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GMO, non-GMO hybrids produce similar yields in side-by-side trials

With the rapid introduction of GMO seed technology, typical long-term field studies are not feasible. In addition, these new GMO products are often available to farmers at the same time they become available to scientists, providing little opportunity for researchers at public institutions to conduct the field trials necessary to provide objective results before widespread planting begins.

To address two production issues related to the introduction of these GMOs, we compared glyphosate (Roundup) tolerant (GT) corn hybrids and non-GT sister lines at nine locations across five states in 1999 to determine 1) the effect of glyphosate on glyphosate tolerant hybrids and 2) if yield penalties exist.

Research addresses two key questions:

- How do yields from GMO and non-GMO sister hybrids compare?
- How does glyphosate affect yield with glyphosate-tolerant hybrids?

Cooperators in the study were corn extension specialists at universities from five north central states. Four replicates were used at all locations, but production practices and combinations of hybrids compared varied at the locations. Seed was supplied by DeKalb and NC+ seed companies. DeKalb hybrids were sorted into three maturity groups to process the data: Early maturing (94-106 days), DK 448, 493, 512, and 566; medium maturing (108-112 days), DK 580 and 626; and late maturing (114 days), DK 642. The NC+ hybrids,

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Balance herbicide (active ingredient isoxaflutole) was introduced by Rhone Poulenc (now Aventis) in 1999. In Nebraska about 10% of the corn acres were treated with Balance and about 15% of these had some corn injury. Aventis indicated that about 41% of the injured corn was due to an incorrect rate for the soil, i.e. variable soil texture, spray overlap, and poor sprayer calibration. Another 29% was due to mixing, dispersion, and application error; 8% to agronomic issues such as incorrect planting depth and open seed furrows; and 22% to excessive rainfall. In order to reduce the injury risk, Aventis made some changes in the Balance label for 2000. Changes include:

1. Not recommended on coarse textured soils with less than 1.5% organic matter (OM) content or pH > 7.5
2. On medium textured soils with pH > 7.5, reduce the rate by .25 oz.

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Wheat diseases reported in Plains states

The wheat disease situation across Nebraska has been relatively quiet but that may change in the next few weeks. There are reports of major outbreaks of leaf rust in Texas and Oklahoma and of barley yellow dwarf in Kansas. Kansas is also reporting active wheat streak mosaic, spindle streak mosaic and soilborne mosaic.

In Nebraska the most evident disease now is soilborne wheat mosaic. The incidence of soilborne wheat mosaic has steadily increased in Nebraska due to continuous wheat cropping practices. This disease is no longer strictly an eastern Nebraska disease, but is now present throughout much of the south central and west central wheat growing areas.

Losses in wheat yields from this disease vary from year to year because of the varieties grown, continuous cropping and environmental factors favoring disease development. Symptom expression and disease development are favored by temperatures below 70°F. Affected fields develop a yellow or pale green color that may conform to low areas or drainage paths or be just generally distributed across the field. Individual leaves from infected plants show a mosaic pattern of light and dark green.

Since this is a virus disease no curative controls are available. Generally, yield losses are minimal which, due to the present dry conditions, will probably hold true for this year. I have a much greater concern about the emerging potential for leaf rust, barley yellow dwarf and wheat streak mosaic.

John E. Watkins
Extension Plant Pathologist

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GMO, non-GMO (Continued from page 31)

Figure 1. Research data show that the herbicide used did not affect the yield of glyphosate tolerant hybrids in any hybrid grouping. RU = Roundup Ultra  TR = traditional method

2019 (100 days), 4339 (107 days), and 5029 (111 days) were compared in a separate group.

DeKalb and NC+ glyphosate tolerant hybrids were compared with traditional herbicides and with glyphosate to determine the effect of the herbicides on the hybrids. Yields of glyphosate tolerant corn hybrids were similar with either glyphosate or traditional herbicides. Data in Figure 1 show that the herbicide used did not affect the yield of glyphosate tolerant hybrids in any hybrid grouping.

To answer the question posed in the second objective, DeKalb glyphosate tolerant hybrids were compared in side-by-side plots with their sister lines which were non-glyphosate tolerant. Traditional herbicides were used in this portion of the study. Figure 2 shows that yields of non-GT sister lines and GT sister lines were similar in all three maturity groups.

