</td>
</tr>
<tr>
<td>Cymoxanil (27) Curzate 60 DF, 60%</td>
<td>Spray or fungigation</td>
<td>3 1/3 oz/A</td>
<td>X</td>
<td>Must be tank-mixed with a protectant fungicide. Do not apply within 14 days of harvest.</td>
</tr>
<tr>
<td>Cymoxanil (27) + Chlorothalonil (M5) Ariston, 37.15%; 4.96%</td>
<td>Spray or fungigation</td>
<td>2 pts/A</td>
<td>X</td>
<td>Begin applications early in the season when conditions are favorable for disease. Do not exceed more than 17.5 pts of Ariston/A/year.</td>
</tr>
<tr>
<td>Dimethomorph (40) Forum, 43.5%</td>
<td>Spray or fungigation</td>
<td>6 oz/A</td>
<td>X</td>
<td>Do not exceed 30 oz/A per season. Do not apply Forum alone; must be tank-mixed with fungicides other than mefenoxam or metalaxyl registered for late blight control. PHI = 4 days.</td>
</tr>
<tr>
<td>Famoxadone (11) + Cymoxanil (27) Tanos, 25%; 25%</td>
<td>Spray or fungigation</td>
<td>6-8 oz/A</td>
<td>X</td>
<td>Resistance statement ⁵ Use 6 oz/A for early blight and 8 oz/A for late blight. Do not make more than 1 application of Tanos before alternating with a fungicide that has a different mode of action. Maximum of 72 oz/A/season. Also labeled for brown spot.</td>
</tr>
<tr>
<td>Fluazinam (29) Omega 500F, 40%</td>
<td>Spray or fungigation</td>
<td>5.5 fl oz/A for late blight 5.5-8 fl oz/A for white mold 1.5-3.0 pints/A in-furrow for powdery scab</td>
<td>X</td>
<td>Begin applications when conditions favor disease development. Repeat applications at 7-10 days. Do not apply more than 3.5 pts per acre per season. Do not apply within 14 days of harvest. Provides some tuber protection against late blight when used at the end of the season.</td>
</tr>
</tbody>
</table>

¹ Spray = ground or aerial. Fungigation = application through sprinkler irrigation system.
² Dosage = amount of formulated product to apply.
³ X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴ Check the NDSU blight hotline, (888) 432-7286, for information on infection potential of early blight and late blight. Whenever late blight is severe, vine killing is extremely important and should be done at least 2 weeks before harvest to prevent tuber infections. Hilling of soil around the vines should be done just before killing them.
⁵ See fungicide resistance management statement on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluopyram (7) Velum Prime, 41.5%</td>
<td>Fungigation 2(ee) label for in-furrow use</td>
<td>6.5-6.84 fl oz/A</td>
<td>Late Blight</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Early Blight</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Remarks statement 6⁵</td>
<td>Appy Velum Prime with overhead fungigation equipment. Despite suppression of root-knot nematode, tuber quality may not be adequately protected. If root-knot nematode is severe, other suppression measures should be used. A Velum Prime 2(ee) label allows application in-furrow at 6.5 fl oz/A. It is recommended not to make more than one application of fluopyram/A/season.</td>
</tr>
<tr>
<td>Fluopyram (7) + Pyrimethanil (8) Luna Tranquility, 11.3%:33.8%</td>
<td>Spray or fungigation</td>
<td>11.2 fl oz/A</td>
<td>Late Blight</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Early Blight</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Remarks statement 6⁵</td>
<td>None of the currently known SDHI mutations of the pathogen causing early blight (Alternaria solani) that affect boscalid appear to affect fluopyram. Also effective against white mold, botrytis, brown spot, and black dot. Apply Luna Tranquility mid-season on a 7-14 day interval. For resistance management of early blight and improved late blight management, mix Luna Tranquility with an EBDC or chlorothalonil. Do not apply more than 2 sequential applications or any Group 7 or 9 containing fungicide before rotating with a fungicide from a different group. PHI = 7 days.</td>
</tr>
<tr>
<td>Fluoxastrobin (11) Evilo, 40.3%</td>
<td>Spray or fungigation</td>
<td>3.8 fl oz/A</td>
<td>Late Blight</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Early Blight</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Do not apply within 7 days of harvest. Do not make more than 6 applications per season.</td>
<td></td>
</tr>
<tr>
<td>Fluxapyroxad (7) + Pyraclostrobin (11) Priaxor 14.33%:29.58%</td>
<td>Spray or fungigation</td>
<td>4 to 8 fl oz/A</td>
<td>Late Blight</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Early Blight</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Resistance Statements 5⁵ and 6⁵: Recent NDSU research demonstrated that ≥90% of Alternaria solani isolates are resistant to another FRAC 7 product, boscalid, and greater than 50% of those isolates are also resistant to fluxapyroxad. Also, &gt;90% of A. solani isolates are resistant to pyraclostrobin. Also, for control of black dot, brown spot and blackpit, and suppression of Botrytis gray mold. For suppression of late blight only. Do not apply more than 3 applications or 24 fl oz/A per season. PHI = 7 days.</td>
<td></td>
</tr>
<tr>
<td>Iprodione (2) Rovral 4F, 41.6% Nevada 4F, 41.6% Meteor, 41.6%</td>
<td>Ground spray or fungigation</td>
<td>1:2 pt/A early blight</td>
<td>Late Blight</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Early Blight</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Resistance statement 2⁵: Also labeled for control of white mold. Do not apply within 14 day of harvest. If pH of spray water is above 7.0, buffer to pH 5.0-7.0.</td>
<td></td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴Check the NDSU blight hotline. (888) 482-7286. for information on infection potential of early blight and late blight. Whenever late blight is severe, vine killing is extremely important and should be done at least 2 weeks before harvest to prevent tuber infections. Hilling of soil around the vines should be done just before killing them.
⁵See fungicide resistance management statement on Pages 7-8.
# Potato Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage</th>
<th>Disease Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Late Blight</td>
<td>Early Blight</td>
</tr>
<tr>
<td>Mancozeb (M3)</td>
<td>Spray or fungigation</td>
<td>0.5-2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Dithane M-45, 80%</td>
<td>Spray or fungigation</td>
<td>1-2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Manex II, 37%</td>
<td>Spray or fungigation</td>
<td>0.8-1.6 qt/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Manzate Pro-Stick, 75%</td>
<td>Spray or fungigation</td>
<td>1-2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Manzate Max, 37%</td>
<td>Spray or fungigation</td>
<td>1-2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Penncozeb, 80%</td>
<td>Spray or fungigation</td>
<td>1-2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Penncozeb DF, 75%</td>
<td>Spray or fungigation</td>
<td>0.4-1.6 qt/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Roper DF Rainshield, 75%</td>
<td>Spray or fungigation</td>
<td>1-2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mancozeb (M3) + Azoxyostrobin (11)</td>
<td>Spray or fungigation</td>
<td>1.6-2.1 lbs/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Dexter Max, 70%; 5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mancozeb (M3) + Chlorothalonil (M5)</td>
<td>Spray or fungigation</td>
<td>1.8-2.4 lbs/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Elixir, 62.5%; 12.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mancozeb (M3) + Copper (M1)</td>
<td>Spray or fungigation</td>
<td>1.5-5.0 lbs/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>ManKocide, 15.0%.46.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mancozeb (M3) + Zoxamide (22)</td>
<td>Spray or fungigation</td>
<td>1.5-2 lb/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Gavel, 66.7%;8.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Spray = ground or aerial, Fungigation = application through sprinkler irrigation system.
2 Dcsage = amount of formulated product to apply.
X = product labeled for crop and disease; Blank = product not labeled for specific disease.
4 Check the NDSU blight hotline, (888) 432-7286, for information on infection potential of early blight and late blight. Whenever late blight is severe, vine killing is extremely important and should be done at least 2 weeks before harvest to prevent tuber infections. Hilling of soil around the vines should be done just before killing them.
5 See fungicide resistance management statement on Pages 7-8.
## Potato Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage$^2$</th>
<th>Disease Control$^3$</th>
<th>Remarks$^4$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Late Blight</td>
<td>Early Blight</td>
<td></td>
</tr>
<tr>
<td>Mandipropamid (40)</td>
<td>Spray or fungigation</td>
<td>8 fl oz/A</td>
<td>X</td>
<td>Begin applications prior to disease development and continue on 7-10 day intervals. Make no more than 2 consecutive applications before switching to another non-Group 40 fungicide. Use short intervals under high disease pressure or when conditions are conducive to disease.</td>
</tr>
<tr>
<td>Revus, 23.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandipropamid (40) + Difenoconazole (3)</td>
<td>Spray or fungigation</td>
<td>5.5-7.0 fl oz/A</td>
<td>X</td>
<td>Begin applications before disease development and continue on 7-10 day intervals. Also controls black dot and brown spot. Do not make more than 2 applications before switching to a different mode of action. Do not apply within 14 days of harvest or apply more than 28 fl oz/season.</td>
</tr>
<tr>
<td>Revus Top, 21.9%:21.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mefenoaxm (4) + Chlorothalonil (M5)</td>
<td>Spray or fungigation</td>
<td>2 lb/A</td>
<td>X</td>
<td>Resistance statement$^5$. Do not apply Ridomil Gold/Bravo, Ridomil Gold/Bravo Liquid or Ridomil Gold/Copper within 14 days of harvest. For late blight control, begin applications when conditions are favorable for late blight, but after infection, and continue at 14-day intervals until threat of disease is over. To minimize the potential for resistance, do not make more than 3 applications. The full rate of a protectant fungicide should be applied between Ridomil applications, regardless of the Ridomil formulation used. See label for rotation restrictions: waiting period to plant after application of Ridomil (all formulations) is 0 days for dry beans, soybeans, potatoes and sugarbeets; 40 days for wheat, barley, and oats. 9 months for corn; and 12 months for all other crops. A minimum of 2 applications at 2 lb/A (flowering and 14 days later) for all Ridomil formulations will control A1 late blight tuber rot, <em>Pythium</em> leak and <em>Phytophthora erythroseptica</em> pink rot. For aerial applications, a minimum of 5 gal/A spray volume is recommended.</td>
</tr>
<tr>
<td>Ridomil Gold/Bravo WP, 4.5%:72%</td>
<td></td>
<td>1 container/10 acres</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Ridomil Gold/Bravo Liquid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mefenoaxm (4) + Copper Hydroxide (M1)</td>
<td>Spray or fungigation</td>
<td>2.0 lb/A + 0.8 lb ai/A of manebe, mancozeb, metiram or chlorothalonil</td>
<td>X</td>
<td>Resistance statement$^5$. Do not apply Ridomil Gold/Bravo, Ridomil Gold/Bravo Liquid or Ridomil Gold/Copper within 14 days of harvest. For late blight control, begin applications when conditions are favorable for late blight, but after infection, and continue at 14-day intervals until threat of disease is over. To minimize the potential for resistance, do not make more than 3 applications. The full rate of a protectant fungicide should be applied between Ridomil applications, regardless of the Ridomil formulation used. See label for rotation restrictions: waiting period to plant after application of Ridomil (all formulations) is 0 days for dry beans, soybeans, potatoes and sugarbeets; 40 days for wheat, barley, and oats. 9 months for corn; and 12 months for all other crops. A minimum of 2 applications at 2 lb/A (flowering and 14 days later) for all Ridomil formulations will control A1 late blight tuber rot, <em>Pythium</em> leak and <em>Phytophthora erythroseptica</em> pink rot. For aerial applications, a minimum of 5 gal/A spray volume is recommended.</td>
</tr>
<tr>
<td>Ridomil Gold/Copper WP, 5%:60%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^1$Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.  
$^2$Dosage = amount of formulated product to apply.  
$^3$X = product labeled for crop and disease; Blank = product not labeled for specific disease.  
$^4$Check the NDSU blight hotline, (888) 432-7286, for information on infecton potential of early blight and late blight. Whenever late blight is severe, vine killing is extremely important and should be done at least 2 weeks before harvest to prevent tuber infections. Hilling of soil around the vines should be done just before killing them.  
$^5$Mefenoaxm provides average control of new mating types of the late blight fungus; it provides excellent control for mefenoxam-sensitive strains of the A1 mating type. Most late blight strains present since 1998 are resistant to mefenoxam.  
$^6$See fungicide resistance management statement on Pages 7-8.
# Potato Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage</th>
<th>Late Blight Control</th>
<th>Early Blight Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mefenoaxm (4) + Mancozeb (M3) &lt;br&gt; Ridomil Gold MZ, 4%.64%</td>
<td>Spray or fungigation</td>
<td>2.5 lb/A</td>
<td>X&lt;sup&gt;5&lt;/sup&gt;</td>
<td>X</td>
<td>Resistance statement 4&lt;sup&gt;6&lt;/sup&gt;: Do not apply Ridomil Gold MZ within 14 days of harvest. For late blight control, begin applications when conditions are favorable for late blight, but before infection and continue at 14-day intervals until threat of disease is over. To minimize the potential for resistance, do not make more than 3 applications. The full rate of a protectant fungicide should be applied between Ridomil applications, regardless of the Ridomil formulation used. See label for rotation restrictions: waiting period to plant after Ridomil application (all formulations) is 0 days for dry beans, soybeans, potatoes and sugar beets; 40 days for wheat, barley and oats; 9 months for corn and sweet corn; and 12 months for all other crops. Two applications (flowering and 14 days later) at 2.5 lb rate will control A1 late blight tuber rot, <em>Pythium</em> leak and <em>Phytophthora erythroseptica</em> pink rot. For aerial applications, minimum of 5 gal/A spray is recommended.</td>
</tr>
<tr>
<td>Mefentrifluconazole (3) &lt;br&gt; Provysol, 34.93%</td>
<td>Spray</td>
<td>4.0 fl oz/A</td>
<td></td>
<td>X</td>
<td>Apply prior to disease development. Controls black dot, brown spot and early blight. Do not make more than one application before alternating with a non FRAC 3 fungicide. Apply at 7-14 day intervals. Do not apply more than 15 fl oz/A per year.</td>
</tr>
<tr>
<td>Mefentrifluconazole (3) + Pyraclostrobin (11) &lt;br&gt; Veltyma, 17.56%; 17.56%</td>
<td>Spray</td>
<td>8.0 fl oz/A</td>
<td></td>
<td>X</td>
<td>Apply prior to disease development. Controls black dot, brown spot, early blight, black pit. Do not apply more than 30 fl oz/A per year.</td>
</tr>
<tr>
<td>Metconazole (3) &lt;br&gt; Quash, 50%</td>
<td>Spray or fungigation</td>
<td>2.5-4.0 fl oz/A</td>
<td></td>
<td>X</td>
<td>Also effective on black dot, brown spot, and white mold. Use in a tank mix with Chlorothalonil or Mancozeb. Do not apply more than 2 applications per season. PHI = 1 day.</td>
</tr>
</tbody>
</table>

