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CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

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No. 2004-4, April 9, 2004

Monitor shows disparity in soil moisture levels: east recovering, but the west looks for snowmelt

Soil moisture levels across southeastern Nebraska have improved dramatically over the last few months. The High Plains Regional Climate Center (HPRCC) soil moisture sensors show moisture responses down to 100 centimeters. On the other side of Nebraska, however, there has been a substantial lack of moisture across the southern Panhandle and southwestern corner of the state.

We have attempted to develop a relationship between the current available moisture at each of the monitoring sites and precipitation since October 1, 2003. The average effective rate of precipitation for these sites has been 65%. This means that for each inch of moisture received since October 1, about 0.65 inch has been captured in the profile. Please note that these sites are under grass and fields dedicated to production agriculture may have higher or lower infiltration rates.

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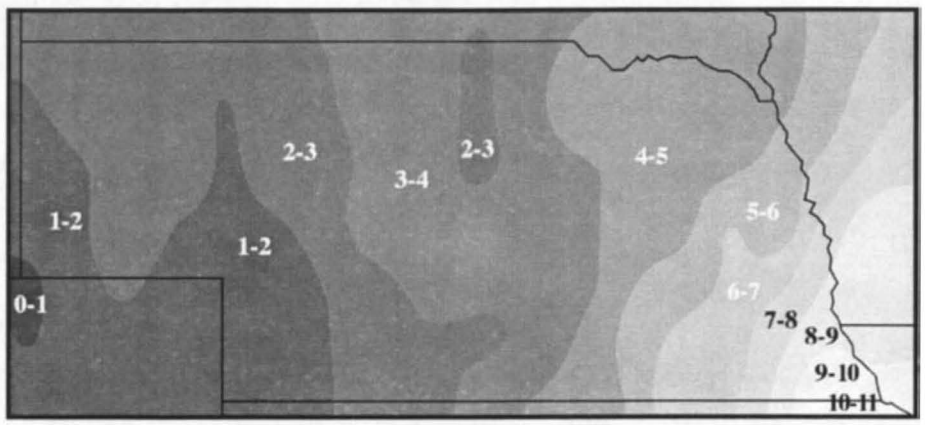

Figure 1. Estimated soil moisture in inches available in the top five feet of the profile as of April 2, based on accumulated precipitation at each reporting cooperative weather station. Accumulated totals were multiplied by an efficiency factor of 0.65 to provide a rough estimate of how much available moisture may be in the soil profile. *(Map developed by Al Dutcher, State Meteorologist, High Plains Climate Center.)*

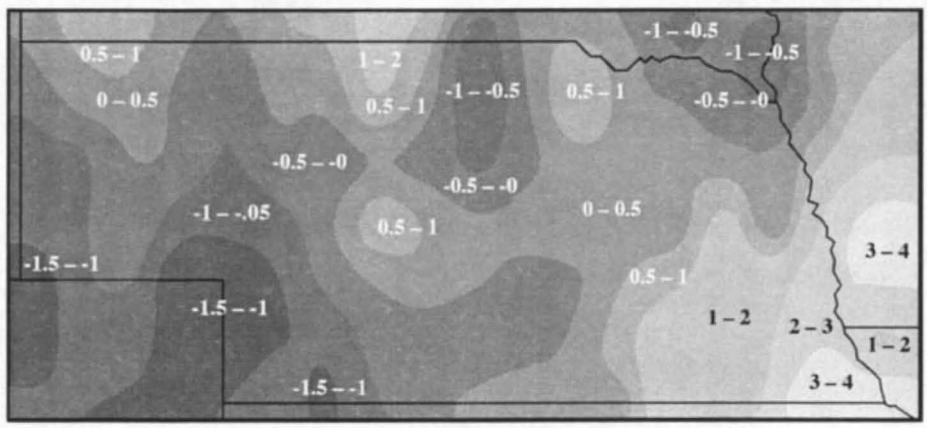

Figure 2. Difference between 2004 estimated available soil moisture (*Figure 1*) and normal soil moisture levels in inches, based on 1971-2000 precipitation normals multiplied by an efficiency factor of 0.65. *(Map developed by Al Dutcher, State Meteorologist, High Plains Climate Center.)*

Ag briefs

John Wilson, Extension Educator in Burt County: Producers are getting their planters ready for the season and applying anhydrous. If the weather cooperates, planting is likely to begin next week.

