North Dakota State University
# CROP & PEST REPORT
NDSU Extension Service

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## entomology

### SCOUT FOR ALFALFA WEEVILS IN SECOND CUTTING

Alfalfa weevils overwinter as adults (Fig. 1) in plant debris, woodlots, and ditches. As temperatures warm up adults migrate to alfalfa fields to lay eggs. By using degree days with a base of 48 F, the life stages and development of alfalfa weevil can be predicted (see degree day table). Go to the insect section in the NDAWN website:

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

and select the degree day base of 48 F to determine the accumulated degree days (DD) for your location. See map (Fig. 2) of North Dakota for alfalfa weevil degree day accumulations.

**Figure 1.** Alfalfa weevil adult (*photo courtesy Clemson Univ., USDA Coop. Ext. Slide Series, Bugwood.org*)

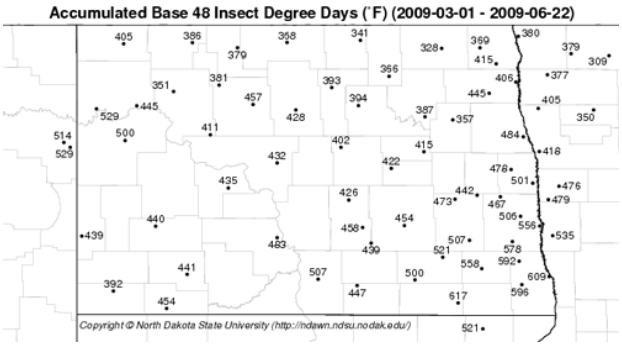


**Figure 2.** Alfalfa weevil degree day accumulations.

| Stage of Development | Degree Days Required to Complete Indicate Life Stage | Accumulated Degree Days (base 48 F) | Days | General Activity |
|---|---|---|---|---|
| egg | 300 | 300 | 7 to 14 | |
| 1st instar | 71 | 371 | 21 to 28 | Light leaf feeding |
| 2nd instar | 67 | 438 | | Light leaf feeding |
| 3rd instar | 66 | 504 | | Major leaf feeding |
| 4th instar | 91 | 595 | | Major leaf feeding |
| pupae-adult | 219 | 814 | 10 | Mating & egg laying |

Field scouting for alfalfa weevil is initiated at 300 DD. However, the cool spring has delayed alfalfa weevil development into the second cutting. Major feeding by the alfalfa weevil will occur from 430 to 595 DD ($2^{nd}$ - $4^{th}$ instar). At greater than 600 growing degree days feeding normally stops and adult emerge.

Scout the south-facing slope or sandy knoll areas which warm up rapidly first. These areas will have early development of alfalfa weevil larvae. Scout fields by sampling 10 plants in 5 random locations (50 total plants) and walking in an M-shaped or similar pattern throughout the field. Small alfalfa weevil larvae (Fig. 3) are slate-colored. As larvae mature, their color changes to bright green with a white line running down their back. Larvae have a black head capsule and are about ⅜th of an inch long.

**Figure 3.** Alfalfa weevil larva (*photo courtesy Clemson Univ., USDA Coop. Ext. Slide Series, Bugwood.org*)

Management of weevil infested alfalfa stands depends on when the infestation occurs. If the infestation occurs relatively late, when the alfalfa has reached 20 to 25 inches in height, consider taking an early harvest. Small larvae, those less than ¼ inch in length, will drop to the soil and generally die if the soil is dry. If the infestation occurs early, when alfalfa is 10 to 15 inches in height, chemical treatment may be necessary. Insecticide treatment is recommended if two live larvae per stem occur at this stage and/or 35 to 40% of the plants are showing tip feeding. In general, if alfalfa is 7-10 days out from harvest and 35 to 40% tip feeding is present, an insecticide treatment is recommended. North Dakota insecticide recommendations for alfalfa are listed at the following website:
http://www.ag.ndsu.edu/pubs/plantsci/pests/e1143w1.htm

Remember to check the preharvest interval as these restrictions vary according to the insecticide used and the rate applied. Other factors to consider when selecting an insecticide is its price, potential hazards to honey bees and whether or not it is a restricted use insecticide.

## INSECT SCOUTING UPDATES

**Wireworms:**
Some complaints have been reported with wireworm in no-till barley from Renville County near Mohall. Wireworms were tunneling up into stems and killing plants (appeared yellow and stunted, Fig. 4). If a plant is dissected, one will find a healthy wireworm larva inside stem. There was no insecticide applied as seed treatment in this case. The crop consultant indicated that some of the barley plants were recovering from injury and starting to tiller. On the North Central Region Extension Entomologist conference call this week, entomologists were concerned about the lack of control with insecticide seed treatments in general on many field crops including soybean, corn, canola and sugarbeet. This could be from the cool spring slowing plant development and uptake of insecticide active ingredients into the plant.

Fig. 4 Yellow barley plant that is injured by wireworms (photo by K. Michels).

