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Assessing and renovating alfalfa stands

As alfalfa begins to green up this spring, many growers may find their stands are thinner than expected.

Last year's flooding killed all or portions of many fields. In addition, it was common to mow and windrowalfalfa only to have it lay on the ground for a week or more before it was dry enough to bale. Plants underneath these windrows often were smothered to death. Many alfalfa plants trying to grow in soils that were saturated for prolonged periods were weakened by root diseases or lack of oxygen in the soil.

Compaction and direct physical injury also killed some plants as heavy equipment drove on wet fields. Many fields were harvested during the primary winterizing period (Sept. 1 to Oct. 1 in northwest Nebraska; Sept. 15 to Oct. 15 in southeast Nebraska). This stressed an already weakened crop.

Early evaluations are needed to take advantage of reseeding or stand thickening options. Although more accurate evaluations can be made if alfalfa shoots are five to six inches tall, waiting that long will significantly limit your options.

Instead, estimate stand density and observe how uniformly plants and alfalfa shoots begin to grow. Older, dryland fields need two or three plants and 30 shoots per square foot for good yields. Very productive sites, such as irrigated and sub-irrigated fields, should have 4 to 6 plants and 50 shoots per square foot. Check for these densities in several areas of each field.

By the time the earliest shoots are 3 inches tall, it must be decided if interseeding is likely to improve production. Some shoots will begin growing later than other shoots so stands with adequate plant density but slightly low shoot density probably will be alright, especially if shoot height and distribution is fairly uniform. But if plant density is low, or shoot growth is uneven, production probably will be lowered unless interseeding or other improvement options are used.

Most alfalfa fields that need renovations will have one of three types of stand reduction:

- whole fields or patches nearly killed;
- general thinning throughout the field or in large patches; or
- strips thinned or killed due to windrow smothering.

Regardless of the type of stand reduction, no renovation procedure will be effective if weed pressure is severe. Winter annual weeds like downy brome, pennycress, and mustards are particularly competitive. If these weeds are common, either rotate the field to another crop or spray with a contact herbicide, like granoxone or roundup, that has no soil residual activity.

Whole fields that are nearly a complete loss are the easiest to make decisions about because the only option is complete reseeding. A new field of alfalfa can be seeded at another site or back into the same field. It usually is best to seed the destroyed field to a crop other than alfalfa (see page 2) and gain from crop rotation.

When patches within an existing field need complete reseeding, planting alfalfa with high resistance to phytophthora root rot usually is best if the field is to remain in alfalfa for two or more years. This will simplify harvest management after the patches become established. Both no-till and full seedbed preparation methods of seeding are effective. Another option is seeding red clover in the patches. Red clover is a good hay crop for two or three years but does not perform

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Seeding alfalfa into alfalfa can be risky

Many growers like to maintain long-term alfalfa production, especially on soils that are marginal for economical or environmentally sound grain crop production. When the plant density of existing alfalfa stands declines to a point where alfalfa production no longer is profitable, renovation becomes desirable.

Unfortunately, seeding alfalfa into prior alfalfa stands often is not successful. Three factors primarily cause it to fail:

1. Diseases and insects. Old stands usually have a high concentration of organisms that cause crown and root diseases like phytophthora root rot, anthracnose, and crown rot. Bacterial wilt bacteria and fusarium wilt fungi also live in the soil. In addition, insects like the alfalfa and clover leaf weevil are attracted to existing alfalfa plants and populations of the clover root curculio increase in older stands. New seedlings may not produce as well in this hostile environment as when seeded into soil that has not grown alfalfa for several years.

2. Depleted sub-soil moisture. Alfalfa roots grow deep, as much as 30 feet deep in some dryland soils. They remove moisture from sub-soils that take many years to accumulate. Once this sub-soil moisture is depleted, rainfall from the current year is the only moisture available to support alfalfa growth. Alfalfa requires 6 to 8 inches of rainfall to produce 1 ton of hay with normal efficiency of rainfall use. Fields where prior alfalfa stands removed all sub-soil moisture have lower yield potential than fields with abundant subsoil moisture.

3. Autotoxicity. Alfalfa releases a water-soluble chemical that inhibits or delays germination and growth of new alfalfa seedlings and invaded severely. Heavy, fine-textured soils on dryland have much lower success rates.

