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CROP WATCH

University of Nebraska Cooperative Extension
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No. 2002-5
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Especially with early planting dates

Seed treatments offer measure of security

While this year's seed supply is in much better condition than last year's, producers who have had stand problems or are considering early planting may want to consider adding a seed treatment fungicide.

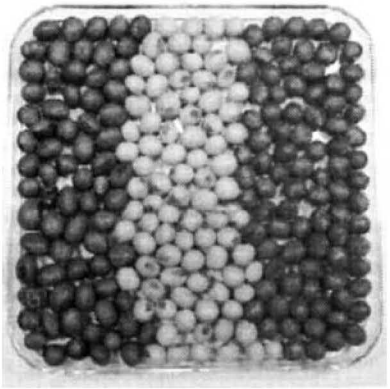
Many producers will place soybean seed into less than optimal environments for rapid germination and emergence. Temperatures below 50°F, soil moisture content high enough to exclude oxygen and the presence of threatening pathogens often characterize the seed environment. Given all of this, I would recommend a fungicide seed treatment if any of the following apply:

1. **History of seedling/emergence problems:** If you have a field with a history of stand problems, treat the seed with a good combination product.

2. **Early planting:** If you're considering early planting, fungicide seed treatments are a necessity. Cool, wet soils are very conducive to poor stands. No-till fields will have cool soils later in the season than tilled fields. These will more commonly have seedling disease problems.

3. **Phytophthora history:** Fields with a history of phytophthora will need additional metalaxyl or mefenoxam treatment. Even with resistant varieties, I recommend a treatment; fields with phytophthora generally favor pythium.

Seed-applied fungicides and their activity are listed in the NU NebFact, "Seed Treatment Fungicides for Soybeans" (NF00-411). (This is currently being revised to include new products.)



Various colors indicate the type of soybean seed treatment.

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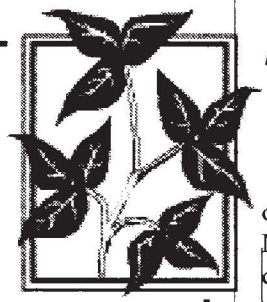

Focus on soybeans

In some Panhandle fields

Army cutworms 'severe'

Severe infestations of army cutworms have been seen in the Nebraska Panhandle. They are currently in wheat and alfalfa and will eventually impact sugarbeets. Due to the current dry conditions in much of the region, cutworms are causing more damage than normal. The slower rate of growth as these crops emerge from dormancy is allowing the cutworms to have an increased impact. However, considering the poor condition of some of this wheat, treatments for this insect should be evaluated very carefully! Normally, economic army cutworm problems do not develop as often in winter wheat as in alfalfa.

The army cutworm eggs are laid in the fall and partially grown larvae spend the winter feeding when conditions are favorable. They are usually a threat to wheat and alfalfa at and shortly after these crops break dormancy. This has been delayed this year due to cool conditions in March. Alfalfa and wheat fields should be monitored immedi-

(Continued on page 44)

Updates

Management tips
April 12-20

♦ Check seed corn inventory to make sure seed size matches your planter.

♦ Wheat growers should check their fields for crown and root rot, particularly, in western Nebraska where dry conditions have prevailed since fall. Healthy plants will have white roots and crowns; diseased ones will have roots and crowns that are tan to brown and top growth that is yellow. Fields that are slow to green up or that start to decline after green up are prime candidates and definitely should be checked. Decide what to do with the field based on the extent of damage.

♦ This is the time to prepare seed beds for chickpea production. Get planters set and make sure inoculum and seed are ready to go.

♦ Spring fertilization and weed control should be initiated on cool-season grass seed production fields during the next two weeks, along with spot control of off-types and noxious weeds.

Field update

Ronald Seymour, Extension Educator in Adams County: Several wheat and alfalfa fields in Adams County were sampled for army cutworm feeding damage and larvae on April 5. No army cutworms or cutworm feeding damage were found in any wheat field checked. Army cutworm larvae, from 1/2 to 3/4 inch in length, were found in several alfalfa fields. With the exception of one alfalfa field out of the six that were checked, the army cutworm infestation was not sufficient to keep the plants from greening up.

Soybean Field Days to explore mixing innovation and experience for profitability

Soybeans American Style is the theme for the fourth annual Soybean Management Field Days to be held at four new sites in mid-August. Field day locations are:

♦ **August 13, Bob Moseman Farm, Oakland,** located 2.5 miles west of Oakland off of Hwy 32

♦ **August 14, David Prothman Farm, Albion,** located off Hwy 39, 4 miles south of the Hwy 14 and 91 intersection in Albion

♦ **August 15, Chad Dane Farm, Clay Center,** located 3 miles west of Clay Center and 1 1/4 miles north.