**Soybean Aphids:**
Low populations of soybean aphids (<25 aphids per plant) have been reported in Indiana, Ohio, Michigan, Wisconsin, Iowa, Minnesota, and South Dakota. In MN, reports are mainly from the St. Paul area where the majority of the overwintering host, buckthorn, occurs. There are no reports from northwest or southwest MN yet. The recent rains may provide some control of aphids by drowning them in areas with severe thunderstorms. However, do not expect much control of aphids from entomopathogens, since these insect-killing fungi require cooler temperatures (in 70s F) for aphid control.

**Seed Corn Maggots:**
Seed corn maggots on dry beans have been reported causing reduced plant stands and spindly seedlings near Finley in Steele County and on corn at Prosper in Cass County. Seed corn beetles were also reported on corn at Prosper. There are NO rescue insecticide treatments available for seed corn maggot. Insecticides must be

applied as a seed treatment or at-plant to control seed corn maggots. Most of the fields with problems had no insecticide treatments and had manure applied. Seed corn maggots prefer fields with high organic matter (e.g., manure). Wet, cool springs also provide ideal conditions for high populations of seed corn maggots.

**Wheat Stem Sawfly:**
Adult wheat stem sawfly is emerging in large numbers in southwest North Dakota near Hettinger, Regent and Scranton. There are no reports of sawfly in north central or northwest regions of North Dakota yet. However, emergence should be underway soon. Adult sawflies can be monitored using sweep nets or yellow sticky cards. Adult wheat stem sawflies are dark and slender, with yellow markings on the abdomen. The adults are less than 1 inch long, and females are generally larger than males though size can vary greatly (Fig. 5).

Fig. 5 Adult wheat stem sawfly (photo by J. Knodel).

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**SUGARBEET ROOT MAGGOT HOT SPOTS ERUPTING**

Major increases in sugarbeet root maggot (SBRM) fly activity have been observed at several sites in the NDSU trapping network during the past several days. Of the 43 monitoring sites, the most active hot spots as of June 22 include fields in the following areas: Manvel, Minto, Grafton, Voss, Nash, Auburn, St. Thomas, Glasston, and Hamilton in ND; and Ada, Borup, Crookston, and Euclid in MN. Although this monitoring program is a good indicator of general activity across the production area, it is no substitute for closer monitoring of individual fields.

Fly activity in the central and southern Red River Valley has probably peaked in the past 2-5 days. The root maggot model suggests that 3-5 more days of high activity are possible for the northern Valley. Weather conditions during the next few days will have a major influence on the exact date of peak activity in fields that have not yet peaked. Cold, windy, or rainy weather will delay the actual peak, even if adequate DD units have been accumulated for adults to emerge from soil.

Current DD accumulations and the updated forecast for peak fly activity at representative locations in the Red River Valley are presented in the following table:

**Degree-day (DD) accumulations for sugarbeet root maggot development and peak fly forecast as of June 22, 2009**

| Site | Air DD[1] | Peak fly activity forecast |
|---|---|---|
| Fargo | 655 | Peaked about June 20 |
| Hillsboro | 617 | Peaked about June 22 |
| Grand Forks | 590 | Peaked about June 23 |
| Grafton | 503 | June 27 + 1st 80° day |
| Cavalier | 494 | June 28 + 1st 80° day |

Raw data provided by the North Dakota Agricultural Weather Network (NDAWN)
[1]Peak fly activity occurs in current-year beet after 600 air DD.

Postemergence additive insecticide applications are recommended in areas of moderate to high risk for damaging root maggot infestations this year. Fields at most risk are those where a moderate rate (10 lb product/ac or lower) of a granular at-plant insecticide was used or in those planted with seed coated with Poncho Beta insecticidal seed treatment. Fields treated with Mustang Max insecticide at planting time will also be at risk because the product is only considered to provide suppression of SBRM. If fly activity in a particular field exceeds about 1 fly per 2 plants, the field should be checked daily to determine if activity increases. Once activity reaches about 0.75 flies per plant on average across the field, a postemergence insecticide application should be made to protect the field.

The 2009 risk map for sugarbeet root maggot infestations in the Valley is presented in Figure 1. Growers in areas of moderate to high risk of damaging maggot infestations should be vigilant at monitoring fly activity in their fields, and plan on applying an additive postemergence insecticide to ensure adequate control.

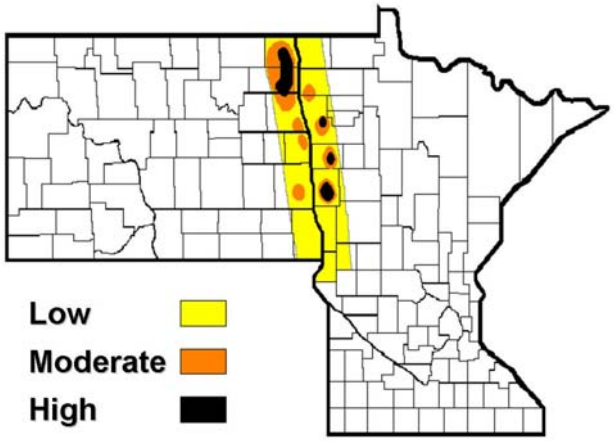


**Figure 1.** 2009 Forecast map for sugarbeet root maggot populations in the Red River Valley (based on fly activity and root maggot feeding injury ratings at 40 monitoring sites during the preceding growing season)

