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PLANT PEST Newsletter



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ALFALFA

ALFALFA WEEVIL—As we quickly move from winter to summer, alfalfa is beginning to green-up with 1 to 2 inch growth common across the southern part of the state. So far, there has been no serious insect activity to cause concern, but the weevil complex (alfalfa and clover leaf weevils) represents the first group of insect pests to be aware of. Adult alfalfa weevils are now active and laying eggs in alfalfa stems. Alfalfa weevil can overwinter in both the egg and adult stages, but because of our “typically” harsh winter weather, very few eggs usually survive.

Most of the larvae that eventually develop in the spring (on the first crop) result from spring-laid eggs.

Beginning with this issue of the Newsletter, I will be providing weekly updates to keep you informed as to the degree-day (heat-unit) accumulations for about 20 locations in most of the major alfalfa-growing areas of the state. By following the degree-day accumulations, this information should help you know when to be looking for key events such as hatching of first-instar (young 1/8") larvae and peak larval activity. For those not familiar with

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contact Extension Plant Pathology at 612-625-6290**

ALFALFA (Continued)

the degree-day concept, insects (unlike mammals) cannot regulate their own body temperature. Therefore, nearly everything they do such as feeding, flying and developing (e.g., molting through each larval stage) is dependent on their environmental temperature. The degree-day model also assumes there is a minimum temperature threshold, below which no significant development occurs. Degree-days, then, are the number of degrees (usually in °F) that accumulate above the minimum threshold each day.

A good illustration is to use the maximum-minimum method to calculate degree-days. Using the 48°F threshold for alfalfa weevil and assuming maximum and minimum temperatures of 82 and 50 for a given day, degrees above the threshold for that day are as follows:

$$\frac{82 + 50 - 48}{2} = 18 \text{ degrees/day}$$

Summing these degrees (or heat units) each day (e.g., since January 1st or since planting date for plants) provides an estimate of the heat accumulated to date that is necessary for growth and development of the organism. This year for the alfalfa weevil, I will be experimenting with several different starting dates, but for now we will continue to use the traditional January 1 starting point. We can expect hatching of first-instar larvae to occur after **300 degree-days** have accumulated. As shown in the table below, we are still below the 300 level throughout the state (as of 4/22). Up until last Friday (4/20), we were only accumulating about 2 degree-days/day. Beginning last Saturday (4/21), most areas of the state were accumulating 15-20 degrees per day. By the time you receive this newsletter, you can safely add another 50-70 degree-days to the current estimates in the table to provide a more up-to-date degree-day accumulation.

ALFALFA WEEVIL DEGREE-DAYS (>48°F)

<u>WEST</u>		<u>S. CENTRAL</u>	
Alexandria	- 83	Faribault	- 83
Morris	- 116	Mankato	- 132
Montevideo	- 115	Waseca	- 114
Willmar	- 79	Winnebago	- 98
<u>CENTRAL</u>		<u>EAST</u>	
St. Cloud	- 84	Rosemount	- 126
*Becker	- 53	Redwing	- 131
Hutchinson	- 86	Rochester	- 84
Cambridge	- 84	Winona	- 105
St. Paul	- 127	Caledonia	- 70
		LaCrosse	- 123

CLOVER LEAF WEEVIL—This weevil primarily overwinters in the larval stage. Given the relatively mild winter, dry fall and dry spring, it is possible that naturally occurring fungal diseases may not have had a major impact on overwintering mortality. Larvae have been detected in southern Iowa. Remember, clover leaf weevil (CLW) larvae have a similar shape and green color as alfalfa weevil (AW) but CLW larvae have brown heads whereas the AW larvae have jet-black head capsules. CLW larvae also grow to about 2X the size of AW larvae. CLW are difficult to detect because they do most of their feeding at night and spend the day at the base of the alfalfa crown or in the stubble. If present, you should be able to detect them on the foliage in the evening. Fields that should be watched most closely are those that had high numbers last summer or those that are not greening up in the presence of adequate moisture. Significant populations, however, usually do not develop until late into the first crop or after first cutting.

