4-5-2002

CropWatch No. 2002-4, April 5, 2002

Lisa Brown Jasa
University of Nebraska-Lincoln, ljasa@unlnotes.unl.edu

CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

No. 2002-4
April 5, 2002

Achieving early season weed control in corn

Planting season is just around the corner and many producers are still not sure what to use for weed control. While the methods are plentiful, choosing a foolproof herbicide strategy can be difficult. Often, there is no perfect answer.

The process of analyzing all the necessary information needed to make a weed management decision can be frustrating. Economic factors such as herbicide costs, fuel and time, combined with biological and environmental factors make the job tough enough. And when you consider weed species spectrum, soil type, organic matter, herbicide efficacy, herbicide restrictions, annual precipitation, precipitation at time of application, and the ability to make a timely treatment applications it is just not an easy decision.

Corn /weed competition

All weeds are not created equal. Each weed species competes differently with corn with some species being much more competitive than others do. For example, common sunflower has a competitive index of 10 and is much more competitive than pigweed, which has a competitive index of around 3. Understanding the differences between species and their competitive factors can be very important in determining what weed management strategy will provide you the best return on investment.

Since weeds are not created equal we should acknowledge that neither are crops. Each crop differs in its competitive ability as well. Corn is one of the most competitive row crops planted 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 ft^2, to

(Continued on page 34)

Inside: Focus on corn

Jumpstarting your corn crop --

When to use starter fertilizers

With starter fertilizers small quantities of nutrients are placed in a concentrated zone near the seed at planting. The goal is to provide a nutrient rich zone close to the root to stimulate rapid early growth. This accelerated growth, however, does not always lead to yield increases. The response of corn growth and yield to starter fertilizer depends on the date of planting (the weather before and during emergence), starter fertilizer formulation, placement method, soil tillage (residue coverage), and soil test nutrient levels (including possible nutrient stratification). Rates of root growth and nutrient uptake are particularly low on cool, wet soils, soils with generally low nutrient status, or soils with compaction. The wide variation in these factors and their possible combinations explains why many research studies seem to provide inconsistent results. In addition, starter fertilizers also appear to lower grain moisture content at harvest. When assessing the profitability of using starter fertilizers, this also must be considered.

Current UNL recommendations are based on the assumption that starter fertilizer is a good method to get phosphorus into the ground but it often does not add much economic benefit when soil tests are above the critical level. However, most research on starter fertilizers for row crop production in Nebraska has been

(Continued on page 33)

IANR

Updates

Management tips
April 9-15

♦ **Corn planting depth** should be at least 2 inches when using a planter with angled press wheels. With shallower planting, the angled press wheels pack the soil below the seed, restricting root growth.

♦ **Put out bait stations for wireworm** monitoring during the first two weeks of April. If one or more wireworms per trap are found, there is a potential for economic damage from wireworms and an insecticide for wireworm control should be used at planting. See pages 36-39 for more information and research results on early season insect control. For more details about making and using wireworm bait stations see NU NebGuide, G91-1023, *Insects That Attack Seeds and Seedlings of Field Crops.*

♦ With the planting season fast approaching, **check center pivot electrical and mechanical operation** so that you're ready to activate a herbicide if needed. Start by checking for rodent damage to electrical systems, and replace lubricants where needed. More details will be provided in the May newsletter.

♦ **With soil moisture conditions being relatively dry across much of the state,** producers may want to consider spreading their risk by mixing in some shorter season hybrids with more traditional length hybrids. This could help offset the effects of reduced soil moisture and reduced yield in dryland conditions.

Market Journal

NU's High Plains Regional Climate Center will be one of the weather resources featured on the April 11 edition of "Market Journal," a twice-monthly video presentation hosted by NU farm management specialist Doug Jose.

Ken Hubbard, HPCC director, says ag producers who know how to access and use climatic data can reduce weather-related risk.

"We can't get rid of the risk, but we can, hopefully, minimize the risk," said Hubbard.

Accurate forecasts help producers decide which hybrids to plant, how much and when to irrigate, and when and where to market their crops. The Center collects and interprets climatological data and offers information about how to use the data to reduce risk.

Also on the April 11 edition of "Market Journal," a look inside the National Drought Mitigation Center. This NU-based organization helps ag producers and government officials develop and implement plans to lessen the impact of drought.

"Market Journal" will be streamed live over the Web and broadcast live via satellite 8-9 p.m. Thursday, April 11. The program can be viewed at any of 20 NU Cooperative Extension downlink locations across Nebraska, or in the Lincoln area on Time-Warner Cable channel 21. To log on to the live Webcast or for a listing of downlink locations, visit the "Market Journal" Web site, *http://marketjournal.unl.edu.* All programs are archived for later viewing online.