**Postemergence Control Tips:** At this late date in fly development/activity, granular insecticides are no longer a viable option. Thus, liquid insecticides will be the tools of choice. Liquids work best if applied between 3-4 days before or within 3 days after peak fly. NDSU research indicates that control can be optimized by splitting full rates of Lorsban 4E (and other chlorpyrifos-containing liquid materials labeled for use in sugarbeet) in to two applications: make one application a 3 or 4 days before anticipated peak fly and repeat it about 7 days later. This strategy should work well this year with such high fly activity spread over several days of warm weather surrounding the actual peak. Rates less than 1 pt/ac should be avoided if applying as a broadcast treatment.

**Be careful of label restrictions!** The North Dakota Department of Agriculture will be monitoring pesticide applications closely. The following restrictions apply to Lorsban 4E most other materials containing chlorpyrifos as the active ingredient:

1. Restricted-use pesticide: treated fields must be posted
2. Do not make more than 3 applications per season
3. Do not apply more than 6 pints of product (3 pounds a.i.) per season
4. Maximum single rate: 2 pints product (1 lb a.i.) / acre
5. Wear personal protective equipment (see label)
6. Do not re-enter or allow a worker to enter treated field within **24 hours** unless required personal protective equipment is worn.

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# plant science

**NITROGEN AND NODULATION IN SOYBEAN**

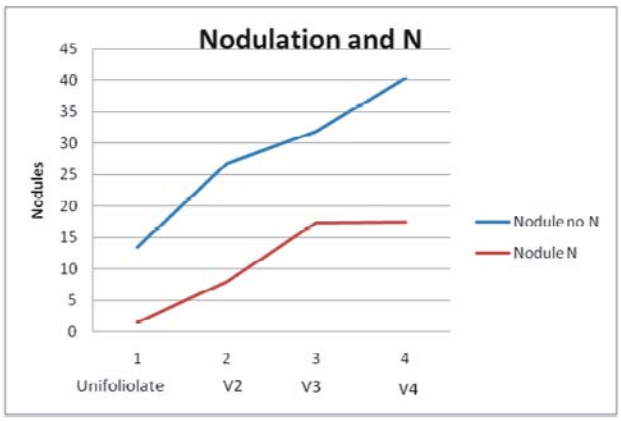
Soybeans are legumes that form a beneficial relationship with specialized bacteria to fix atmospheric nitrogen (N) making it available to the soybean plant. In North Dakota soybeans do not normally require N fertilizer because of this relationship with beneficial bacteria. The nitrogen-fixing bacteria colonize host roots and form nodules (small swellings) on the root system (see picture). These nodules are pink or red inside when they function properly.

Nodulation is decreased when Nitrogen is available in the soil. Limited nodulation may also occur in fields where there is no previous soybean cropping history (limited numbers of beneficial bacteria). Other factors that may reduce nodulation are wet conditions early in the season or dry soil conditions. The presence of root rots may also inhibit the ability of the bacteria to form nodules. It is recommended to check roots for nodules. Carefully dig up plants to avoid sloughing off the nodules and wash them in a bucket of water. Check a number of locations in each field.

During the past winter a hands-on demonstration about the effect of nitrogen application and nodulation was given at two locations (Grand Forks and Fargo). Sixty-seven groups of 3 to 4 producers were asked to evaluate soybean plants at four growth stages (unifoliolate, V1,V2, and V3) for their nodule number per plant and compare plants which had received nitrogen to plants which received no nitrogen. Dr. Jay Goos and his team prepared the demonstration and grew the plants in a greenhouse.

Each pot was filled with one kg 'Renshaw' sandy loam soil and one kg sand. The soil pH was neutral and had no history of soybeans. Soil was inoculated at a level of roughly 1,000 Bradyrhizobium japonicum per gram. Nutrients (P, K, S and Zn) were applied before inoculation and mixed completely with the soil mass. Two Nitrogen rates were 0 and 200 mg N/pot. By surface area, the equivalent N rate was about 100 lb N per acre.

The average of the observations made by producers is summarized in graph below. Pots which did not receive Nitrogen had higher numbers of nodules at each of the four development stages and the nodules where bigger. This demonstration showed clearly that the Nitrogen available to the plant resulted in lower numbers of nodules and smaller nodules. Most fields will have some residual nitrogen at the beginning of the growing season and soybean plants will use this Nitrogen. In North Dakota, we do not recommend the application of Nitrogen fertilizer if the plant is able to normally nodulate and provide the needed Nitrogen to the plant from the symbiotic relationship with the beneficial bacteria.