Gary Hein, Extension Entomologist at the Panhandle REC: We're still in need of moisture and the potential for snowpack isn't looking good. Producers should be checking high risk areas for army cutworm activity, including areas where they are planting sugarbeet following winter cereal cover crops or grassy edges around clean-tilled fields. Army cutworms can make quick work of a seedling sugarbeet plant, consuming multiple plants in a night.

Scott Brady, Extension Educator in Greeley, Howard, Sherman and Valley counties: Field preparation and fertilizer applications are underway. If the weather cooperates, corn planting will probably begin next week. Some alfalfa is being treated for cutworms. We're finishing up calving and spraying some pastures.

USDA's Nebraska Agricultural Statistics Service reported this week that wheat condition rated 11% very poor, 23% poor, 37% fair, 26% good, and 3% excellent, near last year and the average. Fields had begun to joint in some southern and eastern counties.

Randy Pryor, Extension Educator in Saline County: The early spring weather has prompted preplant anhydrous and phosphorous fertilizer applications, with some early corn planting to follow. This week I observed one farmer disking up a level, weed-free, soybean stubble field that would have made a beautiful seedbed for no-till corn. Change is often difficult, but this change can improve a farm's bottom line. The winter wheat crop is good to excellent, and we've got an excellent window for fertilizer and weed control applications.

Tom Holman, Extension Educator in Scotts Bluff and Morrill counties: Producers are chopping stalks and turning them under in preparation for planting; probably 10-20% of the county's sugarbeet crop has been planted. Following several years of drought and low prices, more and more farmers here are looking at nontraditional crops such as annual forages and irrigated grass. There is a strong producer movement toward moisture preservation through minimum or no-till.

Army cutworm update

Reports of army cutworm damage to alfalfa and wheat continue. Most of the calls are from counties along Nebraska Hwy. 81 and west, although some spraying is occurring in eastern Nebraska too.

There have been some reports of chemical salesmen recommending higher rates than necessary for cutworm control, suggesting that the extra insecticide will give extended residual to help control the alfalfa weevil when it appears (*see page 37*). While there may be some effect on the alfalfa weevil adults entering the field to lay eggs, or some activity on newly hatched larvae in southern and western Nebraska, there is no way to scout this early for alfalfa weevils in most parts of the state to make an informed decision.

Our recommendation is to deal with the army cutworm now, if necessary, and wait to see about the weevils. The threshold for army cutworms in alfalfa is two or more per square foot on seedling alfalfa and four or more per square foot for established stands, or two to four per square foot in wheat, depending on stress and moisture conditions.

In alfalfa, if the fields appear to be greening up normally, army cutworm will not be a problem. Starting next week, army cutworms will begin to cease feeding as they mature, and damage will taper off. Treatment after the April 12 or so will have much less return compared to this week. See the April 2 *Crop-Watch* for recommended insecticides for army cutworms.

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Considering a change?

Soybeans vs dry beans in western Nebraska

With the excellent price of soybeans and relatively weak price of dry edible beans, some western Nebraska producers who traditionally grow dry edible beans are considering switching some acres to soybeans. Following are some factors to consider.

Weed control. With the development of Roundup Ready soybeans and the decreased price of glyphosate, soybeans may offer an advantage in weed management. With soybeans, usually the producer achieves a more profitable crop by using at least a two-thirds or higher rate of a preplant or preemergence herbicide rather than totally relying on a postemergence weed management program.

Timing is critical when weed control depends on post-emergence applications. If an application is late, weeds may be controlled, but yields will have already suffered. A preplant or preemergence treatment will widen the period for post applications.