2. Reseed in April or August during normal alfalfa planting dates.

3. Reduce competition from existing plants. Gramoxone Extra at 1 to 2 pints/acre usually will suppress existing alfalfa and weed growth sufficiently on sandy, irrigated soils to allow new seedlings to become established.

Roundup at 1 to 2 quarts/acre is usually needed on heavy, fine-textured sites. It is more effective with August plantings than with April plantings.

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Renovating alfalfa stands

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have ever been reported with berseem clover.

Oats is an outstanding, short-
term hay crop to temporarily
thicken alfalfa stands. It will only
contribute to the first one or two
cuttings, but the increase in yields
is likely to be from 1/2 to as much
as 3 tons per acre. After the oats
contribution is complete, the alfalfa
stand probably should be de-
stroyed and land planted to
another crop. Drill one to two
bushels of oats directly into the
existing alfalfa sod as soon as soil
conditions permit. Subsequent hay
cut before oats head out will
provide hay with nearly as much
protein and energy as pure alfalfa
along with some oat regrowth. For
higher total yield, cut when oats
are fully headed but before grain
fill begins. This oat/alfalfa hay still
will have over 10% crude protein
and 55% TDN, which is more than
adequate for most stock cows
during winter. But, oats will not
regrow when cut this late.

Do not interseed into alfalfa
that is more than 3 or 4 inches tall
unless the stand is so thin that even
when the remaining alfalfa plants
grow tall they will not shade out new
seedlings. If alfalfa does get too
much growth before interseeding
then it can be completed, a late spring
interseeding of sudangrass or
millet (foxtail or pearl) might work
well immediately after first cutting.
Good soil moisture is essential for
this to work, but if it does excellent
grass/legume hay yields are
possible for the next couple of

Finally, a long-term grass/
alfalfa stand can be developed
using bromegrass, orchardgrass, or
other cool-season grasses. Because
seedlings of these perennial grasses
develop slowly, competition from
remaining alfalfa plants must be
minimized. These grasses must be
seeded as soon as possible in
spring (before alfalfa green-up if
possible) or immediately after an
early September harvest. In addi-
tion, alfalfa must be clipped before
it get tall and thick to avoid shad-
ing out grass seedlings. Little
production can be expected until
the second year.

Bruce Anderson
Extension Forage Specialist
Ward Shires, Extension Educator
Lancaster County

Seeding alfalfa

(Continued from page 2)

Either herbicide should be
applied within three days of
planting alfalfa on irrigated sites.
On dryland sites, allow three
weeks to pass between herbicide
application and seeding. If tillage
and full seedbed preparation is
done, then at least two weeks
between tillage and seeding.

4. Irrigate before planting to
leach some of the autotoxic
chemical from the germination
and seedling growth zone.

5. Place seed directly into
mineral soil at one-quarter to one-
half-inch depth on fine-textured
soils and at three-quarters to one
inch depth on sands. Use an
appropriate drill to obtain these
seeding depths and to get soil
coverage after seeding.

6. Apply postemerge herbi-
cides (Poast Plus, Buctril, 2,4-DB)
as needed.

Bruce Anderson
Extension Forage Specialist

Kansas disease report

The wheat disease situation
remained much the same as last
week. Speckled leaf blotch was the
predominant disease with a few
reports of leaf rust and wheat
streak mosaic. (March 24)

Plant Disease Survey Report
Kansas Department of Agriculture
Phosphorus levels increase significantly

50-year study shows manure effect on corn

Fifty years of research on plots where manure was applied to continuous corn show that both nitrogen and phosphorus can be reduced or eliminated without significantly reducing corn yields.

University researchers established the plots in 1912 near Scottsbluff. From then to 1942 no manure or fertilizer was applied. In 1942 the area was split and 12 tons/acre of wet barnyard cattle manure was applied to one-half of the area, while nothing was applied to the other half. In 1953 both the manure and nonmanure areas were split into six subplots and six fertilizer treatments were initiated. The fertilizer treatments were 0, 40, 80, 120, 160 lb N/acre, and 120 lb N/acre + 160 lb P₂O₅/acre; these same fertilizer treatments with and without a 12 ton/acre manure application have been continued every year since 1953. Corn yields have been measured annually and soil samples have been taken periodically.