PEA APHIDS—Pea aphids (small, green, soft-bodied insects) have been observed at Rosemount and in commercial fields south of the Cities. Nymphs now present have developed from overwintering eggs. These nymphs are more stout and have very short antennae and cornicles ("tail-pipes") compared to the aphids that develop later in the season. In some fields the current infestations look pretty threatening on 1" alfalfa. However, at this time of the year, a naturally occurring parasite, *Aphidius ervi*, is usually quite abundant which helps keep aphid populations in check. Although nymphs have not yet been dissected to determine percent parasitism, relatively high numbers of the parasite adults were collected at Rosemount on 4/22; Kathy Flanders (Dept. of Entomology) estimates a current ratio of about 1 parasite: 11 aphids. As with other insect pests this time of year, the bottom-line is to watch how crop growth progresses. Given sufficient moisture and proper fertilization, alfalfa should be able to grow through the aphid pressure.

ARMY CUTWORMS—If you get through this year without having to worry about armyworms or cutworms, you may still have to deal with the army cutworm, which is primarily a pest of small grain. These worms are not too particular about what they eat, and as their name implies will move in mass in search of new sources of food, including alfalfa. New seedings of alfalfa are especially vulnerable. To date, only a few fields in western Minnesota (Lac Qui Parle Co.) are suspected of having cutworm in significant numbers of 2-3/sq ft. Apparently, the insect does have the ability to overwinter in Minnesota, with undisturbed CRP acreage as one likely site. Because the insect overwinters in the larval stage it will not be uncommon to find 1/2 to 1" worms this time of year which could prevent normal development of the first crop. Treatment threshold estimates from South Dakota State University (Ben Kantack) range from 2 larvae/sq ft on newly-seeded alfalfa to 4/sq ft on established stands. Again, keep a close watch on the development of your crop as well as insect populations before making control decisions.

—Bill Hutchison, Extension Entomologist

*updated only to 4-15-90

WINTER INJURY OF ALFALFA, RED CLOVER AND ORCHARDGRASS

—Winter injury to alfalfa, red clover and orchardgrass is widespread. Damage to alfalfa is extensive and has been reported from southeastern Minnesota (Olmsted, Winona, Dodge, Goodhue, Wabasha and Brown counties) to North Central (Stearns, Todd, Isanti, E. Otter Tail, Morrison counties). In all cases the damage is from cold exposure (sub zero temperatures in December 1989 without snow cover), crowns of alfalfa plants exposed to temperatures below 15°F for a two-week extended period or longer except heaving (plants lifted out of soil from rapid freeze-thaw temperatures) has been reported by irrigators in E. Otter Tail County.

Diagnosis is easier this year because the warm April temperatures have increased the rate of decay of dead plants. Over the next two weeks a complete evaluation of damage will be possible.

Management Alternative

1. Assess fields for damage now. Dig plants with tiling spades within a square foot area to assess the number of live plants. You will find dead plants (no regrowth and rapidly decaying soft-sponge roots), injured plants (plants with one to three shoots growing from the crown, some with decaying roots and some with healthy roots) and healthy plants (several shoots growing from the crown and no damage on crown and roots). Decaying roots and crowns will have a soft texture and a yellowish-brown color. Live root and crown tissue is firm in texture and white in color.
2. Determine population density of live plants. The optimum stand density of pure alfalfa (3 or more year old) is about 6 plants per square foot (10 to 15 plants/sq. ft for two year old stands). Three to 5 plants are optimum with perennial grasses present.
3. If all live plants have several stems growing from the crown and the plant is 6 inches tall, no corrective action is needed—**NO INJURY HAS OCCURRED.**
4. If the live plant count is adequate, but some plants are injured (only one or two stems initiating growth from crown and as many other shoots are dead) consider short-term actions. Delay the harvest date of the first harvest until 50 percent bloom or later. Then, resume a normal cutting

schedule for subsequent harvests. Delaying the first cutting date allows the plant root system to recover from injury; however, this will be dependent upon our spring weather conditions. Windy, dry conditions can be detrimental.

