



Nemaha County

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COVER CROPS - ARE THEY WORTH IT?

The past several years, the use of cover crops has been one of the hottest topics at farmer conferences and field days, particularly in no-till farming systems. We have had a number of field days on this topic the past few years. Here in Nebraska two recent conferences on cover crops have brought in almost 400 participants. Back in 2010 I wrote an article on the use of cover crops in cropping systems. Since that time, the adoption rate on the use of cover crops has increased significantly. With the NRCS promoting their use in EQIP programs with CSP, and potential funding to help with the costs of establishing cover crops, several farmers have used these programs to experiment with cover crops. NRCS is also advocating the use of cover crops to improve soil health and as a method for controlling ephemeral gully erosion on landscapes. NRCS has initiated a number of demonstration farms across Nebraska evaluating cover crops and their impact on soil health. Daryl Obermeyer, east of Auburn has a demonstration site on his farm and he is looking at the impact on soil health and crop yields over the next 5 years. He is also grazing the cover crops. His project is also part of the Nebraska On-farm Research Network, which I referred to in a recent article in the *Nemaha County Herald*.

You may be wondering what is soil health and how can it be measured? Generally if the health of the soil is improving, productivity of the soil will be improving as well and crop yields will increase. Health of the soil can be measured with chemical, physical and biological properties. Chemical and physical properties are easier to measure than biological properties. While improvements usually do not occur in the short-term (<5 years), long-term improvements include an increase in organic matter, water infiltration rate, soil water holding capacity and aggregate stability. Measurements that indicate greater biological diversity in the soil and an increase in microbes and earthworms are good indicators soil health is improving. I look at the use of cover crops as the next level in no-till cropping systems.

Use of cover crops has provided some very positive benefits for farmers in the region. While results are not always positive, under most circumstances farmers that have utilized cover crops have had success and found beneficial crop, soil and sometimes an economic response. The use of cover crops has been more common in the Eastern Cornbelt, where rainfall is generally not a limiting factor. We have been more cautious in the adoption of their use due to

concerns of drought and water use by the cover crops. Flying cover crops on cornfields worked very well the past few years. Last year it was a failure for several farmers though, due to lack of rainfall in August and September, after the cover crops were seeded. While there are still concerns and much research to be done, it may be something you want to investigate and evaluate on your farm on a limited number of acres if you are not using them already.

So what are the benefits of cover crops? Cover crops can provide erosion control, add organic carbon and/or nitrogen to the soil, improve soil structure, increase infiltration rates, provide weed control, potentially suppress diseases in crops, add diversity to the cropping system to enhance the environment for beneficial insects and be a source of forage for livestock. What are negative impacts of cover crops? If cover crops are not terminated in a timely manner, cover crops may use up valuable soil moisture that could impact the following crop. Several on-farm research studies across Nebraska have shown variable results on the effect of cover crops on subsequent grain crops. There have been both positive and negative responses to the use of cover crops. Most of the research we have seen in Nebraska has shown little or no response on soybeans and no or a negative response on corn. Cereal rye is one cover crop that can have a negative impact on germination and growth of the subsequent corn crop if it is not managed properly. Some cover crops (cereal rye) may also tie up nitrogen for the subsequent corn crop, so supplemental nitrogen may be needed to maintain corn yields. If planted after wheat, cereal crops are being used to provide carbon to the mixes and add grazing potential, i.e. brown mid-rib forage sorghum, sudangrass, brown mid-rib corn, pearl millet, rye, triticale, oats, barley, or wheat. The use of cover crops in the fall is an excellent practice to add organic matter to the soil and provide protection from erosion. In 2015, we planted cereal rye around September 1st. On April 15th of 2016, we found live cereal rye roots down to 6' 10". The cereal rye was 18" tall above ground. If you have never used cover crops before, you may want to experiment with oats, if you just want something to hold the soil that will winter-kill.