<sup>1</sup>Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
<sup>2</sup>Dosage = amount of formulated product to apply.
<sup>3</sup>X = product labeled for crop and disease; Blank = product not labeled for specific disease.
<sup>4</sup>Check the NDSU blight hotline, (888) 492-7286, for information on infection potential of early blight and late blight. Whenever late blight is severe, vine killing is extremely important and should be done at least 2 weeks before harvest to prevent tuber infections. Hilling of soil around the vines should be done just before killing them.
<sup>5</sup>See fungicide resistance management statements on Pages 7-8.
<sup>6</sup>Designates restricted-use pesticide.
## Potato
### Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Late Blight Control³</th>
<th>Early Blight Control³</th>
<th>Remarks⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metiram (M3) Polyram 80 DF, 80%</td>
<td>Spray or fungigation</td>
<td>1.5-2 lb/A</td>
<td>X</td>
<td>X</td>
<td>Do not apply within 14 days of harvest. Vine kill should occur 14 days before harvest. Do not exceed 14 lbs/A per season. We recommend that this product be used with an Integrated Pest Management Program. See label for further restrictions.</td>
</tr>
<tr>
<td>Penthiopyrad (7) Vertisan, 20.6%</td>
<td>Spray or fungigation</td>
<td>10-24 fl oz/A (early blight)</td>
<td></td>
<td>X</td>
<td>Resistance statement: Recent NDSU research demonstrated that &gt;90% of Alternaria solani isolates are resistant to another FRAC 7 product, boscalid, and over 50% of those isolates are also resistant to penthiopyrad. Begin applications prior to disease development. Repeat applications every 7-14 days. For white mold, make initial application at full bloom. Do not exceed 72 fl oz/A per season and make no more than 2 sequential applications. PHI = 7 days.</td>
</tr>
<tr>
<td>Picoxystrobin (11) Aproach SC, 22.5%</td>
<td>Spray or fungigation</td>
<td>6-12 fl oz/A</td>
<td></td>
<td>X</td>
<td>Resistance statement: Make initial application at 100% full bloom, or prior to row closure, and then again 14 days later. Also controls white mold. Do not make more than two consecutive applications. Do not apply more than 12 fl oz/A per application. Do not exceed 36 fl oz/A per year. PHI = 3 days.</td>
</tr>
<tr>
<td>Potassium Phosphite (33) + Chlorothalonil (M5) Calaminar</td>
<td>Spray or fungigation</td>
<td>4.0-5.5 pt/A</td>
<td>X</td>
<td>X</td>
<td>Also for pink rot. See label for application instructions. Do not apply more than 17 psi/A/season. Do not apply within 6 weeks of harvest.</td>
</tr>
<tr>
<td>Pyrimethanil (9) Scala, 54.6%</td>
<td>Spray or fungigation</td>
<td>7 fl oz/A</td>
<td></td>
<td>X</td>
<td>Also effective against Botrytis. Use only in tank mix with protectant such as mancozeb and chlorothalonil. Do not apply more than 35 fl oz/A per season. Do not make more than 2 consecutive applications of Scala. PHI = 7 days.</td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴Check the NDSU blight hotline, (888) 432-7286, for information on infection potential of early blight and late blight. Whenever late blight is severe, vine killing is extremely important and should be done at least 2 weeks before harvest to prevent tuber infections. Hilling of soil around the vines should be done just before killing them.
⁵See fungicide resistance management statements on Pages 7-8.
*Designates restricted-use pesticide.
### Potato

#### Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Propamocarb (28)</strong></td>
<td>Spray or fungigation</td>
<td>0.7 pt/A low disease risk 0.9 pt/A medium disease risk 1.2 pt/A high disease risk</td>
<td>X</td>
<td>Do not apply more than 6 pts of <em>Previcur</em>/acre/season. Do not apply within 14 days of harvest. Use in a tank mix with 0.9 lb ai/acre of chlorothalonil (1.2 pt/acre of Bravo WeatherStik or equivalent) or 1 lb ai mancozeb (1.25 lb/acre of Dithane M-45 or equivalent).</td>
</tr>
<tr>
<td><strong>Pydiflumetofen (7) + Fludioxonil (12)</strong></td>
<td>Spray or fungigation</td>
<td>9.2-11.4 fl oz/A</td>
<td>X</td>
<td>For control of brown spot, early blight, powdery mildew and Septoria. For suppression of gray mold, black dot and white mold. Do not make more than two applications of Miravis Prime before alternating with a fungicide that is not in group 7 or 12.</td>
</tr>
<tr>
<td><strong>Pyraclostrobin (11)</strong></td>
<td>Spray or fungigation</td>
<td>6-9 fl oz/A early blight 6-12 fl oz/A late blight</td>
<td>X</td>
<td>Resistance statement 5. Use 6-9 fl oz/A for early blight and 6-12 fl oz/A for late blight. Do not apply within 3 days of harvest. Do not make more than 6 applications per season. Also controls black dot. Apply prior to disease onset.</td>
</tr>
<tr>
<td><strong>Pyraclostrobin (11) + Metiram (M3)</strong></td>
<td>Spray or fungigation</td>
<td>2.0-2.9 lbs/A for black dot &amp; early blight 2.9 lbs/A for late blight</td>
<td>X</td>
<td>PHI = 14 days.</td>
</tr>
<tr>
<td><strong>Oxathiapiprolin (49) + Chlorothalonil (M5)</strong></td>
<td>Spray or fungigation</td>
<td>1.75-2 pt/A</td>
<td>X</td>
<td>Begin foliar applications prior to disease development. Make no more than 2 sequential applications before rotation with a different mode of action. Also suppresses black dot. Do not exceed 10 pt/A/year. PHI = 7 days.</td>
</tr>
<tr>
<td><strong>Oxathiapiprolin (49) + Mandipropamid (40)</strong></td>
<td>Spray or fungigation</td>
<td>5.5-8.0 fl oz/A</td>
<td>X</td>
<td>Begin applications prior to disease development. Make no more than 2 sequential applications before rotation with a different mode of action. Do not exceed 32 fl oz/A/year. PHI = 14 days.</td>
</tr>
</tbody>
</table>

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²Dosage = amount of formulated product to apply.

³X = product labeled for crop and disease; Blank = product not labeled for specific disease.

⁴Check the NDSU blight hotline, (888) 432-7286, for information on infection potential of early blight and late blight. Whenever late blight is severe, vine killing is extremely important and should be done at least 2 weeks before harvest to prevent tuber infections. Hilling of soil around the vines should be done just before killing them.

⁵See fungicide resistance management statements on Pages 7-8.

*Designates restricted-use pesticide
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium (mono - and dibasic -), Potassium, and Ammonium Phosphites (33) Several products</td>
<td>Spray or fungigation</td>
<td>check label</td>
<td>X</td>
<td>Provides better control when alternated with other fungicides. Also provides suppression of storage rot diseases such as pink rot.</td>
</tr>
<tr>
<td>Tea Tree Oil (46) + Difenconazole (3) Regev, 40.5%:20.3%</td>
<td>Spray</td>
<td>4.8-5 fl oz/A</td>
<td>X</td>
<td>Make applications in the early stages of plant growth when conditions favor disease. Use the higher rate under increased disease pressure. PHI = 14 days.</td>
</tr>
<tr>
<td>Triphenyltin Hydroxide (TPTH) RUP (30) Super Tin 80WP AgPak, 80% or Agri Tin, 80% or Super Tin 4L, or Agri Tin 4L, 40%</td>
<td>Spray or fungigation</td>
<td>2.5-3.75 oz/A</td>
<td>X</td>
<td>RESTRICTED-USE PESTICIDE. Do not apply within 7 days of harvest. Do not exceed 11.25 oz/A TPTH per season. May use 1.87 oz/A TPTH when used in combination with another fungicide. Ground application must be with closed cab. Do not enter treated area within 48 hours of treatment without proper PPE specified on label.</td>
</tr>
<tr>
<td>Thiophanate methyl (1) Topsis M WSB, 70% Topsis 4.5 FL, 45% or T-Methyl 4.5F Cercobin, 41.3% Thiofanate Methyl 85 WDG, 85% Incognito 85 WDG, 85% Incognito 4.5F, 46.2%</td>
<td>Spray or fungigation</td>
<td>1-1.5 lbs/A</td>
<td></td>
<td>Resistance statement 1⁵. Topsis M, Topsis 4.5 FL acre, Incognito 4.5F. Incognito 85 WDG, and Thiophanate methyl WDG are labeled for white mold control in potatoes.</td>
</tr>
<tr>
<td>Trifloxystrobin (11) Flint Extra, 42.6%</td>
<td>Spray</td>
<td>3.0-3.8 fl oz/A</td>
<td>X</td>
<td>Resistance statement 5⁶. For early blight, begin applications preventively and continue as needed on a 7-10 day interval. For late blight, begin applications preventively. Alternate Flint Extra with a protectant fungicide registered for late blight on a 7-10day schedule. Do not apply more than 23 oz. Flint Extra per season. Do not apply within 7 days of harvest. Do not make more than 6 total applications per acre per season.</td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴Check the NDSU blight hotline, (888) 482-7286, for information on infection potential of early blight and late blight. Whenever late blight is severe, vine killing is extremely important and should be done at least 2 weeks before harvest to prevent tuber infections. Hilling of soil around the vines should be done just before killing them.
⁵See fungicide resistance management statements on Pages 7-8.
*Designates restricted-use pesticide
# Safflower Seed Treatment

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Control&lt;sup&gt;2&lt;/sup&gt; of Seed-borne Rust</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Carboxin (7)</strong>&lt;br&gt;Vitavax-34, 34%</td>
<td>Slurry</td>
<td>2 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Fludioxonil (12)</strong>&lt;br&gt;Maxim 4FS, 40.3%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spirato 480FS, 40.3%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dyna-Shield Fludioxonil, 40.3%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mancozeb (M3)</strong>&lt;br&gt;Dithane DF Rainshield NT, 75%</td>
<td>Slurry</td>
<td>2.1 oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Dithane F-45, 37%</td>
<td>Drill box or slurry</td>
<td>3.2 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Dithane WSP, 80%</td>
<td>Drill box or slurry</td>
<td>2 oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Manzate Pro-Stick, 75%, 75%</td>
<td>Slurry</td>
<td>2 oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Penncozeb 80 WP, 60%</td>
<td>Drill box or slurry</td>
<td>2 oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penncozeb 75 DF, 75%</td>
<td>Drill box or slurry</td>
<td>2.1 oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Thiram (M3)</strong>&lt;br&gt;42-S Thiram, 42%</td>
<td>Liquid or slurry</td>
<td>2 fl oz/BU</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Thiram 50WP Dyed, 50%</td>
<td>Drill box or slurry</td>
<td>4 oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Signet 480FS, 44%</td>
<td>Liquid or slurry</td>
<td>2 fl oz/BU</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup>Dosage = amount of formulated product to apply.