"Market Journal" is a production of NU Cooperative Extension and the University of Nebraska-Lincoln Department of Agricultural Economics.

Publications

Most NU Cooperative Extension publications are available on-line 24hours a day, seven days a week at *http://www.ianr.unl.edu/pubs*

CROP WATCH

cropwatch.unl.edu

Crop Watch is published from March to November by Cooperative Extension and Communications and Information Technology in the University of Nebraska Institute of Agriculture and Natural Resources, PO Box 830918, 108 Agricultural Communications Bldg., UNL, Lincoln, NE 68583-0918. To order either a printed subcription or to change your address, write to *Crop Watch* at the above address or call (402) 472-7981. The newsletter also is available on the web at **cropwatch.unl.edu**

Lisa Jasa, Editor; Email: ljasa1@unl.edu

For more information about a particular subject, you may contact the authors:
NU Department of Entomology, 202 Plant Industry Bldg., Lincoln, NE 68583-0816
NU Department of Agronomy, 279 Plant Science Bldg., Lincoln, NE 68583-0918
NU Department of Plant Pathology, 406 Plant Science Bldg., Lincoln, NE 68583-0722

Starter fertilizers *(Continued from page 31)*

conducted in tilled conditions. Research in Kansas, Iowa, South Dakota and Minnesota, suggests that a more differentiated view on starter fertilizers is required. In general, starter fertilizer for corn is more important in high-residue, reduced tillage systems than with conventional tillage.

Consider the following guidelines:

1. **On no-till or ridge-till soils with soil test levels of less than 15 ppm Bray-1 phosphorus, always apply a liquid or dry nitrogen-phosphorus starter fertilizer.** Application rates depend on the placement method (*see below*). For placement of at least 2 inches to the side of the seed, starter fertilizer should be applied at a rate of 20-30 lb N/acre and 10-20 lb P_2O_5/acre. On eroded soil with less than 2% organic matter, add 5-10 lb sulfur to the starter mix. On sandy soils with relatively low soil test potassium level (less than 150 ppm K), consider adding about 10 lb K_2O to the starter mix.

NOTES: Rates cited above refer to 2 inches to the side of the seed or 2 x 2 inch starter placement (2 inches to the side of the seed and 2 inches deep). If that is not possible and starter is applied in-furrow with the seed, reduce the nitrogen rate in the starter and drop KCl from it to lower the salt index to below 10 lb/acre. Those nutrients must then be applied by other means.

2. **On no-till or ridge-till soils with high soil organic matter, phosphorus (>15-20 ppm) and potassium levels (>150-200 ppm), yield response to starter fertilizer is less certain and mainly occurs in years with cool weather after planting.** Starter fertilizer can be applied to supply all the fertilizer phosphorus needed, but nitrogen rates should be reduced. Sulfur or potassium should only be included if local field tests indicate a response to starter application of those nutrients.

NOTES: Response to starter fertilizer has been found even on soils with medium to high soil test phosphorus or potassium and probably depends on the degree of nutrient stratification that has occurred in the past, i.e., the length of no-till or ridge-till cultivation. The frequency of a profitable response to starter fertilizer generally increases with decreasing soil test P and K levels, so knowing those is important for deciding on starter rates. Research in Illinois and Wisconsin also suggests that response to starter is larger with late planting of corn and use of longer-duration hybrids.

3. **On fine-textured soils with conventional tillage (disk, chisel, plow), yield response to starter fertilizer is erratic and often not economical.** Yield response is likely at low soil test phosphorus and or potassium levels combined with cool weather during early growth. Focus on maintaining soil test phosphorus and potassium in optimal ranges through a dry fertilizer program (broadcast). As long as soil test levels are low to medium only, apply starter fertilizer at a reduced rate in addition to broadcasting phosphorus or potassium or band-apply phosphorus at a 50% rate. Once soil test levels are in the optimal range, focus on maintaining them and concentrate on accurate soil testing.

NOTES: In on-farm trials conducted in Nebraska, the average corn response to starter fertilizer when available soil phosphorus was less than or equal to 10 ppm was 4 bu/acre with yield increases in 60% of the trials; otherwise, the mean gain was just 2 bu/acre with significant increases in only 17% of the trials. Corn yield was increased by an average of 10 bu/acre when starter fertilizer was applied to sandy and sandy loam soils, while the mean response was only 0.2 bu/acre on fine texture soils. Most of this work was done on tilled soils.

