Happy New Year!!! This week has been a good one to reflect on 2017.

It was a year of unusual situations such as the dry winter allowing for nitrogen burn on  corn, herbicide carryover, wheat stem maggot in corn from late-terminated wheat/rye, dicamba concerns on soybeans/trees/vegetables, downed corn ears and the challenge of recovering them…I think so often as I reflect, it's easy to see the problems that occurred as those tended to be the headlines.

But as I also reflect, I think of so much more. It's been a hard several years both personally and professionally for me and one reason I love Extension is for the relationships I'm so blessed to have. As I reflect on this past year, it was a year of spending time sharing the ways we all were hurting/healing while looking at crop problems, working in on-farm research plots, or just visiting. It was a special year in building even deeper relationships with many of you whom I've served in the past and meeting new people in the area I'm serving. Thank you also for your grace as it is a challenge serving regions of counties. I truly am grateful for the friendships and opportunity to serve you!

One of my highlights was pesticide training…yes, pesticide training! I know it's required for us as private applicators every three years, but it's my chance to teach/learn from/see so many of you and do my best to share important crop information as well. I enjoy winter meeting time as it always feels like a big reunion to me to see who comes and to catch up! Pesticide training last year was fun to still have the opportunity to train those of you in my former area and meet many in my new area.

Another highlight is a group of youth I meet with each month for Crop Science

Investigation (CSI). This was such a rewarding experience for me in Clay County working with Clay/Nuckolls county youth and watching them learn, grow, and some pursue ag careers through the years. In York County I'm blessed with a very young, energetic group of youth who are so much fun and love to learn! Basically, the youth are detectives every time we meet as I give them a real problem to solve. We spend time out in the fields learning about crop growth, weed/insect/disease ID, take industry tours, etc. Our youth right now are mostly in the 6-11 year old range but any youth and parents are welcome to join us if you're interested. Please just let me know at jrees2@unl.edu for meeting times.

On-farm research plots are always a highlight for me for how much can be learned and this year we had some intense plots regarding data collection! Grateful for the farmer-cooperators in the time spent on these plots and how you're so good at working with me.

I also am grateful to the media. With fewer of us in Ag Extension, we're called on more often to share when problems arise. So grateful for the relationships with all our media partners-TV, radio, newspapers, magazines-and all you do in helping us share our research-based information timely!

As I think about 2018, one concern continues to be low commodity prices and ways to make it through. The Farm Bill and what will happen regarding it is another topic. Dicamba unfortunately may continue to be a topic. And, it seems like every year we have varying weather that creates challenges and opportunities. Two things that will continue are the optimism/resiliency I see every year in our farmers and the strong family that Ag in general is. Here's wishing you a safe and blessed 2018!

York Ag Expo: Reminder of the York Ag Expo January 10-11 at the Holthus Convention Center in York. A full list of exhibitors is available at: http://yorkchamber.org/yorkagexpo/. Lyndy Phillips will be the speaker at the Prime Rib Supper at Stone Creek in McCool Junction with social hour at 5:30 p.m. and supper at 6:30 p.m. Tickets can be purchased for $30 at the York Chamber Office. I'm really excited for the opportunity to provide educational sessions this year and am particularly excited about the cover crops/annual forages for grazing. If you have cattle and are looking for outside-the-box ideas, this session may be helpful. Educational sessions include:

- Chemigation Training by Steve Melvin, Jan. 10 from 9-Noon
- Cover Crops/Annual Forages for Grazing, Jan. 10 from 1-4 p.m.
- Private Pesticide Training by Jenny Rees, Jan. 11 from 9-Noon
- Precision Ag, Jan. 11 from 1-4 p.m.

Winter Ag Program Brochure: You can also find our winter ag program brochure for South Central/Southeast Nebraska at: https://go.unl.edu/vzyg.

My top question the past two weeks has been about dicamba training. I just received the information regarding this training from our pesticide program coordinators.

First, to clarify some mis-understandings: Dicamba training is only required for those applying dicamba products to soybeans. The product options are: XtendiMax®, FeXapan™, and Engenia®. These products are all Restricted Use Pesticides (RUP) this year; thus, you have to be a certified applicator to purchase and use these products. Dicamba training is not required if you're applying dicamba corn products.