<sup>2</sup>X = product labeled for crop and disease; Blank = product not labeled for specific disease.
# Safflower Foliar Sprays

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Alternaria Leaf Spot Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Azoxystrobin (11)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quadris, 22.9%</td>
<td>Spray or fungigation</td>
<td>6.0-15.5 fl oz/A</td>
<td>X</td>
<td>Resistance statement. Also controls downy mildew. Make Quadris applications preventatively for best results. Additional applications may be required under favorable environmental conditions. Do not apply more than 27 fl oz of product/season. PHI = 30 days.</td>
</tr>
<tr>
<td>AZteroid FC 3.3, 34.3%</td>
<td></td>
<td>3.9-9.7 fl oz/A for AZteroid FC</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fluxapyroxad (7) + Pyraclostrobin</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pliorox, 14.33%: 28.58%</td>
<td>Spray or fungigation</td>
<td>4-8 fl oz/A</td>
<td>X</td>
<td>For suppression of Sclerotinia. Also controls Septoria sp. Apply prior to disease development. Maximum of 2 applications per season. PHI = 21 days.</td>
</tr>
<tr>
<td><strong>Pyraclostrobin (11)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headline EC, 23.8%</td>
<td>Spray or fungigation</td>
<td>6-12 fl oz/A</td>
<td>X</td>
<td>Also controls Septoria sp. Apply prior to disease development for optimum control.</td>
</tr>
<tr>
<td>Headline SC, 23.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Dosage = amount of formulated product to apply.  
²X = product labeled for crop and disease; Blank = product not labeled for specific disease.

# Soybean Seed Treatment

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Control² of Seedling Blights³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Azoxystrobin (11)</strong></td>
<td>Slurry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynasty, 9.6%</td>
<td></td>
<td></td>
<td></td>
<td>For seed-borne and soil-borne fungi causing decay, damping off and seedling blight.</td>
</tr>
<tr>
<td>Saxony 100 FS, 9.67%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Captain (M4)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Captain 4000, 38.4%</td>
<td>See individual labels for rates of application, formulations and registered use</td>
<td>See individual labels for rates of application, formulations and registered use</td>
<td>X</td>
<td>Hi-Moly contains molybdenum.</td>
</tr>
<tr>
<td>Hi-Moly/Captan-D, 48.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hi-Moly Captan, 18.44%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Carbofuran (7)</strong></td>
<td>Slurry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitavax-34, 34%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germate Plus, 14%</td>
<td>Drill box</td>
<td>3-4 fl oz/cwt</td>
<td>X</td>
<td>Vitavax-34 may be used on seed previously treated with captain or thiram. Germate Plus contains 15% diazinon and 25% lindane insecticide. Kemel Guard Supreme contains 10.42% permethrin.</td>
</tr>
<tr>
<td>Kernel Guard Supreme, 14%</td>
<td>Drill box</td>
<td>1.5 oz/42 lb (2 oz/bu)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.5 oz/42 lb</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Dosage = amount of formulated product to apply.  
²X = product labeled for crop and disease; Blank = product not labeled for specific disease.  
³Seedling blights due to various fungal infections of seed.  
Note: Some seed treatments may affect Rhizobia inoculants; read inoculant label for specific information.
<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Control² of Seedling Blights³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboxin (7) + Captan (M4) Enhance, 20%:19%</td>
<td>Drill box</td>
<td>3 oz/bu</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Carboxin (7) + Thiram (M3) Vitafo-280, 15.5%: 13.25%</td>
<td>Ready to use slurry or mist</td>
<td>4 fl oz/cwt</td>
<td>X</td>
<td>For seed rot, seedling blight and damping off.</td>
</tr>
<tr>
<td>Chenopodium quinoa saponins Heads Up Plant Protectant</td>
<td>Slurry</td>
<td>5-8 fl oz/cwt</td>
<td>X</td>
<td>Signaling plant activator for protection against Rhizoctonia and Fusarium.</td>
</tr>
<tr>
<td>Chloroneb (14) Chloroneb 65W, 65%</td>
<td>Slurry</td>
<td>4 oz/cwt</td>
<td>X</td>
<td>May be used as a supplemental seed treatment for improved suppression of Rhizoctonia and Pythium.</td>
</tr>
<tr>
<td>Ethaboxam (22) intego Solo, 34.2%</td>
<td>Slurry or mist</td>
<td>0.3-0.6 fl oz/cwt</td>
<td>X</td>
<td>For control of Pythium and early season Phytophthora.</td>
</tr>
<tr>
<td>Ethaboxam (22) + Ipconazole (3) + Metalaxy (4)</td>
<td>Slurry or mist</td>
<td>2.11 fl oz/cwt</td>
<td>X</td>
<td>Commercial fungicide seed treatment with contact and systemic activity that protects against seed rots. Pythium, Phytophthora, Fusarium, and Rhizoctonia.</td>
</tr>
<tr>
<td>Ethaboxam (22) + Ipconazole (3) + Metalaxy (4) + Clothianidin</td>
<td>Slurry or mist</td>
<td>3.37 fl oz/cwt</td>
<td>X</td>
<td>Commercial fungicide and insecticide seed treatment with contact and systemic activity that protects against seed rots, Pythium, Phytophthora, Fusarium, and Rhizoctonia. Contains clothianidin for protection against soil insects and early-season foliar insects.</td>
</tr>
<tr>
<td>Fludioxonil (12) Maxim 4FS, 40.3%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt or 0.0038-0.0076 mg ai seed</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi. Registered for control of Rhizoctonia and Fusarium.</td>
</tr>
<tr>
<td>Fludioxonil (12) + Sedaxane (7) + Mefenoxam (4) Vibrance Trio, 2.32%:2.32%:13.95%</td>
<td>Slurry</td>
<td>1.55 fl oz/cwt or 0.72 fl oz/140,000 seed unit</td>
<td>X</td>
<td>For seed and seedling diseases including Fusarium, Pythium and Rhizoctonia.</td>
</tr>
</tbody>
</table>

¹Dosage = amount of formulated product to apply.
²X = product labeled for crop and disease; Blank = product not labeled for specific disease.
³Seedling blights due to various fungal infections of seed.

Note: Some seed treatments may affect Rhizobia inoculants; read inoculant label for specific information.
## Soybean (continued)

### Seed Treatment

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage(^1)</th>
<th>Control(^2) of Seedling Blights(^3)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fluopyram (7)</strong>&lt;br&gt; ILeVO, 48.4%</td>
<td>Slurry</td>
<td>0.075-0.25 mg ai/seed or 0.6-1.97 fl oz/140,000 seeds</td>
<td></td>
<td>Protects the root system against the SDS fungus and early season Septoria brown spot. ILeVO provides protection from plant-parasitic nematodes including soybean cyst, knot, root lesion, reniform and lance.</td>
</tr>
<tr>
<td><strong>Ipconazole (3)</strong>&lt;br&gt; Rancona 3.8 FS, 40.7%</td>
<td>Slurry or mist</td>
<td>0.085 fl oz/cwt</td>
<td>X</td>
<td>Does not provide control of <em>Pythium</em>.</td>
</tr>
<tr>
<td><strong>Ipconazole (3) + Metalaxyl (4)</strong>&lt;br&gt; Rancona Summit, 0.902%;1.443%&lt;br&gt; Rancona Xtra, 1.029%;1.647%</td>
<td>Slurry or mist</td>
<td>4.0 fl oz slurry/cwt&lt;br&gt;3.5-15 fl oz slurry/cwt</td>
<td>X</td>
<td>For seed and seedling diseases.</td>
</tr>
<tr>
<td><strong>Mefenoxam (4)</strong>&lt;br&gt; Apron XL, 33.3%</td>
<td>Slurry or mist</td>
<td>0.15-0.64 fl oz/cwt</td>
<td>X</td>
<td>For <em>Pythium</em> and early season <em>Phytophthora</em> control only. For both commercial and on-farm use.</td>
</tr>
<tr>
<td><strong>Mefenoxam (4) + Fludioxonil (12) + Sedaxane (7) + Thiamethoxam</strong>&lt;br&gt; CruiserMaxx Vibrance, 3.13%; 1.04%; 1.04%; 20.8%</td>
<td>Slurry or mix</td>
<td>3.22 fl oz/cwt or 1.5 fl oz/140,000 seeds</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi and insects. Contains thiamethoxam for insect control.</td>
</tr>
<tr>
<td><strong>Mefenoxam (4) + Fludioxonil (12)</strong>&lt;br&gt; Apron Maxx RFC, 3.46%; 2.31%&lt;br&gt; Maxim XL, 8.4%; 21%&lt;br&gt; Warden RTA 2.2%;0.72%</td>
<td>Slurry</td>
<td>1.5 fl oz/cwt</td>
<td>X</td>
<td>See labels for inoculant remarks.</td>
</tr>
<tr>
<td></td>
<td>Slurry or mist</td>
<td>0.157-0.334 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slurry or mist</td>
<td>5 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Mefenoxam (4) + Fludioxonil (12) + Thiabendazole (1) + Thiamethoxam</strong>&lt;br&gt; Equity, 1.70%; 1.12%; 2.13%; 22.61%</td>
<td>Water based slurry</td>
<td>3.0 fl oz/cwt</td>
<td>X</td>
<td>For protection against insects and early season diseases <em>Pythium</em>, <em>Phytophthora</em>, <em>Fusarium</em>, <em>Rhizoctonia</em> and <em>Phomopsis</em>.</td>
</tr>
<tr>
<td><strong>Mefenoxam (4) + Fludioxonil (12) + Thiabendazole (1) + Sedaxane (7) + Thiamethoxam</strong>&lt;br&gt; Equity, 3.35%; 1.12%; 2.24%; 1.12% 22.40%</td>
<td>Water based slurry</td>
<td>2.95 fl oz/cwt</td>
<td>X</td>
<td>For protection against insects and early season diseases <em>Pythium</em>, <em>Phytophthora</em>, <em>Fusarium</em>, <em>Rhizoctonia</em> and <em>Phomopsis</em>.</td>
</tr>
</tbody>
</table>

\(^1\)Dosage = amount of formulated product to apply.

\(^2\)X = product labeled for crop and disease; Blank = product not labeled for specific disease.

\(^3\)Seedling blights due to various fungal infections of seed.

**Note:** Some seed treatments may affect Rhizobia inoculants; read inoculant label for specific information.
<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Control² of Seeding Blights³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mefentrifluconazole (3)</td>
<td>Slurry or mist</td>
<td>0.2-0.8 fl oz/cwt</td>
<td>X</td>
<td>Seed and seedling diseases caused by <em>Fusarium</em> spp. and <em>Rhizoctonia solani.</em></td>
</tr>
<tr>
<td>Metalaxyl (4) Allegiance Fl., 28.35%</td>
<td>Mist or slurry</td>
<td>see remarks</td>
<td>Metalaxyl is for <em>Pythium</em> damping off and early season <em>Phytophthora</em> control only. For use only with commercial seed treatment equipment.</td>
<td></td>
</tr>
<tr>
<td>Sebring 318FS, 30.14%</td>
<td>Slurry</td>
<td>0.75-1.50 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belmont 2.7 FS, 28.98%</td>
<td>Slurry or mist</td>
<td>0.75-1.50 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sebring 480 FS, 44.08%</td>
<td>Slurry or mist</td>
<td>0.5-1 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metalaxyl (4) + Thiophanate-Methyl (1) + Fludioxonil (12) + imidacloprid</td>
<td>Slurry or mist</td>
<td>4.0 fl oz/cwt</td>
<td>X</td>
<td>For protection against damping-off, seed and seedling diseases due to <em>Pythium, Phytophthora, Fusarium,</em> and <em>Rhizoctonia</em> and early-season insects. For use only in commercial seed treatment facilities.</td>
</tr>
<tr>
<td>Oxathiapiprolin (49)</td>
<td>Slurry</td>
<td>0.566 – 1.130 fl oz/cwt</td>
<td>X</td>
<td>Use higher rate in areas with history of disease pressure. For management of <em>Phytophthora.</em></td>
</tr>
<tr>
<td>Pentrufen (7) + Prothioconazole (3) + Metalaxyl (4)</td>
<td>Slurry or mist</td>
<td>1 fl oz/cwt</td>
<td>X</td>
<td>For seed rot and damping off caused by <em>Rhizoctonia, Fusarium,</em> and <em>Pythium.</em> Also, for seed decay caused by <em>Phomopsis.</em></td>
</tr>
<tr>
<td>Pydiflumetofen (7) Salto, 41.7%</td>
<td>Slurry</td>
<td>1.52 fl oz/cwt</td>
<td>X</td>
<td>For sudden death syndrome (SDS), early season <em>Septoria</em> brown spot and suppression against plant parasitic nematodes.</td>
</tr>
</tbody>
</table>

¹Dosage = amount of formulated product to apply.
²X = product labeled for crop and disease; Blank = product not labeled for specific disease.
³Seedling blights due to various fungal infections of seed.

