POTATO PSYLLID ALERT

The potato psyllid has migrated up from the southern states into North Dakota and is being found in three counties: Dickey, Kidder and Morton. Both adults and nymphal stages have been found, evidence that the insect has been here for probably two weeks. The potato psyllid is the vector for the bacterium that causes zebra chip. Tests are currently being performed at NDSU to determine if the psyllids found in North Dakota carry the bacterium. It is likely that these psyllids are not carrying the zebra chip bacterium, since most tests conducted on psyllids collected in Texas, Kansas and Nebraska have been negative. However, it is important for potato growers to be aware that psyllids can cause yield and quality damage to potato in the absence of zebra chip due to a toxin they inject into the plant during feeding. This toxin disrupts the flow of carbohydrates from the leaves to the roots and tubers, reducing the bulking rate of the tubers.

This condition is known as “psyllid yellows.” Symptoms of psyllid yellows are extreme cupping and erectness of the upper leaves which will redden and become yellow as the toxin intensifies (Fig. 1). At this point, all tuber bulking ceases and the damage is irreversible.

Figure 1. Psyllid yellows on potatoes (N. Gudmestad, NDSU).

It is important for growers to scout fields for psyllids by sweeping foliage to look for adults and to examine the underside of leaves for nymphs in the middle to upper third of the canopy. Psyllids are very difficult to see with the naked eye so a hand lens is recommended for detection. Adult potato psyllid are small (2 mm long) and look like small cicadas with clear wings held rooflike over the body at rest. There is a broad white band on the first abdominal segment and an inverted “V” on the last segment (Fig. 2). The nymphs (immatures) are flat green with a fringe of spines around the edges (Fig. 3). During the growing season, a treatment would be warranted if an average of one to two psyllids per leaf or 10 per plant is observed.

Figure 2. Potato psyllid adult (W. Cranshaw, CSU, Bugwood.org).
The following website provides more information on zebra chip disease and contains psyllid identification photos and management recommendations: www.plantmanagementnetwork.org/infocenter/topic/focus onpotato/

Several insecticides are available for the control of psyllids in potato. Agrimek/Epimek (abamectin) is an insect growth regulator and has excellent activity on psyllids, but has a short residual. Abamectin also is not harmful to most beneficials. Fulfill and Beleaf are active on first and second instar nymphs. Fulfill (pymetrozine) is a Group 9B insecticide and Beleaf (flonicamid) is a Group 9C insecticide. Both are selective homopteran feeding blockers. Movento (spirotetramat) and Oberon 2SC (spiromesifen) are active on first to fourth instar nymphs, and belong to the Group 23 insecticide (inhibitor of lipid synthesis and growth regulation).

If growers require further information please contact Jan Knodel, Department of Entomology, NDSU 701 231-7915, Nick David 701 231-8732 or the Department of Plant Sciences, NDSU 701 231-8362.

Source: Blightline August 6, 2010 - N. Gudmestad & G. Secor, Department of Plant Pathology, NDSU, with edits from J. Knodel, Department of Entomology, NDSU.

CONTINUE TO SCOUT FOR SOYBEAN APHIDS AND SPIDER MITES IN SOYBEANS

Soybean aphids continue to be below economic threshold levels (250 aphids per plants on 80% of the plants in field) in most soybean fields in North Dakota (Figs. 4 & 5). However, winged (alate) and wingless soybean aphids are starting to increase in Cass, Richland, Steele and Traill Counties and there has been some isolated insecticidal spraying. Winged soybean aphids will become more common as the soybean plant matures, and these aphid will move between fields as they seek more suitable host plants. Continue to scout through the R6 crop stage (full seed).

DO ADJUVANTS IMPROVE INSECTICIDE PERFORMANCE AGAINST SOYBEAN APHIDS?

There has been some questions about mixing spreader/stickers and/or adjuvants with soybean insecticides to either improve efficacy or increase the residual of the insecticide. However, in visiting with my entomology colleagues in Minnesota (K. Ostlie, I. MacRae, B. Potter), we all agree that there is no research that shows adjuvants will improve soybean aphid control or increase residual levels. Here’s some 2007 data from K.
Ostlie’s adjuvant-insecticide soybean aphid studies at Rosemount, Minnesota (Fig. 6 & 7).

He saw no improvement in performance and no evidence of increased residual levels. In other words, there is no added economic advantage to adding these compounds to soybean insecticides. Remember to always look at the label to see if any non-ionic surfactant (NIS) or Crop Oil Concentrate (COC) is recommended with the insecticide. For example, some of the neonicotinoids recommend an NIS, COC or both. This may improve the plant uptake by allowing the insecticide to move across the plant’s waxy membrane layers. However, labels for pyrethroids and organophosphates do not typically recommend this. There is still a lot of work that needs to be done on tank-mixing spreader/stickers/adjuvants and insecticides.