4. **Placement: Agronomically, placing dry or liquid starter 2 inches to the side on the soil surface or 2 inches to the side of the seed and 2 inches deep provides the best response and allows applying higher rates without crop damage.** If this kind of placement is not feasible, reduce rates, particularly those of nitrogen and potassium, and place the starter over the row. In-furrow placement increases the risk of salt effects on emergence and should only be used at lower rates of starter fertilizer, not exceeding a salt index of 5-10 lb/acre. (See *Starter Fertilizers for Corn, Grain Sorghum, and Soybeans,* NU NebGuide G77-361, *http://www.ianr.unl.edu/pubs/fieldcrops/g361.htm)* for estimating the salt index of starter fertilizer). Also note that starter fertilizers are hygroscopic — they will draw moisture away from the seed, resulting in germination damage and loss of stand if corn is planted into very dry soil and the starter is placed too close to the seed.

These rules of thumb are associated with many uncertainties and implementing them depends on the available fertilizer sources and application technologies. Producers should plant and compare their own test strips using various options for starter fertilizers. If a combine with yield monitor is available, use it to compare both yield and grain moisture with and without several schemes of starter fertilizer use to assess the overall profitability of each approach.

Achim Dobermann
Soil Fertility Specialist

"Backyard Farmer" moves to Thursdays

NU's Backyard Farmer returned for its 49th season this week. The hour-long program airs at 7 p.m. on Thursdays and is rebroadcast on NETV2 at 9 a.m. and 1:30 p.m. Friday and 10:30 a.m. Sunday, said Brad Mills, NU program producer.

It features NU extension specialists and other experts discussing and demonstrating garden topics such as pest management, landscaping and other issues related to the home landscape environment.

Setting planters and drills for the season

When the weather and time is right for planting, producers should be in the field planting, not getting equipment ready and making last minute repairs. Any repairs should have been made at the end of planting season last year when problems were fresh in their minds. Luckily, there is still a little time to ensure that the equipment is properly maintained.

In the shop

- Read the owner's manual for suggested maintenance and lubricate as directed.
- Check the operation of the seed metering devices and replace worn parts.
- Adjust the seed metering devices using this year's seed to match seed size and shape.
- Check, adjust, and lubricate chains, sprockets, bearings, and fittings. Replace worn ones.
- Adjust or replace the seed-furrow opener disks and other ground engaging components.
- Properly inflate the all tires, including those on the tractor.

In the field before planting season

- Set the toolbar and the hitch point at the proper height to match soil conditions and any ridges.
- Level the planter from front-to-rear, slightly tail down to help with seed-to-soil contact.
- Blind plant a short distance to check operation: check residue cutting and handling, check penetration to desired seeding depth, evaluate seed-to-soil contact, and evaluate closing the seed-vee.
- Adjust downpressure springs to improve residue cutting and seedbed penetration.
- Add weight as needed for the downpressure springs to work against and to keep the drive wheels in firm contact with the ground to avoid slippage.

In the field during planting season, especially when changing fields

- Check residue cutting and handling. Leave more residue over the row as the weather warms up to reduce seedbed drying.
- Check planting depth and seed-to-soil contact. Back off on pressure in wet soils that are easily compacted.
- Slow down to improve seed placement uniformity.
- Check seed spacing for proper population.
- Adjust harrows on drills to redistribute residue and help close the seed-vee.

A little preseason work now will make the planting season go much smoother, minimizing surprises and downtime. Remember to re-check the equipment as planting conditions change.

Paul Jasa
Extension Engineer

Weed control *(Continued from page 31)*

cause a 5% yield loss. Sunflower has a competitive index of 10, therefore it would take 3.6 sunflower plants per 100 ft^2 to cause a 5% yield reduction in corn. This is all under the assumption that the weeds emerge at the same time as the crop.

Accurately calculating yield loss, especially when several species of weeds are present in the field, can be very difficult. WeedSOFT, a computer aided weed management decision support tool, can be purchased from the University of Nebraska to supply this information for you at the click of a button. Utilizing this type of technology allows for more accurate yield loss analysis, providing better information needed to make a weed management decision.

Early preplant and preemergence weed management

Controlling weeds before they become a problem just makes good sense. As the saying goes "an ounce of prevention is worth a pound of cure" and this is true with weed control in corn. Various techniques are available and depending on individual circumstances, one may be better than the other. Producers need to determine their seasonal goals before committing to any one strategy.

Before we dive into all of the strategies available, you may want to review *Table 1 on page 35* for an explanation of terms and acronyms related to preemergent corn weed control.

Early preplant herbicide applications 10-30 days before planting offer many advantages to most producers, especially no-till farmers. First, early preplant treatments, especially in no-till, allow producers to kill winter annuals including henbit and mustards and early summer annuals, including giant ragweed, common sunflower and lambsquarter. This can be important in a year characterized by drought conditions because these early weeds, while not competing directly with the crop, can quickly rob precious soil moisture. Second, an early preplant treatment reduces most if not all weed competition as the crop emerges from the soil. Although this early competition

(Continued on page 35)

Weed control

(Continued from page 34)

may not be the most critical with respect to yield, it can quickly reduce yield as corn enters the two-leaf stage. Another advantage is that in years with limited moisture, the herbicide has a greater chance of being activated before the crop emerges. A disadvantage of the early preplant treatment is decreased residual activity after emergence. 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 and the weed history of the field needs to be considered before selecting a weed control strategy

Preplant is similar to early preplant and many of the same herbicides can be used. Treatments are typically made 0-10 days before planting. Preplant doesn't give you the advantage of catching early weeds, but it may give you the needed residual for setting the stage for a good POST treatment.