**Note:** Some seed treatments may affect Rhizobia inoculants; read inoculant label for specific information.
## Soybean (continued)
### Seed Treatment

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Control² of Seedling Blights³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sedaxane (7) Vibrance, 43.7%</td>
<td>Slurry</td>
<td>0.08-16 fl/oz cwt or 2.5-5 gal/100 kg seed</td>
<td>X</td>
<td>Seed decay, seedling blight and damping off caused by <em>Rhizoctonia solani</em>.</td>
</tr>
<tr>
<td>Sedaxane (7) + Fludioxonil (12) + Mefenoxam (4) + Thiamethoxam Warden CX, 1%; 1%; 5.99%; 20.0%</td>
<td>Slurry</td>
<td>3.38 fl oz/cwt</td>
<td>X</td>
<td>For suppression of <em>Rhizoctonia</em> sp., <em>Pythium</em> sp., <em>Phytophthora</em>, and <em>Fusarium</em> sp. Thiamethoxam is for broad spectrum insect control.</td>
</tr>
<tr>
<td>Tolclofos-methyl (14) Rizolex, 42%</td>
<td>Slurry or mist</td>
<td>0.3 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases. Controls <em>Rhizoctonia solani</em> and <em>Fusarium</em> species.</td>
</tr>
<tr>
<td>Trifloxystrobin (11) Trilex, 22%</td>
<td>Slurry</td>
<td>0.32 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
<tr>
<td>Trifloxystrobin (11) + Metalaxyl (4) Trilex 2000, 7.12%; 5.96%</td>
<td>RTU or slurry or mist</td>
<td>1.0 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
</tbody>
</table>

¹Dosage = amount of formulated product to apply.
²X = product labeled for crop and disease; Blank = product not labeled for specific disease.
³Seedling blights due to various fungal infections of seed.

Note: Some seed treatments may affect Rhizobia inoculants; read inoculant label for specific information.
# Soybean Soil Application

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Azoxystrobin (11)</strong></td>
<td>In-furrow spray</td>
<td>0.4-0.8 fl oz/1,000 ft row</td>
<td>X</td>
<td>For suppression of <em>Rhizoctonia.</em></td>
</tr>
<tr>
<td>Equation, 22.98%</td>
<td></td>
<td>0.24-0.48 fl oz/1,000 ft row for AZteroid FC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetraban, 22.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AZteroid FC 3.3, 34.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Azoxystrobin (11) + Metalaxyl (4)</strong></td>
<td>In-furrow</td>
<td>0.34 fl oz/1,000 linear feet of row</td>
<td></td>
<td>Apply in a 7-inch band One application per season.</td>
</tr>
<tr>
<td>Uniform, 28.2%.10.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bacillus amyloliquefaciens strain D747 (44) + Bifenthrin</strong></td>
<td>In-furrow</td>
<td>4-17 fl oz/A</td>
<td></td>
<td>Restricted use pesticide. Suppression of seedling blights.</td>
</tr>
<tr>
<td>Ethos XB, 5.0%, 15.57%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bacillus subtilis QST 713 (44)</strong></td>
<td>In-furrow spray</td>
<td>2-6 fl qt/A</td>
<td></td>
<td>Apply as a directed spray in the seed furrow and to cover soil at planting.</td>
</tr>
<tr>
<td>Serenade ASO, 1.34%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Coniothyrium minitans</strong></td>
<td>Soil incorporation</td>
<td>1-4 lb/A</td>
<td></td>
<td>Fungus attacks sclerotia of the white mold fungus in the soil.</td>
</tr>
<tr>
<td>Contans WG, 5.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fluoxastrobin (11)</strong></td>
<td>In-furrow spray</td>
<td>0.11-0.16 fl oz/1,000 ft row</td>
<td></td>
<td>For suppression of <em>Rhizoctonia.</em></td>
</tr>
<tr>
<td>Evito, 40.3%</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Mefenoxam (4)</strong></td>
<td>In-furrow spray</td>
<td>0.08-0.28 fl oz/1,000 ft. of row</td>
<td>X</td>
<td>Resistance statement 4[^3].</td>
</tr>
<tr>
<td>Ridomil Gold EC, 48%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-furrow, 7&quot; band or T-band</td>
<td>1.5-6 oz/1,000 ft. of row</td>
<td>X</td>
<td>Do not apply directly to seed but to soil that will be mixed in covering the seed. Use lower rates for early to mid-season control; full rates for full-season control. See label for planting restrictions within 12 months of application.</td>
<td></td>
</tr>
<tr>
<td>Ridomil Gold GR, 2.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[^1]: Dosage = amount of formulated product to apply.
[^2]: X = product labeled for crop and disease; Blank = product not labeled for specific disease.
[^3]: See fungicide resistance management statements on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Control of Pythium, Phytophthora</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metalaxyl (4)</td>
<td>In-furrow</td>
<td>0.21-0.79 fl oz/1000 ft. row</td>
<td>Apply in-furrow as a spray or stream directed to the soil adjacent to seed rather than directly on seed to increase crop safety.</td>
<td></td>
</tr>
<tr>
<td>Xyler FC, 31.3%</td>
<td></td>
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</tr>
<tr>
<td>Prothioconazole (3)</td>
<td>In-furrow spray</td>
<td>2.6-5.0 fl oz/A</td>
<td>For control of Rhizoctonia. Apply up to 5.0 fl oz/A (0.14 fl oz/1,000 ft if on 15&quot; rows or 0.21 fl oz/1,000 ft if on 22&quot; rows).</td>
<td></td>
</tr>
<tr>
<td>Proline, 41.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyraclostrobin (11)</td>
<td>In-furrow spray</td>
<td>0.4-0.8 fl oz/1,000 ft. row</td>
<td>For suppression of Rhizoctonia. For 22” rows, use maximum of 0.5 fl oz/1,000 ft. of row. For 36” rows, use maximum of 0.7 fl oz/1,000 ft. of row.</td>
<td></td>
</tr>
<tr>
<td>Headline EC, 23.6%</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Pyraclostrobin (11) +</td>
<td>In-furrow spray</td>
<td>0.2-0.6 fl oz/1,000 ft. row</td>
<td>X (Pythium suppression)</td>
<td>Do not mix with liquid fertilizer. Also suppresses Rhizoctonia and Fusarium. Maximum of 1 application per season.</td>
</tr>
<tr>
<td>Fluxapyroxad (7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Priaxor, 28.58%, 14.33%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Dosage = amount of formulated product to apply.
²X = product labeled for crop and disease; Blank = product not labeled for specific disease.
³See fungicide resistance management statements on Pages 7-8.
## Soybean Nematicide Seed Treatment

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage</th>
<th>Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abamectin Avicta 500FS, 48.3%</td>
<td>Commercially applied</td>
<td>Nematodes</td>
<td>Syngenta Crop Protection LLC has a commercially treated blend of nematicide, insecticide, and fungicide seed treatment products.</td>
<td></td>
</tr>
<tr>
<td>Abamectin + Thiamethoxam + Mefenoxam (4) + Fludioxonil (12) Avicta Complete Beans 500, 22.20%; 11.10%; 1.67%; 0.56%</td>
<td>Commercially applied</td>
<td>Nematodes (by abamectin), various insects (by thiamethoxam), and various diseases (by mefenoxam and fludioxonil)</td>
<td>Syngenta Crop Protection LLC has a commercially treated blend of nematicide, insecticide, and fungicide seed treatment products.</td>
<td></td>
</tr>
<tr>
<td>Pasteuria nishizawai – Pn1 Clarva pn, 15.0%</td>
<td>Slurry</td>
<td>0.9-33.8 fl oz/100 lbs seed</td>
<td>Soybean cyst nematode</td>
<td></td>
</tr>
<tr>
<td>Thiamethoxam + Mefenoxam (4) + Fludioxonil (12) + Sedaxane (7) + Pasteuria nishizawai – Pn1 Clarva Elite, 12.5%; 1.88%; 0.63%; 0.63%; 4.06%</td>
<td>Slurry</td>
<td>5.6 fl oz/100 lbs seed</td>
<td>Soybean Cyst Nematode Protection against damping off and seed borne diseases due to <em>Pythium</em>, <em>Phytophthora</em>, <em>Fusarium</em>, <em>Rhizoctonia</em>.</td>
<td></td>
</tr>
<tr>
<td>Bacillus amyloliquefaciens Strain PTA-4838 Aveo EZ, 16.5%</td>
<td>Slurry</td>
<td>0.1 fl oz/100 lbs of seed</td>
<td>Nematodes.</td>
<td></td>
</tr>
<tr>
<td>Clothianidin + Bacillus firmus Poncho Votivo, 40.3%; 8.1%</td>
<td>Commercially applied</td>
<td>Provides early season protection of the soybean plant against root nematodes and broad control of insect pests.</td>
<td>The <em>Bacillus firmus</em> bacterium creates a living barrier that prevents nematodes from racing the roots.</td>
<td></td>
</tr>
</tbody>
</table>
## Soybean Foliar Sprays

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage</th>
<th>White Mold Control</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| **Bacillus pumilus QST 2808 (44)**  
Sonaia, 1.38% | Spray or fungigation | 0.5-4 qt/A | X | Use 0.5 to 4 qt/A in tank mix with labeled rates of strobilurin fungicides when conditions are conducive to disease development. Use 1 to 4 qt/A stand-alone. |
| **Bacillus subtilis**  
strain QST 713 (44)  
Serenade ASO, 1.34% | Spray or fungigation | 2-6 qt/A | X | For suppression. |
| **Hydrogen Peroxide + Peroxyacetic Acid**  
OxiDate 5.0, 27%, 5% | Spray | 50-128 fl oz/100 gallons | | Label suggests management of several fungal and bacterial diseases. |
| **Hydrogen Peroxide + Peroxyacetic Acid**  
SaniDate 12.0, 18.5%, 12% | Chamigation | Dilution rate is 1:1000 to 20,000 | | Label suggests management of several fungal and bacterial diseases. |
| **Phosphoric Acid + Hydrogen Peroxide**  
OxiPhos, 27.1%; 14.0% | Spray | 2.5-5.0 qts/A | | Label suggests management of several fungal and bacterial diseases. |
| **Phosphorus Acid**  
Phostrol, 53.6% | Spray | 4 qts/A | | For downy mildew. |
| **Azoxystrobin (11)**  
Quadris, 22.9%  
Satori, 22.9%  
Equation, 22.9%  
Tetraben, 22.9%  
Aframe, 22.9%  
AZtroid FC 3.3, 34.3% | Spray or fungigation | 6.0-15.5 fl oz/A  
3.9-9.7 fl oz/A for AZtroid FC | | Resistance statement 54.  
Products control pod and stem blight, soybean rust and brown spot. |
| **Azoxystrobin (11) + Chlorothalonil (N5)**  
Arius Adv. 11.6%, 44.0% | Spray or fungigation | 20-25 fl oz/A | | Resistance statement 54.  
Apply when conditions are favorable for disease development. Do not apply more than 1.5lb of azoxystrobin/A/year. Do not apply more than 4.5 lbs of chlorothalonil/A/year. PHI = 42 days. |

