CHLORPYRIFOS UPDATE

Chlorpyrifos (trade names Lorsban 4E, Lorsban Advanced, Cobalt, Cobalt Advanced and several generic insecticides) belongs to the organophosphate group of insecticides, IRAC 1B, and is a widely used broad spectrum neurotoxic pesticide for control of many insect pests of field crops. Some examples include:

- Alfalfa – grasshoppers, leafhoppers, armyworms, cutworms, pea aphids, plant bugs
- Dry beans – aphids, armyworms, bean leaf beetles, caterpillars, cutworms, grasshoppers, leafhoppers, seed corn maggots, spider mites
- Field corn – cutworms, grubs, seed corn maggot, wireworm, grasshoppers, armyworms
- Soybean – grasshoppers, Lepidoptera foliage feeders, armyworms, bean leaf beetles, cutworms, soybean aphids, spider mites
- Sugarbeet – grasshoppers, spider mites, Lygus bugs, sugarbeet root maggots, aphids
- Sunflower – cutworms, grasshoppers, banded sunflower moths, seed weevils, stem weevils, sunflower beetles, sunflower moths, Lygus bugs
- Wheat – aphids, grasshoppers, army cutworm, cutworms, wheat midge, cereal leaf beetle

In addition, chlorpyrifos has played an important role as a rotational use product for growers to delay the development of insecticide resistance for some insect pests, such as soybean aphids and spider mites.

The 9th Circuit Court of Appeals recently ordered the EPA to revoke all chlorpyrifos tolerances and cancel all registrations of this widely used insecticide within 60 days.

It is too early in the process to know how the EPA will react to this ruling or what the outcome will be or if it will affect future insect control. Fortunately, we are at the end of our field season for insect management in 2018. Right now, it is still legal to continue using chlorpyrifos according to label directions for insect pest control in field crops. If chlorpyrifos registrations are canceled, there is usually a window of time provided for growers to use up existing stock. Below is a link to EPA’s website on why and how the EPA would revoke a pesticide tolerance, which includes relevant laws and procedural steps:

https://www.epa.gov/pesticide-tolerances/revoking-pesticide-tolerances
NEW SOYBEAN GALL MIDGE FOUND IN OTHER STATES

A new insect, soybean gall midge (Diptera: Cecidomyiidae) has been found in soybeans fields in neighboring states including Minnesota, eastern South Dakota, western Iowa and eastern Nebraska. The bright orange larvae can be found inside the stems or pith near the base of the plant. The orange larvae look similar to the wheat midge larvae that commonly infest wheat in North Dakota. Some entomologists feel that the soybean gall midge is associated with injury from hail or diseases, such as Sclerotinia white mold. Species identification is being conducted from larvae collected in infested soybeans in other states.

As far as we know, there is no soybean gall midge in North Dakota yet. However, if you see or know of any orange larvae in the base of soybeans, please contact Extension Entomology. It is unknown if this insect will become a new economic pest of soybeans in the future and if it will be discovered in North Dakota.

Janet J. Knodel
Extension Entomologist

Soybean gall midge larvae and damage under soybean stem epidermis. Rock County, MN (Photo courtesy of Bruce Potter and Bob Koch, UMN)

2018 IPM SURVEY RESULTS – SMALL GRAIN

The purpose of the IPM (Integrated Pest Management) Survey is to detect the presence and population levels of diseases and insect pests that are common in wheat and barley grown in North Dakota. Ten survey scouts or insect trappers operated out of the Dickinson Research Extension Center, the North Central Research Extension Center (Minot), the Carrington Research Extension Center, the Langdon Research Extension Center, the Williston Research Extension Center and the Fargo Agricultural Experiment Station. The NDSU IPM scouts were:

- Brittney Aasand, central and south central counties, worked out of Carrington REC with Greg Endres
- Marc Michaelson, southwest and west central counties, worked out of Dickinson REC with Ryan Buetow
- Caleb Cross and Bree Obergfell, north central counties, worked out of NCREC in Minot with Travis Prochaska
- Scott Roseth and Jace Paryzek, northwest counties, worked out of Williston REC with Audrey Kalil
- Dan Kraemer and Stafford Thompson, southeast and east central counties, worked out of NDSU campus, Fargo with Jan Knodel, Andrew Friskop and Sam Markell.
- Kaylee Anderson and Traci Murphy, northeast counties, worked out of Langdon REC with Leslie Lubenow and Benson County Extension Office with Scott Knoke