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**COVER CROPS FOR "PREVENTED PLANTING" ACRES**

As a result of a multitude of weather related challenges beginning last fall and continuing this spring, many acres have not been planted this cropping season. We are now past the late planting period for practically all crops and decisions are needed on how to manage fields that were not planted. Many will want to plant a crop in order to deplete water from the soil so as to improve the chances of planting a crop next spring. Additionally, in order to maintain eligibility for Direct and Counter-cyclical Payments on land that was not planted this spring, it must be protected from wind and water erosion and must be maintained to control the propagation of weeds, including noxious weeds throughout the crop year. Approved practices include:

1. Leaving crop residue after mechanical cultivation or chemical fallow.
2. Solid seeding of a crop that is seeded early enough to provide an adequate cover.
3. Rye and winter wheat seeded during the normal fall planting date for harvest the following year.
4. Approved wildlife food plots which may include corn windbreaks.
5. Flax strips at the normal seeding rate of not more than 16 feet apart may contain a minimum of one row of flax, with two or more rows encouraged. Two or more rows are required on flax strips up to 25 feet apart.
6. Winter wheat or fall rye strips up to 18 inches in width to be used the following spring for sugar beet seeding.
7. Spreading of straw-type manure and/or crop residue can be substituted in place of cover crop or crop residue.
8. Tillage is allowed to control weeds, wind and water erosion in a manner consistent with erosion control measures normally carried out on other crop land in the area.
9. Weeds, including weeds on planted acreage, must be control by either mechanical or chemical treatment.

Additionally, if a prevented planting payment was received, cover crops cannot be grazed or hayed until after November 1st. Given the above guidelines and restrictions, the following are some suggestions on potential cover crops and other management practices.

1. Small grains – Small grains can be planted as soon as conditions allow, usually establish quickly and are relatively heavy water users. Because small grains will likely head and produce seed, even when planted in June and July, they should be handled as a green manure crop and should be incorporated into the soil before viable seeds are formed. The advantages of using a small grain crop as a cover are: seed is usually available on-farm, seed costs are moderated when using retained seed, they compete well with weeds, and numerous herbicide options are available for within crop weed control, if needed.
2. Sugar beets – In the unlikely event that you can find a cheap source of non-GMO seed, sugar beets would be an excellent crop for areas of excess moisture and developing salt problems. Sugar beets' deep roots are capable of capturing nitrogen that might have moved to deeper soil profiles and are fairly tolerant to moderate levels of salt.

3. Sudangrass, sorghum-sudangrass hybrids, and millets – These warm season grasses are capable of excellent growth and form a good cover when planted when temperatures are warm. If planted in late June or early July, these crops would have to be grown as a green manure crop; however, since they cannot be hayed or grazed until after November 1st, and would be quite tall and not particularly palatable by that date. When planted in late July or early August, they may be in reasonable form for grazing or haying after November 1st if producing fodder is one of your objectives. The growth of these grasses is retarded when temperatures dip below 60 degrees.
4. Warm season legumes – There are a few species of legumes that establish and grow well in mid-summer. These include the sweet clovers, cowpea, soybean, and Sunn Hemp. The advantage of growing a legume cover is that it is able to fix nitrogen prior to being incorporated into the soil. The downside is the cost of the seed. Furthermore, some of the small seeded legumes have hard seed coats and may become a nuisance in subsequent crops. Bin run soybeans with GMO herbicide tolerance cannot legally be grown, even if there is no plan to harvest the seed.
5. Commercial mixtures of cool season crops – A few seed companies market mixtures of crops specifically for use as cover crops following a normal fall harvest. Since these mixtures contain cool season crops they tend to do best when planted in August when temperatures begin to cool. Therefore, they would be a poor option for developing a cover in early or mid-summer if that is your objective. Seed cost for some of these mixtures can be pricey.
6. Flax and winter wheat – If you plan to plant winter wheat, planting flax in early August to establish a residue crop in which to plant winter wheat is probably the best available option. Recommendations on how to use flax as a residue crop were contained in an earlier issue of this newsletter.
7. Chemically fallowing previous crop residues in no-till regions – For regions of the state where no-till is practiced and excessive moisture is usually not a serious issue, retaining the existing residue and controlling weeds with herbicides can be a practical option. If residues are of sufficient height, they could also be used for establishing winter wheat this fall.

Undoubtedly there are many other viable cover crop options that might be considered. When choosing a crop, consider the cost of seed, the objective of establishing the cover, how the potential crop might respond to mid-summer or fall planting, and how you plan to use the crop residue once it is established.

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# plant pathology

**NDSU IPM FIELD SURVEY UPDATE**

NDSU IPM field scouts surveyed 124 wheat fields and 37 barley fields across the state for the week ending June 19. The average growth stage for wheat fields was the tillering stage, and ranged from 1.5 leaf to flowering. The average growth stage for barley also was at tillering, and ranged from 1.5 leaf to boot.

**Tan spot** was found in 65% of the wheat fields surveyed, with an average severity in infected fields of 4.3%, and a high severity of 40% in one winter wheat field in a southeast county.

Five wheat fields were observed with **wheat streak mosaic** symptoms and two fields showed **barley yellow dwarf virus** symptoms. Only one field was observed to have a few grain aphids present. In barley, 65% of the surveyed fields had symptoms of either spot blotch or net blotch fungal leaf spot. As observed the previous week, severities of these two barley leaf spots remained low.