At a conference I attended in Iowa a few years ago, interesting research reported that in Illinois, cereal rye suppressed Soybean Cyst Nematodes (SCN), Sudden Death Syndrome (SDS) and some other diseases in soybeans. Cereal rye was also effective in suppressing both mare's tail and glyphosate resistant mare's tail. These are all issues that we face here in southeast Nebraska. The University of Nebraska-Lincoln will actually conduct research this summer on the impact of cereal rye on SCN suppression. Data collected from central Nebraska showed cover crops were

effective in scavenging nitrogen from seed corn fields which reduced the potential for nitrogen being lost to the environment. Research at ENREC (formerly ARDC near Mead) showed cattle grazing cover crops gained 1.5 – 2.0 lbs/hd/day on a cover crop mix that included oats and radishes.

There are definitely opportunities to use cover crops here in southeast Nebraska. Using cover crops in forage systems and under irrigated conditions may have the most potential. If you are thinking about including cover crops in your cropping system, be aware of herbicides you can and cannot use on your previous crop that would prohibit planting a cover crop and/or a cover crop for forage or grazing. An article in Cropwatch addressed this issue in 2015, Corn and Soybean Herbicide Options for Planting Cover Crops for Forage in Fall can be accessed at: http://cropwatch.unl.edu/archive/-/asset_publisher/VHeSpfv0Agju/content/cover-crop-herbicide-options. Last week Nebraska Extension held an in-service training to learn about research being conducted with cover crops, questions that need to be answered concerning cover crops and soil health and educational needs for Nebraska. With grants we currently have for funding, we hope to answer many of these questions. If you have questions about this issue, please contact me at (402) 274-4755 or via email at glesoing2@unl.edu.

WHAT CAN WE DO ABOUT HERBICIDE RESISTANT WEEDS?

Herbicide resistance in weeds is an important issue that needs to be met head-on. With the increased use of glyphosate (Roundup or other generic brands), this issue has come up often in crop production meetings. Initially Round-up was used on Roundup Ready or glyphosate resistant soybeans. Now there are also several generic glyphosate products on the market and almost all the soybeans planted in Nebraska are glyphosate resistant. Roundup-ready or glyphosate-resistant corn hybrids are now used extensively throughout the Cornbelt. Many farmers are using glyphosate for both soybeans and corn. This heavy reliance on glyphosate can lead to resistance problems if herbicides with different modes of action are not used as a part of a farmer's weed management strategy.

We may think weed resistance is something new, but actually it is not new at all. It has been around for several years with many herbicides with different modes of action. Modes of action are the chemical methods or pathways that the herbicide uses to kill the weed. Waterhemp is a very common weed in Nebraska and surrounding states. It first developed resistance to triazine herbicides, such as atrazine in corn. Then it developed resistance to ALS herbicides, i.e. Classic, Pursuit, Accent and Beacon. Then waterhemp developed resistance to

the PPO inhibitors, i.e. Cobra, Valor, Blazer and Flexstar. Now it has developed resistance to glyphosate in several states. Waterhemp has also shown to be resistant to HPPD inhibitors, such as Callisto and even growth regulators, like 2,4 – D and Banvel. To say the least, waterhemp is a very resilient weed. There could be circumstances where waterhemp is resistant to more than one herbicide. This is what we call stacked resistance.

Here in southeast Nebraska, we know glyphosate resistant marehail exists and glyphosate resistant giant ragweed has been confirmed in Nemaha and Richardson Counties. Waterhemp is probably resistant to more than one herbicide on farms in southeast Nebraska as well. So how can we keep herbicide resistant weeds from increasing? There are a number of strategies that can be done to minimize the impact of herbicide resistant weeds in your fields. First, it is important to understand the biology of the weeds present. You need to know when they emerge and when they are most susceptible to herbicides. An example is if you think you may have glyphosate resistant giant ragweed, manage your field to control this weed with other herbicides. Giant ragweed is an early emerging weed. In soybeans it may be advisable to delay planting to get as many of the weed seedlings emerging prior to planting. Giant ragweed is susceptible to 2,4- D so in no-till systems a pre-plant burn down containing 2,4 – D would be effective. Be sure to follow label directions for planting following 2,4 –D. It is very important to plant into a weed-free field and keep fields as weed-free as possible.