Balance (Continued from page 31)

3. Rate limited to 1.0 oz per acre on clay knolls, eroded hillside, or terraces with scraped exposed subsoil

4. Presoak Balance in water prior to adding to the spray tank fo improved dispersion. Maintain vigorous agitation during mixing and spraying. No time element is stated, but 5 to 10 minutes should suffice. Use a gallon of water per 20 oz of granules.

EPIC herbicide, which also contains isoxaflutole, has also undergone some label changes:
1. Do not use on coarse textured soils if pH > 7.5 or OM is < 1.5%.
2. Not recommended on medium textured soils if pH > 7.5 and OM is < 2.5%

The “not recommended” statement indicates that, although not a label violation, the company believes that this use has a substantial risk of crop injury and the product should not be used under these circumstances. “Do not use” represents a label violation if transgressed.

In all cases with these herbicides, plant corn at least 1.5 inches deep with complete seed furrow coverage. Only corn can be replanted in the event of a crop failure.

Fred Roeth, Extension Weed Specialist
South Central REC

ruralroutes.unl.edu
Farm, ranch and family news on the Web
Achieving early weed control in corn

As the planting season comes quickly upon us, producers are hashing through the many strategies available to them for weed management in corn this year. Choosing a fail-proof strategy can be complicated, and in many cases, the perfect strategy may not exist.

Analyzing all the information necessary to select the most cost-effective weed management decision can be frustrating. Economic factors such as herbicide costs, fuel, and time, plus biological and environmental factors including weed species spectrum, soil type, organic matter, herbicide efficacy, herbicide restrictions, annual precipitation, precipitation at application, and ability to make a timely treatment application all must be considered for successful weed management.

Corn/weed competition

Each weed species competes differently. For example, common sunflower has a competitive index of 10 and is much more competitive than pigweed, which has a competitive index of about 3. Understanding the differences between species is important to determining what management strategy will provide the best return for your money.

Each crop also differs in its competitive ability. Corn is one of the most competitive crops in Nebraska. The relative competitive load necessary to cause a specific yield loss quantifies the competitiveness of a crop. For corn, it would take a competitive load of around 36, per 100 ft², to cause a 5% yield loss. Sunflower has a competitive index of 10, therefore it would take 3.6 sunflower plants per 100 ft² to cause a 5% yield reduction in corn. This assumes the weeds emerge with the crop. Accurately calculating yield loss, especially when several weeds are concerned, can be very difficult.

WeedSOFT (see enclosed brochure) is a weed management decision support software that can help you consider various aspects. It also offers information and treatment recommendations, providing for more accurate yield loss analysis and better information.

Early preplant and preemergence weed management

Controlling weeds before they become a problem is a sound strategy. Various techniques are available and depending on individual circumstances, one may be better than the other. Producers need to determine their seasonal

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Soil moisture at 20”-40” below wilting point

In the third week of March, Nebraska NRCS staff took soil samples in fields at 16 sites across Nebraska. At each site, soil moisture samples were taken at 4-, 10-, 20-, and 40-inch increments. At the 20-inch level 10 out of 16 samples were less than that needed for the wilting point and at 40 inches 13 out of 16 of the sites were below the wilting point. The following table indicates that while there may be soil moisture to start a crop, there is little soil moisture in the deeper profile in much of Nebraska. Without significant rains to recharge the profile, dryland yields will be affected. Table courtesy of Nathan McCaleb, NRCS state soil scientist.

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<td>WP</td>
<td>FC</td>
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<td>19.9</td>
<td>11.1</td>
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</table>

FC = field capacity; WP = wilting point. Shaded areas = samples with soil moisture below the wilting point. The field capacity and wilting point of the soils were determined by comparing soil textures at the sites with known soil textures and their average soil moisture percent for field capacity and wilting points as determined by the National Soil Survey Laboratory, NRCS, Lincoln.
Dryland sorghum or corn — what’s best for your operation?

One of the burning questions on many dryland farmer’s minds over the last several years is, “Should I plant milo or corn, and how much of each should I plant?”.

Finding the answer to this question had been difficult because few replicated yield comparisons were available. So, in 1997 we combined the dryland sorghum and corn University of Nebraska Yield Performance Test plots into the same Nuckolls County field to provide for better comparison. Similar comparisons were added at two other locations in 1998 and 1999.