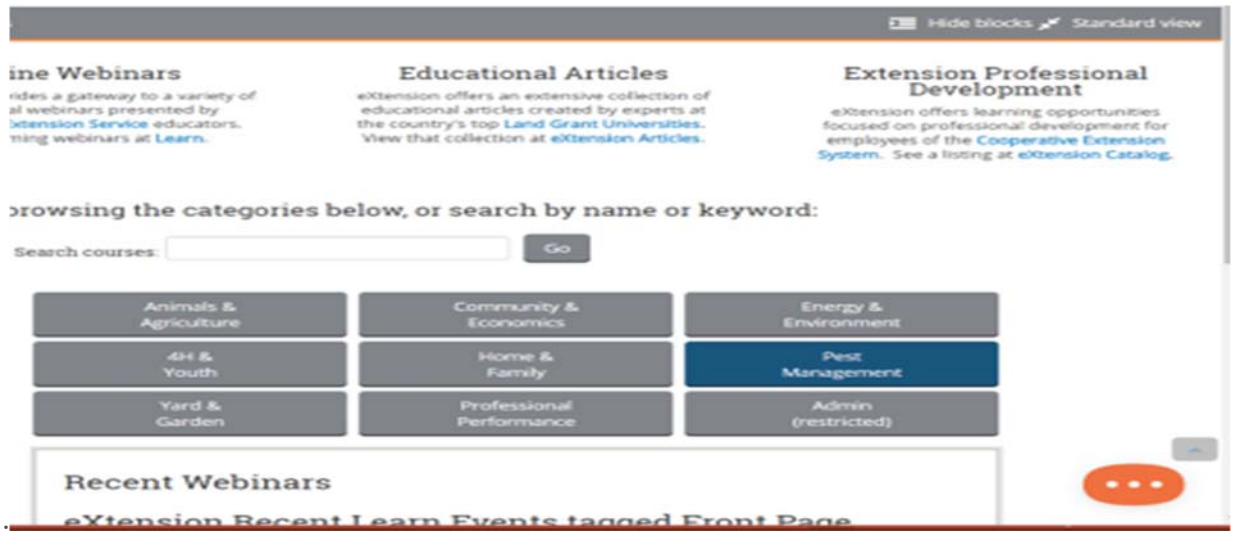
Second, pesticide training of any kind **is not** the same as dicamba training. Dicamba training is completely separate. Having your pesticide applicator license does not qualify you to apply RUP dicamba in 2018.
Third, some have asked if everyone in the operation needs this training or not…specifically the person who is purchasing the RUP dicamba with his/her applicator license but is not the one intending on applying the chemical. NDA says that, "Dicamba-specific training is **only** required for application of the product, **not** for purchase of the product."

- You need to be a certified pesticide applicator to **purchase** the RUP dicamba products.
- You need to be a certified pesticide applicator **and** complete dicamba training to **apply** the RUP dicamba product. So hopefully that helps clarify who in your operations need this training.

Your options for RUP dicamba training include the following:

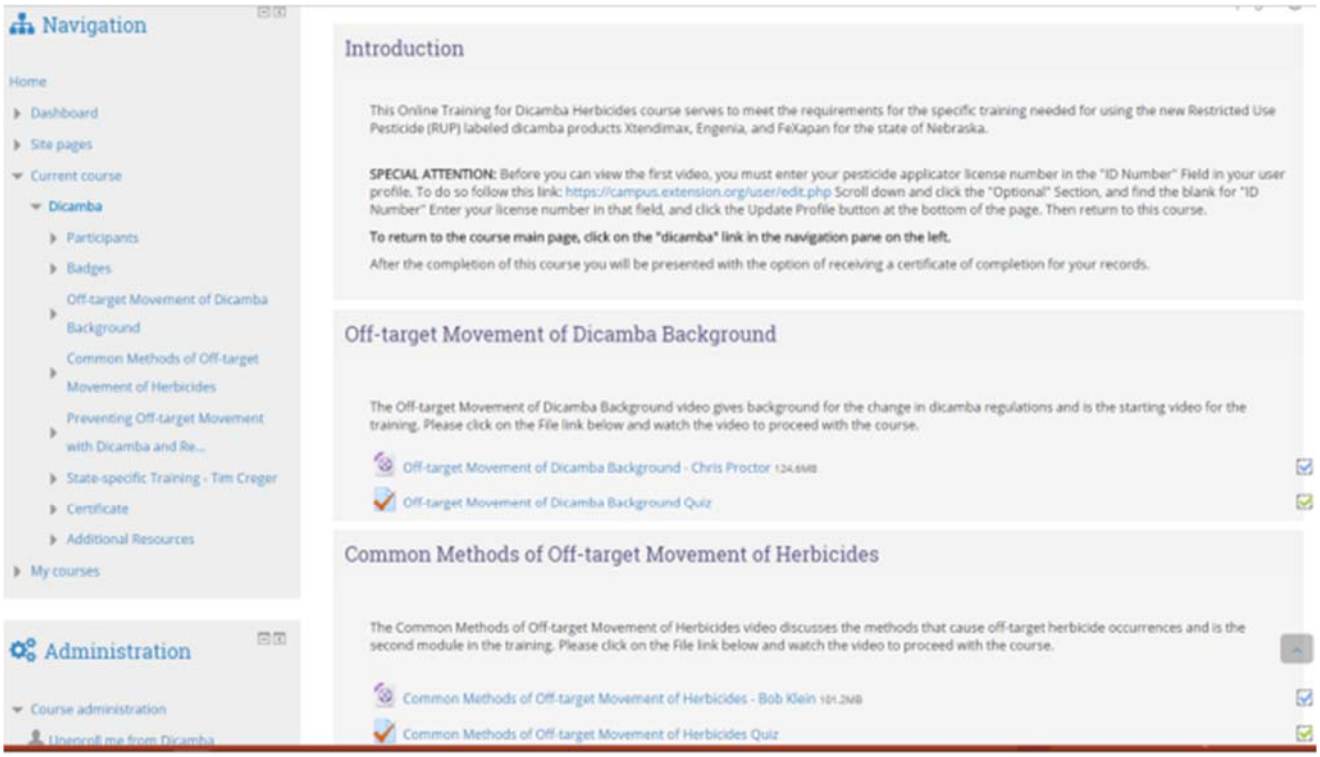
1. Nebraska Extension online training course hosted by eXtension. See the link at : https://campus.extension.org/login/index.php (1.25-1.5 hours).
2. Crop Production Clinics or Nebraska Crop Management Conference. Details at https://agronomy.unl.edu/cpc and https://agronomy.unl.edu/ncmc
3. County-hosted training sessions at the option of local educators presenting the video which is the same as the online training (1.25-1.5 hours).
4. RUP dicamba product (XtendiMax®, FeXapan™, and Engenia®) manufacturer sponsored training. Each manufacturer will advertise individually.