NDSU IPM field scouts surveyed a total of 1,385 wheat fields (winter wheat, hard red spring wheat, durum wheat) and 105 barley fields for 18 diseases and 6 insect pests of North Dakota in 2018. The survey was initiated on June 4 and continued through August 10. Crops were surveyed from the 2-leaf stage through ripening stages. IPM survey data/maps provide near real-time pest information to North Dakota producers and others in agriculture to assist with scouting and pest management decision making. Pest maps from the 2018 IPM Survey in North Dakota were uploaded weekly onto the NDSU IPM website. Some of the pest highlights for wheat and barley are summarized on the next pages.
Insect Pests:

**Grasshoppers** – Adult grasshoppers were observed in 75% of the fields surveyed. This was an increase from last year’s incidence with only 36% of fields surveyed reporting grasshoppers. The number of grasshoppers per 4 sweeps (1 yd²) ranged from 1 to 25. The hot and dry weather conditions during August favored late season grasshopper infestation; however, most fields only had feeding damage on field edges. Grasshopper ‘hot spots’ in 2018 included Benson, Bottineau, Renville and Ward Counties.

**Grain aphids** were very low and observed in only 3% of the wheat fields and 8% of the barley fields surveyed in North Dakota. Grain aphids were first detected on June 19 and populations never developed economic levels (85% of stems infested with one or more aphids).
**Wheat stem maggot** was observed in 16% of wheat fields surveyed in ND and the number of white heads ranged from one to 36% of plants infested. Wheat fields with high numbers of white heads, >20% incidence, were observed in Barnes, Cass, Ransom and Sargent Counties in southeast area (see map below).

**Wheat stem sawfly** was found in only 2% of the wheat fields surveyed in ND. In 2018, wheat stem sawflies were observed in northwest (Burke, Divide, McKenzie, Mountrail Counties); north central (Bottineau, McLean, Renville and Ward Counties) and southwest (Golden Valley County) areas of ND. The late summer drought impacted these sawfly-infested areas, increasing favorable conditions for wheat stem sawfly. Although populations were low statewide in 2018, wheat growers reported lodging problems from wheat stem sawfly in Bottineau, Renville and Ward Counties.

**Cereal leaf beetle** is no longer a pest of export concern for shipments of hay from North Dakota to California or Canada; however, we still monitor cereal leaf beetle as an economic insect pest of wheat and barley. In 2018, there was only one observation of cereal leaf beetle in wheat in Divide County and no positive observations in barley. North Dakota counties that have had cereal leaf beetle detections in the past include Burke, Divide, McKenzie, Mountrail and Williams counties in northwest; Renville and Ward counties in north central; and Cavalier county in northeast.

**Barley thrips** were low and observed in only 14% of the barley fields surveyed from June through July. The central area of ND reported most of the barley thrips at an average of <1 thrips per stem, which is below the economic threshold. The rains in early summer helped reduce populations of barley thrips. The 2018 economic threshold for barley thrips was an average of >4 thrips per stem for malting barley.
Diseases:

The two most common wheat diseases detected by IPM scouts in wheat were tan spot and bacterial leaf streak. Tan spot was recorded in 12.7% (Figure 1) of the fields and bacterial leaf streak was recorded in 10.4% (Figure 2) of the fields. Tan spot severity levels remained low and were not regularly detected on the flag leaf. However, in fields where bacterial leaf streak was found, extensive damage on the flag leaf was noticed likely leading to yield loss. Barley foliar diseases were found in 20% of the fields and were generally at very low severities. Bacterial leaf streak was the most common foliar disease detected (13%), followed by net blotch (11%), then spot blotch (8%).

![Figure 1. Tan spot incidence (%) in North Dakota wheat fields in 2018.](image1)

![Figure 2. Bacterial leaf streak incidence (%) in North Dakota wheat fields in 2018.](image2)
Fusarium head blight (scab) risk was moderate to high at various points in the growing season. The greatest areas of risk were in southwestern ND, central ND and northeastern ND. The NDSU IPM scouts visited 272 wheat fields during the time scab is most visible and documented the disease in 25% of the fields (Figure 3). Most fields were at low severity (< 5.0 severity index), while a few fields had moderate to high amounts of scab (> 10.0 severity index).