In the trials, which were conducted in south central and southeast Nebraska, two crops were compared in the same field, using cultural and management practices appropriate to each crop. Productivity of these sites and growing conditions were good to excellent.

In 1997, 29 milo hybrids were compared with 38 corn hybrids in Nuckolls County. Both crops were surface planted after disking. The field had been planted to wheat the previous three years. Average corn yields were 81 bu/acre with a range of 61 to 107 bu/acre. This compares to average sorghum yields of 107 bu/acre with a range of 77 to 124 bu/acre. Heavy rains after planting reduced corn stands to an average of about 12,000 plants per acre and milo stands to an average 31,000 plants per acre.

In 1998, similar comparisons were planted in Otoe and Webster counties. In Otoe County, 60 corn hybrids were planted in the same field with 18 sorghum hybrids. Both crops were planted without tillage into soybean stubble. Average corn yield from this trial was 138 bu/acre. Individual hybrid yields ranged from 117 to 159 bu/acre. This compares to an average 133 bu/acre for sorghum with a 115-158 bu/acre yield range. Cool and wet conditions during plant emergence and early growth and soil compaction slowed development and emergence of both crops and contributed to poor stands. Corn was yellow after emergence due to excess moisture. In Webster County in 1998, 36 corn hybrids were compared to 20 sorghum hybrids. Both crops were no-till planted into wheat stubble. Average corn yield was 131 bu/acre with yields ranging from 107 to 172 bu/acre. This compares to an average yield of 153 bu/acre for sorghum with a range of 125 to 177 bu/acre. Conditions were excellent at this site.

In 1999 the trials were conducted in Nuckolls and Gage counties. The Gage county site had over 40 corn hybrids and 22 sorghum hybrids. The plot was planted into soybean stubble and had excellent growing conditions through late summer when it became fairly dry. Most of the corn plot was lost because of a herbicide problem, however comparing the hybrids that were not damaged and the producer’s corn in the rest of the field, the corn yielded about 150 bu/acre. The sorghum averaged 143 bu/acre with yields ranging from 122 to 170 bu/acre. The Nuckolls County site was no-till planted into wheat stubble and contained 33 corn hybrids and 19 sorghum hybrids. The growing conditions were fairly wet early and very dry late in the summer. Average corn yields were 88 bu/acre, ranging from 73 to 110 bu/acre. The sorghum yields averaged 109 bu/acre and ranged from 92 to 121.

When we started this project, we expected that sorghum would out yield corn in dry years, corn would out yield sorghum in wet years, and they would have about the same yields in average years. However, three years of data from up to five locations have shown that in south central Nebraska, sorghum out yielded corn by an average of 23 bu/acre. In southeast Nebraska in two years with excellent yields, the average yields were 6 bu/a higher for the corn. Sorghum will probably have even a greater yield advantage in dry years. People think that corn usually will out yield milo, but when you ask where the crops were raised, the corn was usually planted on the best land (most fertile, level, best subsoil, and most residue cover) and the sorghum was grown on the poorer land (side hill land that is eroded, has less subsoil moisture, and less residue cover). When both are planted into the same conditions, sorghum appears to out yield corn in south central Nebraska.

Figuring the economics

In addition to yield differences, typically there are also differences in prices and production costs. Historically, grain sorghum prices in Nebraska have averaged about 25 cents per bushel below the corn price, although the spread in loan rates is less (about 17 cents per bushel). Since production costs are lower for sorghum, up to $12 per acre for seed alone, sorghum generally requires less than a 10% yield advantage to net more than corn. For example, 106 bushel grain sorghum at $2.20 per bushel (106 x $2.20 = $233.20) would be more profitable than 100 bushel corn at $2.45 per bushel at a $12 per acre higher production cost (100 x $2.45 - $12 = $233). On the other hand if sorghum yields are below 40 bushels per acre, corn must yield more than sorghum to be the most profitable alternative at $2.45 corn.

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Corn planting depth important in dry times

Research has shown that non-uniform planting depth can reduce corn yield by 2-3% in a year of average moisture, but even more with limited soil moisture. Not planting to moisture decreases corn yields by 6% to 9% or more, according to most estimates. Equally important to planting to moisture is obtaining good seed to soil contact. Depth of planting, uniformity of depth, and good seed furrow closure are important to successful planting. These same factors were also important to crop response to herbicides in corn in 1999 (see Balance, page 31).