The NDSU IPM web page is now posting maps of field survey observations, at:

http://www.ag.ndsu.nodak.edu/aginfo/ndipm/

These maps will be updated on Wednesdays or Thursdays of each week.

**WHEAT LEAF RUST**

Wheat leaf rust was found by Greg Endres, Carrington REC Extension Agronomist, on June 23 in Jagalene winter wheat at the Ellendale winter wheat plot site. This is the first report of wheat leaf rust in ND this year. Jeff Stein, SDSU plant pathologist, reported that he observed wheat leaf rust on winter wheat on June 15th at Brookings, SD.

**NDSU DISEASE FORECASTING SITE SHOWS INCREASED WHEAT DISEASE RISK**

Rainy weather this past week has increased the risk of leaf disease and head scab infections in some areas of the state, especially in those areas with repeated rains and recurrent high dew points. The NDSU Small Grain Disease Forecasting site at:

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

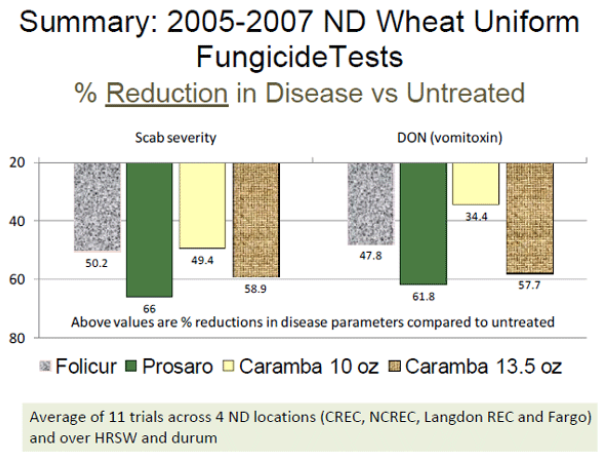
predicts risk of infection for tan spot, Septoria blotch, leaf rust and Fusarium head blight (scab).

With the wide range of crop growth stages and the unpredictable weather this year, it is critical to keep on top of disease risk forecasts, disease development, and crop growth stages, to be sure that any needed fungicide is applied, and is applied at the appropriate timing. A blanket statement about disease risk and need for fungicide isn't going to work at all this year, because of the high variability in crop growth stages, crop condition, and spottiness of showers.

**ND DATA COMPARING PRODUCTS FOR FUSARIUM HEAD BLIGHT (SCAB) SUPPRESSION**

Several new products have been registered for scab suppression in wheat and barley this past year that generally have better activity against Fusarium head blight (scab) than Folicur (tebuconazole), the product that was traditionally used for this purpose for many years, available then as a Sec. 18 Emergency Exemption product.

The two newest products available are Prosaro (tebuconazole + prothioconazole), manufactured by Bayer Cropscience, and Caramba (metconazole), manufactured by BASF. The following table provides comparisons of these products to Folicur for reduction of scab severity and DON (vomitoxin). The data is a summary over uniform fungicide trials that were conducted on wheat and durum across ND from 2005-2007.




Average of 11 trials across 4 ND locations (CREC, NCREC, Langdon REC and Fargo) and over HRSW and durum

**CORRECTION TO LAST WEEK'S REPORT ON FUNGICIDES FOR SCAB MANAGEMENT**

In last week's edition of the NDSU Crop and Pest Report, I provided a table listing the recommended fungicide products for Fusarium head blight (scab) suppression in wheat and barley. I indicated that Caramba (metconazole) was registered for scab suppression from 10 to 13.5 fl oz/acre, with the higher rate giving better scab suppression.

In fact, the Caramba label from BASF states that the rate used for scab suppression should be 13.5 to 17 fl oz. The 10 fl oz rate is for leaf disease control only. Therefore, application of a 10 fl oz rate/acre of Caramba for Fusarium head blight (scab) suppression is not supported by the Caramba label.

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## soils

**YELLOW SOYBEAN SEASON**

With the recent wet weather and many soybeans in the region reaching the first trifoliate state, yellow soybeans have returned. The most common reason that soybeans in the region turn yellow is from iron deficiency chlorosis (IDC) and nitrogen deficiency. To find out which one is causing the yellow problem, look at the leaves. If the mid-rib is greener than the area between the veins, the problem is IDC. If the veins are also yellow, the culprit may be nitrogen deficiency. This early in the season, N deficiency is seldom a problem. The condition may persist if the soil remains saturated with water and nodules are late developing. First or second year soybeans in a field is particularly worrisome, because it suggests that the field has not been adequately nodulated. If soybeans grow to the 4$^{th}$ true leaf and N deficiency yellowing persists, a top-dress N application may be warranted. These statements are purely precautionary, since N deficiency to this degree in soybean is seldom a problem.

If a field exhibits IDC symptoms, this is a perfect time to take an aerial photo of the field, or call in a satellite image. If you ever wondered where the calcareous portions of your fields were, now is the time to take the shot.