Harvest. Another advantage of planting soybeans is being able to direct harvest. Flex platforms which follow the contour of the ground have reduced soybean losses in the field.

Growing season. One of the disadvantages to planting soybeans in western Nebraska is that they push the growing season. This is especially true in high elevation areas where early fall frost can occur before soybeans mature. While helpful, early planting can only be so early. At some western locations, a late spring frost is likely to nip beans planted prior to May 20.

Nitrogen. Both crops reduce the amount of nitrogen needed for the next crop. The nitrogen produced by either crop is not available early enough for a following winter wheat crop but is available for succeeding crops or late spring planted crops. Also, most crops do benefit from following either crops.

Residue. A disadvantage of dry beans is that after harvest, little residue is present, which makes the soil subject to erosion. The plus side of dry beans is that they are usually harvested earlier and it is possible to seed winter wheat sooner than following soybeans.

Long-term picture. If you've become a little discouraged with dry beans, don't write them off too quickly. Usually the grower has been compensated over several years for the extra management and expense of producing this crop.

Summary. Investigate both crops thoroughly before making a decision. Also check with crop insurance and Farm Service Agency programs.

Robert Klein, Extension Cropping Systems Specialist West Ccentral REC
David Baltensperger, Extension Crop Breeding Specialist Panhandle REC
Karen DeBoer Extendion Educator, Cheyenne-Kimball-Banner counties

Soil moisture *(Continued from page 31)*

Figure 1 represents the estimated soil moisture available in the top five feet of the profile as of April 2. This figure was developed by using the accumulated precipitation at each reporting weather station. The accumulated totals were multiplied by an efficiency factor of 0.65 to provide a rough estimate of how much available moisture may be in the profile.

Figure 2 represents the difference between the available soil moisture illustrated in Figure 1 and an average of climatological baseline normals from 1971-2000. In simple terms, *Figure 2* is the difference between *Figure 1* and the 1971-2000 precipitation normals multiplied by a factor of 0.65. The HPRCC soil monitoring sites have not existed long enough to develop viable soil moisture normals, so this is our best attempt to quantify how our current soil moisture status compares to some type of historical baseline.

These soil moisture figures will be updated weekly in ***CropWatch*** through late May. It's important to remember that these are estimates based on past infiltration relationships. In addition, these files will not reflect crop water use extraction and should only be used to gauge soil moisture in an area that has not yet been prepared for the 2004 production season.

During April, soils across eastern Nebraska should be gaining about 0.50 inch of available soil moisture per week, while western Nebraska should be adding 0.40 inch a week. During May, eastern Nebraska soils should gain an average of 0.75 inch per week and western Nebraska should gain 0.50-0.60 inch a week.

If precipitation falls below normal any week, Figure 2 will show a further decrease from the previous week in areas with a soil moisture deficit, along with a reduction in areas that show a surplus. Conversely, above normal precipitation will either reduce soil moisture deficits from the previous week or add to areas with a surplus.

Al Dutcher Extension State Climatologist

Getting optimum performance from front-wheel-assist tractors

Many producers are buying front-wheel-assist tractors and operating them as regular two-wheel-drive tractors, typically adding duals to the rear wheels. This decreases performance, reduces tractive efficiency, and wastes fuel. To get the most out of the extra money spent for front-wheel-assist, operate the tractor as if it was four-wheel-drive.

For optimum front-wheel-assist performance, start with weight distribution. About 40% of the static tractor weight should be on the front wheels and 60% on the rear. In contrast, two-wheel-drive tractors should have about 25% of their weight on the front and 75% on the rear. Most tractor manufacturers recommend the same total tractor weight per horsepower for front-wheel-assist and two-wheel-drive tractors. This can mean up to 25% less rear axle weight with front-wheel-assist, resulting in less compaction. (Compaction is a function of axle weight.) Also, make sure the rear tires follow in the tracks firmed by the front tires, again reducing compaction up to 80% compared to multiple wheel tracks.