**Figure 3.** Fusarium head blight (scab) severity index in North Dakota wheat fields in 2018.

**Acknowledgments:** Sincere thanks to the hard working field scouts of 2018! We also appreciate the help of Darla Bakko, NDSU Dept. of Plant Pathology, for data compilation, and Honggang Bu, NDSU Dept. of Soil Science, for ArcMap programming. This survey is supported in part by the Crop Protection and Pest Management Program [grant no. 2017-70006-27144/accession 1013592] from the USDA National Institute of Food and Agriculture and the North Dakota Department of Agriculture.

Janet J. Knodel
Extension Entomologist

Andrew Friskop
Extension Plant Pathology, Cereal Crops
COVER CROP FIELD DAY NDSU CAMPUS

Cover crop use, the benefits of cover crops, and how they can be used as part of an interseeding system in corn and soybeans will be the focus of a North Dakota State University Extension Field Day on Sept. 18.

The field day will be at the NDSU campus research plots 0.4 mile west of the corner of 18th Street and 15th Avenue North in Fargo. The sessions begin at 8 a.m. and end at 3 p.m.

The event will highlight 20 different cover crop species and how they can be incorporated into a farming operation or used for fall grazing.

Other topics presenters will discuss are the benefits and challenges of cover crops, forage sorghum and grazing mixtures, and the results of seeding timing and the rate of rye and camelina seeded into standing soybeans. The tour also includes viewing interseeding equipment.

In addition, participants will visit the field research plots near Hickson, N.D., by bus. Stops include a research area with cover crop interseeded into corn and a research site investigating the effect of fall-seeded cover crops on the currently grown corn and sugar beet crops.

After lunch, researchers will present results of interseeding camelina and pennycress in corn and soybeans. The program will conclude with a panel discussion, which will include a question-and-answer session.

Lunch will be provided. Registration is required. Go to https://goo.gl/forms/QsGm0k14UTTXNOlF3 to register online. For more information about the field day and preliminary research results, visit the project’s website at https://www.cropsyscap.org/.

This field day is part of the outreach effort associated with a National Institute of Food and Agriculture grant from the U.S. Department of Agriculture awarded to North Dakota Agricultural Experiment Station scientists (Award no. 2016-69004-24784, “CropSys - A novel management approach to increase productivity, resilience, and long-term sustainability of cropping systems in the northern Great Plains”). This research aims to study how cover crops can increase the resiliency and productivity of crops such as corn and soybeans, and improve soil health and land use efficiency.

Hans Kandel
Extension Agronomist Broadleaf Crops
NDSU 2018 SOYBEAN IDC SCORES AVAILABLE

Field choice and selecting a variety with tolerance to iron-deficiency chlorosis (IDC) are the most important management decisions producers will make in avoiding or reducing the negative yield effect of chlorosis. IDC was prevalent in many soybean fields in eastern North Dakota and northwestern Minnesota during the 2018 growing season. During the early summer of 2018, the NDSU soybean breeding program tested 201 Roundup Ready and Xtend soybean varieties, as well as 43 conventional and Liberty Link varieties for IDC tolerance. The test results are available at https://www.ag.ndsu.edu/varietytrials/soybean.

Results are based on field studies conducted at two locations with a past history of IDC. Visual ratings were made on a 1 to 5 scale, with 1 representing no chlorosis and 5 being the most severe chlorosis. Ratings were taken twice, at two different growth stages.

Soybean varieties have genetic differences for the expression of IDC symptoms, and some have tolerance to IDC. No soybean variety is immune to chlorosis, but large differences in yellowing and subsequent plant stunting occur between the most tolerant and most susceptible varieties.

Although most soils in North Dakota have sufficient iron, under certain conditions such as high carbonates, high pH, excess moisture, cool temperatures or high nitrate content, soybean plants are unable to take up sufficient iron from the soil. This often results in soybean fields with yellowing and reduced plant growth.

Plant leaves with IDC symptoms are yellow with green veins. Yellowing, browning and stunting of the plants during the early vegetative stages will result in less photosynthesis in these plants, compared with healthy green plants, causing reduced soybean yields.

The yellowing of the leaves usually becomes pronounced when the plants reach the two- to seven-trifoliolate leaf stages. Soybean plants may grow out of IDC symptoms and turn green at the end of the vegetative growth stages but due to the early season IDC, yields still will be reduced.