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2Dosage = amount of formulated product to apply.  
3X = product labeled for crop and disease, Blank = product not labeled for specific disease.  
4See fungicide resistance management statements on Pages 7-8.
# Soybean Foliar Sprays (Continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>White Mold Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Azoxystrobin (11) + Cyproconazole (3)</strong></td>
<td>Spray</td>
<td>5.0-6.8 fl oz/A</td>
<td></td>
<td>Resistance statement 5⁴ and 3⁴. See label for specifics for target disease. Do not apply more than two applications per year. Do not apply within 30 days of harvest.</td>
</tr>
<tr>
<td>Azure Xtra, 18.2%;7.3%</td>
<td></td>
<td>4.0-6.8 fl oz/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RustEase, 18.2%; 7.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Azoxystrobin (11) + Propiconazole (3)</strong></td>
<td>Spray or fungigation</td>
<td>14-20.5 fl oz/A</td>
<td></td>
<td>Resistance statement 5⁴ and 3⁴. Quilt controls several diseases in soybeans including soybean rust. Do not apply more than 42 fl oz/A. PHI = 21 days for seed, 0 for forage or hay.</td>
</tr>
<tr>
<td>Quilt, 7%;11.6%</td>
<td></td>
<td>10.5-21 fl oz/A</td>
<td></td>
<td>Quilt Xcel controls several diseases in soybeans. Do not apply more than 42 oz/a/year. Do not apply after R6 stage soybeans.</td>
</tr>
<tr>
<td>Quilt Xcel 13.5%;11.7%</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Aframe Plus, 13.5%; 11.7%</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Azoxystrobin (11) + Tebuconazole (3)</strong></td>
<td>Spray or fungigation</td>
<td>8.6 fl oz/A</td>
<td></td>
<td>Resistance statement 5⁴ and 3⁴. Apply as a preventative spray prior to disease development. Do not apply more than 25.0 fl oz/A per season. PHI = 21 days.</td>
</tr>
<tr>
<td>Custodia, 11.0%; 18.36%</td>
<td></td>
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</tr>
<tr>
<td><strong>Azoxystrobin (11) + Tetaconazole (3)</strong></td>
<td>Spray or fungigation</td>
<td>10.0-14.0 fl oz/A</td>
<td></td>
<td>Resistance statement 5⁴ and 3⁴. Apply prior to disease development when conditions favor disease development. Do not make more than three applications per year or apply more than 28.7 fl oz/A per year. PHI = 14 days.</td>
</tr>
<tr>
<td>Affiance, 9.35%; 7.48%</td>
<td></td>
<td>13.0-16.0 fl oz/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brixen, 13.76%; 6.67%</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Benzovindiflupyr (7) + Azoxystrobin (11) + Propiconazole (3)</strong></td>
<td>Spray or fungigation</td>
<td>13.7-20.7 fl oz/A</td>
<td></td>
<td>Make application between R1-R3. Do not exceed 41.4 fl oz/A/year. PHI = 14 days or R6, whichever is longest.</td>
</tr>
<tr>
<td>Trivapro, 2.9%; 10.5%; 11.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Boscalid (7)</strong></td>
<td>Spray or fungigation</td>
<td>5.5-11 oz/A</td>
<td>X</td>
<td>For optimal white mold control, apply at early flowering. If environment remains favorable for disease development, make a second application 7-14 days after initial application. PHI = 21 days.</td>
</tr>
<tr>
<td>Endura, 70%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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²Dosage = amount of formulated product to apply;
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴See fungicide resistance management statements on Pages 7-8.
# Soybean
## Foliar Sprays (Continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>White Mold Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chlorothalonil (M5)</strong></td>
<td>Spray or fungigation</td>
<td>See label</td>
<td>Chlorothalonil products control pod and stem blight and stem canker, and suppress soybean rust.</td>
<td></td>
</tr>
<tr>
<td>Bravo Ultrex,</td>
<td>Spray or fungigation</td>
<td>See label</td>
<td>Do not feed soybean hay or thrashings from chlorothalonil-treated fields to livestock.</td>
<td></td>
</tr>
<tr>
<td>Equus DF, 82.5%</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Bravo WeatherStik,</td>
<td></td>
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</tr>
<tr>
<td>Echo 720</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Equus 720 SST,</td>
<td></td>
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</tr>
<tr>
<td>Praize, or</td>
<td></td>
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</tr>
<tr>
<td>Chlorothalonil 720,</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>54%</td>
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</tr>
<tr>
<td>Echo 90 DF, 90%</td>
<td></td>
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</tr>
<tr>
<td>Echo Zn, 38.5%</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Copper Sulfate (M1)</strong></td>
<td>Spray or fungigation</td>
<td>0.75-1.25 lb/A bacterial diseases 1.25-2.0 lbs/A fungal leaf spots</td>
<td>For control of soybean rust and other leaf diseases. See label for specific rate recommendations. Do not apply more than 11 fl oz/season. Do not apply with 30 days of harvest.</td>
<td></td>
</tr>
<tr>
<td>Cuperox Ultra 40. 71.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cyproconazole (3)</strong></td>
<td>Spray or fungigation</td>
<td>4.0-5.5 fl oz/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alto 100 SL, 8.9%</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fluopyram (7) + Prothioconazole (3)</strong></td>
<td>Spray or fungigation</td>
<td>6.0-10.2 fl oz/A</td>
<td>Apply ProPulse at 6.0-8.0 fl oz/A for control of white mold. For optimum disease control apply at early flowering. Do not apply more than 30.9 fl oz/A/year. PHI = 21 days.</td>
<td></td>
</tr>
<tr>
<td>ProPulse, 17.4%; 17.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fluoxastrobin (11)</strong></td>
<td>Spray or fungigation</td>
<td>2.0-5.7 fl oz/A</td>
<td>Resistance statement 5⁴. For control of Asian soybean rust and many fungal leaf spots. Begin applications preventively and continue as needed on 14-21 day interval. Do not apply more than 11.4 fl oz per year.</td>
<td></td>
</tr>
<tr>
<td>Evito 480SC, 40.3%</td>
<td></td>
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</tr>
<tr>
<td><strong>Fluoxastrobin (11) + Flutriafol (3)</strong></td>
<td>Spray or fungigation</td>
<td>4-6 fl oz/A</td>
<td>Resistance statement 5⁴ and 3⁴. For fungal leaf spots and Asian soybean rust. Apply from R1 to R3. Do not make more than 2 applications per season. Do not apply more than 12 fl oz/A per season. PHI = 30 days.</td>
<td></td>
</tr>
<tr>
<td>Fortix, 14.8%; 19.3%</td>
<td></td>
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</tr>
<tr>
<td>Preemptor, 14.84%; 19.3%</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>White Mold Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoxastrobin (11) + Tetaconazole (3) Zolera FX, 17.76%; 17.76%</td>
<td>Spray or fungigation</td>
<td>4.4-6.8 fl oz/A</td>
<td></td>
<td>Resistance statement 5⁴ and 3⁴. For fungal leaf spots and suppression of white mold. Do not apply more than 6.8 fl oz/A per season. Apply at or prior to R1 for white mold suppression. PHI = 30 days.</td>
</tr>
<tr>
<td>Flutriafol (3) Topguard, 11.8%</td>
<td>Spray or fungigation</td>
<td>7-14 fl oz/A</td>
<td>X Suppression Only</td>
<td>For control of foliar fungal diseases.</td>
</tr>
<tr>
<td>Fluxapyroxad (7) + Pyraclostrobin (11) Priaxor, 14.33%; 28.56%</td>
<td>Spray or fungigation</td>
<td>4-8 fl oz/A</td>
<td>X Suppression Only</td>
<td>Resistance statement 5 and 6⁴. For control of several soybean diseases. Do not apply more than 2 applications and 16 fl oz/A. PWI = 21 days</td>
</tr>
<tr>
<td>Mefentrifluconazole (3) + Fluxapyroxad (7) + Pyraclostrobin (11) Revytek, 11.61%; 7.74%; 15.49%</td>
<td>Spray</td>
<td>8-15 fl oz/A</td>
<td>X Suppression Only</td>
<td>Controls diseases such as, but not limited to, Alternaria leaf spot, anthracnose, Septoria brown spot, and Cercospora leaf blight. Do not apply more than 30 fl oz/A per year.</td>
</tr>
<tr>
<td>Penthionyl (7) Vertisan, 20.6%</td>
<td>Spray or fungigation</td>
<td>10-30 fl oz/A</td>
<td>X</td>
<td>Begin applications prior to disease development. Vertisan controls several diseases. For white mold, make initial application at beginning of bloom and a second application at full bloom. Apply no more than 61 fl oz/A per year with no more than 2 sequential applications. PHI = 14 days.</td>
</tr>
<tr>
<td>Picoxystrobin (11) Aproach, 22.6%</td>
<td>Spray or fungigation</td>
<td>6-12 fl oz/A</td>
<td>X</td>
<td>Resistance statement 5⁴. Apply prior to disease development. Aproach is labeled for suppression of downy mildew. For white mold, make initial application at beginning of bloom and a second application at full bloom. Apply no more than 35 fl oz/A season. PHI = 14 days.</td>
</tr>
<tr>
<td>Picoxystrobin (11) + Cyproconazole (3) Aproach Prima, 17.94%; 7.17%</td>
<td>Spray or fungigation</td>
<td>5-6.8 fl oz/A</td>
<td></td>
<td>Resistance statement 5⁴ and 3⁴. Begin applications prior to disease development for several diseases. Use no more than 13.6 fl oz/A per season and no more than 2 sequential applications of a picoxystrobin containing product. PHI = 30 days.</td>
</tr>
</tbody>
</table>

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### Soybean
**Foliar Sprays (Continued)**

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage</th>
<th>White Mold Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium Phosphite (33) + Tebuconazole (3)</td>
<td>Spray</td>
<td>2-3 pts/A</td>
<td></td>
<td>For control of soybean rust. Do not apply more than 0.225 lbs of tebuconazole/A/year. PHI = 21 days.</td>
</tr>
<tr>
<td>Viathon, 49% 3.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Propiconazole (3) | Spray | 4.6 fl oz/A |   | Resistance statement 3).
| Tilt 3.6 EC, or Propiconazole E-AG, 41.8% | | | | Propiconazole controls several diseases of soybeans, including soybean rust. Do not apply more than 12 fl oz/A. Apply up to R6. |
| Bumper 41.8 EC and Topaz 41.8% | | | | |
| Bumper ES, 40.85% | | | | |
| Propicon 3.6F, 41.8% | | | | |
| Prothioconazole (3) | Spray | 3.0-5.0 fl oz/A | X | For optimum control of white mold, apply at late R1 (at petal drop), before canopy closure, and prior to disease development. A subsequent application may be used 7-14 days later. Also for control of soybean rust and powdery mildew. Do not apply more than 12.9 fl oz/year. PHI = 21 days. |
| Proline 480 SC, 41% | | | | |
| Prothioconazole (3) + Trifloxystrobin (11) | Spray or fungigation | 4.0-4.65 fl oz/A | X | Apply at early flowering. Repeat applications as needed on a 10-21 day interval. Do not apply more than 13.95 fl oz/A/year. PHI = 21 days. |
| Stratego YLD, 10.8%; 32.3% | | | | |
| Protegam YLD, 10.8%; 32.3% | | | | |
| Prothioconazole (3) + Trifloxystrobin (11) | Spray or fungigation | 8.0-11.0 fl oz/A | X | For optimum control of white mold, apply at late R1 (at petal drop), before canopy closure, and prior to disease development. Repeat applications preventatively and continue as needed on a 10-21 day interval. Use shorter intervals when conditions favor severe disease pressure. Do not apply more than 33 fl oz/A/year. PHI = 21 days. |
| Delaro, 16.0%; 13.7% | | | | |
| Prothioconazole (3) + Trifloxystrobin (11) + Fluopyram (7) | Spray or fungigation | 8-11 fl oz/A | X | For optimum control of white mold, apply at late R1 (at petal drop), before canopy closure, and prior to disease development. Repeat applications preventatively and continue as needed on 10-14 day intervals. Use shorter intervals when conditions are favorable for severe disease pressure. Do not apply more than 33 fl oz/A/year. Do not apply within 21 days of harvest. |
| Delaro Complete, 14.9%; 13.1%; 10.9% | | | | |

1Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
2Dosage = amount of formulated product to apply.
3X = product labeled for crop and disease, Blank = product not labeled for specific disease.
4See fungicide resistance management statements on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage</th>
<th>White Mold Control&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pydiflumetofen (7) + Difenconazole (3) Miravis Top, 6.9%; 11.5%</td>
<td>Spray</td>
<td>13.7 fl oz/A</td>
<td>X (suppression)</td>
<td>For white mold, the first application should be at R1 (early bloom) to R2 (full bloom). Maximum use rate is 27.5 fl oz/A/year. PHI = 14 days.</td>
</tr>
<tr>
<td>Pydiflumetofen (7) + Azoxystrobin (11) + Propiconazole (3) Miravis Neo, 7.0%; 9.3%; 11.6%</td>
<td>Spray</td>
<td>13.7-20.8 fl oz/A</td>
<td>X (suppression)</td>
<td>For white mold, use 20.8 oz/A and the first application should be at R1 (early bloom) to R2 (full bloom). Maximum use rate is 42 fl oz/A/year and do not apply after R6. PHI = 14 days.</td>
</tr>
<tr>
<td>Pyraclostrobin (11) Headline EC, 23.6% Headline SC, 23.3%</td>
<td>Spray or fungigation</td>
<td>6-12 fl oz/A</td>
<td></td>
<td>Resistance statement 5&lt;sup&gt;4&lt;/sup&gt;. Apply prior to onset of disease. PHI = 21 days. Controls pod and stem blight and several fungal leaf spot pathogens.</td>
</tr>
<tr>
<td>Tebuconazole 38.7% (3) Orlis 3.6F Tebuzol 3.6F Monsoon Onset 3.6L</td>
<td>Spray</td>
<td>3-4 fl oz/A</td>
<td></td>
<td>For control of soybean rust and powdery mildew. Do not apply more than 12 fl oz/A per season. PHI = 21 days for all products.</td>
</tr>
<tr>
<td>Tetraconazole (3) Domark, 20.5% Andiamo 230, 20.5%</td>
<td>Spray</td>
<td>4.0-5.0 fl oz/A</td>
<td>X</td>
<td>Do not make more than 2 applications per year. Do not graze or feed forage or hay to livestock. Do not apply after soybean growth stage R5.</td>
</tr>
</tbody>
</table>

<sup>1</sup>Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.

<sup>2</sup>Dosage = amount of formulated product to apply.

<sup>3</sup>X = product labeled for crop and disease; Blank = product not labeled for specific disease.