♦ **August 16, David Antholz Farm , Burr,** located 3 miles west of the Hwy 50 and Buff Spur intersection south of Syracuse.

Each site will offer four field stops, each with demonstration plots, plus lunch and time for questions. This year's field stops will focus on marketing and ag policy, insect and disease control, irrigation and production practices, and weed management. The event will be held 9 a.m.- 2:30 p.m. with registration at the door There is no charge for admission or lunch.

Soybean Management Field Days is sponsored by the Nebraska Soybean Board and University of Nebraska Cooperative Extension. The information and demonstrations are unbiased and research-based. Presenters include University of Nebraska specialists, educators and industry consultants.

For more information about the meetings, contact Keith Glewen, NU Cooperative Extension, at 1-800-529-8030 or Vic Bohuslavsky, Nebraska Soybean Board, at 1-800-852-2326.

CROP WATCH

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Determining when to inoculate soybean seed

The relationship between *Bradyrhizobia spp.* and plants is unique to legumes. When infected by *B. japonicum* bacteria, soybeans form special structures called nodules that enclose the *B. japonicum* colonies. The plant provides carbohydrates and mineral nutrients to the *B. japonicum* which in turn provide nitrogen to the plant. This is a symbiotic (beneficial to both) relationship. The *B. japonicum* species that "infects" soybeans is not native to U.S. soils and acts in symbiotic relationship only on soybeans. This means the *B. japonicum* inoculant for soybeans cannot be used for alfalfa and other legumes, and vice versa.

Because of this symbiotic relationship, soybeans can obtain up to 75% of their nitrogen needs from the air when nitrogen-fixing *B japonicum* bacteria are present in the soil and inoculate the plants. Establishing *B. japonicum* (inoculation) in a field that has never grown soybeans is necessary to insure nitrogen fixation. Results from fields with a previous history of nodulated soybeans are not consistent. Many have found that if a field has a prior history of soybean it is not necessary to re-inoculate. For example, *Bradyrhizobia japonicum* numbers were similar among treatments in a long-term crop rotation and tillage study even though some plots had not had soybeans for more than five years. However, earlier-introduced, established strains are likely less efficient at nitrogen fixation than modern strains. Unfortunately modern strains often do not compete well with established strains and may not overwinter. In these cases, reinoculation may increase yields even in fields with a recent history of soybeans.

Commercial firms periodically incorporate aggressive new strains of *B. japonicum* from the USDA and other labs into inoculant products. Commercial firms typically rotate strains or use a blend of strains in their products. Dry, peat- and clay-based products (for planter box treatment), liquid products (for planter box and in-furrow treatment), and granular (in-furrow treatment) products are available. Adhesive agents are used with some products. Sterile inoculant carriers are more common than before.

Two cautions are important for those who use in-furrow inoculant products:

1) They are not economically viable for narrow (drilled) soybeans because the current labeled application rate is based on linear row length. (At least one inoculant manufacturer is changing labels to allow a lower rate for narrow row soybeans.)

2) To obtain nodulation, place in-furrow inoculants within 0.5 inch of the seed.

Inoculation failures are infrequent but do occur especially on soils that have never had well-nodulated soybeans. Most failures are probably due to either *B. japonicum* dessication (prior to, during, or following planting) or an inoculant-seed treatment incompatibility. Post-plant inoculant applications likely are not useful.

If inoculation failures are discovered early in the growing season, consider nitrogen application. Contact local Extension Specialists or Educators for suggested rates of application.

Roger Elmore
Extension Crops Specialist
South Central REC

Inoculation guidelines

- Always inoculate fields that have never had a well-nodulated soybean crop. A well-nodulated soybean plant should have 5 to 7 nodules on the primary root two weeks after emergence or 12 nodules per inch of tap root at flowering.
- Inoculation is not essential in soils that have had nodulated soybeans within the last five years.
- Maintain soil pH in the 6 to 7 range for optimum nitrogen fixation.
- Plant seed within four hours after inoculating. (Watch for new developments in pre-inoculated seed which may allow for several weeks of shelf-life for treated seed.)
- Investigate fungicide-inoculant compatibilities with inoculant manufacturer. Read and follow product labels. If in doubt, use in-furrow inoculant applications.
- Always inoculate after fields are flooded and on sandy soils.