In a dry year without center pivot irrigation or adequate moisture such as with the ridge plant system, consider planting 1/2 inch deeper. Most corn in fine-textured soil should be planted 2 inches deep and up to 2 1/2 inches if surface soil conditions are dry or may dry out before germination and plant establishment occurs. With coarse-textured soil always plant at least 2 inches deep and up to 3 inches deep if necessary. Planting too deep can also cause problems. Some seeds may lack enough seedling vigor to become established, especially with early plantings. Since it takes longer for the plant to become established, injury with some herbicides may increase. The biggest problem may occur when furrow openers are used and rain moves additional soil over the seed, making it too deep to emerge.

Dr. Paul Nordquist made an interesting observation on planting depth several years ago during an Ecofallow Corn Hybrid Evaluation study in Furnas County. At harvest he noted that about a third of the field was standing well, about a third was heavily lodged and about a third was in between. He found that the corn standing well was planted 2 inches deep, the heavily lodged corn was planted about 1 to 1 1/4 inches deep and the in between was planted 1 1/4 to 1 1/2 inches deep. How did this happen? Three people using hand planters planted the field. One planted at least 2 inches deep, another barely got the corn in the soil while the third planted 1-2 inches deep, depending on hardness of the soil. This is a good illustration of rootless corn syndrome. On shallow planted corn the nodal roots will attempt to develop at or near the soil surface. If the soil is hot and or dry, the brace roots may not penetrate the soil surface and lodging is more likely.

Furrow closure is important not only to keep the seed zone from drying out, but also to reduce the possibility of herbicide injury. This was an important factor in crop response to Balance in 1999. Soil moisture, texture, bulk density, and

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Dryland sorghum (Continued from page 35)

$2.20 sorghum and an additional $12 per acre cost of growing corn.

Crop insurance

Crop insurance coverage may be an additional consideration in choosing between corn and grain sorghum, particularly when beginning the year with low subsoil moisture. For farms that have a higher proven yield for dryland corn than grain sorghum it would appear the producer with multiperil crop insurance would be better off in case of crop failure to have planted corn than grain sorghum. However, this conclusion is not necessarily correct. For example, say for the same insurance premium we can purchase 65% coverage on a 110-bushel sorghum yield at $1.75 per bushel or 60% coverage on a 120-bushel corn yield at $1.90 per bushel. The corn coverage would generate an indemnity of .60 x 120 x $1.90 = $137 per acre in case of complete crop failure. The sorghum would generate a maximum indemnity of .65 x 110 x $1.75 = $125 per acre. If production costs are $12 per acre less on sorghum, the two are breakeven. Further, if you were to raise some sorghum (but corn would have failed completely) and the market price is above the indemnity price, you would be better off having planted sorghum even though in our example the yield guarantee on the sorghum, .65 x 110 = 71.5 bu, is slightly less than the yield guarantee on the corn, 60 x 120 = 72 bu.

Conclusion

We would not encourage anyone to stop growing dryland corn. First, three years of data in five locations is not enough information to make any conclusive decisions. Secondly, there are still some good reasons to produce dryland corn — a better herbicide selection, crop rotation benefits, spreading out field work and better maximum yield potential on excellent years. However, sorghum appears able to yield as well as and sometimes better than corn, even in most good situations, is cheaper to produce, and is much less risky in dry years.

For related information, contact your nearest Cooperative Extension Office or view variety test results at http://ianr.unl.edu/ianr/agronomy/varitest2.htm

Steve Melvin, Extension Educator
Roger Elmore, Extension Crops Specialist
Lenis Nelson, Extension Crop Variety and Seed Production Specialist
Roger Selley, Extension Farm Management Specialist
Effect of plant population on ecofallow yields

Table 1. 1998 Ecofallow corn hybrid evaluation.

<table>
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<tr>
<th>County</th>
<th>10,000</th>
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<th>15,000</th>
<th>17,500</th>
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Table 2. 1999 Ecofallow corn hybrid evaluation.

