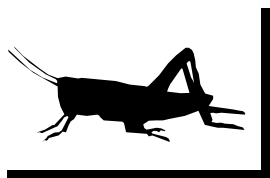


Inside this week . . .

Sunflower Beetles 1
 Wheat Midge Emergence in Southeast ND 1
 Dimilin 2L, Special Local Needs Label
 for Rangeland Grasshopper Control 1
 ND Biological Control Field Days and Events 2
 EPA Action Regarding Chlorpyrifos 2
 European Corn Borer Update 2
 Herbicide Injury in Corn Low Here 2
 Check Your Soybeans for Nodulation 3
 Saturated Soils Affect Crop Growth 3
 Appraising Hail Injury to Small Grains 3
 Hail Damage in Oilseed & Row Crops 4
 Man-dak Zero till Tour 5
 Monitoring for Dry Bean Rust 5
 Rust Sampling in Dry Beans 5
 Small Grain Disease Survey Update 5
 Disease Forecasting System 6
 Root Rot Problems of Sugarbeet 6
 Plant Pest Diagnostic Lab 6
 Water Infiltration Rates 7
 Nitrogen and Heavy Rain 7
 Discover Herbicide Registered in Wheat 7
 Questions and Answers 7
 Soybean Herbicide Update 8
 Trees - Yellowheaded Spruce Sawflies 10
 From Around the State 10



ENTOMOLOGY

SUNFLOWER BEETLES

Sunflower beetle adults have been active for a couple of weeks now. Egg laying is underway. Though we have not had reports of large numbers of adults feeding on seedlings like recent years, it is time to intensify scouting to determine population levels in your fields.

Scouting Method: Sampling should be 75 to 100 feet from the field's edges. Adults and/or larvae should be counted on 20 plants at each of 5 sites along an X pattern for a total of 100 plants. The average number of adults and/or larvae per plant should be determined.

Economic Threshold: Adult - one to two per seedling. Larvae - 10 to 15 per plant will cause approximately 25 to 30% defoliation if allowed to continue feeding. Control is advised if average defoliation reaches the 25 to 30% level.

Insecticides Approved for Sunflower Beetle		
Trade Name	Product/Acre	Dosage (lb AI/acre)
Asana XL*	1.45 - 5.8 fl oz**	0.0075 - 0.03
Baythroid*	0.5 - 1.6 fl oz	0.0125 - 0.025
Sevin	(varies)	1.5 - 2
Furadan 4F*	0.25 - 0.5 pts	0.125 - 0.25
Lorsban 4E	1 - 1.5 pts	0.5 - 0.75
Scout X-tra*	0.71 - 1.42 fl oz	0.005 - 0.01
Warrior*	1.28 - 2.56 fl oz	0.01 - 0.02

* RUP - restricted use insecticide

** reduced rates are for SF beetle larvae

WHEAT MIDGE . . .

EMERGENCE IN SOUTHEAST ND

It's that time of year for wheat midge emergence to get underway in southern ND counties. We will reach 1200 DD in **Richland, Sargent, Ransom, Dickey, LaMoure, and Cass** counties around June 17 - 19. These counties have not had significant numbers of midge found during fall surveys. However, there have been isolated fields where populations have come close or slightly exceeded the treatment threshold of 1 adult midge per 4 to 5 wheat heads in previous seasons.

Since a large number of fields will be heading soon, some evening scouting would be recommended to assess adult populations in the region.

To see when your production area reaches 1200 DD, the point when wheat midge emergence gets underway, visit the NDSU Entomology Updates web site at:

<http://www.ag.ndsu.nodak.edu/aginfo/entomology/entupdates/index.htm>

Of greater concern in these parts of the state will still be the **Cereal Aphids**. Surveys indicate populations of aphids are still low. The recent rains and abundant predators are going to help delay aphid population increases. Grain growers and consultants in South Dakota are reporting larger populations of aphids this week. Their wheat is a little farther along than ours and fully headed fields are present in that area.

DIMILIN 2L, SPECIAL LOCAL NEEDS LABEL FOR RANGELAND GRASSHOPPER CONTROL

A label for Dimilin 2L was issued this week in North Dakota for the use of this insecticide, an insect growth regulator, to control grasshoppers in rangeland. The manufacturer is Uniroyal Chemical. The active ingredient in Dimilin is called diflubenzuron. It controls immature stages of insects by inhibiting their ability to synthesize chitin, a polysaccharide which binds with proteins to form the hard outer covering, or exoskeleton, of insects.

The product is used against the nymphs. For optimum results, treatments are recommended when the majority of grasshopper nymphs are 2nd and 3rd instar. This product is not

effective against adult grasshoppers since they no longer will molt, or shed their exoskeleton.

The label rate is 0.5 to 1.0 fl oz per acre. Aerial application requires 1 to 5 gallons of water plus crop oil; ground application requires 5 to 20 gallons of water plus crop oil. The label does include a recommendation for using Reduced Area and Agent Treatment (RAATs). RAATs is a strategy where treated and non-treated strips are alternated, capitalizing on movement of grasshoppers between the two areas. RAATs may involve treating as low as 50% of the total area while achieving satisfactory control of young grasshoppers.

If interested, a copy of the label will be available through the North Dakota Pesticide Training and Certification web page which can be found at:

<http://www.ag.ndsu.nodak.edu/aginfo/pesticide/pesticide.htm>

NORTH DAKOTA BIOLOGICAL CONTROL FIELD DAYS AND EVENTS

Collection dates for obtaining **Leafy Spurge Flea Beetles** have been set for around the state. There are 32 sites on the schedule. Counties with dates scheduled include: Ransom, LaMoure, Dickey, Cass, Barnes, Stutsman, Foster, Eddy, Nelson, Pembina, Burleigh, Morton, Grant, Stark, Billings, Ward, and Burke.

For dates, schedules, collection specifics, and contacts, visit the North Dakota Department of Agriculture web page at:

<http://www.state.nd.us/agr/>

If you do not have access to the internet, you can contact the Department of Agriculture at 1.800.242.7535.

EPA ACTION REGARDING CHLORPYRIFOS

On Thursday, June 8, EPA and DowAgrosciences announced new restrictions on the insecticide, chlorpyrifos. This insecticide is found in Lorsban, Dursban, and many other brand name products.

The primary action involves the uses of chlorpyrifos in structural and lawn/ornamental applications. These uses will be eliminated as of December 2001.

Agricultural use changes include the reclassification of **Lorsban 4E** and **Lorsban 50W** and other chlorpyrifos products to a Restricted Use Pesticide (RUP) effective with the 2001 growing season. North Dakota growers who have used **Lorsban 4E-SG** for controlling wheat midge, aphids, and grasshoppers in wheat should be aware that this formulation was already classified as an RUP. The **Lorsban 15G**, **Chlorfos 15G** (Griffin LLC) and other chlorpyrifos granular formulations for agriculture will remain as a non-restricted use pesticide. Registered use patterns of these agricultural products will not change except for the following uses.