More soybean production stories next week

Featured stories will address scouting for and control of the bean leaf beetle and other soybean pests; development of bean pod mottle virus; recent soybean research, and more

Mix corn and forage sorghum to get best of both

When growing and harvest conditions are good, corn silage can't be beat. But most of our silage is grown where soil and weather conditions often are stressful, especially on dryland. Forage sorghum often shines on these sites.

One way to balance the year-to-year variability in silage is to plant both corn and forage sorghum in the same field. Corn will increase the energy level of forage sorghum silage while the forage sorghum will slightly boost the protein content of corn silage. In wet years, tonnage for corn and sorghum silage is similar. But, when it is dry, forage sorghum will give good yields even when corn gets severely stressed. With dry soils in many fields this spring, sorghum might reduce some risk.

You can combine these two plants in the same field several ways. Some folks mix seed together in the same row throughout the field. This is difficult to do with some planters, so other folks plant one, or several rows of corn followed by one or more rows of straight forage sorghum.

Since many herbicide and fertilize recommendations are similar for corn and sorghum, this combination won't cause problems with these practices. Corn silage is best when conditions are good, but a combination of corn and forage sorghum isn't far behind.

Bruce Anderson
Extension Forage Specialist

Market tips

Economist and producer Roy Smith discusses changes in the soybean market during this week's *Market Journal.* Get the latest info at *http://marketjournal.unl.edu*

Army cutworms *(Continued from page 41)*

ately. Larvae will be found buried in the soil and debris or under clods in wheat fields. They feed mainly at night and may be found on the plants on some cloudy days.

Treatment decisions should be based on the number of cutworms present, the amount of damage, and the plant's ability to outgrow any damage. In poorly growing wheat or alfalfa two or more per square foot may warrant treatment; in healthy wheat or alfalfa four or more per square foot would be the threshold. It is important to consider the plant's ability to outgrow defoliation damage as well as the numbers of cutworms present.

In a few weeks, as sugarbeets begin emerging, the cutworms will become a serious threat. The greatest risk is in fields where a winter cereal cover crop has been used. As the sugarbeets emerge and the cover crops are killed, the cutworms will rapidly move to the young sugarbeets and cause damage. Because of the large size of the larvae and the small size of the beets at this time, the cutworms can cause tremendous stand loss very rapidly. Threshold levels of one cutworm per 20 row feet can result in up to 10% stand loss. Sugarbeet fields not planted to cover crops will not be impacted as greatly, but field margins can be impacted as cutworms move out of grasses around the edges (ditches, fencerows, etc.) of the field. These cutworms will remain a threat to emerging crops until the larvae mature in May.

Due to the current dry conditions and slow plant growth, cutworm damage is greater than normal; however, due to the poor condition of some wheat, treatment for this insect should be evaluated very carefully.

Emergency control of cutworms in all three of these crops can be best achieved by using one of the various pyrethroid insecticides labeled for that crop. More information on the army cutworm is available in the NU NebGuide, "Management of the Army Cutworm and Pale Western Cutworm" (G1145).

Gary Hein, Extension Entomologist
Panhandle REC

Seed treatments *(Continued from page 41)*

What is the impact of soybean seed treatment fungicides on Rhizobium inoculants?

The seed treatment fungicides with the highest toxicity level to Rhizobium inoculants are captan and thiram. Metalaxyl products have not been shown to have any adverse effects on inoculants. Most product labels will indicate a time prior to planting when it's safe to combine seed treatment fungicides with inoculants on the seed. If a product with high toxicity is being used, in-furrow application of the inoculant is a good choice *(see page 43)*. Newer products *are very considerate* of this issue and fungicide companies are pursuing compatibility with inoculant producers. Most new products are inoculant friendly – some can even be mixed with inoculants as the treatment is applied to the seed. Always read and follow label directions to avoid a lethal combination for the inoculant being used.

Loren J. Giesler
Extension Plant Pathologist

Planting basics that influence soybean yield

Preplant tillage

Soils are dry across Nebraska, making this a great time for Nebraska producers to consider planting soybeans with reduced tillage. Generally, any time producers can save soil moisture, soybean yields are increased with conservation tillage systems.

Any tillage practice may leave the soil more prone to erosion and will result in some degree of soil moisture loss. These moisture losses could reach 1/2 inch per tillage operation and affect soybean stands in dry environments. On well-drained, coarse-textured, or drought-prone soils, soybean in conservation tillage systems often yield more than those in clean-till systems. On moderately to poorly drained, fine-textured soils, the opposite is often true. Yield reductions with conservation tillage systems in these cases and other cases are sometimes associated with increased disease or insect infestations. It is probably wise to avoid using no-till systems on poorly drained soils.