Some other best management practices for herbicide resistant weeds include:

- Use a diversified approach to weed management focused on reducing the seed bank.
- Use multiple effective modes of action against troublesome or herbicide-resistant prone weeds.
- Apply the labeled herbicide rate to weeds no larger than the maximum labeled size.
- Emphasize cultural management techniques that suppress weeds by utilizing crop productivity and competitiveness, i.e. different crop rotations, different planting dates
- Prevent weed seed production.

While the increase of herbicide resistant weeds is a concern, the impact can be reduced by following these good management practices. Any Weed Management Guide from 2015-2018 has a specific section where it evaluates the efficacy of herbicides on several herbicide resistant weeds, helps you select the best sites of action to use for controlling various herbicide resistant weeds and assists you in identifying the best strategies for control of these weeds. There is also research being conducted at field sites to evaluate strategies to use for control of herbicide resistant weeds. In 2016, an issue of *Crop-Watch* reports on a research trial comparing pre-plant tillage and the use of 2,4-D to control glyphosate resistant giant ragweed. Both methods provided similar levels of early season control. This article can be accessed at <http://cropwatch.unl.edu/2016/using-preplant-tillage-manage-glyphosate-resistant-giant-ragweed>. If you have

questions or want to purchase a 2017 Weed, Disease and Insect Management Guide, feel free to contact me at (402) 274-4755 or at glesoing2@unl.edu.

ON-FARM RESEARCH OPPORTUNITIES EXIST FOR SOUTHEAST NEBRASKA FARMERS

I had the opportunity to attend the On-farm Research Reporting session last month at ENREC (former ARDC) near Mead. There were a number of projects reported on at the meeting. Here in southeast Nebraska we had a few on-farm projects conducted. Daryl Obermeyer, Nebraska Soybean Board member from Nemaha County has a cover crop research project being conducted on his farm. He is planting cover crops and determining their impact on the subsequent crop. Winter hardy cover crops are planted and compared to cover crops that winter-kill. In 2017 corn planted following the winter hardy cover crop yielded significantly less than corn planted following the cover crops that winter-killed. Soybean yields were similar and not affected by the different cover crop treatments. This site is also an NRCS Demonstration Farm that will go for 5 years. Crop yields will be measured each year of the study. Stephen Kennedy, Resource Conservationist, USDA NRCS, and Aaron Hird, Nebraska Soil Health Specialist NRCS, collected soil samples for base-line soil data and at the end of the five-year period will collect samples to determine if this cropping system impacted soil health as well.

A project in Richardson County on the Keithley Brothers Farm evaluated yields from corn hybrids with different relative maturities to determine if there were yield differences. Small plot research at the University of Nebraska indicated shorter season hybrids yielded similar to longer season hybrids. If this were the case, cover crops could be planted sooner and have a better opportunity for establishment and more growth to increase soil benefits from the cover crops. Results of this study showed no significant differences between 105, 111 and 115 day corn, with 95 day corn yielding significantly less.

Another study in Richardson County on the Dean and Deb Stevens farm used a drone with a sensor to determine in-season nitrogen fertilizer needs of a corn crop, with nitrogen later applied according to the results of the sensor with an airplane equipped to apply a variable rate of nitrogen. This system was compared to a system with nitrogen applied pre-plant and a flat rate applied in-season according to corn nitrogen needs. Corn yields, nitrogen rates applied and costs were measured in this experiment. Corn yields and costs were similar, but nitrogen required to produce a bushel of corn was significantly lower with the drone systems

compared to the grower's system. These experiments will be repeated in 2018. The on-farm research program has been conducted across Nebraska with Nebraska Extension for several years. This program is expanding and getting stronger with support from the Nebraska Corn Board. In 2017 more than 80 on-farm research projects were conducted in Nebraska. These research projects cover products, practices, and new technologies that impact farm productivity and profitability. To find out more about the on-farm research program go to: <https://cropwatch.unl.edu/on-farm-research>.