5. If you expect a least 65 percent of your spring growth is coming from cool-season grasses, quackgrass included, and you are short of feed, apply at least 50-75 pounds per acre of actual nitrogen as soon as possible. This will supply you with an early source of feed.
6. If you have less than 3 plants per square foot, and the alfalfa stand is 3 years old or older, your options are to: renovate the field by seeding with another forage legume (red clover) or a legume-grass mixture that does not include alfalfa; or to rotate to a row crop such as corn or soybeans.

However, many farmers insist on reseeding alfalfa into fields of old or winter-killed alfalfa. Autotoxin produced by old plants may involve a significant risk to new alfalfa seedlings. It is therefore least risk to not plant alfalfa after alfalfa. If you must plant alfalfa immediately following alfalfa, your risk from the toxin is greatest for fields older than 3 years of age. Reduce risk by removing the toxin; use primary and secondary tillage operations to speed the decay of plants, delay seeding by 2 to 3 weeks, and use a preplant or post-emergent herbicide to control annual grasses with solo seedings. We expect no-tilling alfalfa after alfalfa to be the highest risk of stand failure.

Alternative Forage Crops: The crop with the highest yield and quality is corn for silage. Forage sorghums are highest in yield, but low in digestibility and difficult to ensile. Small grain crops for forage are a good planting option until mid-May. If seeding is done after mid-May, sorghum crops (forage sorghum, sorghum-sudangrass hybrids or sudangrass hybrids and foxtail millets are good options). We have very limited experience with pearl millets - they don't have much drought tolerance and must be managed different than sudangrass for consistent regrowth.

The list of alternate forage crops becomes extensive especially when we start mixing crops (peas with small grains, sorghum and soybeans, etc). Use the data in *Proceedings of 14th Annual Minnesota Forage Day, 1989, Forage Crop Selection in 1989: Emergency or Otherwise*, pp. 1-7, to determine which crop fits the producer's needs best. Mixing crops can result in present weed control problems, and ensiling problems.

—Neal P. Martin, Extension Agronomist-Forages

CORN

BLACK CUTWORM UPDATE—No major moth flights have been detected since the pheromone trap network began operating two weeks ago. Flight activity increased over the last week with the return of southerly winds. But peak captures of less than

2 or 3 per night were well below significant levels of 8 or more in two nights.

—Ken Ostlie, Extension Entomologist

GRASSHOPPER NEWS

I traveled from St. Paul to Hallock through central Minnesota and then south through Crookston, Moorhead and down to Morris early this week (week of April 23). I did not find grasshopper hatch anywhere along that route of travel. At this point we still have not had enough moisture anywhere to change our expectations of hopper problems in 1990.

The grasshopper amendments were passed and a mutual set of laws arrived at through a conference on Tuesday, April 24. Before I say much about their fine points I want to confer with the Department of Agriculture. Taxation guidelines, modest funding for 1990, an appeal process and some guidelines for honey bee protection however, have been added.

NONCOMMERCIAL APPLICATOR GRASSHOPPER SPRAYING—Wayne Dally of the Minnesota Department of Agriculture, Agronomy Services has given me the following set of guidelines for grasshopper control by commercial, noncommercial and private applicators.

- No. 1 No person can contract directly for spraying for fees without a **commercial** applicator license with the category D certification (ag fungicide & insecticide).
- No. 2 A noncommercial applicator may spray for grasshoppers with general use pesticides as a part of his employment responsibilities without any requirement for licensing.
- No. 3 Exchange of services between government entities, ie. township and counties, shall not be considered commercial application if monetary exchange is not to individuals and only covers operational costs.
- No. 4 A commercial applicator may apply grasshopper insecticides to rights of ways, CRP and other adjacent property to crop land with the D category. He does not need J (the rights of way category).
- No. 5 Certified private applicators may apply approved insecticide (RUP or general use) to areas adjacent to crop lands.
- No. 6 Any person, noncommercial, private party, farmers or anyone else may apply general use insecticides according to label directions without licensing as long as it is "not for hire."