Variety rankings do not vary among tillage systems. Thus, variety performance trials conducted in conventional tillage systems are useful for selecting variety for conservation tillage systems and vice versa. Also, soybean responses to planting dates and seeding rates are similar regardless of tillage system.

The tillage system that results in the highest yields and/or the lowest management risk will likely result in the most profit. Consider your management strategy, field conditions, and soil moisture when selecting your tillage system.

Roger Elmore
Extension Crops Specialist

Planting date

Soybeans tolerate a relatively wide range of planting dates in contrast to corn. Optimum planting dates for Nebraska and most of the northern states range from early to mid May. Yields in most cases appear to decline rapidly in June. Determinate varieties in Nebraska differ in response to planting date compared to indeterminate varieties based on a UNL study. Determinate yields were best with late May-early June planting dates while indeterminate yields were best with early to late May planting.

Planting date affects the size of plant attained before flowering begins. Indeterminate soybeans planted early in May and later in June are usually shorter and have fewer nodes. Planting dates of May 10 to 20 provide time for adequate vegetative growth with the indeterminate soybeans and good yield potential. Planting after June 1 generally results in lower yields due to reduced vegetative plant size. Late-planted determinate soybeans often have similar or greater heights and node numbers than those planted earlier.

Planting the latest adapted varieties early in the planting season followed by early- to mid-season adapted varieties from mid-May through early June has some merit. Mid- season adapted varieties are advised for later planting dates including double crop situations. These varieties will provide greater height and node numbers than shorter-season varieties when planted late and will have reduced risk of late-season frost injury compared to long-season varieties.

Roger Elmore
Extension Crops Specialist

Seeding rate/plant density

Soybeans have a remarkable ability to maintain high yields over a large range of seeding rates, row spacings, and environments. Results from numerous seeding rate experiments across the northern U.S. production area over the years have shown the same thing: seeding from 120 000 to 150,000 seed per acre will optimize yield in wide rows with conventional tillage and indeterminate varieties. Soybean responses to seeding rates are the same in both dryland and irrigated fields and in low-yield and high-yield environments based on University of Nebraska research.

Seeding rates over 150 000 seeds per acre will neither increase nor decrease yield if plant lodging does not occur. This planting rate with normal plant losses during emergence and the remaining growing season will result in 100 000 or more harvestable plants per acre^{-}. Plants in fields with seeding rates above 150,000 seeds per acre in good environments may be tall, spindly, and more susceptible to lodging. If lodging occurs, yields may decrease because not only does lodging

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Planting rate *(Continued)*

complicate harvest and contribute to losses, it also disrupts the leaf canopy, potentially limiting grain development and yield.

Plants in fields with harvest stands with fewer than 100,000 plants per acre will be short, have thick stems, be particularly heavy branched at the lower nodes, and will have many pods close to the ground, making harvesting difficult. Furthermore, weed control is more difficult with poor soybean stands.

There is a little variation on these recommendations for varieties with different growth habits. Indeterminate varieties usually respond to increases in seeding rates like the averages discussed above. Determinate varieties generally follow the same trends discussed, however, higher seeding rates will increase plant height and the lowest pod heights which may be an advantage for determinate varieties. Although lower planting rates may suffice, it is still good management to plant varieties of both growth habits at 120,000 to 150,000 viable seeds per acre to insure against stand reductions due to soil crusting and hail. In addition, fewer plants survive in no-till or minimum-till fields. No-till studies over several northern states have shown that seeding rates of around 225,000 seeds per acre maximize yield.

Roger Elmore, Extension Crops Specialist, South Central REC

Adjusting the seeding rate

The general recommendation of 120,000 to 150,000 viable seeds per acre is for wide rows with conventional tillage systems. Special circumstances such as tillage, planting date and row spacing will modify these recommendations:

- Increase seeding rates 10% to 20% if a drill is used.
- Increase seeding rate 10% for a poor seed bed.
- Increase seeding rate 10% for a 'thin-line' or early-maturing varieties.
- Increase seeding rate up to 50% in no- till systems.
- Increase seeding rate 20% when planting before or after the optimum date.
- Decrease seeding rates with high-value seed, but do not, under most circumstances, seed fewer than120 000 viable seed/acre.

The goal is to end with a harvestable stand of about 100,000 plants/acre. Since soybean seed size varies greatly, insure that seeding rates are based on seeds per acre rather than pounds per acre. For more information see the NU NebGuide: *Soybean Seeding Rates* (G99-1395).

With soybeans, when are fertilizers viable?