The optimal insecticide application includes:
1) an application is made when fields are at economic threshold levels, 2) proper spray nozzles (fine droplet sizes), 3) high pressure (>40 psi) to penetrate dense canopies, 4) high water volume (>18 gallons per acre) to ensure coverage in dense canopies, and 5) a properly calibrated tractor-sprayer.

Two new sunflower insect scouting videos
There are two new videos available on scouting for seed-infesting sunflower insect pests:
• Banded sunflower moth eggs
• Red sunflower seed weevil adults

They should be posted by the end of this week at the Extension Entomology website - Pest Update (scroll down to video links):
www.ag.ndsu.nodak.edu/aginfo/entomology/entupdates

Pheromone trap update for banded sunflower moth and sunflower moth
Pheromone trap catches indicate that adult banded sunflower moth numbers are still high (Fig. 8). Continue to scout for either eggs for sunflowers in the R2-R3 stage, or adult moths in the early flowering stages. Scouting can be discontinued when sunflowers reach the late flowering stages.

Sunflower moth also has been captured at slightly higher numbers than two weeks ago in North Dakota. However, it is still at low numbers overall (Fig. 9). Continue to be vigilant in scouting for sunflower moth as it can quickly increase when blown in on the southerly winds. Reports from southern states like Kansas and Nebraska indicate high populations of sunflower moth. One report near Linton in Emmons County indicated fairly high numbers of larvae in confection sunflower heads. The sunflower moth will be attracted to blooming sunflowers. Any late-planted fields will be targeted by later migrants. When 1 to 2 moths are found for every 5 plants inspected (economic threshold), treatments
should be considered. For more information on sunflower moths, please see Crop & Pest Report Issue 12.

**2010 Sunflower Moth Trapping Network**
*Homoeosoma electellum Hulst*
August 3 - 5, 2010

**Number of sunflower moths per trap per week**
- 0 moths
- 1-10 moths
- 11-27 moths
- >28 moths

Economic threshold during R3 - R5

Figure 9. Sunflower moth pheromone trapping map (T. Mittelsteadt, NSA).

**WATCH FOR GRASSHOPPERS**

As the small grain crop is harvested, scout for grasshoppers moving into late season row crops. Grasshoppers can be especially damaging to flax and lentils. Although with the wet weather, there are adequate food sources, and disease incidence is probably higher than normal. The IPM map shows areas where the populations have increased during the last week, such as Bowman and Sheridan Counties (Fig. 10).

**PREVENT STORED GRAIN INSECT PROBLEMS IN BINS**

Now is the time now to clean your storage bins to prevent potential stored insect problems through good bin management. Several species of insects infest stored grains - confused flour beetle, Indianmeal moth, rice weevil, lesser grain borer, red flour beetle. Damage caused by these insects includes reduced grain weight and nutritional value, contamination, odor, mold, and heat damage, all of which lowers the grain quality.

Good grain bin management practices include:

1) Before treating with protectant, make sure that the bins are free of insect-infested grain. Leftover grain should be removed from the bin, and the walls should be swept and vacuumed. All grain handling equipment, including augers, combines, trucks and wagons, should be thoroughly cleaned and grain residues removed before harvest.

2) A residual bin spray such as malathion, Tempo, or Storcide II should be applied to all interior bin surface areas 2 to 3 weeks before new grain is placed in the bin. The treatment will kill insects in their hiding places (cracks, crevices, under floors and in aeration systems). Also, insects crawling or flying in from the outside will be killed. Apply the spray to as many surfaces as possible, especially joints, seams, cracks, ledges and corners. Spray the ceiling, walls and floors to the point of runoff. Use a coarse spray at a pressure of more than 30 psi and aim for the cracks and crevices. Spray beneath the bin, its supports, and a 15 ft border above the base of the outside foundation. Treat the outside surface, especially cracks and ledges near doors and fans.

3) Remove any vegetation / weeds that may attract and harbor insect pests within 10 ft of a bin and preferably the whole storage area. Follow by spraying the cleaned area around the bin with a residual herbicide to remove all undesirable weedy plants.

4) Repair and seal all damaged areas to grain storage structures. This helps prevent insect infestation and reduces water leakage which leads to mold growth.

5) Whenever fans are not operated, they should be covered and sealed to reduce the opportunity for insects and rodents to enter the bin through the aeration system.

6) If newly harvested grain and/or insect-free grain must be added to grain already in storage, the latter should be fumigated to prevent insect infestation.

7) It is recommended that grain be treated with approved insecticides as it is augered into the bin if it will be in storage for one or more years. Grain protectants kill insects as they crawl about or feed on treated grain and/or grain fragments. Do not apply grain protectants prior to high temperature drying because extreme heat will result

For insecticide recommendations, please consult the 2010 North Dakota Field Crop Insect Management Guide: http://www.ag.ndsu.edu/pubs/plantsci/pests/e1143w1.htm
in rapid volatization and reduced residual qualities of the pesticides. Grain protectants applied to 13% moisture grain will have a greater residual life than grain at 15% or great moisture.

After binning, some grain protectants may be applied as a surface treatment “top dress” to control surface feeding insects such as the Indianmeal moth larvae. Insecticide product should be applied into the top few inches to improve efficacy.

