North Dakota State University
CROP & PEST REPORT
NDSU Extension Service

No. 7 June 26, 2008

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NDSU ANNUAL FIELD DAYS THIS SUMMER

June 26 Central Grasslands Research Ext.Center, Streeter
July 8 Hettinger Research Extension Center, Streeter
July 9 Dickinson Research Extension Center, Dickinson
July 10 Williston Research Extension Center, Williston
July 14 Agronomy Seed Farm, Casselton
July 15 Carrington Research Ext. Center, Carrington
July 16 North Central Research Extension Center, Minot
July 17 Langdon Research Extension Center, Langdon
July 23 Turf Field Day, NDSU campus, Fargo
July 29 Oaks Irrigation Research Site, Oaks
Aug.2 Horticulture Research Field Day, Absaraka

For these and other events this summer (including Pulse Crop Tours, Canola Days, etc…), visit http://www.ag.ndsu.edu/research/fielddaydates2008.htm or contact your local county agent or Research Extension Center. Hope to see you this summer!

entomology

RECENT FIELD OBSERVATIONS OF INSECT PESTS

Potato - Colorado Potato Beetle: Adult Colorado potato beetles are emerging now from overwintering sites. The adult is 3/8 inch long, with oval body and a yellow-brown color with 5 black stripes on each wing cover (see photograph). Eggs are laid on the underside of leaves in clusters of 10 to 30 and are orange colored when ready to hatch (see photograph). The larvae are 1/8 to 3/8 inch long, brick red to light orange in color. Both adults and larvae feed on potato foliage.

The treatment recommendation is that spraying be initiated at first egg hatch. Best results have been achieved by flagging the first egg masses that can be located, monitoring these daily, and spraying at 15 to 30% hatch.

Colorado Potato Beetle - adult

Colorado Potato Beetle - eggs

Soybean - Soybean Aphid: Very low number of soybean aphids have been found in soybeans growing the Red River Valley region of North Dakota and Minnesota and other areas of Minnesota (Crookston, Lamberton, Rosemont, Becker, Morris). The current temperatures between 77 and 86 F are optimal for soybean aphid development. The pre-reproduction period takes about 5 to7 days before aphids begin birthing little nymphs. When scouting soybean field, remember the many different insects inhabit soybean fields throughout the season. Be sure to properly identify aphids and any look-alike insects - thrips, insidious flower bugs, spider mites, leafhoppers, and so on. A good reference is the *Identification of Soybean Aphid and Look-alike Species*, published by the North Central IPM Center.

http://www.ncipmc.org/alerts/soybeanaphid_id.pdf

It's important to be aware of aphid predators, because they play a major role in reducing early population of soybean aphids. Research results have indicated that early-season application of insecticides for control of sub-economic populations of soybean aphids have caused more harm than good. So, no early-season insecticide applications are recommended for pest management of soybean aphids.

Soybean / Dry Bean - Bean Leaf Beetle: Bean leaf beetles have been increasing in North Dakota over the past years Adult bean leaf beetles are emerging from overwintering sites and moving into soybean or dry bean fields. The adults are yellow to reddish-brown and three to four black spots with a black border on wing covers (see photograph). Early feeding injury to leaves appears as small round holes between the leaf veins (see photograph). Treatment thresholds from other regions are 3 to 7 beetles per sweep or based on defoliation - 50% defoliation during early vegetative, 40% defoliation during pre-bloom, 35% defoliation during bloom and 20-25% defoliation during pod set to fill. Late season feeding on the foliage and pods by the new adults that emerge in August appears to be more important than early season feeding. This may increase the risk of virus transmission and cause secondary infections (rotting and discoloration) from fungi and bacteria.

Bean leaf beetle feeding on soybean *(photo by C. Strunk, SDSU, Bugwood.org)*

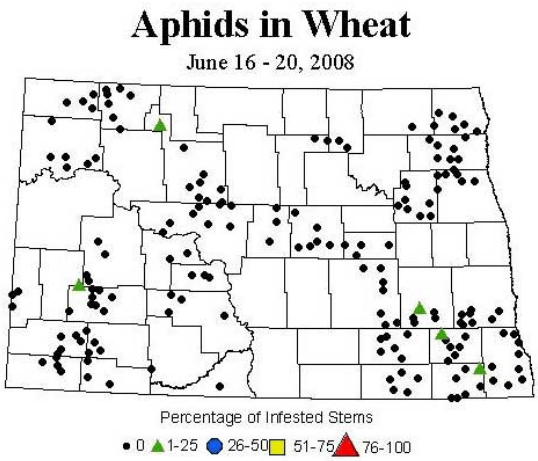
Adult bean leaf beetle *(photo by N. Wright, Fla. Dept. of Ag. and Cons. Serv, Bugwood.org)*

Sunflower - Sunflower Beetle: Adult sunflower beetles (see photo.) are emerged, however, no economical populations have been reported. The economic threshold is 1 to 2 adults per seedling on seedlings. Please refer to the NDSU Bulletin E-824 for more information:

http://www.ag.ndsu.edu/pubs/plantsci/pests/e824.htm

Adult sunflower beetle

Small Grains - Cereal Aphids: Low numbers of cereal aphids are being reported throughout the state (see IPM map). For scouting and economic threshold recommendations, please refer to issue 5 of the Crop & Pest Report on June 12, 2008.