The average corn yields on this plot from 1953 through 1993 indicate that an annual application of 12 tons/acre of cattle manure is sufficient to attain near-optimal corn yields with no additional nitrogen. The 42-year average grain yield for the nonfertilized, nonmanured plots is 41 bu/acre; while the average yield on the nonfertilized, manured plot is 115 bu/acre. The average grain yield during the same 42-year period is 113 bu/acre on the plots receiving 160 lb/acre of fertilizer nitrogen and no manure, and 121 bu/acre on those plots receiving 160 lb/acre of fertilizer nitrogen and 12 tons/acre of manure.

Surprisingly, plots which never received phosphorus fertilizer averaged only 4 bu/acre less grain production during the last 42 years than plots that annually received 160 lb P₂O₅/acre.

Soil samples taken in the spring of 1993 from this long-term study indicate that the organic matter concentration of the surface 6-inch layer of soil on the manured plots (2.2%) is twice the organic matter concentration of the nonmanured plots (1.1%). The organic matter concentration increased with increasing rate of fertilizer nitrogen on the nonmanured plots as more residue was produced. These results demonstrate the value of manure applications for increasing soil organic matter concentrations. Increased soil organic matter concentrations generally will improve the overall productivity of the soil by increase the soil's nutrient and water holding capacities, the nutrient supplying capacity, and the infiltration capacity. It also will improve the overall soil tilth.

In this study, the manure applications have increased the soil test levels of some nutrients. In the spring of 1993 the soil potassium level was about 400 ppm on the nonmanured plots and about 800 ppm on the plots that had received 12 tons/acre of cattle manure since 1942. The DTPA zinc level was about 0.6 ppm on the nonmanured plots and about 2.8 ppm on the manured plots, while the DTPA iron level was about 6 ppm on the nonmanured plots and 10 ppm on the manured plots. The annual manure applications have had no significant effect on the sodium concentration, the electrical conductivity level (salt concentration), or the pH of the surface 6-inch layer of soil.

The annual manure applications have caused dramatic increases in the soil phosphorus levels. On the manured plots the average sodium bicarbonate phosphorus level in the surface 6-inch layer of soil was 113 ppm, while it was only 19 ppm on the nonmanured plots. The University of Nebraska fertilizer recommendations for corn indicate that a sodium bicarbonate level of 8 ppm is sufficient for optimal yields of

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Control broadleaf weeds in wheat now

Most broadleaf weeds in winter wheat are effectively and economically controlled with 2,4-D amine or ester. Weeds should be treated early in their development for optimum control, however, crop growth stage must dictate the appropriate time for herbicide application. Winter wheat must be well tillered but not jointed to avoid significant crop injury.

Ester formulations may provide better weed control than amine formulations but also may injure winter wheat more readily. Neither formulation provides much residual soil activity. Recommended 2,4-D use rates, based on a 4 lb/gal acid equivalent, are 1 to 1.5 pt/acre with amine formulations and 0.5 to 0.75 pt/acre with ester formulations. Use Low Vol esters to reduce the movement of fumes from the field.

Control of erect knotweed, kochia, and wild buckwheat is poor to fair with 2,4-D. A tank mix of 2,4-D plus Banvel can control weeds that are tolerant of 2,4-D. This treatment will control most problem broadleaves, although, blue mustard may be more effectively controlled with 2,4-D alone. Apply to well tillered winter wheat before the jointing stage. Winter wheat tolerance to Banvel is marginal and Banvel treatments made to wheat in the joint stage or later may result in significant crop injury. Residual weed control with 2,4-D plus Banvel is moderate with soil persistence of two to four weeks. Banvel use rates are 2 to 4 oz/acre, based on a 4 lb/gal acid equivalent, plus 0.75 to 1 pt/acre 2,4-D amine.