Consider this an invitation to partner with the Nebraska On-Farm Research Network to secure and work with 2018 on-farm research projects.

1. You select a topic which you feel is important and needed in providing answers in your growing region. We will work with you to establish a plan on how to plant and harvest the study using your own equipment. Nebraska On-Farm Research can also assist as needed throughout the year.
2. We have developed protocols for a number of study topics that focus on areas of critical importance to crop production (including nitrogen, irrigation, and planting population studies). A number of new and revised research protocols are being developed and will be posted soon. These protocols are self-contained and include an example treatment map. Here is the link to the protocols: <http://cropwatch.unl.edu/farmresearch/protocols>.
3. We are making arrangements for industry partnership studies in the 2018 growing season.

If interested in participating in these studies, please contact Laura Thompson – 402-245-2224 laura.thompson@unl.edu Nathan Mueller - 402-727-2775 nathan.mueller@unl.edu or Keith Glewen (402-624-8005) for specifics on the above.

If you interested in conducting any on-farm research, feel free to contact me, Gary Lesoing. I am the Extension Educator in southeast Nebraska who is a member of the On-Farm Research Network. You can reach me at (402) 274-4755 or glesoing2@unl.edu.

TIPS FOR IMPROVING YOUR BOTTOM LINE FOR YOUR SOYBEAN CROP

With the low commodity prices and high input costs, it is important to look at strategies that can improve your bottom line for your soybean crop this year. Sometimes minor changes in management such as using disease resistant varieties, a lower planting rate, an earlier planting date or Integrated Pest Management (IPM) can improve your potential for profitability.

Soybean cyst nematode (SCN) is the pest that causes the single largest loss to soybean producers in both Nebraska and the U.S. each year. The University of

Nebraska has conducted research to evaluate the impact of the use of SCN resistant soybeans compared to susceptible varieties. From 2006 to 2013, the University of Nebraska has conducted 29 trials comparing yields of SCN-resistant and susceptible varieties on fields infested with soybean cyst nematodes. The average yield advantage was 6 bushels per acre. At today's prices, that's an additional \$50+ per acre return without investing a dime. SCN-resistant varieties cost no more than susceptible varieties, but yields are significantly higher on infested sites. In short, you can achieve better yields on SCN-infested sites with no increased costs. A few years ago, a trial conducted in Richardson County in a field with SCN egg numbers between 2,000 – 3,000 per 100 cc's of soil; showed an average of 11 bushels per acre yield advantage for the SCN-resistant varieties compared to the susceptible varieties. If you haven't sampled your fields recently, now is the time. The Nebraska Soybean Board is supporting Nebraska soybean producers by covering the costs of samples submitted to the University of Nebraska for SCN analysis. Bags for submitting samples and soil probes are available at the Nemaha County Extension office in Auburn. Feel free to contact me if you have a field or fields you want sampled or contact the Extension office in your county for sample bags.

If you have problems with Phytophthora in some of your soybean fields, especially poorly drained soils, the use of fungicide seed treatments is recommended to reduce early season seed decay and damping off in your soybeans. There are certain commercially available varieties of soybeans that exhibit resistance to specific races of Phytophthora as well. If you have fields that are infested with Sudden Death Syndrome (SDS), the seed treatment ILeVo has shown consistently about a 4-5 bu/ac yield response in trials conducted throughout Nebraska and the Midwest. With SDS, the impact on soybean yields is inconsistent from year to year. There are SDS resistant varieties available as well, but this seed treatment adds more protection against this disease. Research at K-State showed a 17 bu/ac yield response from ILeVo on a field with a high infestation of SDS. The recommendation of most of the University Plant Pathologists is to use resistant varieties and ILeVo in combination for fields that are infested with SDS.