Barley - Barley Thrips: Sampling for thrips should begin when the flag leaf is first visible and continue until the head is completely emerged from the boot. Most thrips can be found under the top two leaf sheaths. The dark brown to black thrips can be found by unrolling the leaf sheaths away from the stem. With the high market value of barley, the economic threshold is lower in 2008 than previous years. Using a cost of control of $8.00 per acre and dollar value per bushel of $6.50, the current threshold is only 3 thrips per stem. Insecticide treatments are only effective when applied before heading is complete.

AVOID FLAG LEAF APPLICATIONS OF INSECTICIDE FOR CONTROL OF WHEAT STEM MAGGOT

Preliminary research indicates that insecticides applied at the flag leaf stage were NOT as effective in reducing the number of white heads caused by wheat stem maggot when compared to insecticides applied at the 4-leaf crop stage (see table). Warrior insecticide reduced the number of white heads caused by the wheat stem maggot when applied at to 4-leaf wheat. However; the number of white heads per plot was not significantly different from the untreated plot when Warrior was applied later in the growing season. Wheat yield was the greatest where Warrior was applied with a fungicide (Quilt or Tilt) for leaf disease control at the 4-leaf stage. Although later season applications of fungicide also increased wheat yield, it did not show the same level of increase as the 4-leaf application applied with an insecticide (Warrior).

NDSU Ext. Entomology recommends '**NOT to add an insecticide**' at flag leaf for control of wheat stem maggots or when no economic levels of insect pests are present in field.

Treatment	Rate (fl oz/a)	Timing	White heads (plts/plot)	Leaf disease %	Yield (bu/a)	Test Weight(lb/bu)
Untreated			27	55	14	57.5
Warrior + Quilt	2.56 + 7	4-leaf	4	25	22	58.2
Warrior + Tilt	2.56 + 2	4-leaf	13	35	23	58.1
Warrior	2.56	Flag leaf	21	42	15	57.1
Warrior + Quilt	2.56 + 14	Flag leaf	26	22	16	58.5
Quilt	14	Flag leaf	25	14	18	58.1
Warrior	2.56	Early heading	22	61	17	57.3
LSD (0.05)			13	NS	3	0.6
CV			38	50	9	0.6

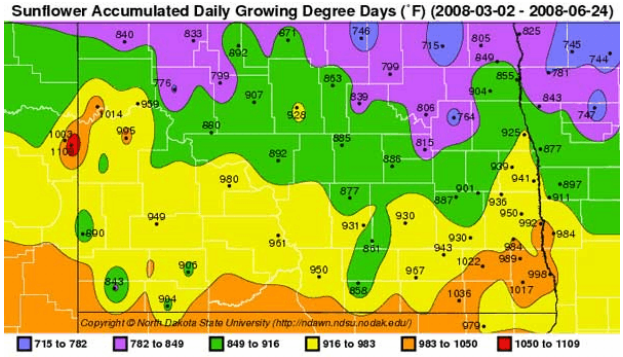
Clearfield HRSW was seeded May 24, 2007, at 1.1 million seeds/A. Source: D. Markle, NCREC, Minot, ND

STILL EARLY IN SEASON FOR COLLECTING LEAFY SPURGE FLEA BEETLES

There have been several questions about how many degree days are required for collecting leafy spurge flea beetles. The accumulated growing degree days (AGDD) for sunflower (base of 44 F) can be used as a guide to determine when to begin scouting for adult flea beetles. Begin scouting for adult flea beetles when the AGDD approaches 1,000. Likewise, the flea beetle population and egg laying by females begins to decline when the AGDD reaches 1,600 or more. **Collect flea beetles between 1,200 and the 1,600 AGDD.**

With the cool spring temperatures, most of North Dakota is still below 1,000 AGDD (see sunflower AGDD map), except for the far southeastern region. The GDDs for sunflower are about 200 GDDs behind the five-year average. Use the sunflower degree days/growth stage application in NDAWN and enter "2008-03-01" for planting date and select "degree day" for map type.

http://ndawn.ndsu.nodak.edu/sunflowergdd-form.html



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plant science

USING HAIRY VETCH IN THE CROPPING SYSTEM

Interseeding hairy vetch (*Vicia villosa* Roth) in corn and sunflowers is an alternative opportunity to gain additional biomass production. The vetch can be ploughed or grazed. When seeded at the four-leaf growth stage of sunflower, hairy vetch produced 1423 lb of dry matter per acre (averaged over five environments with four replicates), without reducing the sunflower yield. Although this article will focus on vetch, there are other legumes like sweetclover, alfalfa, and red clover, which can be interseeded in corn or sunflower.

Interseeding can be looked upon as a double cropping system in northern climates. In this specific case, hairy vetch is utilizing sunlight and moisture, which normally are unused in the later part of the growing season. The secondary crop can be used as green manure plow-down or for additional grazing. The benefits of interseeding vetch are: nitrogen fixation by the legume, increased organic matter (after incorporation of the vetch), and preventing soil and wind erosion.