I took the online training so I could better answer your questions. The link to the UNL online dicamba training can be found at the http://pested.unl.edu site or you can go directly to the training at: https://campus.extension.org/login/index.php. Once at this site, you will need to create an account. You will then be sent a confirmation email and upon opening that, you will be logged in. From the course list choose "pest management"



Then scroll and click on “Online Training for Dicamba Herbicide”.

You will then need to register for the training. It will ask you to add your Nebraska pesticide applicator number in a specific field as well. Your name and applicator number are required before you begin the training. You can then click on the first video followed by the first quiz. It keeps track if you completed the entire video or not before you can advance.



I felt the information was good overall and I appreciated the fact that they mentioned how corn dicamba applications also influenced the problems we saw in 2017. They also share quite a bit of research regarding volatility, conditions/timing of temperature inversions, dosage amounts and effects on yield. The quizzes are

short and were fairly common sense. You can click to check each answer once you have selected your choice and will have to submit all your answers before moving on. When you have completed all the videos and quizzes, you can have a certificate emailed to you. You will also be officially entered into Nebraska Department of Ag's database. NDA said they will only honor those names in their database as those who've completed dicamba training.

NDA is asking ag retailers selling these RUP dicamba products to check the NDA database to ensure the person applying the product has received dicamba training. NDA's dicamba information including record keeping forms, etc. can be found at: http://www.nda.nebraska.gov/pesticide/dicamba.html.

The other thing you need to know: some have asked if a group of people can watch the online training at the same time at your farmstead. The answer is actually no from the standpoint you all would have to watch the training on separate computers/devices. The only way your name is recorded in the NDA database is through your registration name and pesticide applicator number on the training site. It only allows one person to enter his/her information to view the training and complete the quizzes. If you attend an NDA approved face-to-face training such as at Crop Production Clinics, you can train as a group but will still need to supply your individual names and pesticide applicator numbers at the training.

Hopefully this helps clarify some of the questions you have and during this cold weather, you have the opportunity to get this training completed if you need it for 2018.

Reminder: York Ag Expo at the Holthus Convention Center in York January 10-11. Schedule of Events and Exhibitors: http://yorkchamber.org/yorkagexpo/
Educational Sessions: https://jenreesources.com/2017/12/26/york-ag-expo-educational-sessions/

Dicamba Updates: For those of you who farm in both Nebraska and Kansas, or have customers that do, the following is what is needed for RUP-dicamba training. Nebraska and Kansas have a reciprocal agreement regarding private, commercial, and non-commercial applicator training. Those who have a KS applicator license who wish to apply RUP dicamba in Nebraska don't need to take additional pesticide training in Nebraska. They do need to apply for a reciprocal license in Nebraska through the NDA and pay the $25 fee (private) or $90 fee (commercial/non-commercial) for a Nebraska pesticide applicator license. There is no additional fee for dicamba training in Nebraska. Kansas Dept. of Ag accepts Nebraska's dicamba training with no further requirements. Nebraska will accept Kansas dicamba training IF you can also prove you watched the NDA Nebraska specific requirements video. Otherwise, it's perhaps simpler to take the RUP online dicamba training from Nebraska or attend a Nebraska face to face session. If you missed the UNL face to face sessions for your area, you can also attend Industry trainings which are upcoming and listed on the NDA website at: http://www.nda.nebraska.gov/pesticide/dicamba.html (please refresh your browser). And, you may wish to attend an industry training anyway depending on the product which you plan to apply to hear more about specific buffer requirements and ask specific questions.

Also, to be clear, anyone who has attended UNL trainings will not receive certificates. Your proof of training will be to download the excel spreadsheet at the NDA website listed above and ensure your name is on that spreadsheet. I've been asking that you give NDA 7-10 days before checking it with all the paperwork coming in right now. If you attend a training and don't see your name, please contact the trainer whose session you attended. It may take longer for those of you who became new pesticide applicators.