The sulfonylurea herbicides Ally, Amber, and Finesse (a premix of Ally and Glean), when tank mixed with 2,4-D, provide good to excellent control of most broadleaf weeds in winter wheat plus moderate to long residual weed control. Control of erect knotweed, Pennsylvania smartweed, and sulfonylurea resistant kochia may be improved by tank mixing with Banvel instead of 2,4-D. Control of other broadleaf weeds occasionally may be reduced, however, with tank-mixes containing Banvel and the sulfonylurea herbicides. Because Ally, Amber, and Finesse are usually applied in a tank-mix with 2,4-D or Banvel, apply before the joint stage to avoid crop injury. Use rates are 0.1 oz/acre Ally, or 0.28 to 0.56 oz/acre Amber, or 0.2 to 0.3 oz/acre Finesse plus 0.5 pt/acre 2,4-D ester or 2 to 3 oz/acre Banvel. Check the labels for these and other rates plus the need for surfactants. These treatments all have rotational restrictions that should be considered prior to use. Rotation restrictions may be as long as 36 months for some crops. Refer to the labels for specific information.

Tordon plus 2,4-D ester can provide excellent control in fields where wild buckwheat is a major concern. Apply after the resumption of active growth in the spring until the early joint stage. Use rates are 1 to 1.5 oz/acre Tordon plus 0.5 to 0.75 pt/acre 2,4-D ester. Use only on fields to be planted the next year to grass, barley, oats, wheat, or ones to be fallowed.

Buctril acts primarily as a contact herbicide, therefore, thorough spray coverage is essential. Buctril is very safe to winter wheat and may be applied from the two-leaf to boot stage if applied alone. Buctril has no residual activity in the soil and is expensive to apply when compared to 2,4-D. Use it in combination with 2,4-D and then apply the tank-mix after the joint stage. Use rates are 1 to 1.5 pt/acre Buctril plus 0.5 pt/acre 2,4-D amine.

Winter wheat fields infested with Canada thistle may be treated with Curtail herbicide after the crop is fully tillered but prior to the joint stage. In many years the window of opportunity is small because the wheat is jointing by the time Canada thistle basal leaves have appeared. The Curtail label allows application to winter wheat up to the boot stage, but winter wheat injury is likely to increase after the joint stage. Use rate is 2.0 to 2.67 pt/acre. Do not rotate to any crops other than wheat, barley, oats, and grasses for one year after treatment.

Other herbicides labelled for use in winter wheat include Harmony Extra and MCPA.

Mixing herbicides and fertilizers

Spraying winter wheat with herbicide and fertilizer mixtures has become common. The application window overlaps depending upon weed species in the field. Combining liquid fertilizer, usually UAN, with herbicides saves time, fuel, and money. However, farmers have become concerned about potential crop injury when UAN plus herbicides are applied to growing winter wheat. Most herbicides are applied between the well-tillered and joint stages.

The fertilizer needs to be in place as soon as possible in the spring. Sometimes weeds may emerge later. Waiting until weeds emerge to apply fertilizer and herbicides may be after the optimum time for fertilizer application has passed. Later nitrogen applications may not produce maximum yields if precipitation is limited causing positional unavailability of UAN.

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Integrated pest management scout training in May

Basic training on procedures for field crop scouting, including identification of insects and mites, plant diseases, weeds, crop health and irrigation scheduling will be addressed at four workshops to be held in May. These sessions are sponsored by University of Nebraska Extension as part of the Nebraska Extension Integrated Pest Management Program.

This training would be appropriate for individuals who will be working as field scouts for crop consultants or coops, or interested farmers who want to learn how to monitor field crops for pest problems. Sessions include classroom lectures and laboratory sessions, but do not include field training. The Lincoln meeting will not include training on irrigation scheduling.

Training sessions will be held:
May 10, Lincoln, Lancaster County Extension office.
Registration at 8:15 a.m.; program begins at 8:45 a.m. The $15 registration fee includes lunch. For more information contact Barb Ogg, (402) 441-7180.
May 17, Kearney, Buffalo County Extension office.
Registration at 8 a.m.; program begins at 8:30 a.m. The $10 registration fee includes lunch. For more information contact Ron Seymour, (308) 532-3611.
May 18, North Platte, West Central Research & Extension Center. Registration at 8 a.m.; program begins at 8:30 a.m. The $10 registration fee includes lunch. For more information contact Ron Seymour, (308) 532-3611.
May 19, Concord, Northeast Research & Extension Center. Registration at 8:30 a.m.; program begins at 9 a.m. The $5 registration fee includes lunch. For more information contact Keith Jarvi, (402) 584-2261.