Effective Dec. 31, 2000, applications of chlorpyrifos insecticide on **apples** will be allowed pre-bloom only. EPA also intends to reduce the tolerance for chlorpyrifos in apples.

The EPA intends to reduce the residue tolerance on **grapes**, and to revoke the tolerance for **tomatoes**. This change will not impact product use patterns for U.S.

producers of these crops. However, the tolerance reduction may impact the use of chlorpyrifos on grapes and tomatoes grown elsewhere for export to the United States, because residues on imported fruits and vegetables must conform to U.S. standards.

EUROPEAN CORN BORER UPDATE

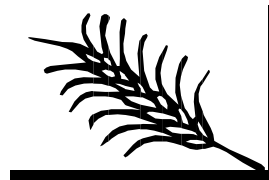
ECB moths have been captured in a few of our blacklight traps located in North Dakota. The numbers are still small. We also have emergence cages containing last years stalks at several of these sights. No emergence from stalks has occurred. The moths we are catching in the traps are most likely migrants from areas to the south. Significant numbers of moths have been captured in some blacklights traps in southern Minnesota and South Dakota.

ECB require corn that is 17 inches tall before they are likely to survive on the plant. Corn plants less than 17 inches tall contain high enough concentration of the plant chemical DIMBOA to act as an antifeedant and disrupt normal behavior of the larvae, resulting in high mortality.

To stay current on ECB moth activity in ND and neighboring states, visit the NDSU Entomology Updates web page and go to the European Corn Borer link:

<http://www.ag.ndsu.nodak.edu/aginfo/entomology/entupdates/index.htm>

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PLANT SCIENCE

HERBICIDE INJURY IN CORN LOW HERE

Recent reports from Illinois have shown corn injury from the herbicide Aim. This new postemergence corn herbicide was first registered in the United States in 1999. Low cost and effectiveness on such weeds as velvetleaf has allowed this PPO (portoporphyrinogen oxidase inhibitor, like other herbicides with this mode of activity (Authority, Blazer, Flexstar, Cobra), to be used. If injury is seen, it will usually occur within hours following the application and will show tissue chlorosis and necrosis on the corn plant. This "burn" look on the crop is due to rupturing of plant cell membranes.

Five years of research on this chemical through several states has shown that this herbicide can show corn injury ranging from 0-30% following postemerge applications. The symptoms usually seen are the necrotic lesions and in more severe cases breakage of leaf midribs on some of the leaves. Symptoms usually do not persist over 30 days after application.

This year in Illinois, the symptoms not only showed the classic leaf "burning" symptoms but also showed a tight wrapping of the uppermost leaves. This "buggy whipping" will usually be outgrown by the plant, but not on all the plants this year in Illinois. This year the more severe damage may be due to one of several speculated causes including:

applications to wet corn foliage (dew or precipitation shortly after application) may have concentrated the chemical in the corn whorl; the plant may not have been able to metabolize the herbicide quickly enough; application with a crop oil concentrate (COC) not under dry conditions generally needing the use of the COC; or, tank-mixing Aim with another emulcifiable concentration (EC) herbicide with the total mix applied during environmental extremes. See the complete article from Illinois and pictures of damaged plants at: <http://spectre.ag.uiuc.edu/cespubs/pest/articles/200011j.html>.

CHECK YOUR SOYBEANS FOR NODULATION

Soybean plants that are six to eight inches tall should have their first unfolded leaflets (V2 stage). Nodulation, the symbiotic relationship of bacteria on the soybean roots, can be seen shortly after emergence, but the plant is not actively fixing nitrogen until the V2 to V3 stages. The number and nodules formed on the soybean roots along with the amount of nitrogen fixed increases until the R5.5 stage. Nodules actively fixing nitrogen for the plant are pink or red inside. White, brown or green nodules indicate that nitrogen-fixation is not occurring. Nitrogen fertilization after planting (other than pop-up or early, limited fertilization) is not recommended as nitrogen fertilizer applied to active nodules will render these nodules inactive or inefficient, depending on the amount of nitrogen applied. Soil nitrogen is utilized over fixed nitrogen, if available in large amounts. Check the health of your soybean nodules and check root proliferation. At V2, soybeans should be rooting down six inches into the soil and by V5 will completely reach between 30-inch rows, making any cultivation at V5 needing to be very shallow.

SATURATED SOILS AFFECT CROP GROWTH

Recent heavy rains and in some locations hail, like in Grand Forks, Walsh and Pembina counties, have caused flooding, ponding, and plant damage across low field areas. Prolonged soil saturation affects crop growth and yield. Corn is very sensitive to flooding in the early vegetative stages (especially prior to the fifth or sixth leaf stage). In early growth stages, corn or soybeans can survive for only two to four days under water in anaerobic conditions. Moderate water movement can reduce flood damage by allowing some oxygen to get to the plants, keeping them respiring and alive. Drainage within one to two days increases the chance of survival.

The injury extent to seedlings is determined by the plant stage of development at ponding, duration of flooding and the air/soil temperatures as well as if auxillary buds are present on damaged plants. If temperatures are warm during flooding (greater than 77 F), plants may not survive 24 hours. Cool temperatures may prolong survival. However, cold, wet weather favors disease development. Seed treatments are effective, but limited in protection. Seedling development slowed or delayed two to three weeks allow soil-borne pathogens a greater opportunity to cause damage. Seed rots, seedling blight, corn smut and crazy top affect corn plant development later even though ponding occurred earlier. Delayed soybean growth allows diseases such as Fusarium root rot, Phytophthora rot and Pythium rot to establish and weaken or destroy seedlings. Limited hybrid

and variety resistance to these diseases and difficulty in predicting damage makes evaluation difficult. Carefully assess damage before deciding to replant or before tearing up the existing stand. The National Crop Insurance Service in their corn loss instruction booklet have shown that yield loss from early season stand reduction (up to the 10-leaf stage) can vary. With a 100% plant stand, yield loss is negligible; a 75% stand can equate to a 10% yield loss; a 50% early corn stand is at least a 26% yield loss; and, a 25% stand will usually result in at least a 43% yield loss if original seeding rates were reasonable and remaining stands were healthy. In soybeans, research through various areas of the United States have shown that yields are not affected by population reductions until stands drop below 125,000 plants per acre but yields can be lower if large gaps are present. These skips can rapidly reduce yields in soybeans. According to information from Purdue, two-foot skips in soybeans in 50% of each row can decrease yield 6%. Three-foot skips in 50% of each row will drop yields 13%. Four-foot skips in 50% of each row will decrease yield by 15% in healthy stands.