To use vetch successfully good weed control is essential. If seeded into a weedy field, the vetch will grow but it will not compete well with weeds. If seeded in the early summer and left over winter, the following spring it will quickly grow into a weed-choking mat.

Seeding rates should be 15 to 20 lb pure live seed per acre to establish a thick stand. Vetch seed should be inoculated with type 'C' inoculant (similar to pea inoculant) and incorporated to a depth of 1/2 to 1 inch in the soil. Corn and sunflowers, planted in 22-30 inch rows, will provide enough room for a tractor to pass through the field while the crop is growing, to spread the vetch seed. In experiments conducted on commercial fields, a simple broadcast seeder was mounted on the front of the cultivator tractor to distribute the seed; calibration of the equipment is required. Row cultivator equipment can vary greatly in how aggressively it tills. Some seed can be lost if a cultivator buries the seed too deeply. Vetch seed commonly contains 10 to 20% hard seed, which can remain in the soil and germinate in following years. Unfortunately the unwanted plants can be a problem in other crops. This is especially important for organic and no-till producers.

The timing of vetch seeding will influence how well it produces, but uncontrollable environmental factors can affect results. The four-leaf stage in sunflowers was found to be the optimum time to seed vetch. The timing is influenced by the growth characteristics of the sunflower hybrid. For example, if the sunflower grown is a dwarf hybrid with an open canopy, vetch seeding should be delayed to the six-leaf stage to prevent the vetch from growing too quickly and over-running the sunflowers. Conversely, if the sunflowers are a conventional height, seeding at the four-leaf stage is recommended. Figure 1 illustrates that the percent light reaching the soil surface is reduced as the crop height increases. After full bloom the lower sunflower leaves yellow and fall off the plant. At this point the amount of light reaching the understory crop will increase (about 90 days after seeding the sunflower).

Vetch has proven to be a good grazing crop because it is nutritional, fast growing, and produces a large amount of biomass. If vetch is used for grazing or hay, it must be cut or grazed before it produces seed because the seed is toxic to livestock. Cutting or grazing before plants are in full bloom will prevent seed production.

Hairy vetch produces forage which is high in crude protein (approximately 23%) and high in digestibility (60% TDN). These characteristics make it an excellent forage from a nutritional standpoint. When included in an interseeded mixture with corn or sunflower, hairy vetch produces a highly digestible source of forage for livestock, which will compliment the crop residue from corn or sunflowers well.

Hairy vetch growing in between the rows of sunflower.

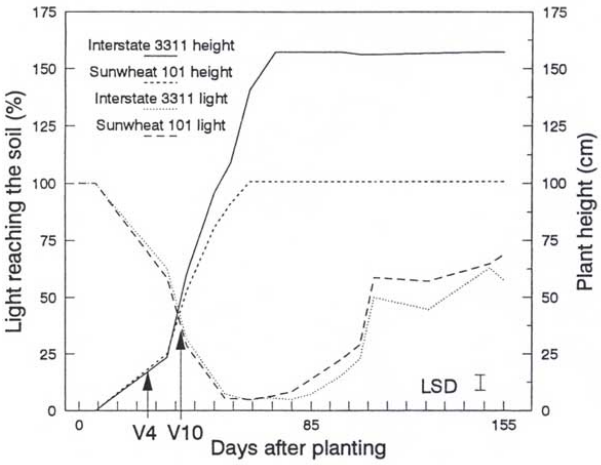

Figure 1. Percent incoming solar radiation available for an understory crop. Interstate 3311 is a standard height sunflower hybrid and Sunwheat 101 is a dwarf hybrid.

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CORN DEVELOPMENT AND STAGING

The first seven weeks of the corn growing season, at least for most of the state, have not been kind to the corn crop. The cool weather earlier in the spring slowed emergence, exacerbated the challenge of establishing a uniform stand, and slowed root development. This coupled with the excessive moisture in the eastern part of the state has delayed corn development (at least a full leaf behind normal) and resulted in the plants generally looking weak and yellow. The dry and warm weather over the weekend have improved the appearance of the corn crop marginally and crop growth is starting to accelerate. We are still at least 100 GDD behind normal and much further behind last year – most fields were knee high by this time last year and waist-high by July 4th.

GROWTH STAGING CORN

A few management practices, such as the application of certain herbicides, are growth stage dependant. Therefore, being able to properly identify the growth stage of your corn crop is important to ensuring that management practices are applied at the appropriate time. The leaf collar method of growth staging corn is the method most often used in recommendations related to the timing of herbicides. When growth staging your crop you should begin by obtaining a representative sample of plants from the field or part of the field of interest. Ten plants should be selected at random. If emergence has been uniform, you can probably get by with fewer plants. Remove any soil attached to the plants so that you are able to observe the roots and crown. The number of leaves defines the vegetative stages of corn (i.e. V1 equals the 1st leaf stage). Counting leaves in corn is straight forward as the process is not usually encumbered with tillers and leaves on tillers as is the case in small grains. However, care must be taken to ensure that the earliest leaves are included when counting leaf numbers. The first leaf is small and often dies and is torn from the plant during early plant development. The first leaf has a blunt tip (see photo). Look for sheath remnants at the crown of the plant if you suspect that the first leaf (or second for that matter) is missing. Count only those leaves that have a collar. Do not exclude leaves that have been damaged by hail or frost. The total number of leaves that a plant will developed is more or less fixed for a given hybrid; additional new leaves will not replace leaves that are stripped from the plant.