Additional training materials are available for individual study. These include two videotapes and a reference manual. The videotapes cover pest and beneficial insect identification and scouting procedures — one in corn (26 minutes) and the other in soybeans and alfalfa (21 minutes). Each videotape (1/2 inch, VHS format) costs $29.95 plus sales tax; both videos may be ordered on one reel for $50, plus sales tax.

The Field Scout Manual covers all types of pests — insects and mites, weeds, and diseases — commonly found in major Nebraska field crops. Text and color photos provide information on identification, biology and scouting techniques. The cost is $28 plus sales tax.

To order, send a check payable to University of Nebraska to Communications and Computing Services, Attn: Bulletin Distribution, P.O. Box 830918, University of Nebraska-Lincoln, Lincoln, NE 68583-0918.

Bob Wright
South Central Research & Extension Center, Clay Center

Kansas: Parasitic wasps control greenbugs

Greenbugs and other aphids in wheat were being brought under control in fields surveyed recently in south central Kansas. Many wheat fields in some counties in that area would likely have sustained very serious damage from the greenbug, had it not been for the intervention of parasitic wasps.

Recent surveys showed that greenbug infestations had been stabilized and in some cases reduced by an explosion in parasite numbers assisted by the recent milder than normal weather. Based on mummified aphids and off-color greenbugs, aphid parasitism in wheat in south central Kansas was commonly estimated at 10-20% and ran as high as 50%.

(March 25)
Insect Survey Report
Kansas Board of Agriculture

Bob Wright
South Central Research & Extension Center, Clay Center
Scout now for pale western cutworm

Severe pale western cutworm damage has occurred in Cheyenne County and the surrounding area in the Panhandle the last two years. Pheromone trap catches in Cheyenne, Kimball and Deuel counties during the fall of 1993 showed a high population of moths active during winter wheat planting. Pale western cutworm eggs laid in the fall hatch early in the spring. Activity of these cutworms should be starting to become evident over the next few weeks. As a result winter wheat growers in the southern Panhandle and surrounding counties are urged to begin looking for pale western cutworm damage in winter wheat.

When scouting for pale western cutworms look for early leaf damage including holes and feeding at the leaf margin. The presence of dead or wilting tillers is an indication of this insect. This cutworm feeds underground and will be difficult to locate, especially in the early spring when it is quite small. Estimating the severity of an infestation of pale western cutworm is difficult. Infestations are not usually widespread throughout the field especially early in the season. Early infestations are usually limited to the lighter knolls or hills or areas with a southern exposure.

Assess population density by digging and screening the soil from one row foot area. The sample should be dug to a depth of at least 3 inches and extend from the center of row to center of row. Several samples should be dug to determine the density of the cutworm infestation. The area of the infestation should also be determined. Often the area of severe infestation is not that large and if found early these areas could be spot sprayed to reduce the cost of a complete spray of the field.

The threshold for insecticide treatment is one to two pale western cutworms per foot of row. If the wheat has a high yield potential the lower threshold (one per row foot) should be used. If the wheat is poor and had a low yield potential the higher threshold should be used. This threshold is much lower than that for the army cutworm which may also be present in wheat field at this time. It is important to be able to correctly identify these cutworms. Lorsban 4E is the only insecticide registered on wheat that will give any control of the pale western cutworm; however, at the maximum registered rate for Lorsban on wheat (1 pt/acre) control of cutworms will not be consistent. If problems are detected with pale western cutworms, University of Nebraska Extension educators or specialists and the Nebraska State Department of Agriculture should be notified so that a special registration for the possible use of a synthetic pyrethroid can be pursued.

Gary Hein
Extension Entomologist
Panhandle Research and Extention Center

Kansas: Scout alfalfa for aphids and weevils

Alfalfa growers are being urged to check their fields regularly for aphids and weevils, especially as the weather warms and pest populations can increase rapidly.