<sup>4</sup>See fungicide resistance management statements on Pages 7-8.
### Soybean

#### Foliar Sprays (Continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>White Mold Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thiophanate Methyl (1)</strong></td>
<td>Spray or fungigation</td>
<td>0.75-1 lb/A</td>
<td>X</td>
<td>For all Thiophanate Methyl (1):</td>
</tr>
<tr>
<td>Topsin M WSB 70WE</td>
<td></td>
<td></td>
<td></td>
<td>Resistance Statement 1⁴.</td>
</tr>
<tr>
<td><em>T</em>-methyl WSB 70W, 70%</td>
<td>Spray or fungigation</td>
<td>0.75-1 lb/A</td>
<td>X</td>
<td>Thiophanate-methyl also controls pod and stem blight but is not labeled for control of soybean rust.</td>
</tr>
<tr>
<td>Topsin M 70WP</td>
<td>Spray or fungigation</td>
<td>15-20 fl oz/A</td>
<td>X</td>
<td>One application at early bloom (R1-R2) followed by a second application 7-14 days later if conditions favorable for continued disease pressure. PHI = 21 days. 5 gal/A minimum by air.</td>
</tr>
<tr>
<td>Topsin 4.5 FL, 45%</td>
<td>Spray or fungigation</td>
<td>10-20.0 fl oz/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Incognito 4.5F, 46.2%</td>
<td>Spray or fungigation</td>
<td>10-20.0 fl oz/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><em>T</em>-methyl 4.5F, 46.2%</td>
<td>Spray or fungigation</td>
<td>10.9-21.8 oz/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cercobin, 41.3%</td>
<td>Spray or fungigation</td>
<td>0.6-0.8 lb/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Thiophanate Methyl 85 WDG, 85%</td>
<td>Spray or fungigation</td>
<td>0.6-0.8 lb/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Incognito 85 WDG, 85%</td>
<td>Spray or fungigation</td>
<td>0.6-0.8 lb/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Thiophanate Methyl (1) + Propiconazole (3)</strong></td>
<td>Spray</td>
<td>2.0 pt/A</td>
<td>X</td>
<td>Resistance Statement 1 and 3⁴. For management of white mold, soybean rust and other diseases. Do not apply more than 4 pt/A per season.</td>
</tr>
<tr>
<td>Protocol, 23.7%:7.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Thiophanate-methyl (1) + Tebuconazole (3)</strong></td>
<td>Spray</td>
<td>20 fl oz/A</td>
<td>X</td>
<td>Resistance Statement 1 and 3⁴. For management of white mold, powdery mildew and other diseases. Do not apply more than 1.4 lbs thiophanate-methyl and 0.34 lbs tebuconazole per year. PHI = 21 days.</td>
</tr>
<tr>
<td>Froghorn, 37.5%: 7.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lactofen (herbicide)</strong></td>
<td>Spray</td>
<td>6-12.5 fl oz/A</td>
<td>X</td>
<td>Labeled for suppression of white mold caused by <em>Sclerotinia sclerotiorum</em> and Sudden Death Syndrome caused by <em>Fusarium virguliforme</em>. Apply at or just before first bloom (R1). Lactofen effect on white mold is not fungical, but may involve Systemic Acquired Resistance by the soybean plant.</td>
</tr>
<tr>
<td>Cobra, 24%</td>
<td></td>
<td></td>
<td>(suppression)</td>
<td></td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.  
²Dosage = amount of formulated product to apply.  
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.  
⁴See fungicide resistance management statements on Pages 7-8.
## Sugar Beet Seed Treatment

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Disease Control&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroneb (14)</td>
<td>Liquid or slurry</td>
<td>6 fl oz/cwt</td>
<td>X</td>
<td>For control of <em>Pythium</em> and <em>Rhizoctonia</em>. For use as a supplement to another fungicide.</td>
</tr>
<tr>
<td>Chloroneb 65W, 65%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fludioxonil (12)</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td>For control of seed-borne and soil-borne fungi.</td>
</tr>
<tr>
<td>Maxim 4 FS, 40.3%</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Spirato 480FS, 40.3%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td>Provides suppression of <em>R. solani</em></td>
</tr>
<tr>
<td>Fluxapyroxad (7)</td>
<td>Commercial seed treatment use only.</td>
<td>0.52 fl oz/100,000 seeds</td>
<td>X</td>
<td>For use on <em>Rhizoctonia</em> in sugarbeets.</td>
</tr>
<tr>
<td>Systive, 20.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hymexazol (32)</td>
<td>Pelleted seed</td>
<td>20-90 g/unit of 100,000 seed</td>
<td>X</td>
<td>For control of <em>Pythium</em> and <em>Aphanomyces</em>. Use of rates greater than 45 g may result in phytotoxicity. In fields with known heavy disease pressure, use of Tachigaren and a tolerant variety is suggested.</td>
</tr>
<tr>
<td>Tachigaren, 70%</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mefenoxam (4)</td>
<td>Slurry or mist</td>
<td>0.32-0.64 fl oz/cwt</td>
<td>X</td>
<td>For control of <em>Pythium</em>. May be combined with other fungicides if products are known to be compatible. For use only with commercial seed treatment equipment.</td>
</tr>
<tr>
<td>Apron XL, 33.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup>Dosage = amount of formulated product to apply.

<sup>2</sup>X = product labeled for crop and disease; Blank = product not labeled for specific disease.
<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage(^1)</th>
<th>Disease Control(^2)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metalaxyl (4)</td>
<td>Mist or slurry</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td>For control of Pythium. May be combined with other fungicides if products are known to be compatible.</td>
</tr>
<tr>
<td>Allegiance FL, 28.35%</td>
<td>Slurry</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Dyna-Shield, 28.35%</td>
<td>Slurry</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Sebring 318FS, 30.14%</td>
<td>Slurry or mist</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Belmont 2.7 FS, 28.98%</td>
<td>Slurry or mist</td>
<td>0.75 fl oz/cwt</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Sebring 480 FS, 44.08%</td>
<td>0.5 fl oz/cwt</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metconazole (3)</td>
<td>Mist or slurry</td>
<td>0.008-0.016 fl oz/100,000 seed</td>
<td>X</td>
<td>Provides suppression of R. solani</td>
</tr>
<tr>
<td>Metlock, 40%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penthicpyrad (7)</td>
<td>Commercially applied</td>
<td>0.53-1.06 fl oz/unit of 100,000 seeds</td>
<td>X</td>
<td>For control of Rhizoctonia solani.</td>
</tr>
<tr>
<td>Kabina ST</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyraclostrobin (11)</td>
<td>Slurry or mist</td>
<td>1.7-2.5 fl oz/100,000 seeds</td>
<td>X</td>
<td>Provides protection from seedling diseases caused by Fusarium sp. and Rhizoctonia sp.</td>
</tr>
<tr>
<td>Stamina, 18.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\)Dosage = amount of formulated product to apply.
\(^2\)X = product labeled for crop and disease; Blank = product not labeled for specific disease.
<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Disease Control&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sedaxane (7)</strong></td>
<td>Slurry</td>
<td>0.07 - 0.13 fl oz/100,000 seeds</td>
<td>X</td>
<td>For use on seed decay, seedling blight and damping-off caused by <em>Rhizoctonia</em>.</td>
</tr>
<tr>
<td><em>Vibrance, 43.7%</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Thiram (M3)</strong></td>
<td>Liquid or slurry</td>
<td>8 fl oz/cwt</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>42-S Thiram, 42%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signet 480 FS, 42%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiram 480 DP, 42%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tolclofos-methyl (14)</strong></td>
<td>Slurry or mist</td>
<td>1.5 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne diseases. Controls <em>Rhizoctonia solani</em>.</td>
</tr>
<tr>
<td><em>Rizolex, 42%</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup>Dosage = amount of formulated product to apply.

<sup>2</sup>X = product labeled for crop and disease; Bank = product not labeled for specific disease.
# Sugar Beet Soil Application

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage(^1)</th>
<th>Control(^2) of Pythium</th>
<th>Control(^2) of Rhizoctonia</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Bacillus subtilis</em> strain QST 713 (44) Serenade ASC, 1.34%</td>
<td>In-furrow at planting</td>
<td>2-6 fl qt/A</td>
<td>X</td>
<td>X</td>
<td>Apply as directed spray in the seed furrow and to the covering soil at planting for management of <em>Rhizoctonia</em>.</td>
</tr>
<tr>
<td>Minuet, 9.89%</td>
<td>In-furrow at planting</td>
<td>6-12 fl oz/A</td>
<td>X</td>
<td>X</td>
<td>Apply Minuet as directed spray in the seed piece furrow and to the covering soil at planting for management of <em>Rhizoctonia solani</em> and <em>Pythium</em>.</td>
</tr>
<tr>
<td>Azoxytrobin (11) Quadris, 22.9% Satori, 22.9% Equation, 22.9% Tetrabon, 22.9% Aframe, 22.9% AZteroid FC 3.3, 34.3%</td>
<td>Band 7” or less</td>
<td>0.4-0.7 fl oz/1,000 ft. of row (9.5-15.4 fl oz/A as a band, not broadcast, with 22” row) 0.24-0.48 fl oz/1,000 ft of row for AZteroid FC</td>
<td>X</td>
<td>X</td>
<td>Resistance statement 5(^3). Apply Quadris in a band (7” or less) over cotyledonary 4- to 6-leaf sugarbeets before average daily temperatures at 4” soil depth reaches 65°F, using 5-15 gpa. Rate is already determined as a BAND spray, not broadcast. AZteroid FC 3.3 may be tank mixed with starter fertilizer, but may increase pythotoxicity.</td>
</tr>
<tr>
<td>Azoxytrobin (11) + Mefenoxyam (4) Uniform, 28.2%; 10.9%</td>
<td>In-furrow spray</td>
<td>0.34 fl oz/1000 ft. row</td>
<td>X</td>
<td>X</td>
<td>Apply as a spray at a minimum of 5 gal of water or liquid fertilizer per acre.</td>
</tr>
</tbody>
</table>

\(^1\)Dosage = amount of formulated product to apply.  
\(^2\)X = product labeled for crop and disease; Blank = product not labeled for specific disease.  
\(^3\)See fungicide resistance management statements on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage$^1$</th>
<th>Control$^2$ of Pythium</th>
<th>Control$^2$ of Rhizoctonia</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mefenoxam (4)</td>
<td>7” band preplant incorporated</td>
<td>0.21-0.43 fl oz/1,000 ft. of row</td>
<td>X</td>
<td></td>
<td>Resistance statement 4$^3$.</td>
</tr>
<tr>
<td>Ridomil Gold EC, 48%</td>
<td>7” band preplant incorporated</td>
<td>4.3-8.6 oz/1,000 ft. of row</td>
<td>X</td>
<td></td>
<td>See label for planting restrictions within 12 months of application.</td>
</tr>
<tr>
<td>Ultra Flourish, 25.1%</td>
<td>7” band preplant incorporated</td>
<td>0.43-0.86 fl oz/1,000 ft. of row</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metalaxyl (4)</td>
<td>7” band or pre-plant incorporated</td>
<td>45.7-94.4 fl oz/A</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xyler FC, 31.3%</td>
<td>In-furrow spray</td>
<td>0.7-1.6 fl oz/1,000 ft. of row</td>
<td>X</td>
<td></td>
<td>Maximum rate per acre per application is 30 fl oz.</td>
</tr>
<tr>
<td>Penthiopyrad (7)</td>
<td>In-furrow spray</td>
<td>0.4 -0.8 fl oz/1,000 ft. of row</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertisan, 20.6%</td>
<td>In-furrow spray</td>
<td>0.7-1.6 fl oz/1,000 ft. of row</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyraclostrobin (11)</td>
<td>In-furrow spray</td>
<td>0.7-1.6 fl oz/1,000 ft. of row</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headline EC, 23.6%</td>
<td>In-furrow spray</td>
<td>0.7-1.6 fl oz/1,000 ft. of row</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headline SC, 23.3%</td>
<td>Band 7” or less</td>
<td>0.2-0.4 fl oz/1,000 ft. row</td>
<td>X</td>
<td>X</td>
<td>Apply 6.7 fl oz/A in 22” row spacing. Maximum of 1 soil directed application per season.</td>
</tr>
<tr>
<td>Pyraclostrobin (11) + Fixaproxad (7)</td>
<td>In-furrow spray</td>
<td>3.0-3.6 oz/A in band</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Priaxor, 28.58%; 14.33%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trifloxystrobin (11)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flint Extra, 42.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^1$Dosage = amount of formulated product to apply.

$^2$X = product labeled for crop and disease; Blank = product not labeled for specific disease.