Iron deficiency chlorosis is primarily caused, and cannot arise, without carbonates in the topsoil or shallow subsoil. A host of other additional soil, plant and cultural factors serve to make the problem worse. In addition to calcareous soils, salinity, cool weather, moist to wet conditions, soil nitrate, and spring compaction or lack of compaction (depending on soil moisture conditions), variety, and herbicide application can all make IDC symptoms more severe. This would also be a good time to evaluate any seed-placed iron products that might have been applied this spring.

**CORN SEED FERTILIZER INJURY**

In evaluating corn stands, it is clear that some fields suffered from fertilizer injury at seeding. In wet fields, some growers wanting to deep-place fertilizer had to move the fertilizer placement towards the surface. Fertilizer placement with high urea-N rates too close to the seed can and probably have resulted in corn germination injury. In addition, anhydrous ammonia applications were for the same reason more shallow than normal. The closer anhydrous ammonia is to the seed, the greater chance of seed death. In the future, application of anhydrous ammonia at an angle to the projected seed-row direction is advised, since there is no truly safe waiting

time between anhydrous ammonia application and seeding. Not even the fall before. Also, if deep-banded fertilizer applications move nearer the seed due to wet conditions, rates need to be correspondently lower, and urea may need to be taken out of the blends.

**TOP-DRESSING AND WIND**

Any liquid N applications to increase yield on small grains need to be applied with stream-bars. Just having stream-bars on an applicator, however, is no guarantee that the application of N will actually be streamed. Wind plays a role in determining whether stream-applied N stays in the stream. Streaming N in windy conditions breaks up the stream and the application can turn into a leaf-burning broadcast application. Usually wind less than 10 mph does not disrupt the stream. However, some awareness by the applicator would be wise so that the effect of applicator speed in addition to wind is considered. Having someone watch to make sure that the stream is hitting the ground as a stream would be a good plan.

If conditions are too windy and the stream breaks up into a broadcast application, major leaf burning will result. In most studies in North Dakota with 10 gallon/acre of 28% N, leaf burn did not reduce yield. A recent study on winter wheat in Oklahoma confirms our observations. However, higher rates than 10 gallon per acre may cause some crop damage if leaves are burned in a broadcast application.

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**CONTROLLING UNCONTROLLED RAGWEED**

How do I control ragweed that survived the first application? The answer to this depends upon how they survived treatment with glyphosate. If most were controlled and the survivors were still substantially affected, then it may be possible to apply glyphosate again and obtain adequate control. The addition of another product with activity on ragweed could certainly improve control, especially where plants are large. The question here is whether the survival is indicative of a low level of resistance, and an alternative to glyphosate should be used if there are doubts that a second glyphosate application will work.

Where many plants survived the first glyphosate application and showed little response to glyphosate, which is indicative of resistance, it will be necessary to apply a postemergence alternative to glyphosate that is effective on ragweed. Possibilities here include Status, Hornet, Impact, Callisto, Laudis, and NorthStar, among others. In Liberty Link corn, Ignite would be an effective option. Impact, Callisto, and Laudis are most effective on ragweed when mixed with atrazine. Labeled rates and recommended adjuvants should be used to maximize effectiveness of alternatives to glyphosate. It is possible to add some glyphosate to improve control of other weeds. However, be sure to add crop oil concentrate or MSO if recommended on the label of the alternative herbicide, instead of relying on the surfactant that is in most glyphosate products.

**CAN I EAT "DRIFTED-ON" VEGETABLE GARDEN PRODUCE?**

The answer to this "no", except where the herbicide is labeled for the garden plant of concern (such as Callisto or Laudis on sweet corn). Since most corn and soybean herbicides are not labeled for use on vegetables, there is no established tolerance for the allowable herbicide residue in the produce, and therefore no guidelines for "safe" use have been established.

**HOW MUCH N WILL WEEDS ROB FROM CROP?**

A Michigan State University timing study on post emergent weed control showed that 95 percent of weed control or better can be achieved when weeds are 9 inches tall, but yields were reduced 25 bushels per acre (Everman et al., 2008). Post-emergent herbicides provide a greater window of opportunity to control weeds, but delaying application allows weeds to use available N and other nutrients from the intended crop. In a two-year study in Wisconsin, there was no yield loss when weeds were controlled at the 4-inch stage, but delaying application on 12-inch weeds resulted in an average 9 percent yield loss. Looking at the data from another view point, 2006 data showed the MRTN rate was 96 lbs per acre when weeds were controlled at 4 inches, compared with an MRTN rate of 200 lbs per acre when weeds were controlled at 12 inches. Timely weed control will ensure valuable nutrients are used for crop production rather than weed production. (Boerboom et al., 2008.)

**EPA APPROVES LABEL UPDATE FOR LAUDIS**

The EPA recently approved several label updates for Laudis herbicide. Label updates include:

- In most situations, growers can now rotate to sugarbeets and certain dry beans 10 months after Laudis application. The previous rotation requirement was 18 months.
- EPA approved the use of High Surfactant Oil Concentrates (HSOC) with Laudis as alternatives to traditional MSO surfactants. The label update also includes guidelines for using HSOCs with glyphosate herbicides.
- If growers need to make a second application of Laudis on field corn, white corn or popcorn, the applications can now be made seven days apart. The previous requirement was a 14-day waiting period.