There have been a number of soybean plant population trials conducted with on-farm research across Nebraska over the years. The bottom line is, many farmers can reduce their planting rate of soybeans without impacting soybean yields. In 2016 an on-farm research study conducted in Richardson County, in 15 inch rows, soybeans planted at the rate of 116,000 plts/ac yielded 2 bu/ac less than those planted at the rate of 160,000 plts/ac, but were over \$7/ac more profitable. At other locations across eastern Nebraska, planted populations as low as 90,000 plts/ac yielded similar to planted populations of 150,000 plts/ac, but were over \$25/ac more profitable. In earlier research conducted in several counties across eastern and central Nebraska, yields were similar for planted populations of 120,000 plts/ac compared to

150,000 plts/ac. If you have not already done so, cutting your plant population to 120,000 plts/ac could save you \$10 per acre.

Dr. Jim Specht has conducted research at the University of Nebraska, evaluating the impact of planting date on soybean yields. His research suggests having May 1st as your target date for planting soybeans. Earlier planted soybeans will reach V1 earlier and when plants reach V1 earlier, they accrue more nodes during the growing season resulting in more potential pods and seeds per unit area. After V1, Nebraska research data clearly shows that nodes accrue at about 0.27 nodes per day, or, saying it another way, it takes 3.7 days to produce a new node. Yield increases of 1/4 to 5/8 bushel per day have been found for each day planting is moved closer to May 1. It is recommended to plant soybeans the last week in April in the southern two-thirds of Nebraska if soil conditions are suitable and the weather forecast is conducive. Use good judgment. Soil temperature is less of a factor when following these guidelines than calendar date and soil moisture. Regardless of calendar date, neither "mudding in" soybeans — that is, planting when soils are too wet — nor planting in dry soils will turn out well. Treat early-planted soybean with insecticide and fungicide seed treatments. These mitigate potential problems from Bean Leaf Beetle (BLB) as well as fungal organisms impacting germination and hypocotyl elongation. If soil temperatures are greater than 50°F and the short-term forecast is for warm conditions, insecticide and fungicide seed treatments may not be necessary. Use short-term weather forecasts to evaluate frost risks at the estimated time of crop emergence. For the article on early planting soybeans improves yield potential go to: <http://cropwatch.unl.edu/why-planting-soybean-early-improves-yield-potential>.

A final management tool to use during the growing season is IPM. By keeping on top of potential pests, including weeds, diseases and insects, you can determine if treatment is feasible for your soybeans. You may be able to head off yield impact from an infestation of (BLB), soybean aphids, grasshoppers or a field specific infestation of spider mites or the silver spotted skipper, which caused some isolated problems a few years ago. You also may avoid treatment if you have some natural predators present, i.e. ladybugs. Just don't spray for the sake of spraying! These are just possible strategies you may want to consider this year as you plan for the 2018 soybean crop and the upcoming growing season. If you have any questions feel free to contact me at (402) 274-4755 or glesoing2@unl.edu.



TOP EIGHT TIPS FOR MANAGING COVER CROPS THIS SPRING

The main points of this article come from an article written by **Darcy Maulsby**, a freelance writer from Iowa. Iowa Farm Bureau sponsored a webinar a couple of years ago that focused on cover crop management. I have heard Steve Berger, the farmer featured in this article speak at a No-till on the Plains Conference in Salina, KS a few years ago and he has also spoken at the Nebraska Cover Crop Conference near Mead. Tom Kaspar has conducted research with cover crops, especially cereal rye for many years. He has found it is effective in reducing nitrates in water from tile drainage in Iowa. I have modified parts of the article to fit cover crops in Nebraska. Several Nebraska growers are grazing cover crops in the spring and planting green into cover crops and getting along fine. These tips are what a farmer and researcher have found to work well for them in Iowa. **You need to use the system that works best for you on your farm.**

Cover crops offer an effective way to protect against soil erosion in the winter and early spring, but what needs to happen when it's time to prepare the field for corn or soybean planting?

"There are a number of factors to consider when timing the termination of your cover crops," said Steve Berger, a Washington County farmer from Wellman who has used cover crops on a continuous basis for 15 years on all of his farms.