When temperatures are above 50 F, bins should be inspected for insect activity every two weeks. Stored grain insect pests are generally inactive at temperatures below 50 F (Fig. 11).

After binning, some grain protectants may be applied as a surface treatment “top dress” to control surface feeding insects such as the Indianmeal moth larvae. Insecticide product should be applied into the top few inches to improve efficacy.

When temperatures are above 50 F, bins should be inspected for insect activity every two weeks. Stored grain insect pests are generally inactive at temperatures below 50 F (Fig. 11).

Please consult the 2010 Field Crop Insect Management Guide for a complete list of stored grain insecticides.

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Research and demonstration plots provide opportunities to evaluate soybean varieties in the field.

The Variety Testing Program at North Dakota State University is cooperating with industry, state and national crop associations to provide North Dakota producers with the information they need for selecting the right soybean varieties. Trial results were provided to the Soybean Board to be included in data for the Soybean Quality Toolbox which can be found at www.unitedsoybean.org/programs/choosing_the_right_variety/Select_Yield_Quality/soybean_quality_toolbox.aspx.

The Soybean Quality Toolbox is useful to producers in identifying soybean varieties with good protein and oil levels, and provides a dollar value per acre for different varieties. There are a number of steps you must take in order to get to the trial results. First select North Dakota State University data, followed by the harvest year you are interested in (2003 through 2009) and the plot location within the state. The second step is to indicate the type of soybean (conventional or RR) and if you want to search for varieties from a selected company. The last step, to get the value per acre, is to select a market price for the soybean crop. Completing these selection criteria and clicking on “data” will provide the results. There is also a feature to create a scatter plot between oil and protein. This provides a visual aid to focus on high oil and protein level varieties. Data can be exported into an excel sheet format.

The Toolbox, developed by the United Soybean Board, helps growers identify soybean varieties best suited for appropriate production goals. Producers are encouraged not only to look at one year’s data, but also to look at yield trends over time, and several locations in North Dakota.

Information about 2009 soybean variety testing can also be found on the NDSU web site at www.ag.ndsu.edu/varietytrials.

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EARLY START WITH SOYBEAN SELECTION FOR 2011

The selection of soybean varieties for 2011 should start by observing promising varieties under field conditions during the 2010 production season. In the fall there are usually numerous opportunities to visit soybean plot tours and observe the performance of varieties in the field. Producers’ fields can also be viewed since many companies have plot signs indicating which varieties are being grown. Soybean varieties should match expected field conditions and management practices. A variety can be selected with good yield, oil and protein content potential as well as disease resistance.
MANAGE WHEAT STREAK MOSAIC NOW

Wheat streak mosaic virus (WSMV) was severe in a number of wheat fields in North Dakota this year. The virus was confirmed in 71 wheat samples sent to the NDSU Plant Diagnostic Lab, with a majority of these samples from counties in the north central region of the state. Keys to managing this disease include understanding its life cycle and directing steps to break the cycle.

**Virus and Mite Carrier:** The virus causes yellowing and mosaic streaking of the leaves (Figure 1), stunting of the plant, and potentially large yield losses. The virus is transmitted from plant to plant by the tiny wheat curl mite. This mite, only 1/100 of an inch long, needs a green “bridge” to live, reproduce, and survive. The mite can feed, transmit the virus, lay eggs, and complete its cycle within 7-10 days under warm temperatures of 70 degrees Fahrenheit or greater. Starting with one mite, a population of 3 million mites could potentially be produced within 60 days. These virus transmitting mites move from plant to plant by wind. Although mites can be spread a distance of greater than one mile, severely infected fields generally cause problems in fields within one-half mile of the source field. Insecticides or miticides will not control wheat curl mites, and few adapted varieties have some levels of resistance to the mite or virus.

**Mite Hosts:** The most favored hosts for mites are all the wheat crops, winter, spring or durum. Grassy weeds such as Downy brome and smooth crabgrass are good hosts, and corn, cheat and Japanese brome are fair hosts.

Barley, rye and foxtails are poor hosts for the mite, but have been known to be infected with the virus. Mites will feed on corn kernels and can move from green corn into adjacent winter wheat crops.

**Wheat Streak Management:** Wheat streak mosaic disease is managed by breaking the life cycle of the mite through two key cultural practices: 1) controlling volunteer wheat and grassy weeds at least two weeks prior to planting; and 2) use of appropriate planting dates.

Prior to planting winter wheat this fall, the field to be planted and adjacent fields should be free of any wheat volunteers or grassy weeds. This is generally accomplished with burn-down herbicides applied at least two weeks prior to planting, to assure complete weed control prior to emergence of the new wheat crop. If no host is available in the field, the mite will die.

The second step, date of planting, also is very important. Planting winter wheat too early in the fall generally results in emergence of the new winter wheat crop when mites are still very active, because of warm temperatures. Generally, NDSU recommends planting winter wheat in northern tier counties within the first two weeks of September, and in more southern counties, the last two weeks of September. No volunteer winter wheat should ever be left standing over winter as a potential crop. Figure 2 is evidence of the potential devastating effects of leaving volunteer winter wheat containing mites and virus to infect wheat crops the following spring.