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<th>County</th>
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RR = Roundup Ready

Plants population along with hybrid selection are important factors in ecofallow corn production. To learn more about the effect of plant population on ecofallow yields, four plant populations were evaluated at three Nebraska locations in 1998 and 1999.

Two of the sites were in Lincoln and Perkins counties and three were in Red Willow County. Each site consisted of 13 to 32 hybrids in four replications. The plots were planted to 31,600 seeds/acre and thinned to 10,000, 12,500, 15,000 and 17,500 in rep 1, 2, 3, and 4 respectively. A rope was used to mark each population to get the correct plant spacing. The plant nearest the mark was left. Tables 1 and 2 show the 1998-99 yields by counties.

Results

1998 — Weed control at the Red Willow County site was excellent while the weed control at the Perkins County site was good. The Lincoln County site needed the higher plant population to compete with weeds, hence the highest yield with the highest plant population.

1999 — The conventional corn plot at Red Willow was injured by Balance and therefore the highest plant population was needed. In the Roundup Ready corn at Red Willow the weed control was excellent. Notice that the top yields 91.3 (conventional) and 91.1 (Roundup Ready) are almost identical. These plots were side by side. Weed winter annuals (Continued from page 32)

comfort zone in which to apply Roundup. Plan to control winter annuals when they’re in the rosette stage to 5-6 inches tall, before they become too large for adequate control.

Pre-plant (burndown) herbicides available for corn include: 2,4D Ester (1.0 pt/acre); 2,4D Ester + Banvel (0.5 pt + 0.5 pt); Banvel (Atrazine (2 qt); Atrazine + Banvel (2 qt + 0.5 pt); Atrazine + 2.4 D (2.0 pt + 1.0 pt); Field Master (4 qts), Gramoxone Extra (1.5 pt); Gramoxone extra + Atrazine (1.5 pt + 2.0 pt); Roundup Ultra / Touchdown (20 / 15 oz). Pre-emergence herbicides in corn include: Atrazine, Axiom, Balance, Bladex, and Prowl.

Pre-plant (burndown) herbicides in soybean include: Command 3E (1.5 pt/acre); Gramoxone Extra (1.5 pt/acre); Pursuit (4 oz), Pursuit Plus (2.5 pt), Sencor / Lexone DF (16 / 13 oz) and Roundup Ultra / Touchdown (20 / 15 oz).

Pre-emergence herbicides in soybean include: Axiom, Pursuit, Prowl, and Sencor / Lexone. Consult the label for the pre-plant and post-plant intervals. For example, corn should not be planted five days before or after application of 2,4-D. Also 2,4-D can be used for burndown in soybean but application must be at least seven days prior to planting.

Steve Knezevic, Extension Weeds Specialist, Northeast REC

Bob Klein, Extension Cropping Systems Specialist West Central REC

Winter annuals (Continued from page 32)

Planting depth

(Continued from page 36)

compaction, along with down pressure on gauge wheels and seed closer wheel type, angle and down pressure affect seed furrow closer. Many times it is necessary to make adjustments between fields and even in fields because of changing soil conditions, especially after light rain. Be sure you check your planting conditions.

Bob Klein, Extension Cropping Systems Specialist West Central REC
Set wireworm traps to better plan control

Wireworm problems seem to be increasing in recent years in Nebraska, possibly due to several factors:
1) earlier planting;
2) more residue on the ground; and
3) a succession of cool wet springs.

These factors may increase wireworm problems primarily by:

1) slowing germination, allowing the wireworms more time to find germinating seed.
2) keeping wireworms in the germination zone longer (they move deeper in the soil with warmer temperatures), giving them more time to attack the plant after it emerges from the seed.
3) Possibly increasing populations by providing more cover for adults to hide.

Scouting

It’s important to scout for wireworms before planting and not just rely on last year’s populations. There are no “rescue” treatments after wireworms attack seedlings. Control methods need to start before planting with tillage or during planting with the use of insecticides. All control methods have a cost – selecting the wrong method becomes an unnecessary cost.

To assess the potential for wireworm problems, use a bait trap consisting of untreated corn and wheat (or other fast germinating small grain), covered by clear and black plastic. Put the bait traps out in suspected areas two to three weeks before planting, at least one every 10 acres over an entire field and more frequently in “hot spots” where there has been a history of problems. Dig them up just before planting to assess the wireworm population. If an average of more than one wireworm per trap is found, a control measure is usually necessary.