Rotted seed or damped-off seedlings will reveal probable crop losses. Evaluate intended stand to the damaged stand, the uniformity of the stand, the original planting date versus a replant date, likely replant pest control and seed costs as well as projected crop prices. Weigh these costs and price projections against replanting yield gains to evaluate crop injury and replanting gains.

On surviving stands, remember that favorable weather for plants after ponding is important. Cultivation, once soils are dry enough, will open and aerate surface soil and promote root growth. Be careful working the soil. Working wet soil causes compaction that varies crop growth.

An additional nitrogen application in corn may be necessary in fields that show signs of yellowing or uneven growth. A late test for nitrate when corn plants are still six to twelve inches tall can determine if more nitrogen is needed.

Scout more intensively in previously ponded areas of corn and soybean fields. Maintain a good weed control program so that crop plants are not robbed of nutrients and moisture later in the season.

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APPRAISING HAIL INJURY TO SMALL GRAINS

Hail was reported yesterday June 6 and 7 in parts of North Central and North Eastern North Dakota. Prior to jointing hail most often has a minimal effect on yield; however, as the crop approaches reproductive developmental stages, injury to the growing point is more likely and leaf damage or loss has greater impact on yield.

Destruction of leaf area on young plants is seldom as serious as appearances may indicate. During early development the growing point is below the soil surface, making it less susceptible to injury. With this protection, small grains can suffer loss of above ground foliage without dying. If the growing point of small grain is not damaged the plants will likely recover.

When hail causes damage, it is advisable to wait several days after the injury occurs to make an accurate determination of injury. After this period, new growth on plants with uninjured growing points can be observed. If no regrowth is observed, the stem of the plant may be split to inspect the growing point. The growing point should be white or cream colored. Darkening or softening of the growing point usually precedes plant death. When the growing point moves above the soil surface at jointing in small grains it is vulnerable to damage.

Wheat and barley typically produce seven to nine main stem leaves. When leaf injury occurs at the three to five leaf stage most tillers have at least two leaves that have not emerged and are undamaged. The flag leaf, the last leaf produced on each tiller, is the most important leaf; if it remains undamaged throughout the growing season the yield potential will remain largely intact.

When severe injury from hail occurs to small grains after jointing plants still have the potential for recovery by initiating new tillers. Precipitation that usually accompanies hail storms will help stimulate tillering. Potentially, tillering can restore yields to acceptable levels.

Additional information can be obtained from NDSU Extension bulletin A-934, Replanting After Early Season Crop Injury. This provides excellent information on evaluating injury, however, this late in the growing season replanting is probably not advisable. Much of the crop in areas affected was probably not injured beyond the point of recovery.

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HAIL DAMAGE IN OILSEED & ROW CROPS

Hail damage to crops occurs somewhere in the state every year. Reports have already been made last week and this week of hail in some areas of the state. When hail damage occurs on corn, soybean, dry bean and sunflower early in the growing season, replanting is possible; but deciding whether to replant is usually difficult. Total stand reduction, leaf loss, stem injury, weed control, and calendar date are factors to consider when making this decision. At this time its too late to consider a replant.

Corn: The growing point remains below ground 2-3 weeks after the plant emerges (5-leaf). If the growing point is not damaged, corn will recover and perform better than replanted corn. Split the stalk down the center and inspect the growing point. If normal, it will appear white in color and firm in texture. Injured growing points will appear brown or discolored 2-3 days following the hail. Complete loss of leaves early to corn when small usually does not greatly affect grain or silage yields. Corn in the silking and tasseling stage when damaged by hail can result in severe yield losses.

Soybean and Dry Bean: The growing points of beans are located in the top of the plant and in leaf axis. Growing points of beans are easily damaged by hail soon after emergence. Regrowth will not occur if hail stones cut the stem off below the cotyledonary node. If the top of the plant is damaged, regrowth can occur from one or more axillary buds. Bean stems may be bruised or broken. The damage

may not be severe enough to kill the plant. However, the plant may lodge later as the callus tissue is weak and cannot support the pod weight. Reduction in soybean stands to four plants per linear foot of row can still produce fair yields. For dry beans one can get down to two plants per foot of row and still get fair yields.

Sunflower: Sunflower may be more tolerant than beans, but the degree of hail tolerance depends on the intensity of the hailstorm and the stage of growth. Sunflower is least tolerant during the seedling and budding stages, and most tolerant after flowering. Hail damage may be direct or indirect. Direct damage results from stand reduction, loss of recoverable heads because of severely bruised or broken stems, and head shatter at later stages. Indirect damage results from defoliation and disease infestation to injured plant tissue.

Research conducted on simulated hail losses in sunflower indicated that a one-to-one relationship does not exist between stand reduction and yield loss. A 50% stand reduction resulted in only a 28% yield reduction. Defoliation of sunflower by hail was reported to be most damaging during the bud stage. Defoliation of 80% at the bud stage resulted in yield reduction of 53%. Whereas 80% defoliation at the 50% mature stage resulted in only a 12% yield loss.

Canola: Plantings in seedling stages can have stands reduced by 1/2 and still produce acceptable yields. An average stand of 11-12 plants/ft² can be reduced to 4/ft² before yield losses exceed 10 percent. Prior to bolting and flower development, canola can withstand hail without much economic loss. Canola with leaves that are torn and shredded suffer only partial loss, while leaves bruised on the main vein or torn and broken will be lost. Leaf area destroyed will result in seed yield loss. Seed yield losses in canola is approximately 25 percent of leaf area lost. If leaf defoliation is 50 percent, then yield loss would be approximately 12.5 percent.

Canola plants injured in late bolting or early flowering stages seldom die. The well developed root systems and ability to rebranch and develop secondary flower clusters help the plants recover. When buds or flowers are destroyed, the canola recovers rapidly by development of flowers which normally would have aborted. New branches also develop from growth buds lower down on the plant. Seed yield loss will depend on both percent leaves and branches lost. For example, if canola has 60 percent lost branches 7 days into flowering, seed yield loss is estimated at 18 percent, whereas 21 days into flowering, yield loss would be an estimated 60 percent. If hail strikes late, such as during pod filling or ripening, plant recovery is not possible. The time needed to develop new growth, flowers and mature is limited before a killing frost. Canola seed yield loss if injury occurs at the ripening stage depends directly on the loss of branches, individual pods and seeds knocked out of pods. Severe hail losses have occurred in canola swaths.

MAN-DAK ZERO TILL TOUR

The Manitoba-North Dakota Zero Tillage Farmers Association are sponsoring their annual summer tour on Tuesday, June 27, 2000. The tour will travel to South Dakota and visit the Dakota Lakes Research Farm at Pierre, SD.