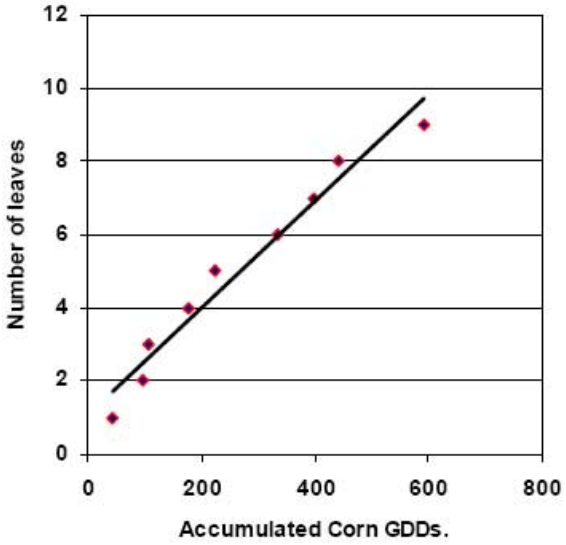
Early corn leaves

In order to determine the growth stage of older plants that have lost their lower leaves, uproot the plant and split the stem with a knife through the root ball. At the very base of the stem, identify the first visible internode. Internodes are the white area between the more yellow bands of the nodes. The first obviously visible internode should about 2 to 3/4 inch in length. The node directly above this internode will be the fifth node, and the leaf arising from this node will be the 5th leaf. Find that leaf and continuing counting leaves from that point.

RELATIONSHIP BETWEEN GDD AND LEAF NUMBERS

There is an excellent relationship between corn growing degree days (GDDs) and leaf appearance in most environments. Corn GDDs are calculated using a base temperature of 50 degrees F (average temperature for the day minus 50) and therefore, differ from small grain growing degrees days which use a base of 32 degrees. GDDs for both corn and small grains for locations near your farm can be obtained using NDAWN (http://ndawn.ndsu.nodak.edu/corndd form.html). Corn requires about 120 GDDs to emerge. Researchers from other states have found that it takes about 80-85 GDDs to produce a new leaf through the 10 leaf stage. Data from the last two years in ND would suggest that new leaves appear after about 70 GDDs (see Figure 1). Based on these data, corn planted on May 1st in Fargo this year should now have about 6 leafs (542 GDD accumulated minus 120 GDD for emergence = 422, 422/70 GDD per leaf = 6 leaves). This number corresponds fairly well with what can be observed in plots near the NDSU campus.

Fig. 1. Relationship between accumulated GDDs and leaf number, Fargo, 2007.



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plant pathology

SOYBEAN RUST/APHID SCOUTING BEGINS NEXT WEEK

Beginning next week (June 30th –July 4th) monitoring for soybean rust and soybean aphid will begin. Monitoring is done by scouting 'sentinel plots', which are small areas in soybean fields. Sentinel plots are scouted once a week for soybean rust and soybean aphid, and any other diseases or insects that may appear. Twenty sentinel plots are scattered throughout Richland, Cass, Traill, Grand Forks, Walsh, Barnes, Ransom, Sargent, La Moure, and Dickey counties. Each sentinel plot will be visited once each week until the beans are mature. All information collected is available will be available at the website www.sbrusa.net.

The monitoring effort is part of a national program to track the movement of the soybean rust as it moves across the country. Soybean rust can only survive the winter in warm climates, which in the United States means along the gulf coast. As the growing season progresses, the disease moves northward on winds from the south. Last year soybean rust was found as far north as Iowa and Ontario (Canada), although the disease was found to late in the season to cause much damage. It is too early to tell how far north soybean rust will go this year. Currently the disease is active in Texas, Louisiana, Florida, and Alabama. For information about soybean aphid see Jan Knodel's article on page 1.

PEA DISEASE SURVEY

Last week, my research specialist and I scouted 23 pea fields from Sheridan County to Williams County. The majority of pea fields looked pretty healthy. However, we took ten plants were taken from each field and evaluated the roots for disease. Root rotting pathogens were recovered from about half the fields. The primary pathogens were Fusarium (rot or wilt) and Ascochyta (foot rot) species. Although there is not much one can do to manage root rots during the growing season, we recommend that people take note of potential problems (poor stand, wilted spots in field). Some root rot pathogens can persist in the soil for several years, so management decisions like rotation and seed treatment may be influenced by what happens this year. Next week we will make another trip around the state to scout for more pea diseases.