Though weevil numbers were mostly light in alfalfa surveyed this past week, infestations had reached treatment levels in a field surveyed in Montgomery County in southeastern Kansas and in a field in Comanche County in south central Kansas. Mixtures consisting mostly of pea and blue alfalfa aphids were common in alfalfa surveyed this past week in east central, southeast and south central Kansas. Though most infestations were light to moderate, some were heavy. (March 25)

Insect Survey Report
Kansas Board of Agriculture
Crop rotation: cultural answer to pest control

This article is a continuation from the March 25 issue and is part of a series reviewing the range of cultural practices useful for crop insect pest management. Last week's article addressed how pests were naturally controlled by rotations.

Rotations favoring certain pests

Inclusion of certain grassy crops, such as grassy pastures or sod, often increases the likelihood that white grubs or wireworms will be present in economically damaging numbers (See CropWatch 94-2, 14). In both cases this is because the adult stages prefer to lay eggs in these crops. These soil insects damage crops by feeding on the roots (white grubs) or by boring into the roots and base of the plant (wireworms). The larvae are less specific in their feeding preferences and will damage a wide variety of crops (some white grubs will also feed on decaying organic matter as well as live plant tissue).

These two pest groups actually consist of several species, which differ in their life cycle, damage potential, and behavior. In Nebraska, white grubs damaging to crops primarily belong to two genera, Cyclonephala and Phyllophaga, commonly referred to as annual and three-year grubs, respectively, in reference to the amount of time it takes for them to complete one generation. The Phyllophaga white grubs have a greater potential to cause problems in subsequent crops because of their longer life cycle. They potentially can cause economic damage to crops in the second and third years of their three year life cycle. Cyclonephala white grubs have an annual life cycle, and are rarely economically damaging to field crops because their feeding is often completed as corn or other crops are emerging in the spring.

The wireworm species in Nebraska are less well studied. They belong to several genera, including Melanotus and Conoderus. Some wireworm species take at least three years to complete the larval stages. It may take extended rotations or fallow periods to reduce their numbers significantly.

An area perspective

Much research on crop rotation has taken a single field approach, and for some less mobile insects, this may be appropriate. However, for some more mobile insects, the rotational history of other fields (either on the same farm or surrounding farms) may affect insect pest management in adjacent fields. An example of this in Nebraska is chinch bugs as a pest of sorghum or corn. There are two annual generations of chinch bugs in Nebraska. The first generation develops on small grains, primarily wheat, and as wheat matures, immature and adult chinch bugs move out of wheat and attack any nearby grass crop, normally sorghum or corn. If wheat or other small grains are not grown in nearby fields, the potential for the first generation of chinch bugs to damage sorghum or corn is greatly reduced.

Bean leaf beetles may damage soybeans near alfalfa. Bean leaf beetles become active in the spring before soybeans emerge and often begin feeding in alfalfa. Soybeans near alfalfa may be at increased risk from bean leaf beetles, particularly after the first cutting of alfalfa which may force beetles to search for alternate food sources.

Spider mites may overwinter in alfalfa (twospotted spider mite) or wheat or other grasses (Banks grass mite). Corn near these crops, especially if downwind from them, may be infested with migrating spider mites earlier in the season, resulting in a greater risk for damage. Thus, use of crop rotation and other tactics in insect pest management must take a whole-farm approach, and sometimes larger units must be considered as well.

There are several reasons why rotations may not fit a pest management plan. Rotation crops which are unsuitable from an economical or other perspective may be needed to control some pests, and rotations may not control highly mobile pest species. Often rotation works against the soil stage of a pest insect. In some cases, for example with white grubs and wireworms, you may be dealing with a species complex, rather than one species, and no rotational system will adequately control the complex if the host range or life cycle of the different species varies greatly. Finally, pests can adapt to rotations, with the best known example being the northern corn rootworm.

Increased use of crop rotation in corn production systems has the potential to greatly reduce the crop insecticide use in Nebraska and other midwestern states. Crop rotation has the potential to reduce pest damage on several other Nebraska crops as well. However, no one rotational system will control all potential pests.

Bob Wright, South Central Research and Extension Center, Clay Center

Corn/sorghum guide

A revised edition of the Nebraska Insect Guide for Corn and Sorghum featuring scouting and treatment recommendations has been published by University of Nebraska-Lincoln Extension. Cost is $2. For your copy, contact your nearest Extension office.