A preemergence treatment applied after the crop is planted but before emergence offers many of the same advantages. An additional advantage is that it allows the producer to increase the length of control. This works well with conventional till fields. This also provides increased management flexibility later in the season as summer annuals begin to emerge.

Table 2 lists 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 *2001 Guide For Weed Management in Nebraska.* It is available at your local Cooperative Extension Office.

Brady Kappler
Weed Science Educator
Alex Martin
Extension Weed Specialist

Table 1. Pre-emergence herbicide terms

Acronym	Treatment	Timing
EPP	Early preplant	10-30 days prior to planting
PP	Preplant	0-10 days prior to planting
PPSA	Preplant surface applied	0-30 days on the surface
PPI	Preplant incorporated	0-30 days incorporated
PRE	Premergence	Planting time until crop emerges

Table 2. Preplant/preemergence herbicides for corn

Treatment	*Rate/acre*	*Application information*
Aatrex/Atrazine	2.2 lb[a]	EPP, PPSA, PPI, PRE, EPOST
Axiom	8 – 15 oz[a]	EPP, PPSA, PPI, PRE
Axiom AT	1.5 – 4 lb/a[a]	EPP, PPSA, PPI, PRE
Balance Pro	1.9 – 3.8 oz[a]	PPSA, PPI, PRE
	Do not use where water table is within 25 feet on loamy sand or sandy loam and soil organic matter is less than 2% or on coarse soils with soil organic matter <1.0%. On medium soils with pH >7.5, reduce rate by 0.25 oz/a from recommended rate.	
Bicep II Magnum	1.3 – 2.6 qt[a]	EPP, PPSA, PPI, PRE, POST
Bicep Lite II Mag.	0.9 – 2.2 qt[a]	EPP, PPSA, PPI, PRE, POST
Bullet/Lariat	3 – 3.5 qt[a]	PPSA, PRE
Callisto	6 oz[a]	PPSA, PRE
Define	12 –20 oz[a]	PPSA, PPI, PRE
Degree	2.3 – 4.0 pt[a]	EPP, PPSA, PPI, PRE, POST
Degree Xtra	2.7 – 3.5 qt[a]	EPP, PPSA, PPI, PRE, POST
Dual II Magnum	1 – 1.7 pt[a]	EPP, PPSA, PRE, POST
Dual IIG Magnum	6 – 12 lb[a]	EPP, PPSA, PRE, POST
EPIC	11 – 15 oz[a]	EPP, PPSA, PPI or PRE.
	Use low rates for soils with pH _>7.4 or with less than 1.0% organic matter.	
Eradicane	4.75 – 5 pt[a]	PPI
Fultime[a]	2.5 – 3.5 qt[a]	EPP, PPSA, PRE
Guardsman/LeadOff	2.5 – 4.5 pt[a]	PPSA, PRE, PPI, EPOST
Guardsman Max	2.5 – 4.5 pt[a]	PPSA, PRE, PPI, EPOST
Harness[a]	1.25 – 2.25 qt[a]	PPSA, PRE, EPOST
Harness Xtra[a]	1.8 – 2.3 qt[a]	PPSA, PRE, EPOST
Hornet WDG	4.0 – 5.0 oz[a]	PPSA, PRE, EPOST
Lasso II	17 – 20 lb[a]	PPSA, PRE, EPOST.
	Do not use on soils < 1.0% organic matter	
Micro Tech/Lasso	2 – 3 qt[a]	PPSA, PRE, EPOST
Outlook	10-18 oz[a]	PPSA, PPI, PRE, EPOST
Prowl/Pendimax	1.8 qt	PRE.
	Do not use on soils < 1.0% organic matter. Do not incorporate.	
Python	0.8 – 1.33 oz[a]	PPSA, PPI, PRE
Surpass[a]	1.5 – 2.5[a]	PPSA, PRE, EPOST
TopNotch	2 – 3 qt[a]	PPSA, PRE, EPOST

[a] Rates dependent on soil type and application type and application type
[b] Do not use on sandy soil if water table is shallower than 30 feet

New options for controlling seedling insects and corn rootworms

Many planting time options are now available to growers to manage seedling attacking insects and corn rootworms. Not too long ago, a planter box seed treatment and granular rootworm insecticides were the only choices for these insects.