Hans Kandel
Extension Agronomist Broadleaf Crops

RECOMMENDATIONS FOR PLANTING WINTER WHEAT – 2018

Given the more favorable spread between winter wheat and spring wheat prices (certainly compared to last year) and the early harvest of many crops to date, planting winter wheat this fall may make sense for many operations. Winter wheat can provide important green cover this fall on early harvested fields. Furthermore, winter wheat can help spread out work and it frequently out-yields spring wheat. The following suggestions are recommended to aid in producing a successful winter wheat crop:

1- When possible plant winter wheat into standing stubble. Survival of winter wheat during the winter is enhanced when it is covered with snow during the coldest months of the year. Standing crop residues can effectively retain snow. Tall, erect flax and canola stubble works best, but any erect stubble that retains snow is recommended. Planting winter wheat into wheat stubble is not ideal for disease reasons, but as long as disease-insect management is planned, wheat stubble can be an acceptable residue.

2- Plant a winter hardy variety, especially if you are not planting into a standing residue. Ratings for the winter hardiness of currently available varieties are summarized in the Winter Wheat Variety Selection Guide https://www.ag.ndsu.edu/crops/winter-wheat-articles/a-1196-hrww-2017-selection-guide. Additionally, the results of the 2018 winter wheat variety trials from many of the RECs are now available at https://www.ag.ndsu.edu/varietytrials/winter-wheat/2018-trial-results. This information can help you select varieties that will likely perform well in your farm. For availability of certified seed refer to the seed guides in North Dakota http://www.nd.gov/seed/field_directory/ and South Dakota.

3- Plant in September: The optimum planting date for the northern half of the state is September 1-15 and for the southern half, September 15-30. In recent years, plantings during the first ten days of October for
southern regions of the state have largely been successful. The last practical date that winter wheat can be planted will depend on the weather but there must be enough moisture and growing degree days so that the seed can germinate and the seedling vernalize by spring. Larger seedlings will overwinter better than smaller ones. Target the earlier portion of the recommended planting date range if planting into bare, fallow ground.

4- Plant 1 to 1.5 inches deep: Adequate moisture for establishing winter wheat is often a concern as the soil profile is usually depleted of moisture in the fall. If there is little or no moisture in the soil’s surface, planting shallow (1 to 1.5 inches deep) and waiting for rain is recommended. Furthermore, these relatively shallow planting depths allow for faster emergence when temperatures are rapidly decreasing.

5- Seed about a million seeds per acre: Generally, a seeding rate of 900,000 to 1.2 million viable seed per acre is adequate. The higher seeding rate may be appropriate if planting late or when planting into poor seedbeds. Since winter wheat tends to tiller more profusely than spring wheat, 1.2 million seeds per acre is the upper end of the recommended seeding rate. Excessively high seeding rates can result in more lodging by harvest time, particularly if you are using a taller variety (like Jerry).

6- Break the green bridge. Breaking the green bridge is critical to reducing the risk of infection of the Wheat Streak Mosaic Virus. This disease is vectored by a tiny mite that moves from green tissue to green tissue by wind. Breaking the green bridge is particularly important when winter wheat is planted early. The green bridge is broken by controlling volunteer cereal crops and grassy weeds in a field, two weeks prior to planting winter wheat. A two-week window of not having a ‘green’ host present assures that the mite has gone through its lifecycle and died before finding a host to feed on and transmit the virus.

7- Avoid varieties that are highly susceptible to scab. Scab is not always a problem in winter wheat. Nevertheless, check the recent Selection Guide for the level of scab resistance in currently available varieties. The following rated are rated as the most resistant: Emerson, Lyman, Moats and Redfield.

Joel Ransom
Extension Agronomist for Cereal Crops

plant pathology

NORTH DAKOTA SCN SOIL SAMPLING PROGRAM

The NDSU Extension Service and the North Dakota Soybean Council are working together again to coordinate a soybean cyst nematode (SCN) soil testing program. A total of 2,000 SCN soil test bags will be available to growers on a first come first serve basis.

Anyone interested in soil sampling for SCN can pick up to three pre-labeled SCN soil test bags from their County Extension office. To submit a sample; fill the bag with soil, provide site information and send the bag to the partner lab (Agvise). Results will be mailed directly to the growers who submitted the sample(s). The laboratory fees are covered by the North Dakota Soybean Council.