Host at the research sites will be well known SDSU Agronomist Dr. Dwayne Beck. Observe what he preaches:

Rotations - Sanitation - Competition. He also has some demonstrations on both dormant seeded canola and hard red spring wheat.

Bus transportation is being provided and can be boarded at two locations on June 27 which include:

6:00 a.m. - Holiday Inn Riverside in Minot, ND

8:00 a.m. - K-Mart Parking lot, 2625 State Street on Highway 83 in Bismarck, ND

All times are central daylight savings time.

To ensure a seat on the bus you must reserve in advance.

Before June 20-call: Alan Ness 701-530-2079

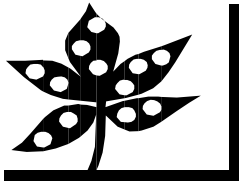
Bob Bradley 204-727-5355

After June 20-call: Alan Ness 701-530-2079

Or 701-442-5457

Following the tour, Bob's Steakhouse in Gettysburg, SD will be the final stop before returning to points of departure.

Duane R. Berglund
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PLANT PATHOLOGY

MONITORING FOR DRY BEAN RUST

Dry bean rust often begins to show up around the end of June or early July. Monitoring for rust should begin soon, with emphasis on susceptible varieties. All pinks and most small reds are susceptible. Some light red kidneys also are susceptible. Most older pintos are susceptible, but many new varieties are resistant to rust races currently present in North Dakota. Rust resistant pintos include Apache, Burke, Buster, Chase, Elizabeth, Focus, Frontier, Kodiak, Maverick, Montrose, Remington, UI-320 and Winchester. These varieties have been released within the past few years, and represent an exciting advance in pinto variety improvement.

Rust races are constantly changing and the number of races present in North Dakota has increased in recent years. This underscores the need to monitor not only fields of susceptible varieties, but all varieties. Susceptible varieties should be sprayed with a rust fungicide once there are 2-3 pustules per leaf and the pods are not yet striping. If there are one or two "hot spots" in a field, it should be sprayed. If rust is present in other fields in an area and the crop is in the flat pod stage or earlier, it should be sprayed. If rust begins to build up in a variety that is supposed to be resistant, a fungicide might be required. I would also recommend sampling rust in that field and submitting it for race determination (see next article for details).

Bravo and maneb are registered for rust control. Bravo gives 7-10 days of protection and maneb gives 5-7 days of protection. Both are effective as protectant fungicides but will not stop established infections. Tilt has a section 18 emergency exemption in both North Dakota and Minnesota. Tilt is locally systemic, provide 14 days of protection and can kill infections up to four days old.

RUST SAMPLING IN DRY BEANS

Pat Gross at NDSU has been actively identifying races of dry bean rust. The number of races present in North Dakota has been increasing and it is essential to determine what races are present. This could provide an early warning system if races develop that can attack currently resistant varieties. I would encourage crop consultants, agribusiness personnel and growers to collect samples of rust and submit them for identification.

Collect rust samples, place them loosely in a paper envelope and allow them to air dry. Then mail them to:

Pat Gross

Department of Plant Pathology

Box 5012

North Dakota State University

Fargo, ND 58105

Please include information on the variety and class grown, where collected, and name and telephone number (or e-mail address) of the person collecting the sample.

Art Lamey
Extension Plant Pathologist
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SMALL GRAIN DISEASE SURVEY UPDATE

Highlights: **Wheat leaf rust** was detected in spring wheat during the past week. **Aphid** counts are increasing in some areas. **Grasshopper** numbers are increasing slightly in the southwest and northwest. **Tan spot** is the most common wheat disease now. Specifics from each area of the state follow:

South Central and Central counties: Additional detections of **wheat leaf rust** were made since the last Crop and Pest Report. Jerry Schneider found trace amounts of leaf rust in hard red spring wheat fields in LaMoure, Barnes and Wells counties the week of June 5-9. We don't know the variety identity of these spring wheat fields, but remember that 2375 and AcBarrie were among the hardest hit by leaf rust in 1999.

Jerry found **tan spot** to be the most common disease detected in spring wheats in the south central and central counties, but levels are still very low and on the bottom leaves. He found only two fields with **aphid** infestations, with 2% of the tillers with 1 or more aphids.

Southwest counties: Amy Dukart found **tan spot** to be the most common wheat disease in most fields, but generally confined to the bottom leaves. Tan spot is most severe where wheat was planted into wheat stubble. She also detected **WSMV** in a field in Slope county and **BYDV** in a field in Bowman county. She is detecting **increased grasshopper activity, plus some leafhopper and aphid** activity in her area, as well. Leafhopper counts were around 1-2 leafhoppers per square foot in field margins. Aphid numbers ranged from 0-10% of tillers in a field showing at least one aphid.

Northeast and Southeast: Matthew Gregoire found **tan spot** to be the most common disease observed in wheat this past week, in counties from Richland and Sargent northward

to Pembina county. Percent tillers infected and severities remain at low levels in most fields, although in winter wheat infections were common on middle leaves and a few were visible on the flag leaf, as well. Low levels of **net blotch** or **spot blotch** also were found in some barley fields.

Aphid detections increased over the past week. Several spring wheat fields in Pembina, county had 20% of the tillers showing at least one **grain aphid**, and 0-20% of tillers with at least one aphid were observed in Ransom, Cass, Sargent and Griggs counties. Matthew also picked up a few **bird cherry oat aphids** in southeast counties.

Mike Peel, Extension Agronomist from Fargo, found trace amounts of **leaf rust** in his winter wheat plots in Ransom county.

Northcentral and Northwest counties: Wheat crops in the northcentral and northwest region are in the 1/1/2 leaf stage to tillering stage. In Bottineau, Renville and Rolette counties, Holly Semler found **tan spot** incidence to range from 14-21% of plants infected and severities were 2-5% on lower leaves. She also found some Septoria spotting on these young plants. No insect problems were found in these counties.

Laura Neal detected **tan spot and root rot** in wheat in Ward and McLean counties. Tan spot severities were 15% on mid-leaves in one field. She also detected 2-3 **grasshoppers** per square yard in the field margins of two fields in McLean Co. In McKenzie county, Allison Marsland found wheat in the early tillering stages to have **tan spot**, with severities on bottom leaves ranging from 5-9%. She also found 1-3 **grasshoppers**/sq. yard in field margins in McKenzie Co.

DISEASE FORECASTING SYSTEM

As described in last week's Crop and Pest Report, the wheat disease forecasting system provided by Dr. Len Francl, NDSU Plant Pathologist, now includes information about favorable infection periods for leaf rust. For example, according to the disease forecasting web site:

www.ag.ndsu.nodak.edu/cropdisease/

Favorable infection periods for leaf rust did occur at several NDAWN sites on June 11. As instructions for the disease forecasting model indicate, "in order for the forecasting model to work as intended, the disease-causing agent must be present. **Thus, each field first must be scouted for the presence of leaf diseases**". When disease is present and multiple favorable infection periods occur, as indicated by the disease forecasting model, then a fungicide may be warranted. The forecasting model also tells if favorable infection periods occurred for tan spot and Septoria (Stagonospora) blotch.