Traps are inexpensive but require a specific window of time. It is important to confirm wireworms as the problem in seedling stand establishment because other factors, such as seedling diseases, herbicide damage, and planting depth problems, among others, may cause similar symptoms.

Management

Sometimes tillage is discussed as an option in managing wireworms. Tillage will warm the soil, allowing the seeds to “outgrow” the wireworm attacks by allowing for faster germination, possibly driving the wireworms into cooler soil beneath the germination zone. Tillage also may disrupt tunnels caused by wireworms moving in the soil. Field experience suggests that this may happen when fields are tilled.

Be cautious when considering tillage, especially this year with dry soil conditions and the potential for drought. Also, residue on the surface will minimize erosion under heavy rainfall. There are many other good agronomic reasons for leaving residue on the soil surface.

Other options for wireworm control are:
1) Delay planting of problem fields to allow the soil to warm up.
2) If you still want to till, till only those areas where traps have confirmed the presence of wireworms and not the entire field. Consider moving residue away just from the row area if possible to allow for warmer temperatures.

3) Use a planter box seed treatment like Kernel Guard or Agrox to protect the seed. Cost: About $1.50 to $2.00 an acre.

Planter box seed treatments will not protect the plant once the plant has emerged from the seed.

4) If you believe wireworms are not being protected by the planter box treatments, Pounce 3.2 EC liquid or 1.5G granule infurrow are other options. Pounce recently received a label for wireworm control. If you use the liquid form, the label recommends 4 to 8 ounces of Pounce per acre. Cost is about $1 an ounce. A similar rate is used for granules. Some farmers are using lower rates and are satisfied with the protection. A Warrior T label has just been released for another infurrow liquid treatment option.

5) Use Novartis varieties treated with ProShield (Force, tefluthrin, insecticide applied directly to the seed). Only certain Novartis varieties are treated and available this year. Cost: about $15 - $16 an acre.

6) Use a reduced rate of soil

Set and monitor wireworm traps two to three weeks before planting to determine how serious the problem may be and what the best control options may be.
Wireworms
(Continued from page 38)

insecticide (preferably Counter 15 G if you can find it). Counter 20 CR is also good but needs more moisture to activate. Aztec, Force, Fortress, and thimet are also options. Cost: about $6 to $10 an acre at half rates. Most companies will not support lower than labeled rates. Good calibration and granule distribution is a must if you reduce rates.

7) Use a full rate of a soil insecticide if you want company support. Cost: about $14 to $20 an acre.

8) Do nothing and replant if needed. It may be cheaper overall than spending money on an insurance treatment that may not be needed.

Keith Jarvi, Integrated Pest Management, Northeast REC
Tom Hunt, Extension Entomologist Haskell Ag Lab, Concord
Bob Wright, Extension Entomologist, South Central REC

Soybean, sorghum acres increase, corn decreases

Nebraska's producers expect to increase acreage planted to soybeans, sorghum, sugar beets, oats and barley, while decreasing acreage devoted to corn, dry beans, winter wheat and sunflowers, according to Nebraska Agricultural Statistics Service.

Nebraska corn growers expect to plant 8.3 million acres in 2000, down 3% from last year and 6% below 1998. If realized, this would be the smallest acreage planted since 1995. Soybean producers expect to plant a record 4.6 million acres, up 300,000 acres or 7% over last year. This would be well above the previous record high of 4.3 million acres planted in 1999. Sorghum growers plan to plant 700,000 acres, up 150,000 acres from last year.

Begin scouting for alfalfa weevils in southern Nebraska

Alfalfa weevils have been serious pests of alfalfa in Nebraska over the years. The last few years, damage has been more intensive in the southern half of Nebraska and in the Panhandle. In 1998 some severe damage occurred in northern Nebraska in Holt and Boyd counties. While it's hard to predict where alfalfa weevil will be a problem from year to year, the potential for damage always exists. The mild winter may have enhanced survival of adults so a greater potential may exist for statewide damage in 2000. Despite pressing row crop planting schedules, producers of high quality hay should take time in the next month to scout for weevils.