The ND SCN sampling program began in 2013 and has been instrumental in understanding where SCN is located in the state. To date, over 3,000 samples have been submitted by North Dakota growers, and about 1/3 of those have had some level of nematode eggs.
The egg levels and geospatial positions from previous years samples that were used to generate SCN distribution maps in North Dakota show ‘hot spots’ in much of the SE and movement west and north (Figures 1 and 2). In 2018, we will use egg level data and add to the map. Importantly, NDSU does not have access to any personal information – just the egg level and geospatial data to generate a map.

We encourage everyone to sample fields for SCN. We thank the North Dakota Soybean Council for funding the effort.

Figure 1. Egg levels in North Dakota from the grower based SCN sampling program. Black circles are negatives. Gray boxes (50-200 eggs/100cc) are very low levels, which could be real, or could be false positives. Green triangles (200-2,000 eggs/100cc) are low-level positives. All other shapes are positives of different eggs/100cc. Importantly, confirmation of SCN in counties should be confirmed using other diagnostic methods; Ward Co. could not be confirmed.

(See Figure 2 on next page)
Figure 2. Egg levels in Southeastern North Dakota from the grower based sampling program.
MINNESOTA SCN SOIL SAMPLING PROGRAM

The Minnesota Soybean Research & Promotional Council (MSRPC) and University of Minnesota Extension have a soybean cyst nematode (SCN) sampling program for Minnesota farmers. The program will sponsor fact sheets, sample ID forms, numbered sample bags and laboratory analysis of up to three soil samples per farmer and a total of 1300 samples.

Participating farmers will receive estimates of SCN egg densities and management recommendations based on these densities. Results from individual farms will be compiled to create a geo-referenced map of incidence and severity of SCN infestations in Minnesota.

While any soybean farmer can participate, this program is focused on reaching farmers in the most recently infested northwest region of the state.

Additional information and program materials can be found by:
• Attending one of the five Soybean Plot Tours in NW MN (Aug. 28-29)
• Visiting the MSRPC booth at Big Iron (Sep. 11-13)
• Contacting your SWCD office (kits may be available at Norman, Mahnomen, Clearwater, Polk, Red Lake, Pennington, Marshall, Kittson and Roseau County SWCD offices)
• Sending an email to: apeltier@umn.edu.

Angie Peltier
U of MN Extension Educator, Crops

SCN SAMPLING

When to sample? Sample in the fall when SCN egg levels are highest, and consequently, the most likely time of year to detect SCN. Sampling can be done before or after harvest, but it should be done before any tillage is done in the field.

Where to sample?
SCN moves with soil, so consider the most likely way SCN-infested soil might be brought into a field. Additionally, consider “suspicious” areas. The most important areas (Figure 1) to consider include:

• Field entrance: SCN-infested soil often moves into new fields on equipment. Movement on equipment is the most common way the pathogen transfers and is thought to be responsible for its expansion across the U.S.
• Flood-prone areas and low spots: Cysts will move with water, so areas that are prone to flooding and water pooling are likely areas where SCN will be introduced. SCN can be moved by birds, on their bodies and in their digestive tracts, and birds frequently visit wet spots in fields.
• Shelter belts: Cysts can move in dust storms or high winds and are deposited as the wind speed slows. In North Dakota, this usually means shelter belts.
• Yellow spots showing up in August: The damage from high SCN levels
usually begins to appear in August, especially if plants are water-stressed. Any lens-shaped areas of fields turning yellow in August are suspicious.

- High pH: High pH soils are very favorable to SCN and, as a result, SCN damage often is noticed first in high pH spots in fields.

**How to sample?**
- Go where SCN is, and aim for the roots. Sampling is most effective when the samples are collected within a few inches of the soybean stem and 6 to 8 inches deep into the soil.
- More samples are better. Take 10 to 20 soil cores or thin shovel slices in a suspicious area and bulk the sample.
- Keep the sample relatively cool and get it to the lab quickly. SCN is a tough worm, but SCN will struggle if the sample sits on the dash of a pickup in the August sun.