**Reasons for More WSMV in 2010:** Wheat streak mosaic virus was severe in 2010 because the late harvest made it difficult for producers to kill volunteers and weed hosts with herbicides a solid two weeks prior to planting winter wheat in 2009. Early planted winter wheat emerged in September when warm weather caused higher mite activity. Winter wheat planted at the end of September or later, emerged in October, which was considerably colder than September and led to decreased mite activity and less spread of the virus. The abundant snow cover during the winter had two adverse consequences. It allowed the wheat curl mite and infected spring wheat to survive better, resulting in further spread...
of the disease. Producers in high risk areas did get some relief in May as cooler temperatures allowed the wheat to grow faster than mite populations.

Sources: Marcia McMullen, NDSU Extension Plant Pathologist; Dan Waldstein, NDSU Extension Area Specialist, NC Research Extension Center, Minot

NDSU IPM SMALL GRAIN DISEASE SURVEY, AUG. 2-6

Field scouts are finishing up with the small grain portion of the IPM survey. They surveyed 30 wheat fields in the first week of August, primarily in the north central, northwest, and southwest districts.

Wheat leaf rust was found in 20% of fields surveyed, and stripe rust in 10%. Wheat streak mosaic and loose smut were observed in 17% of surveyed fields. Bacterial leaf streak was observed in 20% of surveyed fields. Scab levels had increased slightly from previous weeks, with 20% of the surveyed wheat fields in that week showing some scab incidence, and an average severity in those fields of 4.6%. However, across all surveyed fields, field severity of scab remained under 2%. Early harvest reports of wheat and barley indicate relatively good yields and quality, with minimal damage due to diseases.

STRAW, GRAZING, HAY RESTRICTIONS FOR WHEAT AND BARLEY FUNGICIDES

Hail damage in some areas on small grain fields treated with fungicides has resulted in a few questions about using these crops for hay, forage or straw. The following table contains information about harvest, grazing, hay and straw restrictions for the most commonly used fungicides on wheat and barley.

Marcia McMullen
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<table>
<thead>
<tr>
<th>Class</th>
<th>Active ingredient</th>
<th>Product</th>
<th>Rate/A (fl. oz)</th>
<th>Harvest Restriction</th>
<th>Label Language: Grazing, Hay, Straw Restrictions</th>
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<tbody>
<tr>
<td>Strobilurin</td>
<td>Azoxystrobin 22.9%</td>
<td>Quadris 2.08 SC</td>
<td>6.2 - 10.8</td>
<td>45 days</td>
<td>Forage: 14 days; Hay: 14 days; Straw: 45 days</td>
</tr>
<tr>
<td></td>
<td>Pyraclostrobin 3.6%</td>
<td>Headline 2.09 EC</td>
<td>6.0 - 9.0</td>
<td>Feekees 10.5</td>
<td>Forage: 14 days; Hay: 14 days</td>
</tr>
<tr>
<td>Triazole</td>
<td>Metconazole 8.6%</td>
<td>Caramba 0.75 SL</td>
<td>10.0 - 17.0</td>
<td>30 days</td>
<td>No livestock feeding restrictions</td>
</tr>
<tr>
<td></td>
<td>Propiconazole 41.8%</td>
<td>Tilt 3.6 EC, PropiMax 3.6 EC, Bumper 41.8 EC</td>
<td>4.0</td>
<td>Feekees 10.5</td>
<td>Forage: 30 days; Straw: 40 days; Hay: 45 days</td>
</tr>
<tr>
<td></td>
<td>Prothioconazole 41%</td>
<td>Proline 480 SC</td>
<td>5.0 - 5.7</td>
<td>30 days</td>
<td>No restrictions</td>
</tr>
<tr>
<td>Tebuconazole 38.7%</td>
<td>Folicur 3.6 F, Other tebuconazoles</td>
<td>4.0</td>
<td>30 days</td>
<td>Grazing: 6 days; Hay: 6 days; Straw: no restrictions</td>
<td></td>
</tr>
<tr>
<td>Prothioconazole 19%</td>
<td>Tebuconazole 19%</td>
<td>Prosaro 421 SC</td>
<td>6.5 - 8.5</td>
<td>30 days</td>
<td>Grazing: 6 days; Hay: 6 days; Straw: no restrictions</td>
</tr>
<tr>
<td>Mixed mode of action</td>
<td>Metconazole 7.4%</td>
<td>TwinLine 1.75 EC</td>
<td>7.0 - 9.0</td>
<td>Feekees 10.5</td>
<td>Hay: 14 days</td>
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<td>Pyraclostrobin 12%</td>
<td>Quilt 200 SC</td>
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<td>Feekees 10.5</td>
<td>Forage: 30 days; Hay: 30 days</td>
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<tr>
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<td>Azoxystrobin 7.0%</td>
<td>14.0</td>
<td>Feekees 10.5</td>
<td>Forage: 30 days; Hay: 30 days</td>
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<td>Azoxystrobin 13.5%</td>
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<td>Feekees 10.5</td>
<td>Forage: 30 days; Hay: 30 days</td>
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<td>Trifloxystrobin 11.4%</td>
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<td>35 days</td>
<td>Grazing, Forage: 30 days; Hay: 45 days</td>
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</table>
BACTERIAL PUSTULE FOUND IN ND SOYBEANS