$^3$See fungicide resistance management statements on Pages 7-8.
### Sugar Beet Nematicide
**Seed Treatment**

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage ¹</th>
<th>Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Pasteuria nishizawai</em> – <em>Pn1</em></td>
<td>Slurry</td>
<td>0.034-1.36 fl oz per 100,000 seeds</td>
<td>Sugar beet cyst nematode</td>
<td></td>
</tr>
</tbody>
</table>

### Sugar Beet Foliar Sprays

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Bacillus pumilus</em> strain 2808 (44) Sonaia, 1.38%</td>
<td>Spray or fungigation</td>
<td>2-4 qt/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Hydrogen Peroxide + Peroxyacetic Acid OxiDate 5.0, 27%; 5%</td>
<td>Spray</td>
<td>50-128 fl oz/100 gallons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrogen Peroxide + Peroxyacetic Acid SaniDate 12.0, 18.5%, 12%</td>
<td>Chemigation</td>
<td>Dilution rate is 1:1000 to 20,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phosphoric Acid + Hydrogen Peroxide OxiPhos, 27.1%; 14.0%</td>
<td>Spray</td>
<td>2.5-5.0 qts/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴Begin when disease is first observed in field. Higher rates are used when disease is severe on susceptible varieties. Use 5-10 gal water with airplane or 20-40 gal water and at least 100 psi with ground equipment. Repeat tin or copper at 10-14 days. Repeat maneb or mancozeb at 7-10 days.
⁵See fungicide resistance management statement on Pages 7-8.
# Sugar Beet
## Foliar Sprays (continued)

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Azoxystrubin (11)</strong></td>
<td>Spray or fumigation</td>
<td>6.2-15.4 fl oz/A</td>
<td>X</td>
<td>Resistance statement 56. 123 fl oz Quadris/acre/season maximum. May be applied the day of harvest. REI = 4 hours. Band application at 4-leaf stage for management of Rhizoctonia stem and crown canker.</td>
</tr>
<tr>
<td>Quadris, 22.9%</td>
<td></td>
<td>3.9-12.8 fl oz/A for AZteroid FC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satori, 22.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetraban, 22.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aframe, 22.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AZteroid FC 3.3, 34.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Azoxystrubin (11) + Tetraconazole (3)</strong></td>
<td>Spray</td>
<td>19-21 fl oz/A</td>
<td>X</td>
<td>Apply when conditions are favorable for Cercospora leaf spot. Do not apply more than 21 fl oz/A/year. Do not make more than one application of this product per year. PHI = 14 days.</td>
</tr>
<tr>
<td>Brixen, 13.75%; 6.67%</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Copper (M1)</strong></td>
<td>Spray</td>
<td>4 lb/A</td>
<td>X</td>
<td>Does not provide adequate control of Cercospora leaf spot</td>
</tr>
<tr>
<td>Basicop WP, 53%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Champ DP, 57.6%</td>
<td>Spray or fumigation</td>
<td>1.33-3.33 lb/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Champ WG, 77%</td>
<td>Spray or fumigation</td>
<td>2.5 lb/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Champ Formula 2 Flowable, 35.5%</td>
<td>Spray or fumigation</td>
<td>1.33-3.33 pt/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>ChampION++, 46.1%</td>
<td>Spray or fumigation</td>
<td>0.75-2.0 lb/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cuprofix Ultra 40 Disperss, 71.1%</td>
<td>Spray or fumigation</td>
<td>1.25-3.0 lb/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Kocide 2000, 53.8%</td>
<td>Spray or fumigation</td>
<td>1.5-3.75 lb/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Kocide 3000, 46.1%</td>
<td>Spray or fumigation</td>
<td>0.75-2.0 lb</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Kocide 4.5 LF, 37.5%</td>
<td>Spray or fumigation</td>
<td>1.33-2.66 pt/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>MasterCop, 21.46%</td>
<td>Spray or fumigation</td>
<td>0.5-1.5 pt/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Badge SC, 32.17%</td>
<td>Spray or fumigation</td>
<td>1-4 pt/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Badge X2</td>
<td>Spray or fumigation</td>
<td>1 -4 pts/A</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

¹Spray = ground or aerial; Fumigation = application through sprinkler irrigation system.
²Dosage = amount of formulated product to apply.
³X = product labeled for crop and disease; Blank = product not labeled for specific disease.
⁴Begin when disease is first observed in field. Higher rates are used when disease is severe on susceptible varieties. Use 5-10 gal water with airplane or 20-40 gal water and at least 100 psi with ground equipment. Repeat in or copper at 10-14 days. Repeat maneb or mancozeb at 7-10 days.
⁵See fungicide resistance management statement on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cercospora Leaf Spot⁴</td>
<td>Powdery Mildew</td>
</tr>
<tr>
<td>Difenoconazole (3) + Propiconazole (3) 22.8%:22.8% Inspire XT, 23.2%</td>
<td>Spray or fungigation</td>
<td>7 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Resistance statement 3⁵. Do not apply within 21 days of harvest. Do not apply more than 3 applications per year or 21 fl oz/A/season. Do not apply more than 0.34 lb/ai/A of propiconazole products, and no more than 0.46 lb/ai/A of difenoconazole products per season. REI = 12 hours.</td>
</tr>
<tr>
<td>Fenbuconazole (3) Enable 2F, 23.5%</td>
<td>Spray</td>
<td>8 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Preharvest interval of 14 days. Resistance statement 3⁵. REI = 12 hours.</td>
</tr>
<tr>
<td>Flutriafol (3) Topguard, 11.8%</td>
<td>Spray</td>
<td>10-14 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Resistance statement 3⁵. Do not exceed 26 fl oz or 2 applications per season. PHI = 21 days. REI = 12 hours.</td>
</tr>
<tr>
<td>Fluopyram (7) + Prothiophene (3) ProPulse, 17.4%:17.4%</td>
<td>Spray or fungigation</td>
<td>13.6 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>For optimum disease control, apply at first symptom of disease. Do not apply more than 34.2 fl oz/A per year. Do not apply ProPulse within 7 days of harvest. REI = 12 hours.</td>
</tr>
<tr>
<td>Fluxapyroxad (7) + Pyraclostrobine (11) Priaxor, 14.33%:28.58%</td>
<td>Spray or fungigation</td>
<td>6 to 8 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Resistance statements 5 and 8⁵. For control of Rhizoctonia stem canker and crown rot, use 8 fl oz. Do not exceed 3 applications or 24 fl oz/A per season. PHI = 7 days. REI = 12 hours.</td>
</tr>
<tr>
<td>Inpyfloxam (7) Excalia, 31.25%</td>
<td>Spray</td>
<td>2 fl oz/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>For Rhizoctonia foliar blight, crown and root rot. Apply at the 2-8 leaf stage in 10 GPA. Do not make more than 2 broadcast applications per year. Do not apply more than 4 fl oz/A/year. PHI = 50 days. Refer to label for banded application restrictions.</td>
</tr>
</tbody>
</table>

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⁵See current "Sugar Beet Production Guide" for management strategies.
⁶See fungicide resistance management statements on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application</th>
<th>Dosage</th>
<th>Disease Control</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mancozeb (M3)</td>
<td>Dithane DF</td>
<td>Spray or fungigation</td>
<td>1.5-2 lb/A</td>
<td>Leaf Spot</td>
</tr>
<tr>
<td></td>
<td>Rainshield NT, 75%</td>
<td>Spray or fungigation</td>
<td>1.2-1.6 qt/A</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Dithane F-45, 37%</td>
<td>Spray or fungigation</td>
<td>1.5-2 lb/A</td>
<td>Powder Mildew</td>
</tr>
<tr>
<td></td>
<td>Dithane M-45, 60%</td>
<td>Spray or fungigation</td>
<td>1.5-2 lb/A</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Koverall, 75%</td>
<td>Spray or fungigation</td>
<td>1.5-2 lb/A</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Manex II, 37%</td>
<td>Spray or fungigation</td>
<td>1.2-1.6 qt/A</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Manzate Max, 37%</td>
<td>Spray or fungigation</td>
<td>1.2-1.6 qts/A</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Manzate Pro-Stick, 75%</td>
<td>Spray or fungigation</td>
<td>1.5-2 lb/A</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Penncozeb, 80%</td>
<td>Spray or fungigation</td>
<td>1.5-2 lb/A</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Penncozeb DF, 75%</td>
<td>Spray or fungigation</td>
<td>1.5-2 lb/A</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Roper DF Rainshield, 75%</td>
<td>Spray or fungigation</td>
<td>1-2 lb/A</td>
<td>X</td>
</tr>
<tr>
<td>Mancozeb (M3) + Copper (M1)</td>
<td>Mankocide, 15%, 46.1%</td>
<td>Spray or fungigation</td>
<td>2.5-6.5 lbs/A</td>
<td>X</td>
</tr>
<tr>
<td>Mancozeb (M3) + Azoxyostrobin (11)</td>
<td>Dexter Max, 70%, 5%</td>
<td>Spray or fungigation</td>
<td>1.6-2.1 lbs/A</td>
<td>X</td>
</tr>
<tr>
<td>Mefentrifluconazole (3)</td>
<td>Provysol, 34.93%</td>
<td>Spray</td>
<td>4.0 fl oz/A</td>
<td>X</td>
</tr>
</tbody>
</table>

1 Spray = ground or aerial; Fungigation = application through sprinkler irrigation system.
2 Dosage = amount of formulated product to apply.
3 X = product labeled for crop and disease; Blank = product not labeled for specific disease.
4 Begin when disease is first observed in field. Higher rates are used when disease is severe on susceptible varieties. Use 5-10 gal. water with airplane or 20-40 gal. water and at least 100 psi with ground equipment. Repeat tin or copper at 10-14 days. Repeat maneb or mancozeb at 7-10 days.
5 Because benzimidazole (Topsin M)-resistant strains of Cercospora beticola have developed in many sugar beet-growing areas, Topsin M should be used only once per season and only in combination with a non-benzimidazole fungicide. See current *Sugar Beet Production Guide* for management strategies.
6 See fungicide resistance management statements on Pages 7-6.
7 Designates restricted-use pesticide.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metconazole (3)</td>
<td>Spray or fungigation</td>
<td>9-14 fl oz/A</td>
<td>X</td>
<td>For optimal powdery mildew control, begin application prior to disease development. PHI = 14 days. Maximum of 34 fl oz/season. REI = 12 hours.</td>
</tr>
<tr>
<td>Caramba, 8.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pentyopyrad (7)</td>
<td>Spray or fungigation</td>
<td>14-30 fl oz/A</td>
<td>X</td>
<td>Maximum of 6 fl oz/acre per season. PHI = 7 days. REI = 12 hours.</td>
</tr>
<tr>
<td>Vertisan, 20.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Picoxyostrobin (11)</td>
<td>Spray or fungigation</td>
<td>6-19 fl oz/A</td>
<td>X</td>
<td>Resistance statement 5. Begin applications prior to row closure and prior to disease development and make a second application on a 5 to 14 day interval.</td>
</tr>
<tr>
<td>Aproach SC, 22.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Propiconazole (3)</td>
<td>Spray or fungigation</td>
<td>4 fl oz/A</td>
<td>X</td>
<td>Resistance statement 3. Begin application at first sign of disease. Do not exceed 12 fl oz/year. PHI = 21 days. REI = 12 hours.</td>
</tr>
<tr>
<td>Tilt 3.0 EC, 41.8% or</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Propiconazole E-AG, 41.8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bumper 41.8 EC, 41.8%</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Topaz, 41.8% Bumper ES,</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>40.85%, Propicure 3.6F,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41.8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prothioconazole (3)</td>
<td>Spray</td>
<td>5.7 fl oz/A</td>
<td>X</td>
<td>Resistance statement 3. Proline at 5.7 fl oz/A in a 7&quot; or less band at the 4-leaf stage also manages Rhizoctonia stem and crown canker. Do not apply more than 17.1 fl oz of Proline per year. Do not apply within 7 days of harvest. REI = 12 hours.</td>
</tr>
<tr>
<td>Proline 480 SC, 41.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prothioconazole (3) +</td>
<td>Spray or fungigation</td>
<td>11.0 fl oz/A</td>
<td>X</td>
<td>Resistance statement 3 and 5. For optimum control apply at the first symptom of disease. Repeat applications on a 14 day interval. Tank mix Delaro at 11 fl oz/A with Proline at 1.7 fl oz/A for best management of leaf spot. Do not apply more than 33 fl oz/A/year. PHI = 21 days.</td>
</tr>
<tr>
<td>Trifloxystrobin (11)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delaro, 16.0%; Trifloxystrobin (11)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delaro, 16.0%;</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
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⁵See current “Sugar Beet Production Guide” for management strategies.
⁶See fungicide resistance management statements on Pages 7-8.
## Sugar Beet
### Foliar Sprays (continued)

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<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pyraclostrobin</strong> (11)</td>
<td>Spray or fungigation</td>
<td>9-12 fl oz/A</td>
<td>Leaf Spot⁴ X Powdery Mildew X</td>
<td>Resistance statement ⁵. 48 fl oz Headline/acre/season maximum PHI = 7 days. REI = 12 hours.</td>
</tr>
<tr>
<td>Headline EC, 23.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headline SC, 23.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sulfur (M)</strong></td>
<td>Spray or fungigation</td>
<td>8 pt/A</td>
<td>Powdery Mildew X</td>
<td>Apply sulfur fungicide if mildew appears prior to mid-September. One application gives protection for 4 weeks. Degree of control depends on amount of sulfur used (if less than 5 lb ai is used, only partial control may result).</td>
</tr>
<tr>
<td>Super Six, 52%</td>
<td>Spray or fungigation</td>
<td>5-10 lb/A</td>
<td>Powdery Mildew X</td>
<td></td>
</tr>
<tr>
<td>Microthiol Disperss, 80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Micro Sulf, 80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tea Tree Oil (46) + Difenconazole (3)</strong></td>
<td>Spray</td>
<td>4-8.5 fl oz/A</td>
<td>Leaf Spot⁴ X Powdery Mildew X</td>
<td>Apply when conditions favor disease. Use the higher rate under increased disease pressure. Do not apply more than 34 fl oz/acre/year.</td>
</tr>
<tr>
<td>Regev, 40.6%:20.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tetraconazole (3)</strong></td>
<td>Spray or fungigation</td>
<td>13 fl oz/A</td>
<td>Powdery Mildew X</td>
<td>Preharvest interval of 14 days. Do not apply more than 13 fl oz/A per season. Resistance statement ³. REI = 12 hours.</td>
</tr>
<tr>
<td>Minerva, 11.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eminent VP, 11.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tetraconazole (3) + Triphenyltin Hydroxide – TPTH (30)</strong></td>
<td>Spray</td>
<td>16 fl oz/A</td>
<td>Powdery Mildew X⁶</td>
<td>RESTRICTED-USE PESTICIDE. Do not make more than one application per growing season. Apply when conditions are favorable for disease development. Apply no more 0.75 lbs/A of TPTH per season. PHI = 14 days.</td>
</tr>
<tr>
<td>Minerva DUO, 7.66%; 21.08%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
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⁴Begin when disease is first observed in field. Higher rates are used when disease is severe on susceptible varieties. Use 5-10 gal water with airplane or 20-40 gai water and at least 100 psi with ground equipment. Repeat tin or copper at 10-14 days. Repeat maneb or mancozeb at 7-10 days.
⁵See current “Sugar Beet Production Guide” for management strategies.
⁶See fungicide resistance management statements on Pages 7-8.
<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
<th>Application¹</th>
<th>Dosage²</th>
<th>Disease Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Leaf Spot⁴</td>
<td>Powder Mildew</td>
</tr>
<tr>
<td>Thiophanate Methyl (1)</td>
<td>Spray</td>
<td>10-20 fl oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Incognito 4.5F, 42.6%</td>
<td></td>
<td>0.4-0.8 lb/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incognito 85 WDG, 85.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiophanate Methyl (1) + Propiconazole (3) Protocol, 23.7%;7.1%</td>
<td>Spray or fungigation</td>
<td>1.25-1.33 pt/A</td>
<td>X⁶</td>
<td>X⁶</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trifloxystrobin (11)</td>
<td>Spray only</td>
<td>3.0-3.6 oz/A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Flint Extra, 42.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triphenyltin Hydroxide (TPTH) RUP* (30)</td>
<td>Spray</td>
<td>2.5-5.0 oz/A</td>
<td>X⁶</td>
<td></td>
</tr>
<tr>
<td>Super Tin 80WP AgPak, 80% or Agri Tin, 80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Super Tin 4L or Agri Tin 4L, 40%</td>
<td>Spray</td>
<td>4.0-8.0 fl oz/A</td>
<td>X⁶</td>
<td></td>
</tr>
</tbody>
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⁵See current "Sugar Beet Production Guide" for management strategies.  
⁶See fungicide resistance management statements on Pages 7-8.
# Sunflower Seed Treatment