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ROOT ROT PROBLEMS OF SUGARBEET

Sugarbeet plants that are in warm, wet soils may be affected by Aphanomyces root rot. Aphanomyces is most common in southern Minnesota and the Southern areas of the Red River Valley. This disease can be devastating in the seedling stage, and can also cause serious root rot later in the

season. Infected plants turn a sickly yellow green and tend to wilt in the afternoons of hot and sunny days. Some plants may die; those that survive usually have stunted and feeder roots and are unproductive.

Aphanomyces can be managed by using tolerant varieties that are not as severely affected as susceptible varieties; using Tachigaren pelleted seeds; planting early; keeping the soil dry by cultivation and enhanced drainage; effective weed control; and avoid spreading of contaminated soil from infected fields to disease free fields.

American Crystal shareholders can have their soil indexed for this disease.

Fortunately, most growers planted early and most sugarbeet fields were not warm and wet during the sugarbeet seedling stage. As such, we have not had an acute phase of Aphanomyces. However, now that the soils are warming up, and with the blessing of some showers, we need to ensure there is proper field drainage to protect plants from the chronic stage of Aphanomyces.

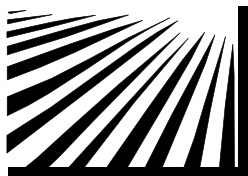
Most of our sugarbeet fields in North Dakota (except for a few dry areas in Grafton and Drayton) and Minnesota are looking good to excellent. The early indications are that we are going to have another good sugarbeet crop, once we take care of Cercospora leaf spot!

Mohamed Khan
Extension Sugarbeet Specialist
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PLANT PEST DIAGNOSTIC LAB

Problems recorded in the lab include: Ash (anthracnose, ash male flower gall mite, ash bark beetles, lecanium scale); flax (probable frost injury); sugarbeet (Rhizoctonia and Pythium root rot, probable, unidentified nutrient deficiency); honey locust (honey locust pod gall midge); elm (leaf scorch); soybean (Phytophthora, Rhizoctonia, Pythium root rot); alfalfa (spring black stem, alfalfa stem weevil, alfalfa blotch leafminer); spruce (dieback due to wet soils); Roundup injury on corn, wheat, and barley; and growth regulator herbicide injury on sugarbeet, basswood, linden, ash, apple, and Austree.

Cheryl Ruby
Diagnostician
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SOILS

WATER INFILTRATION RATES

The volume of water that can enter an area of surface soil is called the infiltration rate. We have unfortunately recently had a demonstration of its limits in some parts of the state and the result was rainfall much higher than the soil ability to absorb it. The amount of rainfall that can enter the soil is sometimes greater initially than later on during the rain. If the soil is well aggregated, as in a no-till field, water enters more quickly until larger pores are saturated. If the soil contains more clay and is cracked, filling the cracks with water initially results in initially high infiltration until the clay becomes saturated, swells and closes the cracks.

Once the pores are filled and cracks are closed, the texture of the soil becomes the most limiting factor in water infiltration. The force of the rain, the presence of shallow limiting layers, such as compacted tire tracks or tillage pans also restrict the downward flow of water. But in the absence of these factors, texture is the key to water infiltration. The following chart contains general numbers from a "An Introduction to Soil Physics", by D. Hillel, 1982. The values are useful to demonstrate the magnitude of water infiltration. Individual soils will vary around these values.

Textural class	Steady infiltration rate inches/hour
Sands	>0.8
Sandy loams	0.4-0.8
Loams, fine sandy loams	0.2-0.4
Clay loams, silty clay loams and clays	0.04-0.2
Sodic clay soils	<0.04

So in St. Thomas, with 2 inches of rain over about 8 hours on a fine sandy loam, hardly any runoff occurred. But in areas with 10 inches in 8 hours in clay soils- perhaps one inch entered the soil through cracks and normal infiltration, but the other 9 inches ponded or ran off the field. Because of the size of the area affected, the drainage-ways that we call "rivers", but to many of us are more aptly called creeks or brooks, cannot handle the kind of water that 8-14 inches of rain over a several county area can provide. So the water backs up and is held on the field until downstream levels recede. In a clay soil, 24 hours of ponding may result in only 1/2 inch of water infiltration. Several days are needed to absorb 3-4 inches of ponded water.

NITROGEN AND HEAVY RAIN

The heavy rain recently experienced will result in many problems. In areas where crops are covered with water for several days, many acres will be lost. In areas where rainfall was not quite so heavy and the crops survive, the nitrogen status of these areas will be questionable. In ponded areas, warm soil temperatures and active bacteria populations will result in denitrification in eastern areas, particularly the Valley. In sandy areas, most of our nitrogen is now nitrate and significant leaching will have occurred. In row crops,

these sandy ridges can be supplemented through sidedressing. In small grains, such as spring wheat, leaf analysis at early heading will indicate N status to determine whether protein enhancement through post-anthesis application of foliar N would be worthwhile.

Irrigators should also be vigilant and conduct plant analysis to determine the nitrogen status of their crops and supplement as needed through the pivot.

Dr. Dave Franzen,
NDSU Extension Soil Specialist



WEEDS

DISCOVER HERBICIDE REGISTERED IN WHEAT

Discover (clodinafop) at 3.2 fl oz/A plus DSV adjuvant at 10.2 fl oz/A controls wild and volunteer oat, barnyardgrass, canarygrass, and volunteer corn and at 4 fl oz/A plus DSV adjuvant at 12.8 fl oz/A controls green, yellow, and giant foxtail, Persian darnel and annual ryegrass in wheat, including durum. Discover and DSV adjuvant are packaged in one box in separate containers. Add both herbicide and adjuvant in spray tank and apply at 40 (4 fl oz/A) or 50 (3.2 fl oz/A) acres per box. Wheat has excellent tolerance to Discover. Discover does not contain nor require a safener for wheat safety. Apply Discover with at least 10 gpa by ground or 5 gpa by air. Apply Discover to wheat from 2-leaf to emergence of 4th tiller. Discover will control foxtail in the 1- to 5-leaf stage and wild oat in the 1- to 6-leaf stage. Grasses should be actively growing but Discover control grass weeds over wide environmental conditions. Discover can be applied with many herbicides, insecticides, and fungicides labeled in wheat. Discover is antagonized much less than other grass herbicides labeled in wheat when tank-mixed with other pesticides. See label for approved tank-mix options.