Bacterial pustule, caused by *Xanthomonas axonopodis pv. glycines*, is a rare disease to find in North Dakota, largely because it is favored by temperatures between in the high 80’s and low 90’s and wet canopies. However, it has shown up in the SE part of the state. The disease is NOT economically important in our area; however, the pathogen produces a discrete pustule (hence the name bacterial pustule). Because this pathogen produces a pustule, it resembles a rust disease. To someone who has not seen soybean rust before, they may assume it to be soybean rust. Indeed, this is probably the most commonly confused disease with soybean rust.

Soybean rust has not migrated beyond the coastal states, and should not be a problem in our area this year. So if you are seeing something resembling a pustule in your soybeans, think bacteria. Information on soybean rust and lookalike pathogens can be found at www.sbrusa.net.

![Fig. 3. Bacterial pustule on the top of a soybean leaf.](image)

![Fig. 4. Bacterial pustule on the bottom of a soybean leaf.](image)

DRY EDIBLE BEAN RUST IN THE REGION

Common rust on dry edible beans has shown up in much of the bean growing region in the last two weeks. We have confirmation and samples from Cass, Ramsey, Steele, and Traill Counties in ND, and in NW Minnesota. It can be assumed that bean rust is occurring in other areas of the growing region as well.

As edible beans mature, the necessity and/or effectiveness of a fungicide application is reduced greatly. A general rule of thumb would be that when pinto’s stripe or beans are three to four weeks from harvest, fungicide applications are not recommended.

I would not expect much yield loss from rust this year. However, the rust that develops this year will be very important for disease in the future. We believe that most of the rust occurring in the region is the new race (greenhouse tests will be done this fall to confirm), and the new race can infect virtually all beans we grow. The occurrence of rust this year means that the new race of the pathogen has spread throughout the region, and consequently, the amount of inoculum next year will be much higher than in the beginning of 2009 or 2010. In favorable environments, we may expect rust to occur earlier than in 2010, and may be more widespread. Growers will have to be vigilant about scouting next season.

WHITE MOLD OCCURRING – DON’T SPRAY

White mold is showing up in dry edible beans, soybeans, and sunflowers throughout the region. There is nothing that one can do to mitigate damage. Research data indicates that fungicides are not effective and are not recommended at late growth stages for dry beans and soybeans. Fungicides are not recommended for sunflowers. Although we won’t know for some time, I believe that growers who aggressively managed this pathogen at appropriate growth stages, particularly in dry beans, will be rewarded for their efforts. However, even those who sprayed may still get some mold; but I expect it will be far less than if the field was not sprayed.

SUNFLOWER DOWNY MILDEW SURVEY

Dr. Tom Gulya (USDA Sunflower Research Unit) has been conducting a sunflower-downy mildew race survey this summer. To date, he has 130 samples from ND, SD, MN and NEB tested in greenhouse tests, and 16 of them are a race that can overcome the PI6 gene. This gene is the most commonly used downy mildew resistance gene in commercial sunflower hybrids. This new race was found for the first time last year, but its geographic distribution not totally known. Based on this year’s samples, the new ‘hot’ race appears to be most prevalent in ND (Figure 5), where 16 of 98 samples (38%) were the new race, compared to 6% occurrence in MN and NE samples, and none from SD.
Dr. Gulya and his technician will continue to process samples throughout the summer, and they appreciate all the help they have received from extension personnel, and people in the seed industry who have collected and sent samples in for this study.

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USING WHEAT YIELD AND PROTEIN RESULTS TO MODIFY FUTURE N RECOMMENDATIONS

Wheat yields are generally down from last years records, due to summer heat, and protein levels are up. But not on every farm. Growers and their consultants should use the results from this year to modify their N rates and ways they apply N in the future. Some growers are finding that fall-applied N on sandier soils did not perform in both yield and protein the way that their spring-applied N fields did. This should be a sign that the long-held rule that fall-applied N be reserved for loam and heavier soils is a good rule. Growers farm more land than they did in the past, and it is clear that all of the land may not be well-managed using the same N application methods.

If growers split fields using post-N application to enhance either yield or protein, these results also need to be examined. Take into account the rainfall after the application and consider how likely it would be to receive rain in the future during this time.

If large portions of the field started lodging pre-flowering, this is a sign that the N rate may be too high on that farm or at least in those portions of the farm that lodged. Lodging in grain after flowering did not hurt yield or quality and the combines we have presently do a good job of picking the grain up. Fields that lodged after flowering due to high winds/storms are probably at near the correct N rate for those farms. Check the protein levels, and if they are higher than 15%, then perhaps the N rates could be shaved a little.