Lime application

Producers are often confused by lime recommendations when they review soil test results. Most soil testing labs provide a recommendation for lime application if the soil pH is less than 6.2. However, that is the amount of ag-lime necessary to increase the soil pH to approximately 6.5 - not necessarily the most *profitable* approach to lime application.

For soybean production in Nebraska, lime application is likely to be profitable only on those soils where the 0-8 inch soil pH is 5.5 or less, and where the subsoil pH is 6.0 or less to a depth of two feet. Many subsoils in central and eastern Nebraska are not acidic. Lime application on these soils is not likely to be profitable. Where ag-lime is applied, it may take up to two years to fully effect an increase in soil pH. Often little yield response will occur the first year after lime application, even on fairly acidic soils. For more information on the profitability of lime application, see the article by Charles Wortmann in the March 15 *Crop Watch*, No. 02-02, (*http://cropwatch.unl.edu/archives/2002/crop02-2.htm*).

Starter fertilizer

Producers are discouraged from applying starter fertilizer in the row when planting soybean – the risk of germination damage is too high. If soil test levels of phosphorus are low enough to require fertilization (10 ppm Bray-1 phosphorus or less), broadcast application is safest. If raising no-till soybean on soils low in phosphorus, fertilizer may be applied in a band, either at planting or prior to planting, provided there is at least an inch of soil separating the seed and the fertilizer band.

Inoculation

The most effective way to insure that a soybean crop has an adequate nitrogen supply is through proper inoculation. For most soils inoculate them if there has not been a well-nodulated soybean crop grown on the field in the last three to five years.

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Early planted no-till soybeans provide machinery management options

Producers have long realized that when planting after a certain date, yield potential declines. To adjust for this they have started planting earlier. With the traditional corn/soybean rotation, producers usually plant corn before planting soybeans to provide for maximum corn yields. However, late planted soybeans may not have adequate rainfall or soil moisture during late August for the important pod fill period, the main determinate of yield. In addition, an early fall frost can hurt late planted soybean yields by not allowing the later pods to fill. Thus, there is considerable interest in early planted soybeans to maximize crop yields.

Farther east in the Corn Belt, most producers plant their corn and drill their soybeans at the same time for better yields of both crops. A three-year Iowa State study, conducted in the mid-90s, showed that the maximum yield for soybeans was achieved with late April planting dates, about the same dates as for corn. At the two locations in southern Iowa, June planted soybeans were the lowest yielding due to late summer heat and lack of rainfall during pod-fill. At the two northern Iowa locations, the June planted soybeans were the lowest yielding due to early fall frosts.

Planting corn and soybeans at the same time requires both a corn planter and a drill or a narrow-row soybean planter. The increased soybean yields with narrow rows and no-till planting early usually justifies the added machinery and labor costs to run the two implements at the same time. Studies from Illinois and Indiana showed that producers were money ahead with timely planting even if they had to rent an additional tractor and hire a driver. However, many producers in Nebraska don't own a drill and use their corn planter to plant soybeans after the corn is planted. In some years where planting is delayed or for producers who are undersized on their planter, they may be finishing planting soybeans as late as mid-June. Depending on the later summer rainfall and the first frost date, their yield potential is at risk on these late planted soybeans.

As a machinery management decision and to spread production risks, some producers are no-till planting some of their soybeans before planting corn. While there are concerns about cold soils with early planting, many producers report that soybeans can actually handle cold soil stress better than corn. These producers start their planting season a week or two earlier than normal and no-till plant some of their soybeans before planting corn on their normal planting dates. Then they finish planting soybeans after their corn. This allows them to get the soybeans in the ground before the yield potential declines because of late planting.

For machinery management purposes, planting some soybeans a week or two before corn may make sense for producers who typically finish in June.

Planting too early however has risks involved with late spring frosts and seedling diseases because of slow crop emergence. By using no-till and seed applied fungicides, these risks can be minimized. The soybeans are no-till planted into cool, wet soil with plenty of residue cover. Planting takes place without residue movers so as to leave as much residue protecting the seed as possible. The seed is planted about 1 3/4 to 2 inches deep so the seed won't germinate as readily if there is an early warm spell. Tilled soils tend to warm up too fast early in the spring, allowing early planted soybeans to emerge too quickly, increasing the risk of being killed by a frost. Under no-till conditions, when the soil warms up enough for the seeds to germinate, the threat of a killing frost is usually past. The residue acts as insulation and provides some protection if there is a frost. In addition, the soil moisture conserved with no-till increases the "thermal mass" of the soil, holding heat to reduce the chances of frost injury.