<table>
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<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Disease Control²</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azoxytrarin (11)</td>
<td>Slurry</td>
<td>3.75-15 fl oz/cwt</td>
<td>X</td>
<td>Provides suppression against downy mildew.</td>
</tr>
<tr>
<td>Dynasty, 9.6%</td>
<td>Slurry</td>
<td>3.75-37.5 fl oz/cwt</td>
<td>X</td>
<td>For seeding damping-off caused by <em>Rhizoctonia solani</em> and suppression of downy mildew.</td>
</tr>
<tr>
<td>Saxony 100 FS, 9.67%</td>
<td>Slurry</td>
<td>0.012-0.029 mg ai/seed</td>
<td>X</td>
<td>Seed weight based on 4,500 seeds/lb. For suppression of downy mildew.</td>
</tr>
<tr>
<td>Acibenzolar-S-Methyl (21)</td>
<td>Slurry</td>
<td>2-4 fl oz/cwt</td>
<td>X</td>
<td>For suppression of downy mildew and <em>Pythium</em>.</td>
</tr>
<tr>
<td>Captan (M4)</td>
<td>Slurry</td>
<td>0.075-0.1 mg ai/seed</td>
<td>X</td>
<td>For suppression of downy mildew and <em>Pythium</em>.</td>
</tr>
<tr>
<td>Captan 400, 37.4%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
<tr>
<td>Ethabuxim (22)</td>
<td>Slurry</td>
<td>0.167-0.334 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
<tr>
<td>Intego Solo, 34.2%</td>
<td>Slurry</td>
<td>1.28 fl oz/cwt</td>
<td></td>
<td>In North Dakota, the pathogen causing downy mildew has been resistant to metalaxyl for over a decade. The resistance is thought to be widespread and stable.</td>
</tr>
<tr>
<td>Fiucilaxin (12)</td>
<td>Mist or slurry</td>
<td>1.5-3.0 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maxim 4FS, 40.3%</td>
<td>Slurry</td>
<td>1.5-3 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spirato 480 FS, 40.3%</td>
<td>Slurry</td>
<td>0.08-0.16 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dyna-Shield Fludioxonil, 40.3%</td>
<td>Slurry</td>
<td>1.5-3 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fiucilaxin (12) + Mefenoax (4)</td>
<td>Slurry</td>
<td>1.5-3.0 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maxim XL, 21%, 8.4%</td>
<td>Slurry</td>
<td>1.28 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mefenoax (4)</td>
<td>Mist or slurry</td>
<td>1.5-3.0 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apron XL, 33.3%</td>
<td>Mist or slurry</td>
<td>1.5-3.0 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metalaxyl (4)</td>
<td>Mist or slurry</td>
<td>1.5-3.0 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allegiance FL, 28.35%</td>
<td>Mist or slurry</td>
<td>1.5-3.0 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sebring 318 FS, 28.35%</td>
<td>Slurry</td>
<td>1.5-3 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dyna-Shield, 28.35%</td>
<td>Slurry</td>
<td>1.5-3 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belmont 2.7 FS, 28.96%</td>
<td>Slurry or mist</td>
<td>1.5-3.0 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sebring 480 FS, 44.08%</td>
<td>Slurry or mist</td>
<td>1.5-3.0 fl oz/cwt</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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³An increase in stand has been noted only once in moderately severe tests to date; under very severe conditions, some increase in stand might be expected.
### Sunflower Seed Treatment (Continued)

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Disease Control²</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oxathiapiprolin (49)</strong></td>
<td>Slurry</td>
<td>1.03-2.06 fl oz/cwt</td>
<td>X</td>
<td>Use higher rate in areas with a history of high disease pressure.</td>
</tr>
<tr>
<td>Penaris 200FS, 18.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lumisena, 18.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pyraclostrobin (11)</strong></td>
<td>Slurry</td>
<td>0.8-2.3 fl oz/cwt</td>
<td>X</td>
<td>For seed-borne and soil-borne fungi.</td>
</tr>
<tr>
<td>Siamina, 18.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Thiram (M3)</strong></td>
<td>Liquid or slurry</td>
<td>2 fl oz/bu</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>42-S Thiram, 42%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sgnet 480 FS, 42%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### Sunflower Soil Application

<table>
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<tr>
<th>Organism</th>
<th>Application</th>
<th>Dosage¹</th>
<th>Disease Control²</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coniothyrium minitans</strong></td>
<td>Soil incorporation</td>
<td>1-2 lb/A depending on crop</td>
<td>X</td>
<td>Fungus attacks sclerotia of the fungus.</td>
</tr>
<tr>
<td>Contans WG, 5.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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## Sunflower Foliar Sprays

<table>
<thead>
<tr>
<th>Chemical (Fungicide Group)</th>
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<th>Dosage²</th>
<th>Rust Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azoxyostrobín (11)</td>
<td>Spray or fungigation</td>
<td>6-15.5 fl oz/A</td>
<td>X</td>
<td>Resistance statement 5&lt;sup&gt;4&lt;/sup&gt;. Apply prior to disease development. Also labeled for control of <em>Alternaria</em> leaf spot. Do not apply more than 0.45 lb azoxystrobín/A/year. PHI = 30 days.</td>
</tr>
<tr>
<td>Boscaíd (7)</td>
<td>Spray or fungigation</td>
<td>8-11 oz/A</td>
<td></td>
<td>For suppression of <em>Sclerotinia</em> head rot.</td>
</tr>
<tr>
<td>Fluopyram (7) + Tebuconazole (3)</td>
<td>Spray of fungigation</td>
<td>9.0-12.6 fl oz/A</td>
<td>X</td>
<td>For suppression of <em>Sclerotinia</em> head rot. For optimum disease control, apply prior to disease development. Do not apply more than 34 fl oz/A per year. Do not apply within 50 days of harvest.</td>
</tr>
<tr>
<td>Fluxapyroxad (7) + Pyraclostrobin (11)</td>
<td>Spray or fungigation</td>
<td>4-8 fl oz</td>
<td>X</td>
<td>Resistant statements 5 &amp; 6&lt;sup&gt;4&lt;/sup&gt;. For control of several fungal diseases including <em>Alternaria</em>, <em>Septoria</em>, rust and powdery mildew. For suppression of <em>Sclerotinia</em> head rot.</td>
</tr>
<tr>
<td>Metconazole (3)</td>
<td>Spray</td>
<td>2.5-4.0 fl oz/A</td>
<td>X</td>
<td>For suppression of <em>Sclerotinia</em> head rot. Apply when conditions favor disease development and prior to infection. A second application may be made on a 7-10 day interval. Do not make more than 2 applications per year. Do not apply more than 8 oz of product/A/year. PHI = 21 days.</td>
</tr>
<tr>
<td>Penthionyraz (7)</td>
<td>Spray or fungigation</td>
<td>10-30 fl oz/A</td>
<td>X</td>
<td>For suppression of <em>Sclerotinia</em> head rot. Apply prior to disease development. Do not apply more than 61 fl oz/A per season. PHI = 14 days.</td>
</tr>
</tbody>
</table>

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<th>Rust Control³</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Picoxystrobin (11)</td>
<td>Spray or fungigation</td>
<td>6-12 fl oz/A</td>
<td>X</td>
<td>Begin application at early vegetative growth stage through flowering and seed production prior to disease development and make a second application on a 5-14 day interval. Do not make more than two consecutive applications. Do not apply more than 12 fl oz/A per application. Do not exceed 36 fl oz/A per year. PHI = 7 days.</td>
</tr>
<tr>
<td>Potassium Phosphte (33) + Tebuconazole (3)</td>
<td>Spray</td>
<td>2-3 pts/A</td>
<td>X</td>
<td>Apply at the earliest sign of infection, or when weather conditions favor rust development. Apply the higher rate on susceptible varieties and/or during severe disease conditions.</td>
</tr>
<tr>
<td>Pyraclostrobin (11)</td>
<td>Spray or fungigation</td>
<td>6-12 fl oz/A</td>
<td>X</td>
<td>Resistance statement 5⁴. Apply prior to disease development. Also labeled for control of Alternaria leaf spot, powdery mildew, Septoria leaf spot and white rust. Maximum of 2 applications per season. PHI = 21 days.</td>
</tr>
<tr>
<td>Tebuconazole (3) 38.7%</td>
<td>Spray</td>
<td>4-6 fl oz/A</td>
<td>X</td>
<td>For maximum disease control, labels recommend using lowest rate of nonionic surfactant. Apply at earliest sign of infection. Do not apply more than 16 fl oz per season or within 50 days of harvest. See labels for further information or spray scheduling.</td>
</tr>
</tbody>
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## DISTRIBUTOR LIST

<table>
<thead>
<tr>
<th>Product</th>
<th>Company</th>
</tr>
</thead>
</table>
| Actinovate AG | Valent Syngenta Crop Protection LLC BASF Gowan USA LLC Corteva Merck Wilbur Ellis Bayer Syngenta Crop Protection LLC Sipcam Agro Corteva Syngenta Crop Protection LLC Valent Vive Crop Protection Syngenta Crop Protection LLC Vive Crop Protection Nufarm Gowan USA LLC Nufarm Seed MeteBlue Viking Star Glow Syngenta Crop Protection LLC Sipcam Agro ADAMA BASF Wilbur Ellis BASF Luxembourg-Pamol Cheminova Nufarm Wilbur Ellis Arysta LifeScience Syngenta Crop Protection LLC. Syngenta Crop Protection LLC Prophyta (Advan), Sipcam Agro Syngenta Crop Protection LLC United Phosphorus Inc. Corteva ADAMA Bayer Syngenta Crop Protection LLC. Loveland Products Syngenta Crop Protection LLC Sipcam Agro USA United Phosphorus Inc. Valent Gowan USA LLC Corteva BASF Cheminova Loveland Products ADAMA Bayer Arysta LifeScience Loveland Products Bayer Corteva Arysta LifeScience BASF Gowan USA LLC Trace Trace Wilbur Ellis Wilbur Ellis BASF Trace BASF

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<thead>
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</tr>
</thead>
</table>
Addresses for personnel in NDSU Plant Pathology

USPS
Department of Plant Pathology
NDSU Dept. #7660
PO Box 6050
Fargo, ND 58108-6050

Courier: Ex: Federal Express and UPS
Department of Plant Pathology
North Dakota State University
1402 Albrecht Blvd.
Walster Hall, 306
Fargo, ND 58102

Pesticide certification information on the back of the weed, insect, or fungicide guide:

*******************************************************************************
For information regarding pesticide certification, contact the North Dakota State University Extension Pesticide Program
NDSU Dept. 7060
205 Waister Hall
P.O. Box 6050
Fargo, ND 58108-6050
Phone: 701-231-7180 or 231-6388
Fax: 701-231-5907
Email: NDSU.pesticide@nds.edu
www.ndsupesticide.org

For pesticide enforcement, compliance assistance, registration, and other regulatory issues, contact the Agriculture Chemical Division at the North Dakota Department of Agriculture
600 E. Boulevard Dept. 602
Bismarck, ND 58505-0020
Toll free: 1-800-242-7535
Phone: 701-328-2231
Fax: 701-328-4557
Email: NDDA@nd.gov
www.nd.gov/ndda

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