Lower protein/yield in fields with surface applied urea should be critically examined to see how well these practices worked. With the early-season rains that many areas experienced, the efficiency of surface-applied urea was probably greater than in most years. In the future, as in the past, practices need to be changed to place N below the soil surface in no-till fields.

SOIL TESTING SHOULD BEGIN NOW

If you review current soil testing recommendations, you will see there is no sampling date adjustment. A review of experiments sampling weekly or biweekly from harvest to spring, weather permitting, showed that in some fields nitrate went up, in some nitrate went down and in some the nitrate levels were stable. A fall soil test is a snap-shot in time. There is no time that the value is stable forever. That considered, a fall soil test ANYTIME is better than no test at all. As revealed in the wheat N recommendation review and revision, soil test nitrate is an important part of the N recommendation for wheat and for every N-requiring crop. As soon as the small grains are removed, a soil sampler should be called. If it’s not supposed to rain for awhile, give the sampler a couple days to sample the field before working the land. The sampling results will be much better in the surface soil than if you call after chiseling a field.

There is no need to wait until mid to late September to call the sampler. Do it now.

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RESISTANCE TO HPPD INHIBITORS IN AN ILLINOIS WATERHEMP POPULATION

Waterhemp looks similar to redroot pigweed and is found in many fields in eastern ND and western MN. It has become resistant to ALS herbicides, PPO herbicides, and glyphosate. From several phone calls from growers and consultants it appears that waterhemp have escaped control from these herbicides in this area in ND and MN. Few herbicide modes of action are left to control resistant biotypes. One effective mode of action are the HPPD herbicides like Balance, Callisto, Laudis, and Impact. Below is information about waterhemp populations escaping control from HPPD herbicides in Illinois. If it can happen there, it can certainly happen here.

Waterhemp resistance in Illinois first occurred to ALS-inhibiting herbicides in 1997. Since then, Illinois waterhemp populations resistant to triazines, PPO inhibitors, and glyphosate also have been confirmed. While resistance to any one herbicide family can introduce significant management challenges, biotypes with resistance to more than one herbicide family are becomingly increasingly common.

Weed scientists at the University of Illinois are currently working with a type of herbicide resistance that has not previously been reported. Basic and applied research is underway with an Illinois waterhemp population that is resistant to herbicides that inhibit 4-hydroxyphenyl pyruvate dioxygenase, generally referred to as HPPD-inhibiting herbicides. Foliar-applied HPPD inhibitors are commonly used for control of annual broadleaf and grass weed species in corn.

Initial greenhouse experiments conducted at the University of Illinois confirmed anecdotal reports from the field. Plants grown from field-collected seed and treated with HPPD herbicides survived, whereas treated plants from two known sensitive populations (used for comparison) were completely controlled. Tank-mixing atrazine with each HPPD inhibitor improved control of the resistant population over that provided by each HPPD herbicide alone, but survival was still much greater than with the sensitive controls.

Field research conducted in 2010 confirmed the greenhouse results. Foliar-applied HPPD inhibitors, alone or tank-mixed with atrazine, provided poor control of this waterhemp population. Crossings experiments have confirmed reduced sensitivity to HPPD inhibitors can be transferred to progeny, providing additional evidence that this population is resistant to this herbicide site-of-action family.

Sources: University of Illinois Weed Scientists - Aaron Hager, Dean Riechers and Pat Tranel

OPPORTUNITY STRIKES FOR FALL WEED CONTROL

Now is the time to begin applying herbicides for the control of winter annual weeds, simple perennials such as curly dock and dandelion, biennials such as biennial wormwood, and in some cases cool-season perennial weed species. This is especially true for no-till fields, but also for those fields receiving tillage other than moldboard plowing. For fields in which tillage is planned, apply herbicides at least 5 days prior to tillage. Herbicides may be applied within a few days of crop harvest or until the soil is frozen. Based upon research across the Midwest, the most consistently effective control of dandelions is obtained with fall herbicide applications. The best way to drastically reduce or stop seed production of winter annual species is with fall herbicide applications or effective fall tillage. It is always better to apply herbicides in the fall under less than ideal conditions, than to wait until spring to achieve marginal control of these types of weed species, especially dandelion.

The most effective fall herbicide treatment with the most cropping flexibility next spring is an application of glyphosate at 0.75 pound acid equivalent/acre (lb ae/A) [Roundup at 22 ounce/acre {oz/A} or glyphosate products containing 3.0 lb ae/gallon at 32 oz/A] plus 2,4-D ester at 0.5 lb ai/A. The addition of 2,4-D is most important for dandelion control and will antagonize glyphosate’s activity on Canada thistle and perennial grass species. Another herbicide option, would be the addition of Valor at 2 to 3 oz/A to the glyphosate plus 2,4-D mixture. Fall applications including Valor will be most beneficial west of the Red River Valley where spring rains are not consistent enough to properly activate Valor. Activation of Valor is almost certain with fall applications in the drier areas of the state. Preliminary studies with fall-applied Valor have shown potential to control or suppress weeds such as kochia, seedling dandelion, canola, and chamomile. However, NDSU and Valent are conducting additional research to determine proper timing of application of Valor and efficacy on spring-emerging weeds. Valor should only be applied in no-tillage fields and any substantial soil movement next spring during planting will reduce the effectiveness of Valor on spring emerging weed species. Read the Valor label and follow the crop rotation guidelines when applying Valor in the fall. Only certain crops can be planted in the spring following fall-applied Valor.