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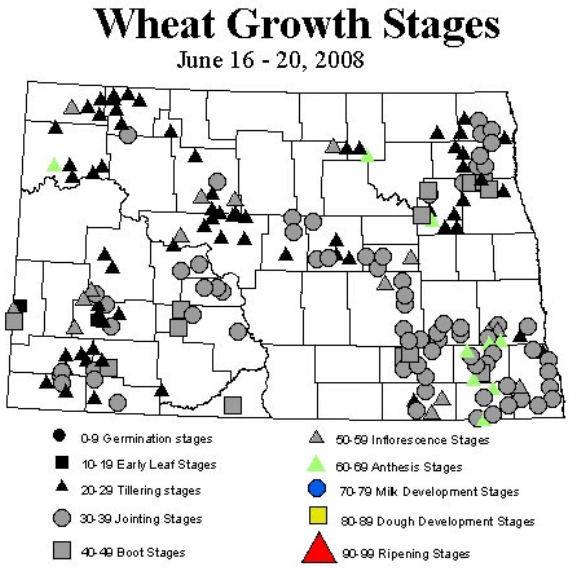
NDSU IPM SMALL GRAIN SURVEY RESULTS - JUNE 24

The NDSU IPM field scouts surveyed 165 wheat fields and 24 barley fields last week. Of the wheat fields, 37 were winter wheat, and the rest spring wheat or durum.



In wheat, **tan spot** fungal leaf disease was by far the most common disease, with severity higher in winter wheat crops or where wheat was planted into wheat stubble. In barley, about 1/3 of the surveyed fields were showing fungal leaf spot infections.

Wheat leaf rust was found in one additional spring wheat field, in Ransom County, last week, but by June 24th, three-fourths of the spring wheat fields in Cass County had trace levels of leaf rust. Greg Endres, area extension specialist in Carrington, reported seeing low levels of leaf rust on June 23rd in a number of varieties of winter wheat in field plots at Ellendale, ND.

DISEASE FORECASTING INFORMATION

On June 24th, the NDSU disease forecasting model for small grains (http://www.ndsu.edu/scabforecast/) indicated only about a third of the NDAWN weather stations had favorable weather for leaf disease infection. NDAWN stations showing risk were those that had rainfall during the past 3-5 days. Head scab risk on June 24th was low for all NDAWN sites. *However*, the occurrence of scattered thunderstorms across the state this week may change disease risk at any site at any time, so continued monitoring of the disease forecasting site and the crop is necessary throughout the heading and flowering stages. Most spring wheat fields are not yet flowering, a key time for fungicide decisions and application. Some barley fields are fast approaching full head emergence.

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OPTIMAL GROWTH STAGE TIMING FOR FUNGICIDE APPLICATION TO SMALL GRAINS FOR SCAB MANAGEMENT

Timing in wheat

The optimum growth stage for applying fungicide for scab control in wheat, the Feekes 10.51 stage, is the same for all classes of wheat (winter, spring and durum). The Feekes growth staging system is used as it describes development from spike emergence to grain-filling in more detail than other systems (see table). Applying fungicide during early flowering helps protect against the fungus infection when it can do the greatest damage. The length of time from head emergence to the beginning of flowering is temperature dependent, but usually takes about three days. Experience has shown that it is better to apply fungicide too early rather than too late, so the beginning of heading is a good indication of when to get serious about spraying for scab in wheat.

Feekes scale: start of heading to early grain fill

Scale	Description
10.1	First spikelet of head just visible
10.2	One-fourth of head emerged
10.3	One-half of head emerged
10.4	Three-fourths of head emerged
10.5	Head emergence complete
10.51	Beginning of flowering (for wheat)
10.5.2	Half of florets have flowered
10.5.3	Flowering complete
10.5.4	Kernel watery ripe

The center spike in the following durum photo is at the ideal stage for applying fungicide in wheat. The spike on the left has emerged from the boot, but has not yet started to flower (note that there are no visible anthers extruded from the glumes). The spike on the right is past the optimum stage. Note that the anthers are bleached and dried, unlike the turgid, yellow anthers in the center spike.

Timing in barley

Flowering in barley begins just before head emergence, so barley florets are not overly susceptible to scab infection. Although scab infections do not generally impact yield greatly, the fungus is able to infect the glumes and produce DON (vomitoxin), which impacts the value of the grain in the market. The optimum stage for applying fungicides to protect the glumes of barley from infection is when the spike is fully emerged from the boot (Feekes 10.5).

In the barley photo, the plant second from the right is at the optimum stage for spraying. The plant on the far right is beyond the optimum stage. With barley, the appearance of the first spikelet from the boot, like the first plant on the left in the photo above, is a good indication that the best stage for spraying is only a few days away.