The York UNL dicamba training has been rescheduled to February 16 from 10:00-11:30 a.m. at the 4-H Building at the Fairgrounds in York. Updated FAQs can be found at this site (https://pested.unl.edu/documents/RUP_Dicamba_FAQ_2018.pdf) as we receive questions and verify answers with NDA and EPA (please refresh your browser for the updated info.)

Converting ground to annual/perennial forage systems: For the past few years, some of you have spoken with me about converting a pivot to an annual forage system if you owned the land and had cattle. We've worked through some economics and a handful of you have tried various options. With current corn and soybean prices, I've received an increasing number of questions regarding this topic from farmers and ag lenders. A team of Extension specialists including Dr.'s Jay Parsons, Mary Drewnoski, and Daren Redfearn are seeking your input into what they've put together for economics of example systems this coming year. A webinar is scheduled for Tuesday, February 13th beginning at 6:00 p.m. CST. To participate, you can click on the following url: https://unl.zoom.us/j/827594794. Audio can be through your computer speakers or you can also call in. Full details regarding phone number options and additional information can be viewed at: https://cropwatch.unl.edu/2018/economics-annual-and-perennial-forages-webinar. The goal of this webinar is to explain economic examples for both annual and perennial forage systems using different classes of cattle and allow you to provide input into those numbers

and ask questions. For those of you interested in this topic and/or are already using annual forages/converted pivots to perennial grass systems, we'd greatly appreciate your input and please do consider sharing your insight!

York County Corn Grower Tour: Gary Zoubek, Extension Educator Emeritus, has planned a great Corn Grower tour for those interested in attending on February 13th! Please call the York County Extension Office at (402) 362-5508 if you plan to attend. Attendees will meet at the York County Extension Office at 8 a.m. with travel to Lincoln at 8:30 a.m. Tours in Lincoln will include Nebraska Innovation Campus (including Nebraska Innovation Studio (the makerspace), the Food Innovation Center, and the Greenhouse Innovation Center, home of the LemnaTec High Throughput Plant Phenotyping system). Attendees will then tour Quantified Ag that developed cattle ear tags equipped with sensors to monitor the health of the individual as well as the herd. Lunch at Valentinos will be followed by Campus visits including learning about biobased textiles, the Ag Econ Marketing Lab/Commodity Trading Room, and the UNL Dairy Store. The final stop will be at Neogen labs that develops, manufacturers, and markets a diverse line of products dedicated to food and animal safety before traveling back to York around 5:15 p.m. You can view more details and the full itinerary at: https://jenreesources.com/2018/01/29/york-co-corn-grower-tour-feb-13/.

Palmer Amaranth: I've been speaking a lot this winter on palmer amaranth and a few shared it's fairly depressing. The positive side of this is we have an opportunity to learn from the research conducted in the Southeastern U.S. regarding palmer management so we don't get to where they're at! Their top question for cash renting or purchasing ground is "do you have palmer?"…so we have an opportunity to manage it here now!

In order to do that, though, we need to think of a system's approach. This approach may not be economical for every year, but a system's approach looks at the long-term benefits as a whole.

The keys for palmer (or any weed) are to keep it from germinating and then, once germinated, keep it from seed production. Palmer germination has been found to be induced more by natural and red light than soil temperature. Thus, bare soil in the first few weeks of May allow for a good situation for palmer germination and emergence. Management to avoid early germination include: keeping the soil covered with residue, small grain, or cover crop; burndown apps and pre-plant herbicide applications. Palmer can continue to germinate throughout the growing season to mid-September. During the growing season, quicker canopy closure and post-herbicide apps with residual are key.

At harvest, management includes seriously considering not running your combine through palmer patches. We've had farmer success stories in 2016 when farmers didn't harvest their soybean endrows but did harvest the rest of their fields. Instead, some chose to disk down endrows with heavy palmer pressure and planted a wheat or rye cover crop in them. In 2017, they shared it made a big difference in reducing palmer in those fields. I've also received farmer testimonials sharing the opposite; they wish they didn't harvest the endrows or the one patch that had palmer in the field as now they've spread it throughout the field. Research has shown 99% of the palmer seed going through the combine is still viable; thus we're just moving it throughout the field and from field to field.

Fire was not found to be effective to get hot enough to kill the seed when the whole field was burned. Instead, crews carry black trash bags, pull the female palmer plants, and haul them out of the fields burning them in burn barrels.

Palmer seed production from soil surface-Clay Co.

The University of Georgia found they had to hoe the plants 2" below the soil surface in order to kill them. An average palmer plant can produce 500,000 seeds/plant. The plant on the edge of the field can produce up to 1.8 million seeds. I had a hard time believing the seed production research from the soil surface (22,000 seeds on average) and 1" stem (36,000 seeds on average), until I saw it walking fields last summer. I remember tweeting out the pictures saying #hatethisweed.