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NDSU PLANT DIAGNOSTIC LAB UPDATE

The NDSU Plant Diagnostic Lab processed 114 samples from August 4 through August 11. Of these, 34 were for routine diagnosis, 72 were for phytosanitary testing, and 8 were included in the wheat virus survey. Diagnoses (by county) for North Dakota samples completed during this time are summarized in the table below:

<table>
<thead>
<tr>
<th>County</th>
<th>Host (Taxonomic Name)</th>
<th>DIAGNOSIS/ID COMMON NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercer</td>
<td>Ash (Fraxinus sp.)</td>
<td>Ash Rust (Puccinia sparganioides)</td>
</tr>
<tr>
<td>Renville</td>
<td>Spruce - Blue (Picea pungens)</td>
<td>Environmental/Chemical injury</td>
</tr>
<tr>
<td>Cass</td>
<td>Daylily (Hemerocallis sp.)</td>
<td>Insect Damage suspected</td>
</tr>
<tr>
<td>Traill</td>
<td>Dry Bean (Phaseolus vulgaris)</td>
<td>Common Bean Rust (Uromyces appendiculatus)</td>
</tr>
<tr>
<td>Golden Valley</td>
<td>Wheat - Durum (Triticum turgidum)</td>
<td>Fusarium Root Rot (Fusarium sp.)</td>
</tr>
<tr>
<td>Golden Valley</td>
<td>Wheat - Durum (Triticum turgidum)</td>
<td>Physiological leaf spot</td>
</tr>
<tr>
<td>Hettinger</td>
<td>Wheat - Durum (Triticum turgidum)</td>
<td>Tan Spot (Dreschlera sp.)</td>
</tr>
<tr>
<td>Cass</td>
<td>Elm - American (Ulmus americana)</td>
<td>Canker (Botryodiplodia hydroidermia)</td>
</tr>
<tr>
<td>Wells</td>
<td>Geranium (Pelargonium sp.)</td>
<td>Pythium Root Rot (Pythium sp.)</td>
</tr>
<tr>
<td>Richland</td>
<td>Lilac (Syringa sp.)</td>
<td>Bacterial Blight (Pseudomonas syringae)</td>
</tr>
<tr>
<td>Ward</td>
<td>Maple (Acer sp.)</td>
<td>Poor Growing Conditions</td>
</tr>
<tr>
<td>Lamoure</td>
<td>Plant ID Request</td>
<td>Devil's beggar tick</td>
</tr>
<tr>
<td>Ramsey</td>
<td>Plant ID Request</td>
<td>Asteraceae family</td>
</tr>
<tr>
<td>Cavalier</td>
<td>Plant ID Request</td>
<td>Hairy beggar tick (Galinsoga ciliata)</td>
</tr>
<tr>
<td>Ramsey</td>
<td>Plant ID Request</td>
<td>Lambsquarters (Chenopodium album)</td>
</tr>
<tr>
<td>Cass</td>
<td>Plant ID Request</td>
<td>Pennsylvania Pellitory (Parietaria pensylvanica)</td>
</tr>
<tr>
<td>Ramsey</td>
<td>Plant ID Request</td>
<td>Galium sp.</td>
</tr>
<tr>
<td>Grant</td>
<td>Aspen - Quaking (Populus tremuloides)</td>
<td>Trunk Girdling</td>
</tr>
<tr>
<td>Cavalier</td>
<td>Canola (Brassica napus)</td>
<td>Herbicide injury</td>
</tr>
<tr>
<td>Burleigh</td>
<td>Wheat - Spring (Triticum aestivum)</td>
<td>Root Rot (Bipolaris sorokiniana)</td>
</tr>
<tr>
<td>Cass</td>
<td>Basil (Ocimum basilicum)</td>
<td>Insect Damage</td>
</tr>
<tr>
<td>Cass</td>
<td>Basil (Ocimum basilicum)</td>
<td>Wind Damage</td>
</tr>
<tr>
<td>Grand Forks</td>
<td>Turfgrass (mixed species)</td>
<td>Dense Thatch Layer</td>
</tr>
<tr>
<td>Burleigh</td>
<td>Turfgrass (mixed species)</td>
<td>Cultural/Environmental Problem</td>
</tr>
<tr>
<td>Burleigh</td>
<td>Turfgrass (mixed species)</td>
<td>Insufficient Light</td>
</tr>
<tr>
<td>Grand Forks</td>
<td>Turfgrass (mixed species)</td>
<td>Patch Disease (various root fungi)</td>
</tr>
</tbody>
</table>

2010 WHEAT VIRUS SURVEY

The Great Plains Diagnostic Network continues to sponsor a small grains virus survey for 2010. Eight samples were tested as part of this survey from July 21 through July 28. Three of these tested positive for wheat streak mosaic virus (counties: Benson, Cavalier, and Golden Valley). None of the other viruses in the survey were detected in these samples. All testing for the wheat virus survey will be completed this week. Final results will be compiled and made available in the last issue of the 2010 Crop and Pest Report.