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soils

CROP YELLOWING, POST MORTEMS, AND CALLS TO ACTION

Following the last couple weeks of rainy weather, a number of wheat fields are showing yellow patterns. The time of wheat head emergence is a time of heavy requirement for nitrogen, and some fields are a little short in areas. Look for yellowing on lower leaves, with newer leaves emerging greener. For some fields, there is a general shortage due to application of surface urea and a long length of time before significant rain fell. I think the number of fields exhibiting this problem is few, due to the exceptionally dry status of surface soils during this period and the resulting low urease activity. For most fields, yellowing is either seen in depressions where water may have sat for many days, or in the coarser-textured hilltops/slopes where leaching occurred. If the percentage of acres showing these symptoms is large, a post-anthesis application of 30 lb N/a as 28% might increase protein content about 1/2%. 30 lb N as 28% will cost about $21/a plus application, so check to see if this might be profitable.

In corn, now that the weather has warmed, there are differences in greenness in most fields. I have seen problems with nitrogen availability, sulfur deficiency and zinc deficiency so far in my travels within the state. Nitrogen would be the result of poor selection of application method, or leaching in sandy soils, or denitrification in eastern counties due to water-logged/poorly drained soils. Look for yellowing on lower leaves, with the new leaves emerging greener. There is still plenty of time to side-dress traditionally, or dribble 28% between the rows (not over the whorl!!!) using a long hose or drop-nozzle.

Look for sulfur deficiency on coarse-textured hilltops and slopes with lower organic matter. Many areas have received large rains during a day or two, and any residual sulfate may be gone. Look for yellow upper leaves, with lower leaves remaining greener.

Many growers are not used to growing corn, and so may have taken zinc for granted. Look for stunted plants with yellow-striped upper leaves, usually on low organic matter hilltops and slopes. Foliar application of one quart/acre of zinc chelate will help to snap the corn out of its deficiency. DO NOT APPLY WITH HERBICIDE (See last weeks pest report). Apply in a separate application.

I have heard the first reports of failures to nodulate with granular inoculants this spring. One of the reports was poor calibration by the grower, which resulted in very spotty nodulation due to the low inoculant application rate and inability to deliver that low a rate through the air seeder. The second report is simply lack of nodulation by an experienced grower from a lot where another grower achieved successful nodulation. This report is a mystery. Given the high crop prices, and the need even for legumes for adequate nitrogen, now is the time to check and see if nodulation is taking place under peas, especially in fields far removed from the last time peas were in the rotation. Check soybeans when the plants have about 3 trifoliates. If there is no nodulation, application of supplemental N will be needed to carry the crop. I think the field that needs help will be rare, but better to find out now than August.

Finally, some crops, like the poorly nodulated peas, or the safflower field that was seeded without nitrogen, will need a rescue treatment of N. It is important to keep in mind the difference between “ideal” and “best-you-can-do”. We recommend primary fertilizer management practices because these most consistently increase grower profit with the least crop injury. Anything else is more risky and often increases crop injury. Application of top-dressed N to a solid-seeded crop falls into the “increases crop injury” category. I would recommend either urea broadcast, or, more practically, stream-bar liquid N (28%). In sunflower, field pea, soybean, and safflower, expect some leaf injury. Occasionally, some fertilizer might nuke a major growing point, causing the plant to branch. This is probably more serious in sunflower than in the other crops, but it will happen. Applying the liquid stream-bar at a slight angle to the row may not decrease the overall plant injury, but will not result in low stretches of row being injured. It will also be important to apply the stream-bar liquid when the wind is low enough that the stream is intact and not dispersed. A windy day will disperse the liquid stream into a broadcast application, resulting in widespread and unwanted injury to the crop. Remember, that even with some leaf injury using stream-bars, the yield increase from the fertilizer will outweigh the injury if the nitrogen is needed.

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weeds

PEST CONTROL IN VEGETABLE CROPS

A couple of weeks ago I mentioned a web site to find pest control information in vegetable crops. There another good web site with additional information. It contains the North Central Regional (NCR) "Midwest Vegetable Production for Commercial Growers". It is available through Purdue University.

http://www.btny.purdue.edu/Pubs/ID/ID-56/

LEGALITY OF MIXING PESTICIDES

1. Follow label directions.
2. Do your own jar formulation compatibility test.
3. Apply products at your own risk.
4. Call the representatives of the products for advice.

These are the four main recommendations for those thinking about combining pesticides that are not labeled for tankmixing and one-pass application.

Some research has been done with tankmixing herbicides to cover a normal weed spectrum but not much research has been done on tankmixing two types of pesticides. The main source of information on this topic would come from the manufacturers. What works? What doesn't work? Could injury happen and how much might occur? These are questions that should be considered.

Products registered on the crop can be legally tankmixed together unless restricted by either pesticide label. If not restricted then - you do so at your own risk, and the chemical companies do NOT have any liability if one or both products do not work, or if crop is injured. If you are intending to tankmix two products that are registered for separate use only, do a jar test first to confirm formulation compatibility. Jar test information is described on most pesticide labels.

Just because products are registered or the tankmix is registered doesn't mean that a one-pass application will be effective. Generally, the tankmix is being applied at the optimum time for one of them (herbicide) and may not be the optimum timing for the other (fungicide). Controlling weeds at the 2-, 3-, or 4-leaf crop stage may be too early for effective for disease control (depending on the type of weather).