Contact your local Novartis rep or refer to www.cp.us.novartis.com/ for a copy of the complete label. North Dakota has issued a Section 24c (SLN) label emending the Section 3 label to allow any crop to be planted 30 days after application.

QUESTIONS AND ANSWERS

Question: Do we have a standard recommendation for a herbicide program for Roundup Ready Soybean? The question comes up because I have been asked if a pre-emergent should be used on ground that will be seeded to RR Soybean. What are your thoughts? Also do we have any information on Extreme, I believe it is (Roundup + Pursuit).

Answer: If the manufacturer answers the question they would probably say - use more Roundup. I do not know nor am able to keep up on program rebates and rewards. I don't know what restrictions are in place in 2000 for tankmixes or soil followed by POST application of herbicides other than

Roundup.

Basically there are two camps of thought:

1. Use one or more applications of Roundup.
2. Use of a residual that covers the weaknesses of Roundup like wild buckwheat, nightshade, dandelion, maretail/horseweed, small kochia, ragweed (some reports), nutsedge, smartweed, common mallow, biennial wormwood, and waterhemp.

There are products that "makes sense" if one chooses the residual route: Pursuit or Authority. Both products have good season long residual, covers the weaknesses of RU and are priced in manner that makes it very competitive with #1 above.

Extreme (Pursuit + RU) will be very popular because the cost is less than \$10/A and controls a wide range of annual and perennial weeds.

Authority applied PRE alone or followed by Roundup controls many important weeds in soybeans, has 6 to 8 weeks residual weed control, cost around \$14/A for the highest rate and is the only herbicide that consistently and adequately controls biennial wormwood. NDSU trials have shown excellent weed control with Authority PRE followed by Roundup postemergence.

Another herbicide that will be important, especially in the future, with several weeds becoming resistant to ALS mode of action herbicides is Flexstar/Reflex. Flexstar/Reflex control many broadleaf weeds found in North Dakota and is very economical. Flexstar/Reflex has a soil residue. Raptor and Flexstar/Reflex have similar crop rotation restriction. See product labels for restriction of crops that cannot be planted the following year.

SOYBEAN HERBICIDE UPDATE

BestShot (Dow)

Mode of action: ALS inhibitor + glyphosate

a.i.: cloransulam tankmixed with glyphosate

Crops: Roundup Ready soybean

Comments: A Dow program of a one-pass tankmix of FirstRate + Glyphomax or Glyphomax Plus for grass and improved broadleaf weed from Dow. FirstRate will provide residual control of some broadleaf weeds.

Boundary (Novartis)

Mode of action: Acetanilde +Photosynthetic inhibitor

a.i.: metolachlor + triazine

Crops: Soybean

Comments: Contains 6.3 lb/gallon of active isomer of metolachlor + 1.5 lb/gallon of metribuzin. The rate of 1.5 pt/A of Boundary gives 1.24 pt/A of Dual II Magnum and 6 oz DF/A of Sencor. Compared to Turbo it is more metolachlor and less metribuzin. Marketed in the Roundup Ready soybean system.

Extreme (American Cyanamid)

Mode of action: ALS inhibitor +glyphosate

a.i.: imazethapyr + glyphosate (Pursuit + Roundup Original)

Crops: Soybean

Comments: ND rate is 2.25 pt/A and is equivalent to 3 fl oz/A of Pursuit and 18 fl oz of Roundup Original. Price is less than \$10/A. Nonionic surfactant (NIS) and

ammonium sulfate (AMS) fertilizer are required.

Formulated adjuvant products containing NIS and AMS are currently available which accomplished the adjuvant load requirement. Some brand names to choose from are Sensation from Rosens and Surfate from AGSCO. Extreme can be used in all of ND and in MN North of Hwy #210.

Harmony GT (DuPont) 75DF

Mode of action: ALS inhibitor

a.i.: thifensulfuron

Crops: Soybean.

Comments: DuPont has issued a supplemental label for Harmony GT on soybeans in ND, MT, MN (North of Hwy 28), and SD (North of Hwy 212).

Rate: 0.083 oz 75DF/A = 1/12 oz 75DF/A

Adjuvants: NIS with or without nitrogen fertilizer

Weeds: Wild mustard, annual smartweeds, lambsquarters, pigweed, and velvetleaf. Suppression of sunflower and cocklebur.

Label allows tankmix with post grass herbicides, Basagran, and Galaxy. The label does not recommend tankmix of Harmony GT with Pursuit. See label for reasons. Other soybean herbicides labels may allow a tankmix with Harmony GT. See individual labels.

Reflex (Zeneca)

Mode of action: PPO inhibitor

a.i.: fomesafen - Same as Flexstar without oil adjuvant.

Crops: Soybean and possible Section 18 on dry bean.

Comments: 2000 Section 18 submitted for ND/MN for use in dry bean for control of ragweed. Data from MI indicates less dry bean crop injury than Basagran. E control of ragweeds, vol sunflower, cocklebur and other weeds.

Rezult (BASF)

a.i.: bentazon +sethoxydim

Crops: Soybean and possibly dry beans and field pea

Comments: Price reduced to approximately \$14/A - cheaper than Basagran alone.

Roundup (Monsanto)

Mode of action: EPSP synthase inhibition

a.i.: glyphosate

Crops: Various

Comments: Licensed glyphosate tolerant 1999 soybean seed cannot be replanted. Based on information available, we are not aware of options that allow planting 1999 seed after paying the required fees.

Roundup is off patent in October of 2000

Glyphosate is available under the following labels:

Roundup Ultra/RT (Monsanto)

Glyphomax Plus (Dow)

Formulated as an isopropyl amine salt at 4 lb ai/gal or 3 lb ae/gal **with full adjuvant load.**

Roundup Ultra Dry (Monsanto)

Formulated as an ammonium salt as a 65% SG **with full adjuvant load.**

(RUU Itra Dry at 1.15 lb = 1qt/A Ultra)

Roundup Original/RT (Monsanto) or

Glyfos (Cheminova) or

Glyphomax (Dow) or

Private Labels (Various)

Formulated as an isopropyl amine salt at 4 lb ai/gal or 3 lb ae/gal **with partial adjuvant load.**

Touchdown (Zeneca)

Formulated as an trimethyl sulfonium salt at 5 lb ai/gal or 3.45 lb ae/gal **with partial adjuvant load.**

1.6 pt/A of Touchdown = 2 pt Roundup Original

Roundup Ultra Max (Monsanto)

Formulated as an isopropyl amine salt at 4 lb ai/gal or 3 lb ae/gal **with full adjuvant load.**

Roundup Custom (Monsanto) or **Rodeo** (Monsanto)

Formulated as an isopropyl amine salt at 5.4 lb ai/gal or 4 lb ae/gal **without adjuvants.**

Do not add NIS: Roundup Ultra/RT, Roundup Ultra Dry, Roundup Ultra Max.