Laudis controls grass and broadleaf weeds such as ragweeds, lambsquarters, velvetleaf, waterhemp and woolly cupgrass in corn fields. The Laudis formulation includes an effective safener that ensures crop safety.

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**WEED CONTROL IN ROUNDUP READY SUGARBEET**

For those growers unable to apply glyphosate to Roundup Ready sugarbeet for the first time due to wet soil conditions, apply the maximum rate of glyphosate allowed. The maximum glyphosate rate for Roundup Ready sugarbeet is 1.125 pounds acid equivalent per acre (lbs ae/A). This equates to 32 fluid ounces per acre (fl oz/A) of Roundup-branded products, 48 fl oz/A of 3.0 pounds acid equivalent per gallon (lbs ae/gal) products, and 39 fl oz/A of 3.7 lbs ae/gal products. This glyphosate rate can only be applied up to the eight-leaf stage of sugarbeet. This rate should be applied to any field with weeds greater than two to three inches in height or with difficult to control species such as wild buckwheat, lambsquarters, and common and giant ragweed.

The timing of sequential glyphosate applications should be based upon weed density and height and whether individual plants survived the initial application. Generally, sequential applications should be applied 18 to 30 days after the preceding application. The greater the weed density the sooner glyphosate should be applied sequentially. Once weeds reach three inches in height, regardless of weed density, glyphosate should be applied a second time. If plants survived the initial application of glyphosate, apply glyphosate at the highest legal amount 14 to 21 days later, regardless of weed density and height. Once sugarbeet has developed beyond the eight-leaf stage, glyphosate can only be applied at 0.75 lb ae/A. This is equivalent to 22 fl oz/A of Roundup-branded products, 32 fl oz/A of 3.0 lbs ae/gal products, and 26 fl oz/A of 3.7 lbs ae/gal products.

If common or giant ragweed have survived the initial glyphosate application, clopyralid can be mixed with glyphosate at a rate of 4.0 fl oz/A. This rate of clopyralid will not control all ragweed plants in the population, but should keep the ragweed from competing with the crop, unless high densities are present. If other weed species, not susceptible to clopyralid, survive a glyphosate application in Roundup Ready sugarbeet, one option is to continue to apply the highest legal rate of glyphosate in subsequent applications. The only other option is to cultivate and remove any remaining surviving plants by hand.

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## forestry

**HEAVY SEED CROP ON SIBERIAN ELM TREES**

This week, I've received a couple of calls regarding the heavy seed crop seen on Siberian elm trees. The phenomenon is fairly widespread, as the calls came from Sargent County and Griggs County. On a trip from Bismarck to Fargo last week, I observed the same thing – Siberian elm trees that had crowns with a mixture of brown (seeds) and green (leaves). Both callers had the same question – Does this heavy seed load indicate a massive die-off of Siberian elm? After all, many trees and other plants will bear heavy seed crops right before they die. It's as though the trees "know" they're about to die, and so they put all of their energy into one massive, final reproductive effort before they expire.

To be honest, nobody knows for sure why the Siberian elms are acting this way this year. The idea suggested by the callers – massive reproduction effort before dying – is something I suggested last year when I saw the same phenomenon on Siberian elms in Bismarck (Crop and Pest Report, June 12, 2008). A recent phone conversation with the Bismarck city forester assured me that there was no massive die-off of Siberian elms in Bismarck last year.

Two other explanations have also been suggested. The first is that the trees are coming out of several years of drought, and with the increased soil moisture this past spring, the trees are finally able to put their energy towards reproduction instead of just survival. That explanation may hold some truth in some parts of the state, but not all locations are coming out of a drought. The second explanation is simply that conditions for

pollination were perfect this year across a wide geographical area. Most elm species have a heavy seed crop every 2 to 3 years.

Only time will tell if the heavy seed crop we're seeing is a precursor of something worse. In the mean time, a related question arises – Will the elm trees leaf out to their full potential? Many tree crowns appear thin right now, especially with the backdrop of brown seeds. I believe that, given decent growing conditions, the trees will develop fuller canopies as the summer progresses. Elms have an indeterminate growth habit. That means that some leaves are pre-formed in the bud, but others are not. After the pre-formed leaves have developed, new twig and leaf growth will continue straight through summer until the end of the growing season. So, we can expect the crowns of Siberian elms to continue to look better as the summer goes by, as long as we have decent weather.