Recently, a couple of changes have occurred in the fight against seedling attacking insects. Several liquid insecticides have become labeled for use, and advances in seed coating technology have allowed insecticide to be applied to the seed, enabling farmers to buy pre-treated seed that is ready to plant. While these products are primarily for seedling insect control, some of the new treatments are labeled for protection against corn rootworms and other crop pests.

Seed applied insecticides

While seed coating advancements have led to increased protection from more pests, the costs of these pre-treated products are higher than the traditional hopper-box treatments. These seed-applied insecticides do offer several advantages:

1. Uniformity of treatment on each seed.
2. Ease of use; no mixing, measuring or special equipment is required.
3. Less exposure to insecticide residues and dusts.
4. Rates of active ingredients are low compared to soil insecticides.
5. Some are systemic and will provide some control of foliage feeding insects such as flea beetles.

As with many products, product marketing may not fully address certain drawbacks. Consider carefully what each product is designed to do. Seed treatments do not do the following:

1. Increase plants stands. They only help protect what you plant.
2. Protect against poor germination due to mechanical damage to seed, poor storage, genetic differences, or poor farming practices.
3. Most products do not give season long protection. Many only last as long as it takes for the plants to emerge or germinate.
4. Protect against all insects.

2001 wireworm research results

As stated earlier, the newer seed-applied insecticides are attempting to go beyond the traditional early season protection role. Not only do they protect against early season insects such as wireworms and seedcorn maggots; some are labeled for use against other pests such as flea beetles and corn rootworms.

Gaucho and **Prescribe** from Gustafson are new products commonly available for corn. Many seed companies are now making these treatments available as an option. The active ingredient in both is imidacloprid, a systemic insecticide that has been used in other crops such as sorghum. The product used for both Gaucho and Prescribe is Gaucho 600. The imidacloprid rate for corn varies according to the target insects. If only seedling insect control is desired, the rate is lower and will be sold under the name Gaucho. Two rates of Gaucho will be available, one for field corn and another higher rate for more susceptible inbreds (Gaucho Extra). Gaucho, although systemic, does not claim to protect the seedling plant from wireworm attack after the plant has emerged from the seed. Flea beetle control is expected through the first true leaf stage for Gaucho and through the fifth leaf stage for Gaucho Extra. When the rate is increased further to provide suppression of corn rootworms, the product is sold under the brand name Prescribe. "Suppression" is a category we would rather not see on a label, but it does indicate that some mortality of target insects will occur. However, under certain conditions, control may not be considered satisfactory. It is expected to give much longer control of flea beetles.

These products will be sold through your seed dealer as pre-treated seed and the cost will range from approximately $9-$11 a bag for Gaucho to about $40 a bag for Prescribe. Cost per acre will vary with the planting rate. (i.e. at 80,000 kernels a bag, 30,000 planting rate at $10 per bag; 80,000/30,000 = 2.66 acres planted per bag; $10/2.66= $3.75/acre cost).

ProShield from Syngenta is a tefluthrin-based seed treatment also labeled for control of corn rootworms that was used in some fields in 2000 and 2001. The seed is coated with Force ST equivalent at approximately two-thirds of the rate of granular Force insecticide. Cost of ProShield will be similar to that of granular insecticides ($15-$18 an acre based on seeding rate).

Clothianidin is a new systemic material from Gustafson. Clothianidin is still in the testing stage but may soon be available.

Cruiser (formerly tested and known as **Adage**) is a systemic from Syngenta. We do not know how much, if any Cruiser will be available for 2002.

Many growers are now applying liquid insecticides in-furrow with or without starter fertilize. We included **Warrior**, **Pounce**, **Regent** and **Capture** in our experiments (*see Table 1, page 39*). We also included granular insecticides at various rates.

2001 corn rootworm research results

We are in the process of rating roots differently from the 1-6 scale used in the past. The new 0-3 scale provides a clearer representation of root pruning than the old scale. In the new scale, a 1, 2, or 3 represents the nodes pruned to within 1½

(Continued on page 39)

Soil insecticides (Continued from page 36)

Table 1. Wireworm study, Emerson, NE, 2001; Plant population per 30 ft of row, June 22 (K. Jarvi)