DIAZINON REGISTRATIONS—We received a note from John Ellis of Ciba Geigy who points out that Diazinon may be used on all labeled sites this growing season. We have it on our grasshopper control list for range, forage and pasture sites. It

should probably not be used on wildlife sensitive sites such as CRP but it is a very viable alternative on corn and alfalfa.

—Dave Noetzel, *Extension Entomologist*

POTATOES

TEMIK[®] REGISTRATION ON POTATOES VOLUNTARILY WITHDRAWN BY RHONE-POULENC—In response to an individual case of residues exceeding tolerance, Rhone-Poulenc announced a voluntary withdrawal of Temik registration on potatoes. Temik is a preplant insecticide/nematicide that has been the subject of controversy in recent years because of its detection in groundwater when used on potatoes planted in sandy soils over shallow aquifers. The voluntary withdrawal, however, was prompted by detection of aldicarb (the active ingredient in Temik) residues in one lot of potatoes (1989 crop) at levels that exceeded tolerance by 10%. Rhone-Poulenc is researching the cause. In the meantime, the company has

initiated a recall of existing stocks of Temik for relabelling (the voluntary withdrawal only affects use on potatoes).

Growers who have purchased Temik or have existing stocks can use the product this year. A legal tolerance for aldicarb residues on potatoes will still be in effect through this year. Growers who treated potatoes with Temik at labeled rates and use patterns should not be unnecessarily concerned. In all likelihood, there will be absolutely no problems with the crop being below tolerance at harvest. It should also be noted that consumption of potatoes harvested in 1989 will present little if any health risk. All indications are that this was an isolated incident.

—Roger K. Jones, *Extension Plant Pathologist*

SOYBEANS

SEEDS—Quality seed sources are a real benefit to Minnesota Farmers. Check germination of seed as a minimum. Last falls dry weather and insect level could result in poorer soybean seed quality. Beans were often harvested at very low moisture and this often increases the mechanical damage. Any fields with grasshopper damage could have seed quality reduced as feeding on pods opens the seed up for infection. A few seed lots with very small numbers of brown stained seed were found to be

infected with *Alternaria*, a fungus that usually follows mechanical damage topods. Since most fall weather conditions were not favorable for seedborne diseases, a wide spread concern for seed quality and potential need for seed treatment does not exist. Select seed lots with low germination may respond to fungicide seed treatments and result in improved seedling stand and vigor. Seed treatment will not help seeds with broken seed coats or mechanical damage.

—Ward C. Stienstra, *Extension Plant Pathologist*

WHEAT

WINTER INJURY ON WINTER WHEAT—Numerous winter wheat fields in Minnesota have shown moderate to severe winter-kill in spring of 1990. In St. Paul, the Roughrider variety had a 50% reduction in stand. In Morris, Roughrider, Minter and Seward had 20% stand reductions while all the other varieties ranged from 20 to 100%. In eastern Polk County on April 18, in a county variety trial conducted by Marvin Lee, a 20% stand reduction was observed for the varieties Roughrider, Rose, Seward and Norstar while the varieties Abilene, Siouxland, Arapahoe and Bighorn had stand reductions ranging from 30 to 90%. The lack of fall moisture and snow cover which was accompanied by very cold temperatures in December were primarily responsible for the winter kill.

The amount of winter-killing should now be readily observed in fields in all parts of the state. In St. Paul, the dead plants are brown, while the relatively uninjured healthy plants are green, have 4 to 7 tillers, and are 3 to 4 inches tall. New white root growth can also be seen on healthy plants. Plants with some winter injury may have one green stem but poor root growth. Chances are these plants will not be very productive compared to uninjured plants. In some cases, because of late fall planting or dry conditions the seeds didn't germinate last fall or germinated only slightly. Any seeds that germinated last fall even if only the coleoptile emerged will have vernalized and the plants should flower. If seeds germinated this spring, these plants likely will not flower and produce grain. It takes about 20 days of temperatures close to 34-35°F for a period of at least 6 hours each day for vernalization to occur.