Many of these management factors were addressed during a recent Iowa Farm Bureau Federation webinar on spring cover crop management. Only winter-hardy cover crops need to be killed with herbicide or tillage in the spring, said Tom Kaspar, a plant physiologist at the USDA's National Laboratory for Agriculture and the Environment in Ames. While oats and radishes winter kill, Kaspar and Berger offered the following tips for terminating winter-hardy cover crops:

1. Understand the nature of your cover crop. Cereal rye terminates easily from any stage of growth with 32 ounces per acre of generic glyphosate.
2. Watch soil moisture, rainfall and cover crop growth. If spring conditions are dry, plan to kill the cover crop sooner than later so it doesn't deplete valuable soil moisture, Kaspar said. **This is especially important this year. Know your soil moisture conditions. Several areas have been very dry this past year and maintaining adequate soil moisture is critical, especially if going into corn.**
3. Pay attention to timing. Kaspar recommends terminating grass cover crops 10 to 14 days prior to corn planting, or before the cover crop is 6 to 8 inches tall. "Before soybeans, the biggest concern is dry conditions," Kaspar added. "If conditions aren't dry, however,

the cover crop can be sprayed three days before planting."

4. Be sure to comply with crop insurance termination dates. Check with your crop insurance provider for more details, Kaspar said.
5. Know when to wait. Vigorous cover crop growth is a good thing. That's why tiling projects and anhydrous applications can make a difference in the timing of cover crop termination. "Let's say there's an area of the field where you've got a tile project, and you go over the soil with a blade or field cultivator," Berger said. "Sometimes when you disturb a cover crop like cereal rye, it's harder to terminate when you spray it afterwards. From the time you work those tile ditches down, maybe wait three or four days to get that rye growing again. Then terminate it, and you'll have no problem." It's the same with an anhydrous ammonia application. "The soil disturbance from applying anhydrous will sometimes cause a rye plant to harden off and not respond to glyphosate," Berger said. "Wait awhile to let the rye re-establish before terminating the cover crop, and you'll be fine."
6. Follow good glyphosate application practices. Berger terminates 99 percent of his cereal rye with glyphosate and encourages growers to respect good glyphosate practices. "Whenever possible, try to spray in the middle of the day when the weather is sunny and warm, there's little wind and the cover crop is actively growing," said Berger, who watches for nighttime temperatures to warm into the upper 40s.
7. Watch for weed and insect issues. When terminating cover crops, be mindful of controlling winter annual weeds and other yield robbers. "This may mean increasing your glyphosate rate or adding some 2, 4-D or LV6," Berger said. "You might also want to add an insecticide to help control pests." **Some farmers had issues with grasshoppers in soybeans in 2017, but it isn't always advisable just to add an insecticide just because you may have a problem. If you previously have had issues in a field, it may be a good idea.**
8. Evaluate tank-mix strategies. Along with glyphosate and an insecticide, Berger sometimes adds residual herbicides to his tank-mix. "There are some risks associated with this, but it's a risk worth taking," said Berger, who also adds UAN to the mix. His 2015 program for acres going into corn included 17 pounds of AMS per 100 gallons, glyphosate with rates increased to 48 ounces, Harness Xtra 6.0 herbicide at 2.3 quarts, atrazine at 0.65 quarts, bifenthrin insecticide at 4 ounces and UAN (25 pounds of nitrogen per acre) at 7 gallons per acre. "We got along fine and had an excellent kill with this program," Berger said. His tank mix for acres to be planted to soybeans included 17 pounds of AMS per 100 gallons, glyphosate (4 pounds) with rates increased to 50 ounces, Anthem herbicide at 7.8 ounces, and LV6 herbicide at 3 ounces. "This tank mix also worked very well as a pre-emerge spray trip," noted Berger, who said that

he only adds the LV6 in the early pre-plant situations when he's far enough away from planting. In many cases, cover crops are terminated within a week or less following these programs. "Maximizing your cover crop investment properly will help you reach your goals of profitable crop production, erosion control and improved soil health," Berger said. The link to this article is: <https://www.iowafarmbureau.com/Article/Top-8-tips-for-managing-cover-crops-this-spring>.

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