Always use single rear wheels on front-wheel-assist tractors. Using duals cuts traction, increases slip, and increases rolling resistance because the outer dual wheels "lifts" the inner tires from the tracks left by the front drive tires. Producers who think they increased pull because of duals on a front-wheel-assist tractor did so because they added weight (of the duals) to the rear of the tractor. They probably would have increased pull even more by adding the same amount of weight distributed to both the front and rear of the tractor to maintain the proper 40/60 ratio.

In the field, use the front-wheel-assist all the time. Ballasting for front-wheel drive and not using it wastes power and makes steering difficult. Ballasting for two-wheel drive and only engaging the front-wheel drive in tough spots doesn't leave enough front weight for traction, contributing to "wheel hop". Tractors with powered front wheels have less rolling resistance because the drive wheels continually climb out of their tracks. In addition, the rear drive wheels have less rolling resistance and can pull 28% to 50% more than the front wheels because they are running in already firmed tracks in the soil. Because of these firm tracks, a properly ballasted front-wheel-assist tractor will have 3% to 7% higher tractive efficiency than a two-wheel-drive tractor of the same horsepower and weight. If duals are added to the rear wheels, as with four-wheel-drive tractors, also add duals to the front wheels to firm the soil for the rear duals.

For optimum field performance, always use the recommended tires and inflation pressures on the front and rear tires of a front-wheel-assist tractor. Improper tire size or inflation can change the rolling radius of the tire, reducing the tractive efficiency, and may damage the power train or cause excessive tire wear. Consult the owner's manual for these and other recommendations to get the most from your front-wheel-assist tractor.

Paul Jasa
Extension Engineer

Drawbacks to duals & advantages of alternatives

Dual wheels or large floatation tires can help minimize surface compaction, provided the inflation pressures are reduced to provide a larger footprint on the soil. Use the lowest recommended inflation pressures for the load to reduce surface compaction. Unfortunately, duals have little influence on subsurface compaction and may actually increase compaction because compaction is a function of axle weight. Depending on the size and hub type, adding duals may increase a tractor's weight from 0.5 to 4 tons, increasing compaction. That is why producers typically add duals to the tractor used to pack silage for better storage. The greatest danger related to duals and compaction, however, is the temptation to use the added floatation to work soil when it is wet.

Producers often add duals or weights to increase the pull of their tractor. But traction does not always increase with duals. In fact, single tires can pull as much as duals in firm soil when both are weighted equally. The increased traction from duals often comes from the added weight of the duals. However, any added weight adds to compaction. Another disadvantage of duals is that the weight and increased rolling resistance requires extra power to move the tractor itself through the field, reducing performance compared to single tires.

To make more effective use of the tractor's power, it's usually better to reduce draft (implement width or operating depth) and increase operating speed since power is a function of both. The reduced draft requires less weight

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Maintain equipment for safer anhydrous use

Maintaining anhydrous application equipment and using it safely can prevent unnecessary and potentially dangerous leaks. The following recommendations can help ensure that you have a safer anyhydrous season with fewer delays.

Check hoses. Hoses are the weakest link in the anhydrous ammonia application system. Always inspect the transfer and filler hoses thoroughly. If the braided layers show through, or if kinks, bulges or coupling slippage is evident, replace as soon as possible. Avoid kinking hoses. Kinks create weak spots. Also, avoid dragging the hose on the ground or running over it with vehicles. When storing, hang hoses on something smooth with a broad-curved surface, such as an old tire rim, and hang hose ends down to ensure drainage.

Handle valves with care. Grasp valves by the valve body or the coupling, not by the valve wheel. The valve wheel might accidentally turn and open. Throwing a hose with an end-valve over the tank might cause the valve to open when it hits the tank and spin open the rest of the way. All tanks are fitted with excess flow valves that operate automatically when a hose ruptures. A carelessly handled end valve that is partially opened may not provide adequate flow to activate the excess-flow valve and the entire tank of ammonia could escape.

Never deactivate the excess flow valve. When opening the nurse tank valve, open it completely. Failure to open completely may restrict flow and if an accident occurs, the excess flow valve will not operate as designed.