The decision when to destroy a winter-injured field can be difficult since often some areas of fields are dead while other areas have reasonable stands. Fields which have 40 to 50 percent stands or about 6 to 8 plants per square foot often produce good yields, especially if growing conditions favor tiller production.

Weeds are often more of a problem in thin stands and extra weed control measures may be needed.

Winter annuals such as flixweed, field pennycress (frenchweed) and shepardspurse are usually the main weed problems in winter wheat. Many of the same herbicides used in spring wheat can be used in winter wheat, however the timing and use rates may be different; therefore it is important to read and follow the label. Research at South Dakota State University has shown that good winter annual weed control can be achieved with the following herbicides:

1. 2,4-D ester at 1 pt/A
2. MCPA ester at 1 pt/A
3. Harmony Extra at 1/2 oz/A

It is important to apply these herbicides before the winter annual begins to flower.

If replanting is necessary, another crop should be planted on the winter wheat acreage. If the acreage is needed to maintain the wheat base, then spring wheat should be planted on another field or the winter wheat destroyed with either clean cultivation or a systemic herbicide such as Roundup at least two weeks before planting spring wheat. Wheat streak mosaic could be a problem if volunteer winter wheat is allowed to grow along with spring wheat. In addition, mixing hard red winter and spring wheat in the same field can cause both harvesting and marketing difficulties.

—Ervin Oelke, *Extension Agronomist—Small Grains*
—Beverly Durgan, *Extension Agronomist—Weed Control*
—Roger Jones, *Extension Plant Pathologist*

MISCELLANEOUS

PLANT DISEASE CLINIC

EXPANDED SOYBEAN CYST NEMATODE TESTING— The Plant Disease Clinic, in cooperation with Dr. Dave MacDonald, is offering an expanded soybean cyst nematode (SCN) soil testing service. This season, in addition to the larvae test, egg count and race identification testing is being offered. Soil testing to determine the population level of SCN eggs or larvae can help soybean growers to identify potential problems and assist in planning management strategies. Race identification testing to determine the race of SCN present in a field will assist in the proper selection of resistant varieties. Fields with a known history of SCN should be monitored and tested before planting back to soybeans. Suspect fields or fields adjacent to infested fields can also be tested (including field entrance points) to determine if the SCN is present. To assist you in the detection and management of SCN, the following tests are being offered:

- 1) **Larvae Test** **Fee: \$8.00**
Test results will quantitatively determine the number of juvenile SCN larvae present in a 116 cm³ sample of soil. Recommended for samples collected from soybean fields.
- 2) **Egg Test** **Fee: \$10.00**
Test results will quantitatively determine the number of eggs present in a 100 cm³ sample of soil. Recommended for samples collected from non-soybean fields or soils that have been allowed to dry after collection.
- 3) **Race Identification** **Fee: \$50.00**
Identifies the race of SCN present in a field to assist in the selection of resistant soybean varieties. This test requires 5-6 weeks to complete and will take longer if we need to increase the SCN population in the greenhouse before the test can be run.

Sampling Procedures:

For all of the above listed tests, please follow these sampling procedures:

- 1) Limit the number of acres represented in a single composite sample to 1 acre.
- 2) Using a soil tube or shovel, collect samples at random from the margins of problem spots (not in the worst portions or areas), near field entrance points and borders of fields adjacent to infested fields. Samples should be taken to a depth of 9-10 inches from within the rows. With a soil tube collect 10 cores, or with a shovel take 1/4 cup of soil from near the shovel tip at several locations. In either case, combine 10 subsamples as a composite sample. Each composite sample should be at least 2 pints of soil.
- 3) Collect the soil samples in plastic bags to reduce drying. Label each bag with appropriate information (see below). Avoid storing the samples in the sun and ship as soon as possible.
- 4) Please indicate the following information:
 - a) Name, address, and telephone number.
 - b) County and township where samples were collected.
 - c) Estimate acreage of sampled area.
 - d) Cropping history of sampled area.
 - e) Current crop in sampled area.
- 5) Send samples, background information and payment to:
Plant Disease Clinic
Department of Plant Pathology
495 Borlaug Hall
1991 Upper Buford Circle
University of Minnesota
St. Paul, Minnesota 55108
- 6) Checks should be made payable to the University of Minnesota according to the following fee schedule:
Larvae Test: \$8.00
Egg Test: \$10.00
Race Identification: \$50.00