A study conducted in Kentucky compared 1-Wheat with double crop soybean 2-Wheat fallow (no herbicides were applied) 3-Full season soybean. They counted palmer plants in 100 square feet in each replicated treatment. No palmer could be found in the wheat other than in the tram lines; the double crop soybean into the wheat stubble only had 5 plants/100 sq. ft. In comparison, the full season soybean

Full article here

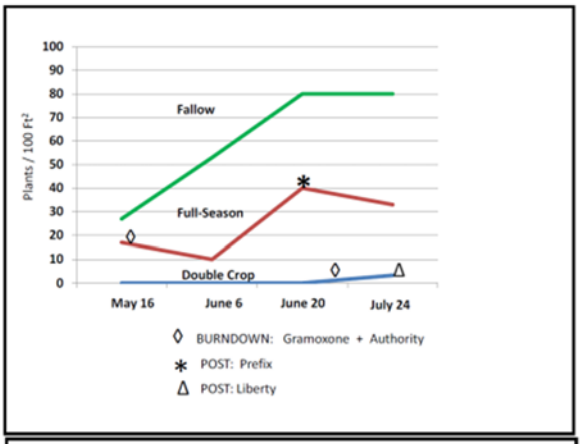


FIGURE 1. PALMER AMARANTH DENSITY (Warren County – 2013)

ranged from 18-40 plants/100 sq. ft. while the fallow ground had 80 plants/100 sq. ft. A system's approach is considering adding a small grain like wheat back into the system. Or, at least consider wheat/rye as a cover crop to help reduce light interception onto the soil surface in early spring.

We've also heard more about tillage in the southern states. Palmer is a small seeded plant and the seed can actually germinate within the top two inches of soil. Spring tillage doesn't appear to significantly reduce palmer germination compared to fall tillage. So the following is all from fall tillage research. Research has found that burying palmer seed at least 2" can reduce densities similar to control with pre- and post-herbicide applications. Research from at least three studies has shown burying palmer seed with a plow to 4" or using inversion tillage reduced palmer germination anywhere from 50-80%. **Leaving the seed**

Full article from University of Georgia here

buried for three years reduced palmer germination further. So, the suggestion is if you deep till, do it once and then get a small grain cover on the field to knock out the early spring light interception. At least two studies showed that fall inversion tillage followed by cover crop resulted in 85% reduction of palmer the next spring. I share this knowing we can't afford plowing for soil loss, soil moisture loss, and tillage doesn't fit some of your systems. It is a management option to consider if other options aren't working for you. Summary: fall tillage once, get a cover on it, and then leave it alone.

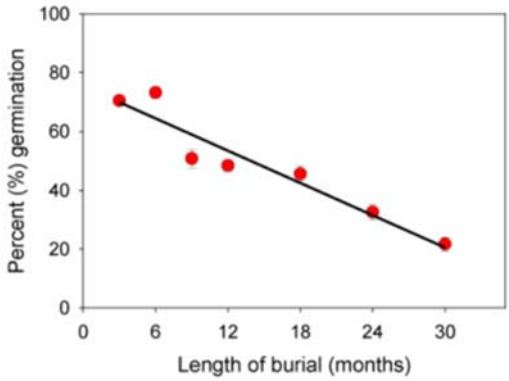


Figure 4. Palmer amaranth seeds become less viable with time.

Ultimately, the management keys are to 'start clean and stay clean' using burndowns, pre's, several effective modes of action, keeping the ground covered to reduce light interception, and

incorporating a small grain and/or cover crop into your system. Hopefully this helps as we think about managing palmer this coming growing season.

On-Farm Research Updates: One of my favorite winter programs is our Nebraska On-Farm Research Updates because of our growers presenting the research they conducted with us. These are upcoming next week starting Feb. 19 at former ARDC near Mead and Feb. 21 at College Park in Grand Island. Programs most days run from 9 a.m.-4:30 p.m. with registration beginning half an hour before each day's program. Full details of dates, locations, and RSVP can be found at: https://cropwatch.unl.edu/2018/growers-statewide-share-farm-research-5-sites. Over 80 on-farm research projects will be presented this year including a wide range of topics: cover crops, variable rate seeding, planting populations, multi-hybrid planting, starter fertilizer, etc. Certified Crop Advisor Credits are applied for. Growers take an active role in the on-farm research project sponsored by Nebraska Extension in partnership with the Nebraska Corn Growers Association, the Nebraska Corn Board, the Nebraska Soybean Checkoff, and the Nebraska Dry Bean Commission. To learn more about the Nebraska On-Farm Research Network, visit http://cropwatch.unl.edu/farmresearch. Hope you consider attending!