Most alfalfa weevils overwinter as adults in sheltered areas. They emerge when the weather warms and lay eggs in alfalfa stems. Sometimes a few eggs will be laid in the fall, and some larvae will overwinter and cause very early feeding damage; however, this is not common in Nebraska. After spring laid eggs hatch, alfalfa weevils generally feed on first cutting alfalfa as larvae, and on regrowth as adults.

However, in recent years weevils in the Panhandle and northern Nebraska have not developed as rapidly as one would predict using growing degree days (GDD). When this happens, larvae continue feeding after the first cutting, which results in significant stubble feeding and delay of regrowth. This type of feeding was particularly severe in Boyd and northern Holt counties in 1998.

Spring hatching weevil larvae usually begin causing noticeable damage in Nebraska at about 300-375 growing degree days (48 degree base). Roughly the southern third of Nebraska will have reached that level by late this week (see map below). Next week we will review scouting and management decisions for alfalfa weevils.

Keith Jarvi
Integrated Pest Management
Northeast REC

Alfalfa weevils

Growing degree day accumulation as of Monday using a 48°base for alfalfa weevil development. Damage is noticeable at 300-375 GDD.
goals before committing to any one strategy.

Early preplant herbicide applications offer many advantages to most producers, especially no-till farmers. First, especially in no-till, early preplant treatments allow producers to burndown winter annuals including henbit and mustards and early summer annuals, including giant ragweed, common sunflower and lambsquarters. This can be important with drought conditions. These early weeds, while not competing directly with the crop, can quickly remove precious soil moisture.

Second, an early preplant treatment reduces most if not all weed competition as the crop emerges. Although this early competition may not be the most critical with respect to yield, it can quickly reduce yield as corn enters the two-leaf stage. Finally, those contemplating the use of a preemergence treatment this year may think hard about an early preplant treatment in a year when precipitation may be limiting. The likelihood of getting the required amount of precipitation for incorporating the early preplant treatment is very good; however early applications will decrease the length of residual activity. Common sense tells you the earlier a herbicide is applied to the soil the earlier it will stop working. Postemergence programs need to be carefully evaluated before making such a decision and some knowledge of the weed history for a field is helpful as well.

A preemergence treatment, applied after the crop is planted but before emergence, offers many of the same advantages. An additional advantage over the early preplant application is that it allows the producer to increase the longevity of control provided by the herbicide. This makes good sense in tilled fields. This also provides increased management flexibility later in the season as summer annuals begin to emerge. One disadvantage of the preemergence treatment is that it may not perform well under low moisture conditions. This may be especially important in a year characterized by drought.

Below is a list of labeled preemergence herbicides and their application timings. As always, read, understand, and follow the label supplied with each product. For further evaluation of herbicide efficacy on weeds and weed/crop competition, see the 2000 Guide For Weed Management in Ne-