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Sunflowers:
Fields in the area are in the R2 (early bud) to R6 (wilted ray petals) stage. Early flowering (R5.1) is a good timing for managing several key insect pests, including banded sunflower moth, sunflower moth, red sunflower seed weevil, and Lygus bugs (confection only) with a follow-up spray approximately one week later, especially in confection sunflowers. It is generally not possible to control all insect pests in sunflower with one insecticide application.

I've received questions this week about sunflower insecticides and bee toxicity. In general, earlier applications before most of the sunflowers are in bloom, will be better to protect foraging bees. In terms of time of day, the best for protection of bees is late evening, followed by early morning, with the worst during the middle of the day when bees are actively foraging. In regards to toxicity of registered insecticides, Asana, Baythroid, Cobalt, and the lambda-cyhalothrin formulations (e.g., Grizzly, Kaiso, Lamda-Cy, Silencer, and Warrior) have the highest toxicity to bees, with chlorpyrifos (e.g., Lorsban, Warhawk, Yuma), Sevin, deltamethrin (Delta Gold) and Mustang with less toxicity to bees than the first group of insecticides (nysipm.cornell.edu/publications/EIQ.html).

Banded sunflower moth trap catches have continued to be high with counts of more than 100 moths per week. Sunflower moth trap catches, however, have remained quite low. Sporadic sunflower midge damage has been found in fields throughout the area with a report of a severe outbreak south of Harvey. A number of fields in the Mohall area have been impacted by sunflower head clipping weevil. Damage was heavy along the edges of fields with little or no damage in the interior. Insecticides are generally not recommended for control of this pest.

Downy mildew was found at low levels in 30% of sunflower fields scouted in Bottineau, McHenry, and Renville Counties. Foliar fungicides are not effective against this disease.

Sunflower rust has been seen at low levels in the area. Be on the look-out for this disease, especially with increased occurrence of rain.

Small grains:
The recent rain showers have increased our risk for scab in late planted wheat in the area. Winter wheat harvest is well underway. Preliminary indications are that yields are above average to exceptional.

We have continued to find wheat streak mosaic virus in spring wheat and durum fields in north central and the northwestern counties. As producers consider planting winter wheat this fall, proper management for wheat streak mosaic virus (WSMV) will be critical. For more information, please refer to the article on WSMV in this week’s version of the Crop and Pest Report and the information on our North Central Research Extension Center website (www.ag.ndsu.edu/NorthCentralREC).

Soybeans:
Soybean aphid populations have been low throughout the area. Grasshopper populations are building but still below threshold in the fields we have scouted. Green cloverworms are common in soybean fields but generally below threshold.

Field Peas and Lentils:
Pea harvest has begun in the area. We have received some reports of white mold problems in lentil in the area. In general, it is not economical to apply a fungicide on lentils this late in the season.

South-Central ND

According to NDAWN (North Dakota Ag Weather Network) data, the region received 0.2 inch (Linton) to 1.9 inches (Pillsbury) of rain during August 1-10. The region’s August 10 rain was welcomed in most areas for row crops. According to NDAWN, corn water use during the week of Aug. 4-10 averaged 0.2 to 0.25 inches/day.

Winter wheat, barley and field pea harvest is near completion. Harvested spring wheat acres may average in the range of 30 to 50 percent complete for the region. Preliminary harvest reports indicate good yield and generally acceptable protein levels for wheat. Most corn is in the blister (R2) to milk (R3) growth stages.

Accumulated growing degree day units for April 25 planted corn and up to August 10, ranges from +72 units at Fingal to -159 units at Carrington, compared to the long-term average for this period. Soybean and dry bean are in the seed development stages, with some early-
maturing dry bean varieties showing striped pods. Sunflower is in the flowering (R5) to wilting ray flower (R6) stages. Yield potential for corn and broadleaf crops continues to be generally positive. Continue checking for insect threats, including aphids and spider mites in soybean, and grasshoppers for all ‘green’ crops. Sunflower growers should continue to monitor for leaf rust.

The Carrington RE Center’s annual row crop tour, featuring production research and recommendations for corn, dry bean, soybean and sunflower is scheduled for September 2.

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weather

Percent of Normal Rainfall (%) (2010-08-04 – 2010-08-10)

Departure from Normal Average Air Temperature (°F) (2010-08-04 – 2010-08-10)
Helping You Put Knowledge To Work

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