Research was conducted in 1999, 2000, and 2001 at the University of Nebraska Rogers Memorial Farm, east of Lincoln, to evaluate the potential of early planting soybeans. (See March 24, 2000, October 27, 2000, and October 26, 2001 *Crop Watch* articles for the yields.) Usually, the highest yields for full season soybeans were with April planted soybeans and the lowest were those planted in June, about 15 bu/A difference. In 2001, an exception occurred for an early maturity soybean which yielded higher the later it was planted because of dry conditions in late June and early July. These trials were in no-till and used a seed-applied fungicide to protect the seedlings. Several producers across eastern Nebraska conducted their own trials and also had higher yields with April-planted soybeans compared to normal May planting dates.

Contrary to popular belief, there is no polymer seed coating commercially available to delay germination and emergence of early planted soybeans. While such a seed coating is under development, early planted soybeans should use seed-applied fungicides to protect the seeds and seedlings since the germination is

(Continued on page 48)

Fertilizers *(Continued from page 46)*

If in doubt, inoculate. *(See story on page 43.)*

In-season nitrogen application

While atmospheric nitrogen fixation is the primary source of nitrogen for soybean, there may be situations where in-season nitrogen fertilization is warranted. If plants are poorly nodulated and show signs of nitrogen deficiency, nitrogen may be needed. Normally, 30-40 lb nitrogen per acre can safely be broadcast as urea or through irrigation systems as UAN solution. Broadcast application of UAN solution is discouraged because of the potential for leaf burn.

The soybean plant incorporates about 60% of the total nitrogen it will require between the R3 and R6 growth stages from soil and atmospheric fixation. Between the onset of flowering to pod fill, peak nitrogen uptake can reach 4 lb nitrogen per acre per day. There can be a gap in soil nitrogen supply and atmospheric nitrogen fixation, as shown in *Figure 1*, resulting in potentially yield limiting nitrogen uptake to the plant.

Recent research in Kansas has shown that in-season nitrogen fertilization at approximately the R3 growth stage can increase yield under certain conditions – generally where yield potential is already relatively high (perhaps greater than 60 bushels per acre), but the ability of the soil to supply nitrogen is limited. In those cases, applying 20-30 lb nitrogen per acre at R3 was beneficial.

Research in Nebraska and Iowa has shown little yield response to nitrogen fertilization of soybean at R3, particularly on higher organic matter soils. Results from six locations on producer's fields in southeast and south-central Nebraska from 1999 to 2001 showed no site with a significant yield increase due to nitrogen fertilization around the R3 growth stage (*http://on-farmresearch.unl.edu*). However, yields at these sites were in the 40-60 bushels per acre range, and might not be expected to be as responsive to supplemental nitrogen as fields yielding greater than 60 bushels per acre. Producers interested in evaluating nitrogen application at the R3 growth stage should select fields with high yield potential and leave some untreated strips to assess the yield benefit from nitrogen fertilization.

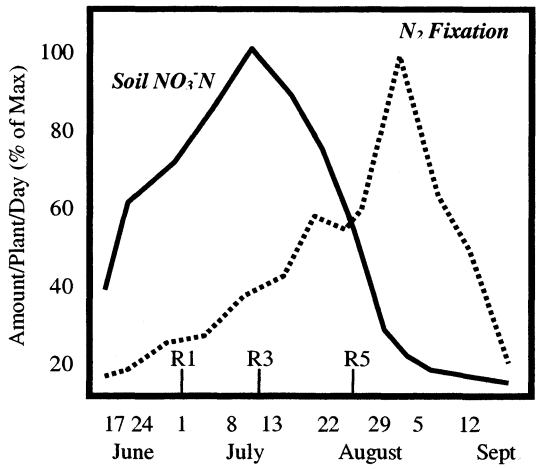

Figure 1. Typical patterns of soil nitrogen supply and atmospheric nitrogen fixation by soybean.

Richard Ferguson
Extension Soil Fertility Specialist
South Central REC

Early planting *(Continued from page 47)*

delayed until the soil warms up. A University of Nebraska trial showed more than a 90% stand loss for early planting beans without fungicides compared to no-till planting with a four-way fungicide treatment. However, in 2001 several early planted plots with reduced stands still had yields similar to normal planted plots with full stands. More research is being conducted at the Rogers Memorial Farm to explore the interaction of population and early planting dates. (Soybeans have already been planted in 2002 on March 14 and April 9, at normal and reduced populations, and three more planting dates are planned. Look for results of this research in a future issue of *Crop Watch*.)