Treatment	*Application method*	*Rate of product or amount ai*	*Plant population*
Gaucho	ST	0.165 mg ai/kernel	36.25 a
Warrior T	IF MT	1 oz/acre	36.25 a
Force 3 G	IF	3 oz/1000 ft of row	36.25 a
Cruiser (Adage) 5 FS	ST	200g ai/100 kg seed	35.25 a
Aztec 4.67 G	IF	2.25 oz/1000 ft of row	35.00 ab
Clothianidin	ST	0.25 mg ai/kernel	34.75 ab
Cruiser (Adage) 5 FS	ST	50 g ai/100 kg seed	34.75 ab
Fortress 5 G	IF	3 oz/1000 ft of row	34.00 abc
Capture 2 EC	IF MT	0.15 oz ai/1000 ft of row	32.75 abcd
Pounce 3.2 EC	IF MT	2 oz/acre	32.50 abcd
Pounce 3.2 EC	IF MT	4 oz/acre	32.50 abcd
Force 200 ST	ST	260 ml/100 kg seed	32.25 abcd
Capture 1.15 G	TB	8 oz/1000 ft of row	32.00 abcd
Cruiser (Adage) 5 FS Kernel Guard	ST	100 g ai/100 kg seed	32.00 abcd
Supreme 24.42 DS	ST	54.8 g ai/100 kg seed	32.00 abcd
ProShield	ST		32.00 abcd
Capture 1.15 G	IF	4 oz/1000 ft of row	31.75 abcd
Regent 4 SC	IF MT	.12 oz/1000 ft of row	30.00 bcd
F0570	IF MT	1.44 oz/acre	30.00 bcd
Capture 1.15 G	TB	4 oz/1000 ft of row	29.25 cd
Counter 20 CR	IF	3 oz/1000 ft of row	28.75 d
Aztec 2.1 G BD	IF	5.025 oz/1000 ft of row	28.25 d
Untreated			28.25 d
Regent 4 SC	IF MT	.24 oz/1000 ft of row	27.75 d

ST = seed treatment IF = in-furrow MT = microtube TB = t-band
Means with the same letter are not significantly different.
(LSD = 5.1743; alpha = 0.05)

Table 2. Wireworm study, Nebraska City, 2001 (Hand-planted plots), 35 plant maximum stand possible (3 repetitions) (Z B Mayo)

Treatment	*Rate of product or amount ai*	*Plant population 6/29/01*
Cruiser (Adage)	50 g ai/100 kg	31.5
Cruiser (Adage)	100 g ai/100 kg	31.0
Cruiser (Adage)	200 g ai/100 kg	31.8
ProShield		30.3
Kernel Guard Supreme		26.5
Untreated		22.0
Untreated		23.5
Force 3 G	4 oz/1000 ft of row	30

(LSD = .05 (alpha = 4.6)

Table 3. Wireworm study, Nebraska City, 2001 (Field length plots), partial data (Z B Mayo)

Treatment	*Plant population per 20 ft of row 6/08/01*
Gaucho	26.0
Gaucho	26.4
Untreated	19.1
Untreated	18.6

inches of the plant. Intermediate numbers are percentages of roots pruned. In this scale a 1.50 indicates that one full node (equivalent to a 4 on the old scale) plus ½ of the roots of another node have been pruned. In general a rating of 0.5 or below will give satisfactory protection. Bear with us while we get used to this rating scale. Reduced rates continue to be screened and in some cases perform similarly to full rates.

Summary

It appears that these seed applied insecticides and liquid insecticides will be effective in protecting seeds from seed feeding insects such as wireworms and seedcorn maggots. However, based on the results of the experiments described here and other experiments and on the suppression label for Prescribe, we advise caution in selecting these newer seed-applied products as rootworm control choices. Two years of data at the Haskell Ag Lab and the South Central Research and Extension Center have shown that under moderate to heavy pressure these treatments do not perform as well as traditional soil insecticides for corn rootworm control. As with all products, it is necessary for growers to assess their individual situations before selecting a control method. More data can be found on these products on the following University of Nebraska web sites

(Continued on page 38)

Soil insecticides (Continued from page 37)

nerec.unl.edu/ipm/jarvi, screc.unl.edu/entomology/index, and *entomology.unl.edu.*

Transgenic Corn

Transgenic corn hybrids are being tested and look as good or better than standard soil insecticides. Future availability is still somewhat unknown.

Economics

Soil insecticides at full rates will cost between $11.00 to $15.00 an acre (based on prices found on the internet as of 11/14/01). Reduced rates for seedling insect control depend on the rate selected by the grower. Pounce 3.2 EC costs approximately $0.75 an ounce. Warrior T costs about $1.71 an ounce. Capture 2 EC costs about $2.50 an ounce.

Growers should carefully assess the risk and reward of using any insecticide treatment. Wireworms are very sporadic and normally do not affect a large number of acres. Does it pay to treat every acre with an insecticide when only a few acres will be affected? Using the previous example for Gaucho, 1,000 acres of treated seed would cost $3,750.00. Do your replant costs over the years justify this annual expense? Or do you believe that the increased stand and potentially higher yield shown in some experiments justify the added cost of seed treatments or liquid insecticides for seedling attacking insects?