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## around the state

**South-Central ND**

During the past two weeks (June 10-23), the region received 0.1 to 5 inches of rain, according to NDAWN weather stations, while reports of up to a foot of rain were received from the Bismarck area. Growing degree day units for corn planted May 1 through June 23 range from 455 to 580 units, which are -70 to -170 units behind for the period compared to the long-term average. Early-planted corn is in the 5- to 6-leaf stage. Some corn in southern counties is near 'knee high' and much of the corn will be at this height by July 4. Winter wheat is flowering and fungicide application for control of leafspot disease and scab is recommended. Leaf rust was found on a susceptible variety of winter wheat near Ellendale on June 23. Small grain planted during the first week in May is in the jointing stage. Cool-season crops generally appear excellent. Soybean and dry bean planted during the third week of May are in the 1- to 2-trifoliate stages. Alfalfa and grass hay cutting is in progress. Corn side-dressing with nitrogen also is occurring. Small grain aphids have been detected in the region.

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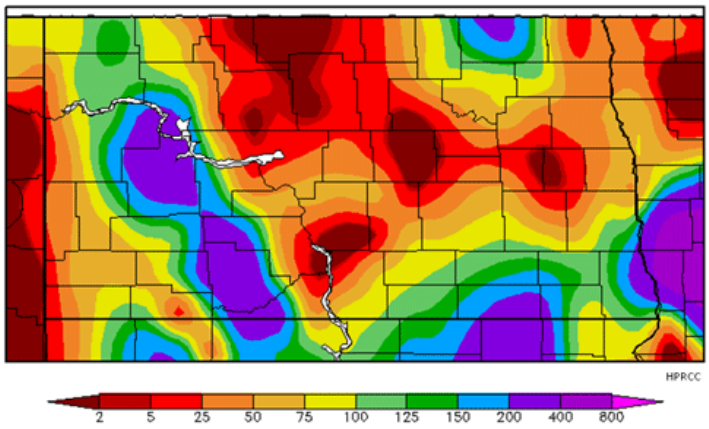
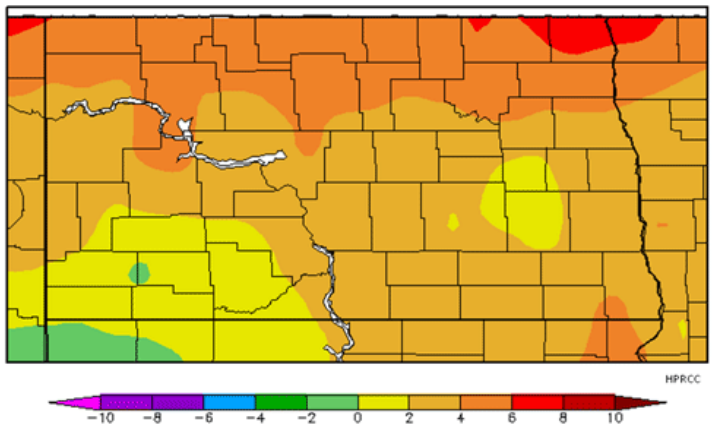
# weather

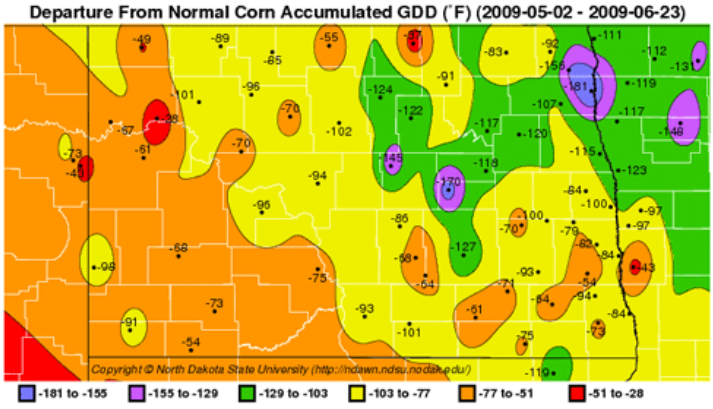
Last 7-Day Percent of Normal Precipitation(%)
6/17/2009-6/23/2009



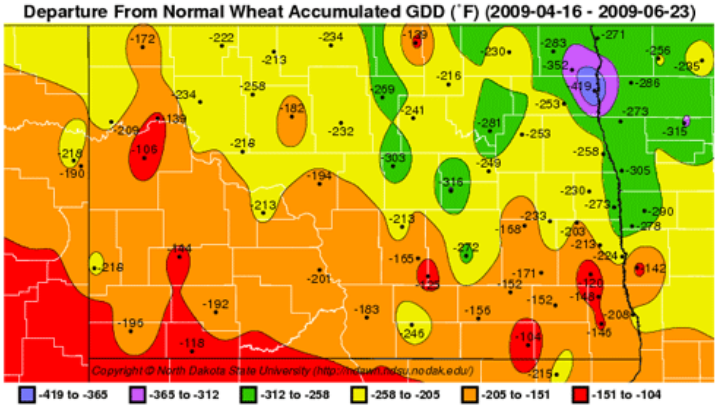

Last 7-Day Departure From Normal Temperature(°F)
6/17/2009-6/23/2009




Departure From Normal Corn Accumulated GDD (˚F) (2009-05-02 - 2009-06-23)




Departure From Normal Wheat Accumulated GDD (˚F) (2009-04-16 - 2009-06-23)

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