While yields from early planting dates look good, producers should not plant their soybeans too early. Early planted soybeans still have risks involved with late spring frosts and replanting may be necessary. In addition, the potential for bean leaf beetle feeding must be considered as later planting dates are a cultural practice to avoid seedling damage. Careful scouting and properly timed spraying may be necessary with early planted soybeans. Also, the bean leaf beetle has been identified as the vector for the bean pod mottle virus; beetle control may be needed even if beetle populations are not above economic threshhold for feeding damage.

Even considering the risks, for machinery management purposes, properly managing and planting some soybeans a week or two before corn makes sense for producers who typically finish planting soybeans in June or for those who want to spread their planting workload and risks. By spreading out the planting dates, harvest dates are also spread, allowing producers to combine their soybeans at more favorable grain moisture contents, reducing losses from harvesting and marketing overdried beans. Another option is that producers who have the equipment should start soybean planting about the same time as corn planting to avoid late planting.

Paul Jasa
Extension Engineer

Early weed control will save valuable moisture

With corn planting just around the corner it may be hard to give any thought to soybeans right now. However, this is a good time to begin planning weed management strategies for soybeans, as many times there is no break between corn and soybean planting. Let's look at some of the factors you may want to consider.

Conventional tillage vs no-till

Depending on how you look at it, weed management strategies for these tillage types will either be very similar or worlds apart. Of course, while the concepts are still the same, the goals are somewhat different. Management strategies for each still focus on the bottom line of yield.

Conventional tillage soybeans

Under a conventional tillage operation, a good portion of weed management is removed from the equation. Many early emerging summer annuals, including giant ragweed, kochia, crabgrass, lambsquarters, and Russian thistle, are removed during tillage, allowing the crop and any new weeds to emerge together.

Under this system, a preemergence herbicide can work really well for producers. It can remove a lot of the weeds that would emerge with the crop and compete heavily with the soybeans. This gives the crop an advantage by several weeks.

Research at the University of Nebraska has shown that each crop has a critical period during which weeds must be controlled to maintain maximum yields (*Figure 1*). For soybeans, this period is from the second trifoliate to approximately the beginning of podset. This is roughly the 10th to the 40th day of crop growth. The research shows that while you may save some money by using a single POST program in your Roundup Ready beans, you're also hurting yields.

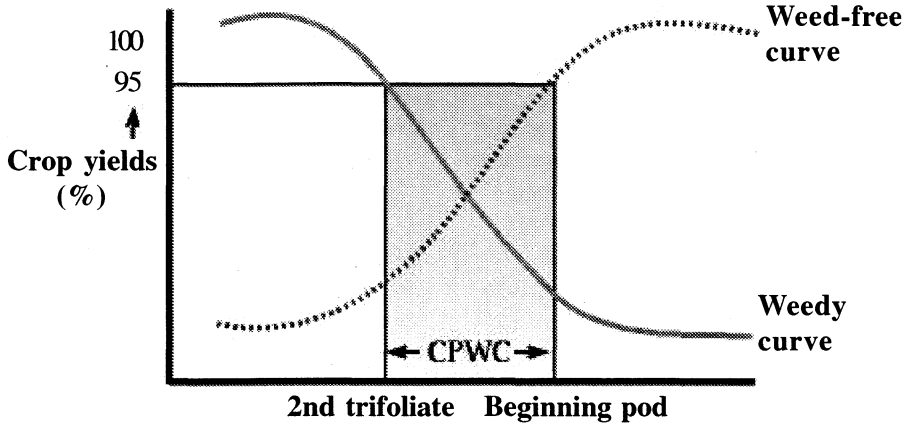

Figure 1. Critical period of weed control for soybean.

Weeds developing before this critical period of weed control may not need to be controlled; however, other factors such as reduced soil moisture and unsightly field clutter also may need to be considered. In a drought year, controlling these early season weeds may be very important.

No-till soybeans

In dry years no-till farmers may be ahead of the game, as they are likely to conserve more soil moisture. This moisture could be a yield-limiting factor in a drought year. Because of the lack of tillage, early summer annuals are likely to cause problems unless controlled. Burndown treatments will eliminate early summer annuals.

Many herbicide strategies can accomplish this while providing some residual control before the crop is planted. One strategy is to apply an early preplant treatment with the burndown 10 to 30 days before planting. This removes early weed competition while providing the residual control needed for the early part of the season. The advantage of this strategy is that most summer annuals have not emerged yet, making the residual herbicide very useful. Another advantage is that it allows more time for rainfall to occur to provide for herbicide incorporation and activity. Finally, depending on the weed spectrum, the early preplant application may eliminate the need for an additional burndown, saving money. However one disadvantage is that the herbicide will lose residual activity earlier in the growing season and post treatments must be planned more carefully.