Add NIS at 0.5% v/v: Roundup Original/RT, Private Labels, Glyfos, Touchdown.

Add NIS at 1% v/v: Roundup Custom, Rodeo.

Only the Rodeo formulation of glyphosate can be applied on water. Rodeo does not contain adjuvants toxic to fish and aquatic life. An NIS must be used with Rodeo. Some NIS adjuvants labeled for use on water are: Agridex, Aberchem Aquatic surfactant, Side-Kick, Side-Kick II, Induce, Liqua-Wet, X-77, Passage, Prospread Activator, R-11, Spreader Sticker, Super Spread 200, Sure-Fact, Triton Ag 98, and Widespread.

Trade Name	Mnfctr	Active ingredients gly = glyphosate	lb ai/gal, gly = lb ai/gal
Acquire	BASF	glyphosate	N/A
Backdraft	Am. Cy.	imazaquin + gly	0.25 + 1.25
Campaign	Monsanto	glyphosate + 2,4-D	1.2 + 1.9
Extreme	Am. Cy.	imazethapyr+gly-ipa	0.17 + 2
Fallowmaster	Monsanto	gly-ipa+dicamba acid	1.1 + 0.5
FieldMaster	Monsanto	acetochlor+atrazn+gly	2 + 1.5 + 0.56
Gly-Flo	Micro Flo	glyphosate-ipa	3
Glyfos	Chemnva	glyphosate-ipa	3
Glyphomax	Dow	glyphosate-ipa	3
Glyphomax Plus	Dow	glyphosate-ipa	3
Glyphosate Orig.	Griffin	glyphosate-ipa	3
Landmaster BW	Monsanto	gly-ipa + 2,4-D-ipa	0.9 + 1.5
Protocol	Monsanto	glyphosate-ipa	3
Rattler	Helena	glyphosate-ipa	3
ReadyMaster ATZ	Monsanto	atrazine + gly	2 + 1.5
Rodeo	Monsanto	glyphosate-ipa	4
Roundup Custom	Monsanto	glyphosate-ipa	4
Roundup Original	Monsanto	glyphosate-ipa	3
RU Original RT	Monsanto	glyphosate-ipa	3

RU SoluGran	Monsanto	glyphosate-NH3	86.5%
RU/Private labels	Various	glyphosate-ipa	3
Roundup Ultra	Monsanto	glyphosate-ipa	3
Roundup Ultra RT	Monsanto	glyphosate-ipa	3
RU Ultra Dry	Monsanto	glyphosate-NH3	65%
RU Ultra Max	Monsanto	glyphosate-ipa	3.7
Silhouette	Various	glyphosate-ipa	3
Touchdown	Zeneca	glyphosate-tms	3.45

Roundup as a preharvest registration in dry beans may be approved for use in 2000. Rates will be limited to 1 qt/A.

Studies in MN, NE, and KS confirm less weed control from application made after 6:00 pm. IA observed similar results with Pursuit.

Touchdown 5E (Zeneca)

Mode of action: EPSP synthase inhibitor

a.i.: Trimethyl sulfonium salt of glyphosate (NOT sulfosate).(Same active ingredient as Roundup but a different salt.)

Roundup/Ultra/RT = glyphosate -sopropylamine salt

Touchdown = glyphosate - trimethyl sulfonium (trimesium).

Crops: Various Roundup Ready crops

Comments: Previously registered only in noncrop uses. Negotiations with Monsanto will allow Touchdown on most Roundup Ready crops in future. Touchdown 5E contains some and requires additional NIS to be added. Touchdown is NOT registered on Roundup Ready corn and may cause serious injury to corn. Touchdown is registered on Roundup Ready soybean with good soybean tolerance. In a few cases, Touchdown may slight yellow flecking on sprayed leaves resulting in NO yield loss. Leaves emerging after application are normal and not affected

Ultra Blazer (BASF)

Mode of action: PPO inhibitor

a.i.: acifluorfen-Na salt

Crops: Soybean

Comments: A new formulation of Blazer with Ion Charge Technology that supposedly produces soybean response similar to Flexstar but less than Cobra. No NDSU studies have been conducted with Ultra Blazer.

Richard Zollinger
NDSU Extension Weed Specialist
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HORTICULTURE

TREES - YELLOWHEADED SPRUCE SAWFLIES

There have been several reports of injury from yellowheaded spruce sawflies in north-central North Dakota this week. All native and introduced species of spruce grown in North Dakota are potential hosts to yellowheaded spruce sawflies. The sawflies are more common in northern North Dakota than in southern areas of the state. These insects are often discovered as late-instar larvae feeding on older needles, at which time much of the damage has been done and chemical control becomes difficult. Treatments are most effective if they are applied when the larvae are small.

Larvae have yellowish- to reddish-brown heads and olive-green bodies with six gray-green stripes running the length of the body. They will rear up in a characteristic "s" when disturbed. Larvae will reach a length of about 3/4 inch before they drop to the ground in July and spin a cocoon where they will overwinter. In early spring, tan to straw-yellow adults emerge, mate, and lay eggs in current year's needles at approximately the same time as the young shoots lose their bud caps. The eggs hatch 4 to 12 days after they are deposited in the needles; therefore, we should be monitoring now for the insect in areas where it has been a problem in the past. Young larvae will begin feeding on new needles and will move to older needles as they mature. Open grown trees that are 5 to 9 years old (3 to 18 feet in height) are more vulnerable to yellowheaded spruce sawfly damage than are older trees or trees in dense stands.

Healthy trees will often survive minor needle loss from yellowheaded spruce sawflies, but complete defoliation can kill trees. The first year of defoliation should be taken as a forewarning to monitor and treat, when necessary, for the insect in subsequent years.

Although rodents will feed on the cocoons and birds on sawfly larvae and adults, these predators, in addition to various parasites, are not always effective in keeping yellowheaded spruce sawfly populations at acceptable levels. If infestations are light, adequate control may be achieved by simply removing young larvae by hand. When an isolated ornamental tree is infested, spraying young larvae off of the tree with a strong jet of water will often be effective in reducing insect numbers. Yellowheaded spruce sawflies tend to attack the same trees repeatedly; therefore, chemical control often becomes necessary as sawfly populations increase. Acephate (Orthene® and Isotox®), carbaryl (Sevin®), chlorpyrifos (Dursban®), and cyfluthrin (Tempo®) are labeled for use against sawfly larvae. Read and follow pesticide labels. Since most yellowheaded spruce sawflies are believed to overwinter very near the soil surface, removing the duff beneath infested trees may reduce the impact of this insect. This should be done after the larvae have finished feeding, but before the spruce buds begin to swell in the spring.