—Jill D. Pokorny, Director, Plant Disease Clinic

DIAL U HIGHLIGHTS

County Agents Please Alert Master Gardeners to the Following Items

Lawns—Now that much of the state has had a good, soaking rain we see lawns greening up, virtually overnight. There are lots of questions about watering, and whether it's really necessary this time of year. The answer is that once the lawns are green and growing actively, they require an average of one inch of moisture a week. When that isn't supplied by rain, you should water, particularly when temperatures are warm.

Because part of the state has had a string of unseasonably hot days (high 70's and 80's), it's probably a good idea to apply a pre-emergent herbicide for crabgrass control any time now. Be sure to water it into the lawn to activate it.

Patch disease—Rains this past week have renewed interests in patch disease. Proper management is the key to preventing, reducing and eliminating patch disease problems. For more information refer to AG-FS-3034, *Patch Diseases of Lawns*, available from local county extension offices.

Elm leaf beetles are greenish-yellow with a black stripe down each side and are often described as being the size of a ladybug. They are occurring in large numbers in homes now. Despite the circumstantial evidence, they are not breeding indoors but are present in homes because they overwintered there last fall. With the warm weather, they have become active. They are a temporary problem and do not persist past spring. Removal by hand or with a vacuum cleaner is the only necessary control. Because these insects are short-lived indoors, insecticides are not suggested.

Anthracnose of shade trees—Continued wet humid conditions will favor leaf spotting, blotching and defoliation caused by several different fungi and collectively called anthracnose. Commonly infected trees include white oak, bur oak, maples and ash. Healthy trees will not be harmed, but trees under stress will be further stressed. Deep watering during dry periods and fertilizer applications to deficient soils will help to improve the vigor of the tree. Fungicides are not normally recommended.

Bulbs—We've gotten many reports of spring-flowering bulbs such as tulips or narcissus that were planted last fall, but have not come up this spring. In some cases people dug in the garden, only to find them soft and rotted. We suspect they froze when the soil got too cold due to a combination of lack of fall moisture, extremely cold temperatures in December, and little, if any, snow-cover. Ample fall watering and mulching might have saved them.

Mound-building ants in the lawn—Ants are common in the lawn and prefer to make their nests in areas of sparse grass. Despite the appearance, they do not kill lawns and control is not necessary for the health of the lawn. Those who still wish to attempt control can spot treat with diazinon or carbaryl (Sevin). For more information see AG-FO-1008, *Controlling Lawn and Turf Insects*.

Dog feces—There's been a lot of concern about dogs defecating in the garden. Dog and cat feces should definitely NOT be used as a fertilizer, nor should they be incorporated into compost piles. They can cause health problems for people who come into contact with the contaminated soil. However, if feces are raked out of the garden before you turn it over in spring, the risk is minimal. (Bury the feces deeply under the soil, or wrap them securely in plastic to be hauled away in the trash. Better yet, flush them down the toilet.)

Clover mites—Descriptions of pinhead-sized, reddish or brownish 'bugs' indoors, especially around windows and other sunny areas are clover mites. They are harmless to people. They can stain fabrics and other surfaces if they are crushed but are otherwise harmless. Vacuum clover mites found indoors or wipe up gently with a damp cloth. Spray chlorpyrifos around windows and doors to help prevent clover mites from coming indoors. Outdoors spray with diazinon, chlorpyrifos (Dursban), dicofol (Kelthane) or malathion. Another option is to cultivate the soil in a band 18 to 24 inches to prevent their movement to the house.

Other common calls include apple scab, canker diseases and environmental desiccation on evergreens.

Deborah Brown
Horticulture

Cynthia Ash
Plant Pathology

Jeffrey Hahn
Entomology

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**Department of Plant Pathology
University of Minnesota
495 Borlaug Hall
St. Paul, MN 55108**

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