**What do the results mean?**
Lab results will be presented as eggs/100 cc soil, which is the number of eggs in approximately a 6-ounce can. “J2,” which refers to the second-stage juvenile worm, also may be included. Think of the egg level as your “risk” factor: the higher the number, the greater the risk. Very low levels (less than 100) could be false positives and should be viewed with some caution. We recommend resampling. Very high levels (greater than 10,000 egg/100 cc) likely will impact soybean production for years to come.

**What do you do if you have SCN?**
We recommend beginning management strategies if you find any positive samples.

**What do you do if you don’t find SCN?**
Be vigilant and sample again next year.

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**CLUBROOT OF CANOLA ALERT**
Canola growers are strongly encouraged to scout canola fields for clubroot; particularly growers in Cavalier County.

In North Dakota, confirmation of clubroot has been limited to few localized fields in Cavalier County. However, clubroot likely occurs in more fields than currently detected and favorable conditions for disease development and symptom expression at the end of the season have opened a critical window for scouting.

Infected plants are less tolerant to warm and dry conditions because their root system has been compromised by clubroot (Fig. 1). The dry conditions that prevailed during the past several weeks have stressed canola plants with clubroot, accentuated disease symptoms and made them much more visible. As stressed plants die prematurely, patches in fields that may resemble drought-stress appear (Fig. 2). Infected roots have galls that are brittle and may disintegrate easily when plants are pulled from the ground (Fig. 3).

![Figure 1. Clubroot symptomatic plant showing deformed root tissues and gall formations.](image)
NDSU Extension and canola pathology personnel, with support from the Northern Canola Growers Association, are conducting end-of-season field surveys to identify infested fields, but surveyors typically scout a relatively small number of fields in each county. We suggest growers investigate ‘dry spots’, use a shovel to dig out plants, and investigate roots for galling. Growers who suspect clubroot are encouraged to contact Dr. Venkata Chapara at the Langdon REC (701-256-2582), Dr. Anitha Chirumamilla at the Cavalier County Extension office (701-256-2560) or Dr. Luis del Río Mendoza in the Department of Plant Pathology (701-231-8362) or through NDSU Extension (701-231-8363). The NDSU canola pathology program led by Dr. del Río Mendoza has the capability to perform laboratory tests to verify clubroot presence in soil samples.

Growers who know their fields are infested with clubroot should take precautions to reduce its spread to other areas. Some of these precautions include working the ground of infested fields the last and cleaning the equipment before leaving the infested fields to avoid moving chunks of dirt in it. Tillage operations, like diskng, plowing, and harrowing, facilitate the distribution of clubroot resting spores from galls into the soil profile and may bring some spores to its surface; thus, we recommend using no-till practices in infested fields. Spores located in the soil surface may be spread by equipment, wind, water overflow, and on boots. When walking on infested fields, we recommend wearing disposable shoe covers to minimize transport of soil.

In the upcoming year, growers who grow canola in areas where clubroot is known to occur are encouraged to plant clubroot-resistant hybrids and consider extending crop rotations to three years with non-host plants like wheat, barley, soybeans, or corn before planting canola again.

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**Figure 2.** Patch of clubroot symptomatic plants in a maturing canola field.

**Figure 3.** Mature clubroot galls disintegrated while pulling canola from ground.
Palmer amaranth (Amaranthus palmeri) a member of the pigweed family was found in North Dakota for the first time. Laboratory analysis confirmed that a plant found in a row crop field in McIntosh County in southcentral North Dakota is Palmer amaranth. A diligent farmer was scouting his field and hand-weeding waterhemp when he came across plants that looked unusual and wondered if they could be Palmer amaranth. The farmer pulled the plants to keep them from going to seed. He showed the plants to a local agronomist that contacted NDSU for confirmation.

Palmer amaranth is pigweed that originated in the desert region of the southwestern U.S. and has spread to the Mississippi Delta before invading Missouri, Kansas, Iowa, Wisconsin, Minnesota and South Dakota, as well as other states. The plant in McIntosh County likely came from seeds dropped by migratory birds.

Identifying Palmer amaranth can be difficult because it resembles redroot pigweed, Powell amaranth and waterhemp. One of the best ways to distinguish Palmer amaranth from the other pigweed family plants is its leaf stem, or petiole. Palmer amaranth’s petiole is as long as or longer than the leaf blade. Another characteristic is Palmer amaranth’s distinctive, long, snaky seed heads. The seed heads can grow up to 2 feet long. Visit NDSU Extension’s Palmer amaranth website at https://www.ag.ndsu.edu/palmeramaranth to learn more about Palmer amaranth and how to identify it.
Anyone who sees a plant that looks different and suspects it may be Palmer amaranth should contact their ag-retailer, crop consultant, industry or their local NDSU Extension agent as soon as possible.