In any case, soybeans should not be treated with insecticides at planting time. Treating corn with insecticides will depend on:

1) whether it is continuous corn,
2) planting date, and
3) past history of seedling attacking insects.

Keith Jarvi, IPM Extension Assistant
Northeast REC
Z B Mayo, Entomology Department Head
Tom Hunt, Extension Entomologist
Northeast REC

The new ag buzz? Try "bio-based"

"Bio-based" may be one of today's hottest new buzzwords, but USDA's ARS has been in the midst of this research for years, helping develop new bio-based industrial products from agricultural crops.

A cornstarch compound that absorbs 1,600 times its weight in liquid, 100% soybean oil printing ink, and industrial lubricants from meadowfoam and other oilseeds are just a few examples.

Table 4. Corn rootworm insecticide screening Concord, 2001 Root Ratings (K. Jarvi)

Treatment method	*Application oz/1000 row ft*	*Rate*	*Rate lb ai/1000 row ft*	*Root rating*
Aztec 4.67 G SB	TB	3 oz	0.15	0.245 a
Force 3 G	TB	4 oz	0.12	0.250 a
Counter 20 CR	TB	6 oz	1.20	0.278 ab
Aztec 2.1 G BD	TB	6.7 oz	0.14	0.290 ab
Counter 20 CR	IF	6 oz	1.20	0.293 ab
Aztec 2.1 G BD	IF	5.025 oz	0.105	0.298 ab
Fortress 5 G SB	TB	3 oz	0.16	0.323 ab
Lorsban 15 G	TB	8 oz	1.20	0.366 ab
Aztec 2.1 G BD	IF	6.7 oz	0.14	0.375 ab
Fortress 5 G SB	IF	3 oz	0.16	0.388 ab
Regent 4 SC	MT 5 gal	0.24 oz	0.13	0.390 ab
Force 3 G	IF	4 oz	0.12	0.418 ab
Force 3 G	IF	3 oz	0.09	0.428 ab
Aztec 2.1 G BD	IF	3.35 oz	0.07	0.443 ab
Counter 20 CR	IF	3 oz	0.60	0.468 ab
Force 3 G	IF	2 oz	0.06	0.480 ab
Counter 20 CR	IF	4.5 oz	0.90	0.485 ab
Aztec 4.67 G SB	IF	3 oz	0.15	0.493 ab
Lorsban 15 G	IF	8 oz	1.20	0.513 ab
Regent 4 SC	MT 1 gal	0.24 oz	0.13	0.585 abc
Lorsban 15 G	IF	4 oz	0.60	0.620 abcd
Capture 2 EC	5 in TB 5 gal	0.30 oz	0.0046	0.658 abcd
Capture 1.15 G	IF	8 oz	0.0054	0.764 abcd
Lorsban 15 G	IF	6 oz	0.90	0.803 bcde
Clothianidin 600 FS	ST	1.25 mg/kernel		1.090 cde
Prescribe 600 FS	ST	1.35 mg/kernel		1.115 cde
Capture 1.15 G	TB	8 oz	0.0054	1.118 cde
ProShield	ST			1.135 de
Capture 1.15 G	IF	6 oz	0.0040	1.340 ef
Furadan 4 F	TB Post	1 qt formulation/ acre broadcast rate		1.733 fg
Untreated				1.828 fg
Untreated				2.205 g

ST = seed treatment IF = in-furrow MT = microtube SB = Smartbox
TB = t-band
Means with the same letter are not significantly different.
(LSD = 0.5438; alpha = 0.05)

With mixed crops and pastures, ensure all pesticide restrictions are followed

If you're planning to use herbicides or insecticides to control pests in mixed crops or mixed pastures, pay special attention to label restrictions. If you have a mixture of grasses and legumes, the pesticide might not be labeled for that use.

Herbicides and insecticides are commonly used in hay fields and pastures to control weeds and insect pests. They can be very effective. But they must be used according to label instructions or serious problems can occur.

This can cause difficulty for forage producers who have increased their use of mixtures of grasses and legumes, especially with alfalfa. A pesticide must be labeled for use on each component of a mixture to be legal to use. Thus, a pesticide that is registered for use on alfalfa but not for grass should not be applied to a pasture or hay field that contains a mixture of alfalfa and grass, even if over 50 percent of the stand is alfalfa.

A pesticide that is registered for use on alfalfa but not for grass should not be applied to a pasture or field that contains a mixture of alfalfa and grass, even if over 50% of the stand is alfalfa.

What could happen if you use one of these pesticides improperly? When misuse occurs, the appropriate state agency has the authority and is expected to take whatever action is needed to keep any potentially affected food or feed commodity out of the channels of trade until it is determined that no harmful or illegal residues will occur. That could include all the hay produced from the treated area. It also might involve livestock that grazed the treated pasture or even milk produced by cows fed hay from the improperly treated area. As you can tell, the penalty could get quite severe.