Respect pressure. Release the pressure from the coupler using a bleeder valve before disconnecting the transfer hose. Bleed the pressure off slowly and then disconnect the coupler immediately. On a warm day, leaving a coupler connected for five to 10 minutes after bleeding allows NH_3 in the hose to rebuild pressure. If bleeding takes longer than 5-7 minutes, either the tank valve or hose valve may be faulty. Repair immediately.

Check applicator tubes. When removing dirt from a plugged applicator tube, treat it as if it contained pressurized NH_3. This is very important when working between the knives of an NH_3 applicator. Never tamper with the safety relief valve. This valve, known as a "pop-off" valve, is factory-set. If it is malfunctioning, the valve should be repaired or replaced. Always know the location of the safety relief valve and stay away from it. The Fertilizer Institute recommends replacement of safety relief valves every five years unless otherwise required by leakage or other defects.

All nurse tank wagons must be securely attached to the vehicle pulling them. Use a drawbar hitch pin, safety clip and safety chain. Before each highway trip, check the hitch pin, safety clip and safety chain to see they are secure. Also make sure the wheel lug nuts are tight and the tires are in good shape and properly inflated. When hauling a loaded nurse tank, drive at speeds of 30 mph or less.

This information is derived from *Using Agricultural Anhydrous Ammonia Safely* which includes further details. It is available on the Web at *http://ianrpubs.unl.edu/safety/ec738.htm*

Anhydrous sales down in 2003

With little rain and soil temperatures ranging from 47 to 54 in the last week, anhydrous tanks are a familiar sight across the Nebraska ag landscape.

Sales for 2004 are still underway, but from January to June 2003, approximately 196,460 tons of anhydrous ammonia were purchased in Nebraska, a significant decrease from the same period in 2002 when 265,399 tons were purchased, according to Ken Jackson, Program Manager, Nebraska Department of Agriculture Bureau of Plant Industry. The drop in sales was fairly uniform across the state.

Duals *(Continued from page 34)*

on the tractor to develop the needed pull, further reducing compaction.

Running duals can increase a tractor's load-carrying capacity if single tires cannot support the load safely. But duals can create a "pinch row" effect on the soil between the tires and compaction is increased because four sidewalls are contacting the soil.

Rather than using duals, a producer may be better off by switching to larger diameter tires or tires with a higher star (or ply) rating to carry the load and adjusting the inflation pressure. However, any added load increases the potential for compaction. A better alternative may be lift assist wheels on mounted equipment or switching to pull-type equipment so that more axles are available to carry the load. In addition to reducing compaction, not as much tractor front end weight will be needed for stability. Usually, lift assist wheels are cheaper than duals and are more effective at handling the load safely, especially during transport.

Paul Jasa
Extension Engineer

Staying safe this season

Keep water close when applying anhydrous

Anhydrous ammonia is one of the most common, one of the most efficient, and yet potentially one of the most dangerous forms of agricultural fertilizers. In the rush to begin anhydrous applications this spring, remember to check your equipment (*see page 35*) and use the appropriate safety gear. Even with the best precautions, an accidental release may occur, but simple protective measures like those described here can help prevent serious consequences.

"Anhydrous" means without water. Consequently, when NH_3 contacts water, it rapidly combines with the moisture and forms ammonium hydroxide. When it is injected into the soil, the liquid ammonia expands into a gas and combines with soil moisture. Similarly, the liquid or gas that contacts body tissue — especially the eyes, skin and respiratory tract — will remove the water and cause dehydration, cell destruction and severe chemical burns.

Producers can protect themselves by following these guidelines:

- **Wear properly fitted unvented goggles or a face shield, lose-fitting rubber gloves and a heavy-duty long-sleeved shirt.** Regular glasses will not provide adequate protection. Never wear contact lenses when working with NH_3. Anhydrous ammonia can get under the lenses and cause permanent eye damage before the lenses can be removed and eyes flushed with water.

- **Work upwind of machinery,** the hose-end valve, bleeder valve, coupler or plugged applicator tubes and plan an escape route.