Tom Peters  
Extension Sugarbeet Agronomist  
NDSU & U of MN

Brian Jenks  
Research Weed Science, NC R&E Center, Minot

Ellen Crawford  
Information Specialist, Extension Ag Communication

AROUND THE STATE

NORTH CENTRAL ND

The North Central Research Extension Center received about 0.71” of rain Sunday evening and into mid-day Monday. The Berthold NDAWN station received 0.42”, Bottineau 0.51”, Garrison 0.39”, and Rugby 0.49”.

Pulse harvest seems to have wrapped up in the region. Small grain and canola harvest appears to be about 2/3rds of the way completed in the North Central Region of the state. The summer generation of Canola Flea Beetle is continuing to make an impact; however, not necessarily in area fields, but in area gardens. For canola growers in the area, the new generation of flea beetles feeding on pods are rarely economic. Please note any high population areas as you think about planting canola in the spring of 2019.

TJ Prochaska  
Extension Cropping Systems Specialist  
NDSU North Central Research Extension Center

NORTHWEST ND

A lot of harvest progress has been made over the last two weeks. Conditions have generally been cooler than normal because of the thick haze from western forest fires hanging in the air. Things were getting very dry up until yesterday (August 26th) and soybeans that were green started to turn yellow and pasture grasses were going brown. However, scattered rain showers brought 0.1-0.5” across much of NW ND yesterday and spotty rain continues today.

Many of the small grain fields and pulse crops in the area have been harvested, but there still are acres waiting to be cut. Late-season crops generally aren’t ready yet and it will be a few weeks before sunflower and soybean are harvested.

A meeting on fall weed control will be held in Crosby at the Divide County Courthouse on Thursday, September 13th at 10:00 am. Farmers and crop advisors are encouraged to attend to learn about horseweed (aka marestail) and narrow leaf hawksbeard control.

Clair Keene  
Extension Cropping Systems Specialist  
NDSU Williston Research Extension Center
PULSE CROP DISEASE SCOUTING SUMMARY

NDSU pulse crop scouts (WREC: Shawn Postovit, NCREC: Graysyn Kitts) surveyed field pea, lentil and chickpea fields in northwest and north central North Dakota for diseases from late May until early August. Regular rainfall during the growing season led to environmental conditions suitable for disease development in all three crops.

Anthracnose and white mold were the primary foliar diseases observed in lentils this growing season. Anthracnose onset was in mid-July when the fields scouted were at the early pod growth stage. Incidence of diseased plants reached up to 18% in some fields (Figure 1). White mold was present in 60% of fields scouted from mid-July to early August with incidence ranging from 1-26% (Figure 1).

Bacterial blight symptoms were observed in field pea beginning in early June when the crop was at late vegetative to early reproductive growth stages. Incidence reached 40-50% in some fields (Figure 2) with 2-18% of the crop canopy exhibiting symptoms. White mold was not observed in pea fields.

Figure 1. 2018 season summary of anthracnose and white mold incidence in lentils

Figure 2. 2018 season summary of bacterial blight incidence in field pea
Onset of Ascochyta blight in chickpea was in mid-June, when the crop was at mid to late vegetative growth stages. Fields varied greatly in incidence and severity of Ascochyta symptoms (Figure 3). In some fields, the percent of plants showing symptoms stayed below 4% throughout the survey, while in others incidence reached 100% by mid-July. The differences observed among fields were most likely due to the amount of the fungal pathogen present in fields (inoculum), rainfall and fungicide application timing.

Thank You to all the producers who participated in the pulse crop scouting effort!

The Northern Pulse Growers Association funded this work.

Audrey Kalil
Plant Pathologist
NDSU Williston Research Extension Center

NORTHEAST ND

Small grains harvest is finished across most of the region. Canola harvest is continuing. Reported yields have been average to good for both cool season crops. Wheat protein percentages are high due to dry conditions, which the plants experienced this year.