Crop Insurance, Farm Bill Policy Update: Also reminding you about the final "Farmers and Ranchers College" program for our area this year to be held Feb. 23 in Geneva at the Fairgrounds. This workshop on Crop Insurance, Farm Bill Policy Update and More, will run from 10 a.m.-3 p.m. with registration beginning at 9:45 a.m. You can view the whole agenda and speakers at: https://vandewalleviews.wordpress.com/2018/02/02/crop-insurance-farm-bill-and-more/

Introductory Beekeeping Classes: Was asked to share about upcoming beekeeping classes. There are two course levels: one for beginning beekeeping and one for those who are currently keeping bees and want information on colony health and maintenance. Workshop details can be found at: https://entomology.unl.edu/bee-lab#tab2.

Mixer/Loaders and RUP Dicamba: Mixer/loaders are now required to have RUP dicamba training; however, they may not have a pesticide applicator license. On the RUP dicamba training registration sheets, just put "mixer/loader" instead of a pesticide applicator number. New pesticide applicators who haven't received their number yet can just put "pending".

Dicamba Best Management Practices: Last week I finished pesticide and dicamba trainings for our area. In each of the meetings, off-target injury from dicamba in 2017 was discussed. A few weeks ago in my column, I shared how dicamba applications to corn played a role in our area of the State. I've also received questions regarding best management practices for all dicamba applications in 2018. A team of Nebraska Extension Specialists and Educators have been discussing this for several months based on the research we could find in the literature. Grateful for this team working together and you will see three articles in this week's UNL CropWatch at http://cropwatch.unl.edu. These articles include: best management practices for all dicamba applications in 2018, potential off-target movement from corn applications, and the tricky task of removing dicamba residues from sprayers. Please check them out! This week's CropWatch also features several student intern reports on soil, forage, and cover crop research.

Farm Bill Meetings: A new federal farm bill is due this year and is under development in Congress. With action completed on a federal budget including some agricultural programs, the farm bill process could pick up quickly with proposals and legislation fully debated in the coming weeks.

Reminder of the last Farmer/Rancher College program Feb. 23 in Geneva (10 a.m.-3 p.m.) at the Fairgrounds on the farm bill and crop insurance. Great lineup of speakers including Steve Johnson from Iowa State University and Brad Lubben with UNL. No charge but please RSVP (402) 759-3712 as they are still taking registrations.

There's also a series of Farm Bill Meetings upcoming in Nebraska and Kansas in late February/early March. The meetings will provide an overview of the current debate and current economic conditions in agriculture which help frame the discussion and will look at crop and dairy commodity programs, conservation programs, and nutrition programs and other policy issues, as well as proposed crop insurance changes.

Leading the discussion will be Mykel Taylor and Art Barnaby from Kansas State University and Brad Lubben from the University of Nebraska-Lincoln. Taylor is a farm management specialist with expertise in producer decision-making, including in-depth analysis of the 2014 farm program enrollment decision. Her analysis of past decisions and outlook will provide perspective on the commodity programs, the potential changes and the decisions ahead in 2019. Barnaby is a national expert in crop insurance with keen insight on the features and performance of crop insurance. His work will explore the proposed changes and the potential ramifications to the program and to producer crop insurance and risk management decisions. Lubben is a noted expert in agricultural policy with insight on both the farm bill issues and the process. He will help frame the debate and the expectations for new programs and policies to provide perspective on the broader budget and policy challenges facing members of Congress in writing the new farm bill.

Each meeting will run from 9:00 a.m. to 2:30 p.m. Registration will begin at 8:30 a.m. with refreshments and lunch served. The registration fee is $20 if pre-registered five days before the date of each meeting, and will increase to $30 after the deadline or at the door. The fee covers the meal, refreshments and meeting materials. To register, visit http://www.agmanager.info/events/2018-farm-bill-meetings and click on the meeting you wish to attend. Locations include:

• DODGE CITY, KS.: Feb. 28, Knights of Columbus Hall, 800 W. Frontview, Dodge City, KS. Host: Andrea Burns, aburns@ksu.edu or 620.227.4542

• MANHATTAN, KS.: March 1, Pottorf Hall – CiCo Park, 1710 Avery Ave., Manhattan, KS. Host: Rich Llewelyn, rvl@ksu.edu or 785.532.1504
• MEAD, NEB.: March 5, ENREC near Mead, Eastern Nebraska Research and Extension Center, 1071 County Road G, Ithaca, NE. Host: Keith Glewen, kglewen1@unl.edu or 402-624-8030
• HASTINGS, NEB.: March 7, Adams County Fairgrounds, 946 S. Baltimore, Hastings, NE. Host: Ron Seymour, rseymour1@unl.edu or 402-461-7209
Further information is available at http://agmanager.info or http://farmbill.unl.edu or by contacting the meeting host at each location.