A second strategy is to apply a burndown such as Roundup Ultra at 32oz/a or Touchdown 5 at 26oz/a alone ahead of planting. When combined with 1.0 pt/a 2,4-D ester, Roundup Ultra can be reduced to 24oz/a and touchdown 5 to 19oz/a. Remember that there needs to be at least a seven-day interval between application of 1 pint of 2,4-D and soybean planting. A 2,4-D application greater than 1 pint requires 30 days before planting. A disadvantage to this strategy is the window between the burndown treatment and the treatment applied at planting. The bigger the gap, the more likely it is for additional weeds to emerge ahead of planting.

Another technique is to apply a two-thirds rate of residual herbicide with the burndown followed by another one-third residual at planting. This allows for a longer win-

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Manure testing

What to ask to get the right information

For those producers planning to take advantage of available manure supplies, remember that manure testing is necessary to make optimum use of manure while protecting water resources. To get the best use of these tests, know what tests to ask for and provide the laboratories with the appropriate background information on the sample so they can provide a more accurate interpretation of the results.

Tests desired

The tests most frequently needed to optimize nutrient management are total and ammonium nitrogen (N), phosphorus (P_2O_5), potassium (K_2O), pH, soluble salts, and dry matter content.

Nitrogen. Most manure nitrogen is in organic forms or as ammonium-N. Ammonium-N is readily available to crops but easily lost to the air. Organic nitrogen is determined as the difference between total nitrogen and ammonium-N. Organic nitrogen becomes plant available as manure decomposes, with 20% to 50% of organic nitrogen available to the first crop after application. Much of the remaining organic nitrogen becomes available in subsequent years.

Phosphorus. Most manure phosphorus (about 75%) is in inorganic forms. About 70% of manure phosphorus would be available to the crop in the first year. Phosphorus is adequately supplied when manure is applied to meet crop nitrogen needs. Loss of manure phosphorus in runoff to surface waters is an environmental concern.

Other tests. Tests for potassium, sulfur, zinc, and other nutrients may be useful. When manure is applied to meet nitrogen or phosphorus needs, other nutrients are generally adequate for soils in Nebraska. If liquid manure is applied to a crop through sprinkler irrigation, test for soluble salts or electrical conductivity to avoid leaf burning. Electrical conductivity is useful in managing anaerobic lagoons.

Report information

When submitting a sample, specify how the results should be reported in reference to the application method; for example, in pounds of nutrient per ton (spreader), per 1000 gallons (tanks or umbilical cord), or per acre-inch (irrigation). For easy calculation of the fertilizer value of manure, the results of the analysis should be reported on an "as is" or wet basis and phosphorus and potassium should be reported as P_2O_5 and K_2O.

Not all manure nutrients are crop available during the year of application. Laboratories can estimate the amount of nutrients available in the first year, and the amount of manure nitrogen available during following years. This is especially important for solid manures.

If the producer provides the laboratory with information on the time (e.g. month or date) of manure application; and days until incorporation, the loss of ammonium-N to the atmosphere can be estimated. Information on the type of manure and animal species is needed to estimate organic-N availability.

The NU NebFact, "Manure Testing: What to Request" (NF02-507), contains more information on submitting a manure sample, including a submission form for the laboratory. Information on interpreting a manure analysis is in the NU NebGuide, "Determining Crop Available Nutrients from Manure" (G97 –1335), available on the web at *http://www.ianr.unl.edu/pubs/wastemgt/g1335.htm.*

Charles Wortmann, Extension Nutrient Management Specialist

Weed control

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dow between the burndown and planting in case planting gets delayed, plus it provides another dose of residual at planting to increase the residual with the crop emergence by a few days, extending your weed control and allowing more flexibility in your postemergence herbicide applications.

In each management strategy, producers should keep two things in mind. First, early season weed competition can reduce yield, especially in a dry year. Second, use a strategy that will provide you with the most flexibility for your management style. Each strategy will have its own shortcomings, so be able to recognize them and adjust as needed.

A pre-emergent herbicide also will allow more flexibility in your timing of post-emergent weed control. This is especially important when the post-emergent application has to be delayed due to environmental conditions such as rain or wind.

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Every dollar in ag exports generates $1.59 in economic activities such as transportation, financing, warehousing, and production. Nebraska's $3 billion in ag exports translates into nearly $5 billion in additional economic activitiy each year.

Nebraska Agriculture Fact Card
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