- **Keep children away from the equipment.** Federal law requires that children younger than 16 not handle, transport or transfer NH_3.

- **The only first aid for anhydrous ammonia is water, water and more water.** Regulations require that all farm vehicles used for NH_3 carry a container filled with at least five gallons of water which is readily available for flushing eyes and skin. Change the water daily to ensure a clean supply. Safety specialists recommend keeping a second five-gallon container of water on the tractor. A pencil size stream of water will consume five gallons of water in 7.5 minutes. The extra five gallons in the tractor provides another source of water for first aid in case the tractor operator is unable to reach the water container on the nurse tank.

- **Carry a six- to eight-ounce water-filled plastic eye wash bottle in a shirt pocket.** It provides an immediate supply of water in case of an accident. The eye wash bottle allows for some ammonia to be washed out of the victim's eyes in the first few seconds.

- **When someone is exposed to NH_3, move him or her to a safe place and immediately flush the exposed area with water and continue flushing it for at least 15 minutes.** Remove contaminated clothing as soon as it is thawed. Remember, the sub-zero temperature (-28° F) of NH_3 can freeze clothing to the skin. Removing clothing before thawing with rinse water can cause extensive skin damage. Contact a doctor or emergency medical services immediately after emergency first aid treatment.

- **Even if small amounts of NH_3 enter the eyes, irrigate them immediately with water for 15 minutes or more.** Hold the eyelids open during irrigation to ensure water contacts all parts of the eye. Immediate first aid is important to avoid partial or total loss of vision.

- **Anhydrous ammonia vapors are easily detected because of their pungent odor,** even in low concentrations. Inhalation of NH_3 can irritate the respiratory tract and lungs. At high concentrations, NH_3 combined with the moisture in the lungs, may damage the alveoli (lung lining) and reduce the ability to transfer oxygen to the bloodstream.

- **When a person has inhaled ammonia, move the victim to a safe area.** Exposures to low concentrations of NH_3 for a short period of time may not require treatment. Exposure to higher concentrations may cause convulsive coughing and respiratory spasms. Provide rescue breathing if victims are not breathing and CPR if they have no pulse. Obtain medical help as soon as possible.

Getting the most from ethanol remains

A fungus may hold the key to unlocking new, value-added uses for corn fiber and distiller's dry grains with solubles – the "leftovers" of making ethanol. USDA agricultural scientists have modified the fungus *Fusarium sporotrichioides* with genes for making lycopene. The modified fungus may provide an opportunity to mass-produce lycopene, considered a neutraceutical, from ethanol co-products like corn fiber rather than extract and purify the carotenoid from tomatoes. Corn fiber is ideal because it's abundant and costs about five cents a pound. The U.S. ethanol industry generates four million tons of the fiber annually.

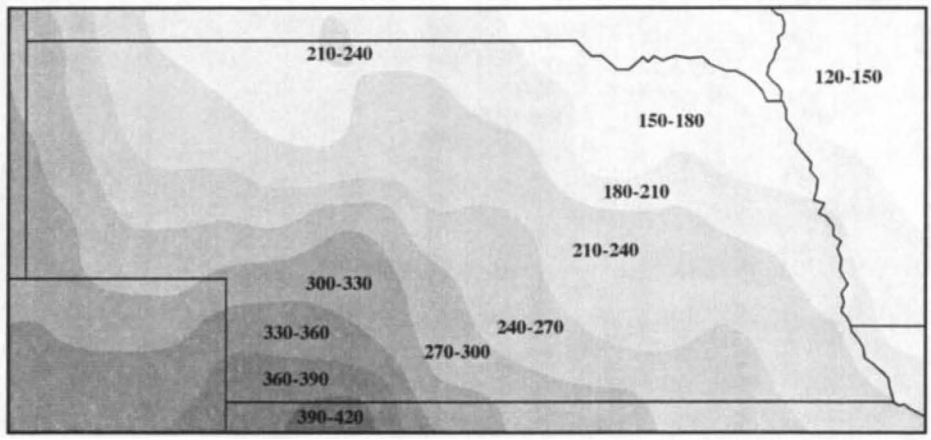
Alfalfa weevil reports building in the south; monitor high value fields for damage

Alfalfa weevil activity has been reported in Oklahoma and Kansas the last couple of weeks, with detectable activity moving northward into southern Nebraska. While things will be getting very busy in the next few weeks with row crop planting, producers should remember to monitor high value alfalfa fields for weevils for the next month.