Central Nebraska Cover Crops Conference: From grazing cover crops, seeding methods, innovative methods to incorporating cover, and more, the Central Nebraska Cover Crops Conference offers the latest information to help Nebraska growers profitably incorporate cover crops into their operation. The event will be held Friday, March 2 at the Merrick County Fairgounds with donuts provided by Lincoln Creek Seed at 9:00 a.m. The event has a great lineup of speakers including Paul Jasa, Extension Engineer; Keith Berns, Green Cover Seed and Nebraska Farmer; Dean Krull, Extension Demonstration Project Coordinator; Mary Drewnoski, Extension Beef Specialist; Daren Redfearn, Extension Forage Specialist; and Steve Melvin, Extension Educator. Exhibitor space is still available for anyone wanting a booth. The event is free but please RSVP to (308) 946-3843. More information is available at https://extension.unl.edu/statewide/merrick/.

SE Nebraska Soil Health Conference will be held March 5 at the Kimmel Expo Center in Syracuse, NE. The program begins at 9 a.m. (Registration 8:30 a.m.) with topics including no-till/cover crop research update, best management practices for planting into cover crops, grazing cover crops, and two Iowa farmers sharing on how they utilize cover crops in corn and soybeans and on their farms. This event is free and lunch is included but pre-registration is necessary by calling (402) 274-4755 or at http://go.unl.edu/senebsoilhealth.

A Sprayer Applicator Clinic will be held on Tuesday, March 6, 2018, from 11:30 a.m. to 4:00 p.m. at the Kimmel Ag Expo Building in Syracuse, NE. "By attending this clinic, you will be a better prepared spray applicator," says Greg Kruger, Weed Science and Pesticide Application Technology Specialist from North Platte, NE. Register by Friday, March 2, 2018, by contacting Nebraska Extension in Nemaha County at 402-274-4755. The cost of the program is $20 per person. Checks should be made payable to University of Nebraska-Lincoln and mailed to the Nemaha County Extension Office, 1824 N St, Ste. 102, Auburn NE 68305. Lunch is being provided by these sponsors: Midwest Farmers Cooperative, Dean Seeds – Syracuse NE, Andy Wellensiek – Channel Seed, Cook, NE, and University of Nebraska-Lincoln Extension. For more details regarding the clinic see the https://extension.unl.edu/statewide/nemaha/unl-sprayer-applicator-clinic/.

On-Farm Research: Last week a team of us did a series of meetings throughout the State regarding on-farm research updates. It's always great to have the farmers presenting their research and adding in additional details that we didn't have when the results booklet was published! Two more meetings continue in western Nebraska this week.

Perhaps my biggest reason for strongly promoting on-farm research is because there often is no better way to obtain answers to some of the questions you all have. These types of studies are often difficult to obtain funding (or can take months to obtain funding, resulting in a lost window of opportunity) and by conducting this research on your farms, we obtain the answers for your specific situations. Sometimes challenges such as storm damage also become opportunities to answer a question via on-farm research. Growers tend to appreciate research conducted on other growers' farms when we share this research at various meetings, field days, and in articles. A variety of topics are researched every year including nutrient management, various products, row spacing, and new technologies including multi-hybrid planters, use of drone sensors, etc.

In this week's UNL CropWatch at http://cropwatch.unl.edu, three on-farm research cooperators are featured. One of these is Ken Herz along with sons Zach and Aaron in the Lawrence, NE area as first-time cooperators. Ken approached me with several questions the winter of 2015. As growers with a non-irrigated, no-till wheat/corn/soybean rotation and a cattle operation, his family was curious about the impacts of grazing cover crops for cattle gains and improving soil organic matter. They were also curious about the trade-offs of the cover crop vs. any soil moisture loss or impact on the successive corn yield. They also wanted this study to be something that would be applicable to what farmers in this area did and something they could all learn from together. Thus, it was decided to not plant cover crops into the corn or soybean residue as that isn't common and this would need to be a long-term study. Dr. Mary Drewnoski and I met with the Herz family to develop a plan for this study. Also thankful for Dr. Suat Irmak for his help in providing additional soil moisture equipment and advice I needed, to the Little Blue NRD in partnering with reduced cost of soil moisture equipment and also for the partnership of Green Cover Seed.

In 2016-2017, this study evaluated four treatments on the effects of successive corn yield: 1-ungrazed wheat stubble 2-grazed wheat stubble 3-ungrazed cover crop 4-grazed cover crop. Wheat was harvested July of 2016 and a five-species cover crop mix of spring triticale, winter peas, oats, collards, and purple top turnips was planted August 14, 2016 (they wanted a mix that would winter-kill). The cover crop received moisture within a week of planting that allowed for germination. Some additional fall moisture allowed for good growth and cover crop biomass was measured (3401 lb/ac) prior to grazing 28 (1100 lb) first-calf heifers for 22 days resulting in the cover crop carrying 2.4 animal unit months (AUM)/ac. The goal was not to graze too heavy to allow for ground cover and any long-term soil improvements, thus 2177 lb/ac of biomass was present post-grazing. Soil moisture was monitored from after cover crop planting through corn harvest. The soil was so dry after wheat harvest prior to planting the cover crop that it took using a drill to install the second and third foot moisture sensors. Beginning soil health parameters were also taken to be compared long-term in this study.