WEED CONTROL IN WHEEL TRACKS

There is ample evidence of increased weed pressure in wheel tracts of crop planting equipment. Soil compaction by tires creates greater seed to soil contact, and with adequate soil moisture makes ideal conditions for germination. PRE herbicides that are have not received sufficient moisture for activation may not control these bands of weed. Even PRE that have been activated may show less control in these areas.

Weeds in wheel tracks have also been seen after POST herbicide applications (glyphosate) made during dry conditions. Dust is the main culprit and can significantly reduce weed control on the wheel track region. Many have fabricated special application equipment to apply a greater amount of herbicide in the wheel track area or apply before or after the equipment passes the weeds. There are not good solutions to overcome dust inactivation of herbicides.

CADET HERBICIDE

Cadet is a new postemergence broadleaf herbicide for use in corn and soybeans from FMC. It contains the active ingredient fluthiacet-methyl, which is a PPO-inhibiting herbicide (Group 14). Cadet can be used on field corn, seed corn, sweet corn and popcorn from V2 until 48 inches tall or before tasseling, whichever occurs first. The preharvest interval in sweet corn is 40 days. In soybeans, it can be used from first trifoliate to full flowering. Cadet rates are 0.4 fl oz/a in tank mixtures with glyphosate, 0.5 fl oz/a with other broadleaf herbicides, and 0.6 or 0.9 fl oz/a if applied alone. Cadet has excellent activity on velvetleaf and controls plants up to 36 inches tall at 0.6 fl oz/a or at lower rates in tank mixtures. Cadet has similar velvetleaf activity to Aim and Resource. At the 0.9 fl oz/a rate, it is labeled to control 2-inch tall lambsquarters, waterhemp, and jimsonweed and 4-inch tall pigweed, but these weeds are only listed as suppressed at lower rates. Cadet needs surfactant or crop oil plus a nitrogen additive if applied alone, but tank mixtures with a fully loaded glyphosate formulation should only need the ammonium sulfate that is typically used with glyphosate. Cadet has contact activity (does not translocate) and basically has no residual activity. It is an option when targeting velvetleaf alone or in tank mixtures with other broadleaf herbicides.

VOLUNTEER CORN CONTROL IN SMALL GRAINS

I have received several phone calls on volunteer corn control in small grains. Below is a list of postemergence grass herbicides labeled for use in small grains and their control of volunteer corn.

Herbicide	Vol corn control
Axial XL	None
Achieve	Not known
Discover	Excellent
Puma	Excellent
Everest	Excellent
Maverick	Not known
Olympus	Not known
Rimfire	Fair to Good
Silverado	Fair to Good

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diagnostic lab

UPDATE FROM THE PLANT DIAGNOSTIC LAB

The tables below summarize samples received and processed by the NDSU Plant Diagnostic Lab for the past two weeks (June 11 through June 25, 2008).

Table 1. Number of Sample Submissions by Category.

Sample Category	# of samples
Field crops	36
Nuts/seeds	33
Woody ornamental -Deciduous	9
Woody ornamental - Evergreen	5
Vegetables	4
Fruit	2
Total	89

Table 2. Diagnoses by state, county, and host.

County	Host	Diagnosis
MN-Kittson	Plant ID request	Speedwell, purslane (*Veronica peregrina*)
ND-Benson	Barley (*Hordeum* sp.)	Mechanical damage
ND-Benson	Winter Wheat (*Triticum aestivum*)	Wheat Streak Mosaic Virus
ND-Burleigh	Yew (*Taxus* spp.)	Scale insects (order Homoptera)
ND-Cass	Wheat (*Triticum* spp.)	Herbicide injury (a result of cool, wet soil)
ND-Foster	Dry bean (*Phaseolus vulgaris*)	Herbicide injury (a result of cool, wet soil)
ND-Foster	Spring Wheat (*Triticum aestium*)	Cool weather injury (not metabolizing herbicide)
ND-Hettinger	Spring Wheat (*Triticum aestium*)	Wheat Streak Mosaic Virus
ND-Mchenry	Ponderosa Pine (*Pinus ponderosa*)	Hail Damage
ND-Mclean	Winter Wheat (*Triticum aestivum*)	Wheat Streak Mosaic Virus
ND-Morton	Green Ash (*Fraxinu pennsylvanica lanceolata*)	Herbicide injury
ND-Morton	Pine (*Pinus* spp.)	Drought stress damage; Winter injury
ND-Richland	Spring Wheat (*Triticum aestium*)	Root rot (not specified)
ND-Sheridan	Sunflower (*Helianthus* sp.)	Herbicide injury (a result of cool, wet soil)
ND-Ward	Field Pea (*Pisum sativum*)	Cutworm damage

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around the state

Northwest ND

During the past week (June 17 – June 23), the region received rainfall ranging from sprinkle near Sidney, MT to about six tenths of an inch near Crosby based on NDAWN sites. There were reports of much heavier precipitation and hail in the region. Warmer temperatures during this time have been a benefit to producers as crops continue to grow.