So -- as you discover insects or weeds you wish to spray in pastures and hay fields this year, carefully read the pesticide label to make sure it is approved for all the plants in your field.

If you don't, the consequences could be serious.

Bruce Anderson
Extension Forage Specialist

Plant alfalfa now to provide for strong root system

Alfalfa can be planted every month of the year. But let's face it, some times are more successful than others. Alfalfa should be planted now, before corn planting begins. Alfalfa planted shortly before corn planting gets a head start on weeds and can be ready for a light first cutting by late June or early July, allowing for two to three cuts the first year.

More importantly, planting early gives plants time to develop larger root systems so when temperatures turn hot, the roots will be able to supply enough moisture so the plant can survive. Alfalfa seeded in mid to late May often is unable to handle hot temperatures no matter how much soil moisture is available.

I know you might be afraid that a freeze might kill plants following early seeding, but very young alfalfa seedlings can tolerate temperatures as low as 15 to 20 degrees. The danger of freezing actually is greater after plants reach the third or fourth trifoliate leaf stage, or are about 4 inches tall. At this stage, alfalfa begins to react as if it is heading into summer and loses its cold tolerance. The only time a spring freeze is likely to injure new alfalfa seedlings is when alfalfa is planted very early and an extra warm, moist April permits plants to grow to more than 4 inches tall by early May. This doesn't happen often.

Managing cutworms

Most alfalfa fields should start greening up soon. If yours does not, check it for army cutworms. You may need to spray to save it.

Count the number of cutworm larvae per square foot in several areas. The economic threshold for spraying is four or more army cutworms per square foot on established alfalfa, but just two larvae are needed in fields seeded last year. Once your alfalfa gets four to six inches tall, spraying is unlikely to be beneficial unless you see a lot of active leaf feeding.

The best insecticides for controlling army cutworms in alfalfa are the synthetic pyrethroids. These include Ambush, Pounce, Baythroid, and Warrior. Lorsban also works well. Before spraying, read and follow label directions to safely apply the correct rate.

Bruce Anderson
Extension Forage Specialist

Row cleaning can enhance no-till corn production

There may be an opportunity to increase corn yields by cleaning soybean residues from the row area two weeks before planting.

The effects of crop residues and their removal from the row area in no-till systems have been inconsistent in the Corn Belt. In most of the studies, the crop residue was removed at planting. In Iowa, removal of residue from a 6-inch band resulted in increased corn plant emergence, but only occasionally increased yield. In southern Minnesota, emergence of corn following corn reached 50% four days earlier with row cleaning and yields of corn after corn and of corn after soybeans were an average of 5 bu/A more with row cleaning. The benefit of row cleaning was greatest when anhydrous ammonia rather than ammonium nitrate was the main nitrogen source, and when no starter fertilizer was applied.

As part of the Nebraska Soybean and Feed Grains Profitability Project, Jerry Mulliken has conducted replicated trials on his farm in Dodge County for four years to evaluate the effect of row cleaning on corn yield following soybean. He cleans a 6-inch band 14 days before planting when he applies the pre-plant herbicide. Mulliken uses a notched or tined furrow opener running just below the residue layer, while moving less than 1 inch of soil. By combining the row cleaning operation with the herbicide application, the added cost is estimated to be $3/A. The average gain in corn yield with row cleaning has been 5.5 bu/A (see table). The reason for the increase yield is not apparent, especially since the harvest population was not increased.

Jerry Mulliken, a Dodge County producer, has experimented with cleaning residue from his no-till corn rows when he applies herbicide about two weeks before planting using a notched or tined furrow opener running just below the residue layer. *(Photo courtesy Jerry Mulliken)*

While the response to row cleaning in the southern Minnesota study was greatest if no starter fertilizer was applied, Jerry's trials have been done with 4-6 gallons of 10-34-0 applied in the seed furrow to strips where crop residue was removed and to the strips where residue remained.

Row cleaning 14 days before planting appears to be sufficiently promising that no-till producers may want to test it by conducting replicated comparisons on one or more of their fields. Row cleaning in the fall might be considered although wind or weather may move the residue. Combining row cleaning with another operation is important to reducing costs. Row cleaning on highly erodible land can result in increased soil erosion, especially when planting up and down slopes.

Charles Wortmann, Extension Nutrient Management Specialist

Table 1. Plant population and yield variances in cleaned and uncleaned corn rows. (Mulliken)

Year	Plant population		Yield, bu/A	
	Residue removed	Residue remained	Residue removed	Residue remained
1998	17,800	18,100	122	119
1999	20,800	20,400	130	127
2000	17,600	16,800	138	130
2001	18,800	21,500	120	112
Mean	18,700	19,200	127.5	122.0