Rainfall has finally come to the region. Areas have picked up 0.1 to 2 inches of precipitation. Drought stressed soybeans have been losing their leaves across the region. This rain will help pod fill in the fields where the beans have been able to hang on during the dry conditions. However, for some fields especially in the drought pockets and light soils, this rain came too late.

I’ve walked in about 70% of hemp fields in the northeast in last two weeks. Overall, the fields are drought impacted with crop heights averaging around 4.5 ft. Well-watered hemp can reach over 7 ft and few fields were that tall. Walking in the field, I could see where moisture was retained from a waterway or shady shelterbelt by function of the
hemp plant height. Hemp is susceptible to white mold. I found it in very low amounts in Grand Forks County where big rainstorms came through in June and July. With no labeled herbicides, hemp relies on shade to kill weeds. Redroot pigweed and common lambsquarters, to a lesser degree, were able to stretch their growth shapes in long spindles to keep up with the towering hemp. In drought-stressed fields, volunteer canola had no problem competing with 4.5 ft tall stands of hemp.

Lesley Lubenow
Area Extension Specialist/Agronomy
NDSU Langdon Research Extension Center

SOUTHWEST ND
August has been dry for many. NDAWN recorded 0.36 inch of rain from August 1st to August and 0.22 of rain falling on August 27th and 28th in Dickinson. Over the same period, Hettinger received 0.89 inch and Mott received 0.50 inch. Small grain harvest is wrapping up in the region. Yields in the area overall have been good for both small grains and canola. With dry conditions throughout August, corn and soybean in the region do not look very good. Some pockets caught timely rains, and the difference in row crops yield potential is evident. While some caught rains this past month, some also caught hail. Sunflowers continue to mature with the crop looking good, sunflowers are in the R6 to R7 stage. Awareness of areas with Aluminum toxicity and low soil pH continues to grow in the region. If you are concerned about low pH be sure to zone sample with depths from 0-2” and 2-6”. If the soil pH is less than 5.5, it will have a negative impact on crop growth. For more information about soil acidity read Dr. Franzen’s Crop and Pest article from 5/24/18, “Growing Problem of Surface Soil Acidity in Long-term No-till. https://www.ag.ndsu.edu/cpr/soils/growing-problem-of-surface-soil-acidity-in-long-term-no-till-05-24-18

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WEATHER FORECAST

The August 30 through September 5, 2018 Weather Summary and Outlook

Temperatures this month have been running mostly at or below average across much of the North Dakota Agricultural Weather Network (NDAWN). Many of you likely recall the brief heat wave from August 10-12 when temperatures exceeded 100° in western North Dakota. As an example, Williston recorded three straight triple digit high temperatures with the NDAWN station recording highs of 105° and 108° on two of those days. Yet, the month as a whole will finish below average at that location (Figure 1). In fact, after a warm start much of North Dakota and northwestern Minnesota the summer of 2018 (June 1 though August 31) will finish very close to average as the second half of the summer has been nearly as cool as the first half of summer was warm.

August, like most of the summer, has been dry across much of northern North Dakota with the northeastern part of the state into northwestern Minnesota being the driest. Most of the rain that has fallen in that area this month occurred this past Sunday night with little or no moisture falling during the first three weeks of August (Figure 2).
There will be several time frames when at least some portion of the region will record rain during the next week. Friday, Sunday and Monday Night into Tuesday look to be the periods with the most widespread rain occurring. The locations that would need the rain the most once again look to be the areas that may record the least and the locations that currently have adequate or surplus moisture may end up with the most during this forecast period. In other words, the same pattern that has been with us through the summer is still in place. These next seven days should be much warmer than the past several days with temperatures mostly in the 70s and on a few occasions in the 80s for maximums. This should bring some additional late season growing degree days (GDDs) to the region. My projected GDDs for the period of August 30 through September 5 is presented in Figure 3.
Using May 5 as a planting date, the accumulated wheat growing degree days (Based 32°) through August 28, 2018 is presented in Figure 4. You can find your exact GDDs for your planting date(s) at: https://ndawn.ndsu.nodak.edu/wheat-growing-degree-days.html

Using May 10 as a planting date, the corn accumulated growing degree days (Base 50°) through August 28, 2018 is presented in Figure 5. You can find your exact GDDs for your planting date(s) at: https://ndawn.ndsu.nodak.edu/corn-growing-degree-days.html
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