Two weevils can be causing damage, but usually the most important of the two is the alfalfa weevil. Clover leaf weevils occasionally are problems; however, they are very vulnerable to fungus disease and haven't been pests since the late 80s and early 90s when spring rains were rare. They may be making a comeback in drought areas where moisture has been limited.

Clover leaf weevil larvae will be in the debris around the crowns during day. To determine the degree of clover leaf weevil infestation, scratch in the soil around the crowns and count the number of larvae found per crown. Their brown heads will help distinguish them from the black-headed alfalfa weevil. The table compares some of the distinguishing characteristics of the alfalfa and clover leaf weevils.

Both weevils feed on first cutting alfalfa as larvae, and on regrowth of the first cutting as adults. While research conducted in northeast Nebraska indicates that clover leaf weevil larvae feeding does not cause yield reduction to first cutting alfalfa, alfalfa weevil feeding can cause severe losses to yield and quality of the first cutting.



Accumulated growing degree days (GDD), using a base of 48 degrees, can be used to help predict alfalfa weevil activity. Feeding begins at about 250 GDD. *(Map desveloped by Al Dutcher, State Meteorologist, High Plains Climate Center.)*

Alfalfa weevil development in the Panhandle tends to lag behind the rest of the state. In many years, weevil larvae will survive the first cutting and feed on the regrowth. This phenomena also has been observed occasionally in northern Nebraska, as far east as Boyd County. While most regrowth problems will be caused by adult weevils, growers in the Panhandle and northern Nebraska need to be aware that either larvae or adults may hold back regrowth after the first cutting.

Based on Growing Degree Day reports *(see map)*, alfalfa weevil feeding should just be beginning roughly south and west of a line that cuts Nebraska in half from northwest to southeast. While it may be a few days before a lot of damage is visible, prepare to scout for weevils in southwest Nebraska

(Continued on page 38)

Comparing the alfalfa weevil & clover leaf weevil

Alfalfa weevil	Clover leaf weevil
Overwinter primarily as adults	Over winter primarily as larvae.
Adults brown with dark brown stripe halfway down back, 3/16 inch long.	Adults dark brown, pitted light brown underneath, over 1/4 inch long.
Larvae prefer to feed on tips.	Larvae feed anywhere on plant.
Larvae remain on plant most of the time.	Many larvae in soil or debris during daytime hours.
Larvae have black heads.	Larvae have brown heads.
Adults leave fields in June.	Adults may remain in fields.