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**Table 1. Preplant/preemergence herbicides for corn**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Rate/Acre</th>
<th>Application Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aatrex/Atrazine&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.2 lb&lt;sup&gt;a&lt;/sup&gt;</td>
<td>EPP, PPSA, PPI, PRE, EPOST</td>
</tr>
<tr>
<td>Axiom&lt;sup&gt;a&lt;/sup&gt;</td>
<td>8 – 15 oz&lt;sup&gt;a&lt;/sup&gt;</td>
<td>EPP, PPSA, PPI, PRE</td>
</tr>
<tr>
<td>Axiom AT&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.5 – 4 lb/a&lt;sup&gt;a&lt;/sup&gt;</td>
<td>EPP, PPSA, PPI, PRE</td>
</tr>
<tr>
<td>Balance&lt;sup&gt;ac&lt;/sup&gt;</td>
<td>1 – 3.0 oz&lt;sup&gt;a&lt;/sup&gt;</td>
<td>EPP, PPSA, PPI, PRE</td>
</tr>
<tr>
<td>(On medium soils with pH &gt;7.5, reduce rate by 0.25 oz/a from recommended rate.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bicep II Magnum&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.3 – 2.6 qt&lt;sup&gt;a&lt;/sup&gt;</td>
<td>EPP, PPSA, PPI, PRE, POST</td>
</tr>
<tr>
<td>Bicep Lite Mag&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.9 – 2.2 qt&lt;sup&gt;a&lt;/sup&gt;</td>
<td>EPP, PPSA, PPI, PRE, POST</td>
</tr>
<tr>
<td>Bicep Magnum TR&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.6 – 2 qt&lt;sup&gt;a&lt;/sup&gt;</td>
<td>EPP, PPSA, PPI, PRE, POST</td>
</tr>
<tr>
<td>Broadstrike + Dual&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.7 – 2.5 pt&lt;sup&gt;a&lt;/sup&gt;</td>
<td>PPSA, PRE, EPOST</td>
</tr>
<tr>
<td>Bullet/Lariata&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3 – 3.5 qt&lt;sup&gt;a&lt;/sup&gt;</td>
<td>PPSA, PRE</td>
</tr>
<tr>
<td>Contour (IMI Corn)</td>
<td>1.3 pt</td>
<td>PPSA, PRE</td>
</tr>
<tr>
<td>Degree&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.25 – 4.25 pt</td>
<td>EPP, PPSA, PPI, PRE, POST</td>
</tr>
<tr>
<td>Degree Xtra&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>2.9 – 3.7 qt</td>
<td>EPP, PPSA, PPI, PRE, POST</td>
</tr>
<tr>
<td>DoublePlay&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>4.5 – 6 pt</td>
<td>PPI</td>
</tr>
<tr>
<td>Dual II Magnum&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1 – 1.7 pt</td>
<td>EPP, PPSA, PRE, POST</td>
</tr>
<tr>
<td>Dual II Magnum&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6 – 12 lb</td>
<td>EPP, PPSA, PRE, POST</td>
</tr>
<tr>
<td>EPIC&lt;sup&gt;ac&lt;/sup&gt;</td>
<td>11 – 15 oz</td>
<td>EPP, PPSA, PPI or PRE.</td>
</tr>
<tr>
<td>(Do not use EPIC on coarse textured soils with &lt;1.5% organic matter. Not recommended on medium textured soils with pH &gt;7.5 and &lt;2.5% organic matter content. Use low rates for soils with pH &gt;7.4 or with less than 1.5% organic matter.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eradicane&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.75 – 5 pt</td>
<td>PPI</td>
</tr>
<tr>
<td>Frontier&lt;sup&gt;a&lt;/sup&gt;</td>
<td>20 – 30 oz</td>
<td>PPSA, PRE, PPI</td>
</tr>
<tr>
<td>Fultime&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>2.5 – 3.5 qt</td>
<td>EPP, PPSA, PRE</td>
</tr>
<tr>
<td>Guardsman/LeadOff&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.5 – 4.5 pt</td>
<td>PPSA, PRE, PPI, EPOST</td>
</tr>
<tr>
<td>Harness&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>1.25 – 2.25 qt</td>
<td>PPSA, PRE, EPOST</td>
</tr>
<tr>
<td>Harness Xtra&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>1.8 – 2.3 qt</td>
<td>PPSA, PRE, EPOST</td>
</tr>
<tr>
<td>Hornet&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.2 – 4.0</td>
<td>PPSA, PRE, EPOST</td>
</tr>
<tr>
<td>Lasso II&lt;sup&gt;a&lt;/sup&gt;</td>
<td>17 – 20 lb</td>
<td>PPSA, PRE, EPOST</td>
</tr>
<tr>
<td>Micro Tech/Lasso&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2 – 3 qt</td>
<td>PPSA, PRE, EPOST</td>
</tr>
<tr>
<td>Prowl/Pendimax&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.8 qt</td>
<td>EPOST</td>
</tr>
<tr>
<td>Python&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.8 – 1.33 oz</td>
<td>PPSA, PPI, PRE</td>
</tr>
<tr>
<td>Surpass&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>1.5 – 2.5</td>
<td>PPSA, PRE, EPOST</td>
</tr>
<tr>
<td>Surpass 100&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>1.6 – 3.3</td>
<td>PPSA, PRE, EPOST</td>
</tr>
<tr>
<td>TopNotch&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>2 – 3 qt</td>
<td>PPSA, PRE, EPOST</td>
</tr>
</tbody>
</table>

<sup>a</sup> Rates dependent on soil type and application type

<sup>b</sup> Do not use on sandy soil if water table is shallower than 30 feet

<sup>c</sup> Do not use Balance or EPIC if the water table is within 25 feet of the soil surface on sands, sandy loam, or loamy sand soils with less than 2% organic matter