Winter wheat has headed out while many of the small grains are at the 6 leaf stage and above. Again reports are that stands are at several different stages of that crop within a field because earlier dry conditions. Continued reports of tan spot and root rot diseases are starting to show up in small grain crops. Producers in the Yellowstone Valley are considering fungicide applications. Field pea leaf stages are up to the blooming stage. Canola is bolting and blooming as well. Root rot diseases are also being reported for field peas. Warm season crops are getting a good start. Corn is starting to green up and to progress. This warmer weather will improve their conditions. Alfalfa harvest has started in the Yellowstone valley.

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South-Central ND

During the past week (June 18 to 24), the region received rain ranging from less than 0.1 inch at Dazey, Linton, McHenry and Pillsbury to 1.9 inches at Fingal, based on NDAWN (North Dakota Agricultural Weather Network).

Crop growth has greatly accelerated during the past week with warm weather and adequate soil moisture. Winter wheat is in the flowering to early-seed development stages, and spring wheat and barley are in the boot to flowering stages. Corn has turned green and is at the 5- to 6-collar stage and nearing one foot in height. Corn planted on May 1 at Carrington is at 484 growing degree day (gdd) units and Oakes at 591 gdd units as of June 24, with both sites behind about 100 growing degree day units compared to the 5-year average.

Current farm activity includes herbicide application for weed control in soybean, dry bean and sunflower. A variety of wheat foliar diseases are present but generally at low incidence. Leaf rust was found in several winter wheat varieties grown in the Ellendale area. Farmers are making decisions on fungicide application and product selection for control of barley and spring wheat leafspot disease and suppression of Fusarium head blight (scab). Haying also began last week.

Upcoming crop tours to be conducted by the Carrington Research Extension Center include:

*Dazey off-station variety trials, July 8.
*Carrington pulse (primarily field pea), July 11.
*Carrington Field Day, July 15.
*Wishek off-station variety trials, July 16.
*Oakes branch station, July 29.

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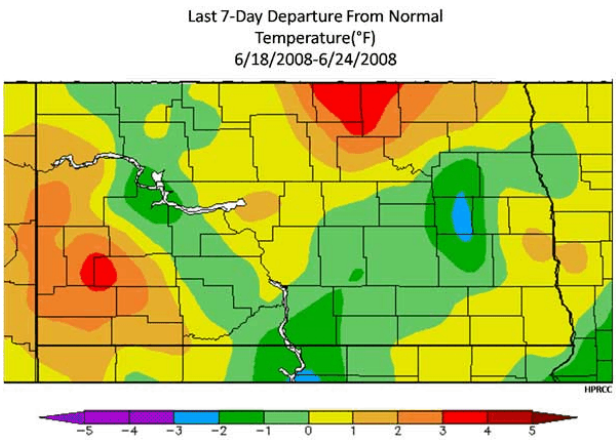
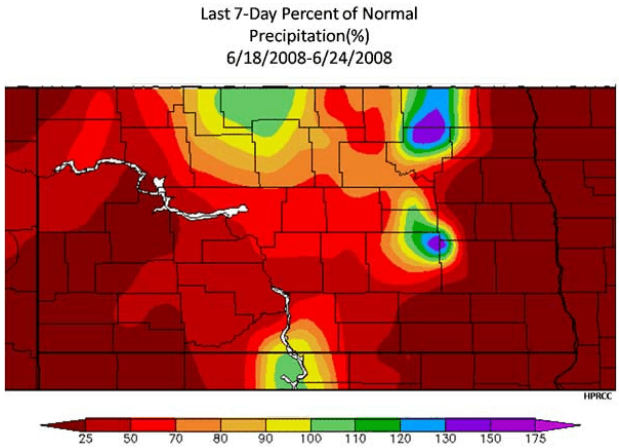
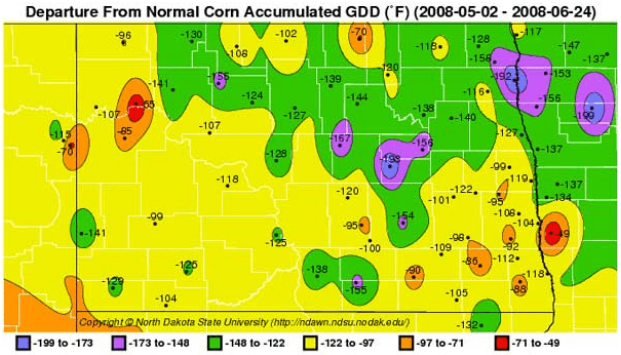
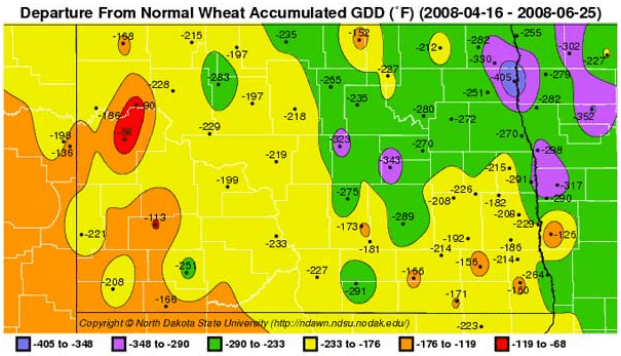
weather









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