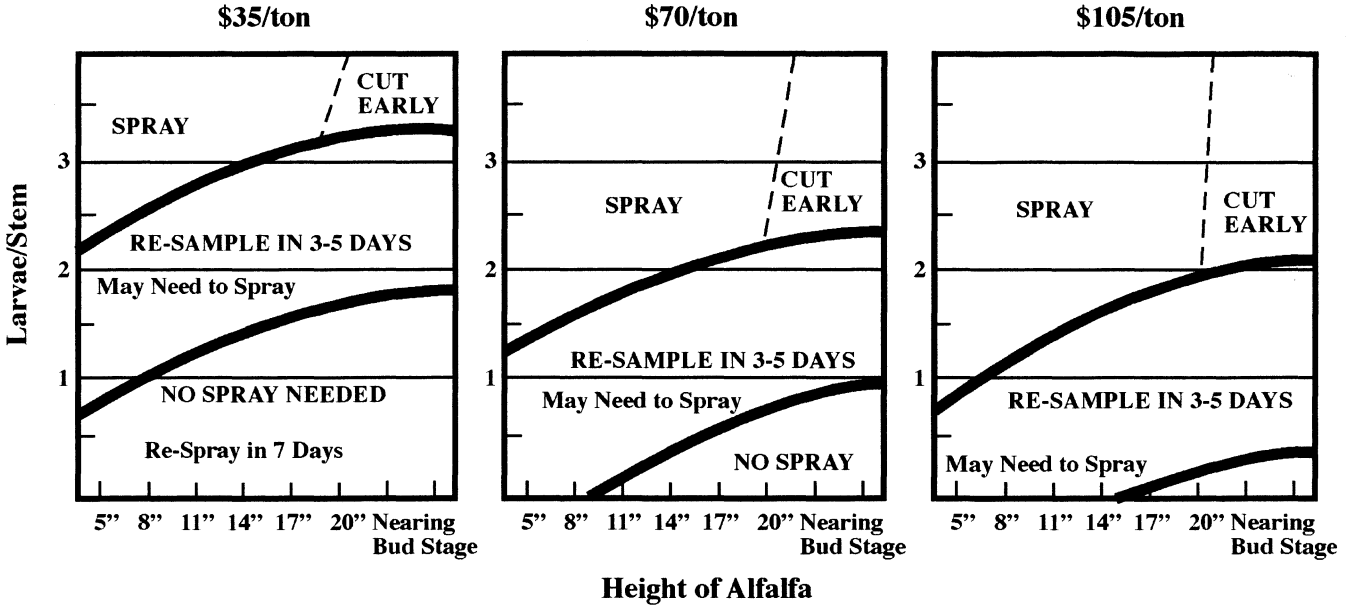


Figure 1. Treatment thresholds for the alfalfa weevil at three alfalfa price levels.

Alfalfa weevils *(Continued from page 37)*

as early as next week (or before) and slightly later in the northeast. It is essential that fields be monitored for alfalfa weevil feeding. Damage consists of small holes and interveinal feeding on the newest leaflets near the stem tips. The larvae are small (1/16 to 3/8 inch in length), pale yellowish green, becoming a darker green when larger. These legless worms have black heads and a white stripe the length of the back. The alfalfa weevil larvae spend nearly all their time on the plant and curl into a C-shape when disturbed.

Once the alfalfa is 4-6 inches high, take a bucket, carefully cut some stems at ground level (30 to 50 per field, from various spots in the field) and shake the stems against the side of the bucket. Average the number of weevil larvae per stem. Use the charts *(above)* to help determine whether control measures are necessary. Each chart has been developed for a different alfalfa value. To treat or re-sample depends on the average number of weevils per stem, the stem length, and the value of the alfalfa. When alfalfa reaches a certain height, it may be more profitable to cut the alfalfa early rather than to treat.

Insecticides registered to control alfalfa weevil larvae include Ambush, Baythroid, Cythion, Furadan, Guthion, Imidan, Lannate, Lorsban, Mustang Max, Penncap M, Pounce, Sevin, and Warrior.

For more information, visit the UNL Department of Entomology Web site at *http://entomology.unl.edu.*

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Western wheat plot meetings in June

Wheat producers interested in seeing how various varieties and practices fared in the field will want to attend a University of Nebraska wheat plot meeting this summer. Mark your June calendar for one of these western Nebraska meetings:

- **Tuesday, June 22**, 7 a.m. CDT, Furnas County, Arapahoe, Methodist Church
- **Wednesday, June 23,** 9 a.m. CDT, Hitchcock County, Trenton, TCDC Building
- **Thursday, June 24**, 9 a.m. MDT, Perkins County, Elsie, Sisco Fertilizer
- **Friday, June 25,** 9 a.m. MDT, Keith County, Ogallala, Jim Welsh Farm Shop

Virtual Tour

And don't forget the University's **Wheat Varieties Virtual Tour** Web site.

For those who want to do some research or make some comparisons before June or who just want to refresh their memory about a particular variety, the site provides unbiased trial data on popular varieties as well as information to help match complementary varieties when planning for this summer's planting. The site is available at *http://www.panhandle.unl.edu/wheat/*