Marcus Jackson, Extension Forester
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<http://www.ag.ndsu.nodak.edu/aginfo/trees/ndtreinf.htm>

From Around the State . . .

North-Central ND

Crucifer Flea Beetle Activity Decreasing in Canola.

Flea beetle activity peaked this last week. The population cycle is at the end of its spring activity and with the cool, rainy, weather it definitely decreased this week.

New Pest Observations

- The first **Bertha armyworm** was captured in a pheromone trap in Mountrail County near Makoti as part of the Canola Trapping Network.
- The first **European corn borer** was captured in the blacklight trap at the North Central Research Extension Center in Minot during June 5-7, 2000. No additional moths have been captured since June 7th.

Grasshoppers Emerging

Grasshoppers are starting to hatch from their egg masses. The cool, wet weather will cause mortality with the small nymphs, and delay further hatching.

Small Grain Diseases

Low severity levels (<10%) of leaf diseases (tan spot, and septoria) were observed during Small Grains IPM Survey last week. Most leaf diseases had a high incidence level though. Counties surveyed include: Bottineau, McKenzie, McLean, Mountrail, Renville, Rolette, and Ward. Prolonged wet growing seasons favor the rapid build-up of leaf diseases. With extended periods of rain, mist, or fog (24 hours or greater), small grains need to be watched for development of severe leaf diseases.

Janet J. Knodel

Area Extension Specialist Crop Protection

General rains of 1 to 4 plus inches fell across north central and north western North Dakota this past week. Heavy rains in Renville and Bottineau counties caused moderate to severe flooding. This area was extremely wet last year.

Crop conditions are good for most crops. The row crops could use some warmer weather. Sunflowers seeded in mid May are growing very slow. Corn seeded in April is only six to ten inches tall. Early seeded small grains range from jointing to flag leaf. Early seeded canola is bolting to early flower. Dormant seeded canola fields are in their second week of bloom and conditions have been excellent for an extended bloom. Winter wheat is beginning to head with excellent yield potential. Spikelets counts of 14 to 17 spikes per head are common in fields in north central North Dakota.

The main concerns now are catching up with herbicide spraying and disease development in small grains.

Kent McKay

Area Extension Agronomist

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North Central Research/Extension Center Minot

South-Central ND

Total rainfall as recorded at NDAWN sites in south-central ND during June 7 to 13 ranged from 0.12 at Streeter to 5.05 inches at McHenry. A dry season has turned very wet in Foster and especially Eddy Counties. Areas south of I-94 received about an inch or less during the past week. On June 11, estimated daily water use of wheat emerged May 1

was 0.2 to 0.3 inches and for corn emerged May 15 the estimated water use was 0.1-0.15 inches. Planting of all crop acreage is essentially complete, except for scattered sunflower acres. Winter wheat and spring-seeded crops continue to be in generally good- to excellent-condition. Winter wheat is in the flowering stage or beyond and spring wheat is jointing or more advanced. Early spring-seeded canola began flowering the week of June 4.

Alfalfa and other hay harvest continues. Alfalfa weevils are commonly found in counties south of I-94. Post-emergence herbicide application continues in corn, flax, and beans and is starting in sunflower. Generally, low levels of tan spot are present but severity should increase with recent rains. Trace levels of leaf rust and low levels of BYDV continue to be found. The NDSU foliar disease forecasting model for the Carrington site indicated likely tan spot and leaf rust infection June 11-13. Currently, low levels of grain aphids can be found in the region. Wheat growers are contemplating fungicide application for leaf spot control and foliar N application for protein enhancement.

Greg Endres.

Area Extension Specialist/Cropping Systems
Carrington Research and Extension Center

Northeastern ND

Rainfall is the big story this week. A minimum of two inches was received through out the region with a maximum of nearly 20 inches in areas of Grand Forks county. Most of the area received 3-4 inches of rainfall the last week. Flooding has occurred along with damaging hail in many areas.

Small grain spraying is 75 % complete with much crop yet to be sprayed in Towner and Rolette counties. Weed spraying in canola is nearly complete while much flax remains to be sprayed. Crop disease concerns will increase as crop matures and recent rainfall promotes disease development.

Winter wheat is heading, wheat is 2 leaf to jointing with 50% of the crop in the 3-4 leaf stage, barley is 4 leaf to jointing, corn 4 leaf, flax from 3 inches to 8 inches tall, sunflower and dry beans are emerging. Canola is beginning to bolt. Sclerotinia will be a concern if wet weather continues.

Crop production potential is very good.

Terry Gregoire
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Southwestern ND

Rainfall for the week of June 7 through June 14 in counties south and west of the Missouri River as recorded by the North Dakota Weather Network sites ranged from 0.25 inches at Beach to 2.56 inches at Mandan. Other reports from county agents and producers indicate that up to 4 inches was received from the latest storm. Crops in areas of southeast Bowman County and in scattered areas in Grant County were damaged by hail.

Winter wheat and much of the 'frost seeded' hard red spring wheat has headed. Spring wheat that was seeded in early April is beginning to head while late seeded wheat has progressed to the third and fourth leaf stage. Much of the crop has advanced to jointing to flag leaf stage of development. We continue to find fields that are infected with wheat streak mosaic as well as barley yellow dwarf virus. Winter wheat fields that were found to be severely infected with WSMV have been destroyed. Net blotch has been found in barley fields in Hettinger and Adams Counties. Reports received to date indicate that grasshopper populations are generally low but some "hot spots" have been reported to have been treated. Aphids have been found in fields but populations have not approached economic thresholds to date though producers should be scouting fields on a regular basis. Also we have been finding aphid predators such as lacewings and ladybugs. These insects will help reduce aphid populations.

Early seeded canola and mustard crops are blooming and have been reported to be in good to excellent condition. Diamondback moths are being trapped in pheromone traps in southwest North Dakota. Last week flea beetle populations were the highest that we have recorded in this area for the season but since the crop is as advanced as it is, pesticide treatment is not required. Flax has been reported to be about six inches tall to 20% bloom. Safflower is elongating while sunflower is emerging to four leaves. Sunflower beetles have been found in limited numbers in the few fields that we have scouted but infestation levels are relatively low.

Corn crop development was slow until the recent warm weather. Freezing weather received earlier this season injured some of the early-planted corn (also injured other crops) but for the most part the crop has recovered and is progressing well.

Differences in plant development are being noted at the Seed Treatment Demonstration on the August and Perry Kirschmann Farm near Regent. The Hettinger Crop Improvement Association has scheduled a tour for Monday, July 10. One of the tour's stops will be at these plots to provide producers an opportunity to evaluate seed treatment performance first hand. For further information about this tour please contact Dwain Barondeau, Hettinger County Agent at (701) 824-2095.

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