Corn was planted May 15, 2017. Prior to planting the corn, the soil moisture where the grazed and ungrazed cover crop plots were located were at 35% depletion (top three feet) compared to at field capacity (full soil moisture profile) in the grazed and ungrazed wheat stubble plots. Eight

inches of rain in May evened out the soil profile allowing all plots to be at a full profile (top four feet) at the beginning of the corn growing season. As the season progressed, the grazing treatments started separating out from the ungrazed treatments from July through end of the season. I don't know how to explain that yet.

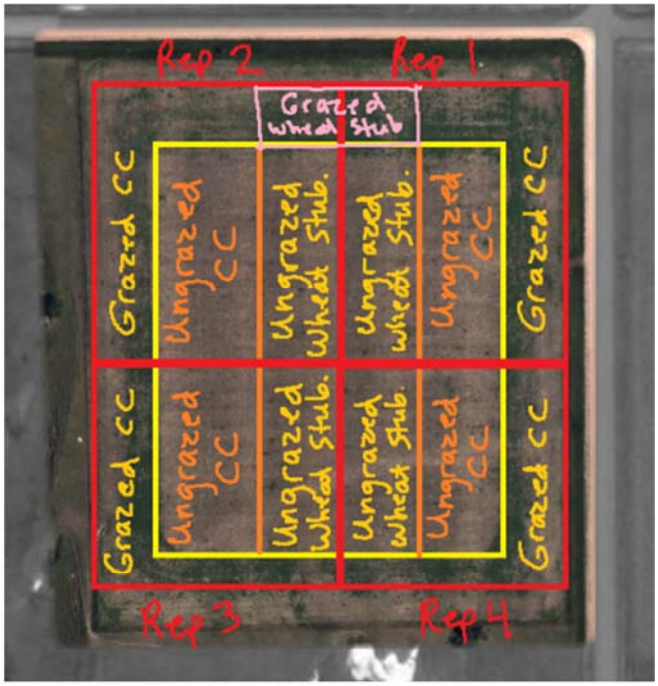
Corn was harvested the Thursday of the major wind event with a calibrated grain wagon. Yields were not statistically different and were 218 bu/ac, 211 bu/ac, and 213 bu/ac for the ungrazed wheat stubble, grazed cover crop, and ungrazed cover crop respectively. The grazed wheat stubble treatment yielded 212 bu/ac but only had two reps at the end of the growing season so was not included in the statistical analysis. Economically, grazing the cover crop was as competitive as the ungrazed wheat stubble treatment when it came to ensuing corn yields and the spring rains made all the difference in beginning soil moisture. Because of the crop rotation, there wasn't an opportunity to add a cover crop in this field Fall 2017. The Herz' feel they lost an opportunity as environmental conditions vary so much every year, and this year, cover crops didn't have as much growth in area fields. Thus, they've chosen to dedicate three fields to this study topic in the future, allowing for one of the fields each year to have wheat/cover crop/grazing to account for environmental variation. Continuing this for the next 5-7 years will better answer their questions while benefiting all of us with what is learned. Perhaps other growers are interested in some variation of this study for your farms?

Most studies are not this in depth and this is just one example of how growers are answering questions they have for themselves via on-farm research. It can take extra time at planting, harvest or other times of the season depending on the study. I believe most growers I've worked with would say the effort has been worth it to scientifically answer their questions for themselves. Truly am grateful for all of you I've had the opportunity to work with via on-farm research! So, if you're thinking about a question you'd like to answer on your farm this year, consider reaching out to me or your local Extension educator and we'd be happy to talk with you now about how to set up your study. It is important to talk this through, especially if this is your first time conducting research. If you'd like to learn more about on-farm research, view some protocols, or view results from previous studies, please check out our website at http://cropwatch.unl.edu/farmresearch.

Bake and Take Month: March is Bake & Take month, a time when wheat organizations encourage others to bake a wheat good and share it with family, friends, neighbors, co-workers and shut-ins. In honor of the month, the Nebraska Wheat Board (NWB) is again sponsoring recipe cards and stickers for any 4-H groups or other organizations that wish to participate. This year's recipes are mini dessert tacos and crockpot cherry chocolate lava cake. Those interested in participating or who have questions can contact the NWB office at (402) 471-2358 or wheat.board@nebraska.gov. There is no cost for the supplies, and no limit on the number that can be requested. Those wishing to preview the recipes before requesting materials can find them listed at http://wheat.nebraska.gov starting March 1.

York County Fair Volunteers: Gary Zoubek asked me to mention he's looking for a few volunteers that could help with 4-H and Open Class primarily on entry and judging day in Ag Hall on July 31 and August 1st. If you're interested, please contact Gary at 402-326-8185 or email gary.zoubek@unl.edu.

This study was conducted on a 40 acre field. Plot sizes are the same other than the grazed wheat stubble area which will not be included in the future. Aerial imagery was also taken throughout the growing season. The corn received hail damage on June 12, 2016 but recovered well.



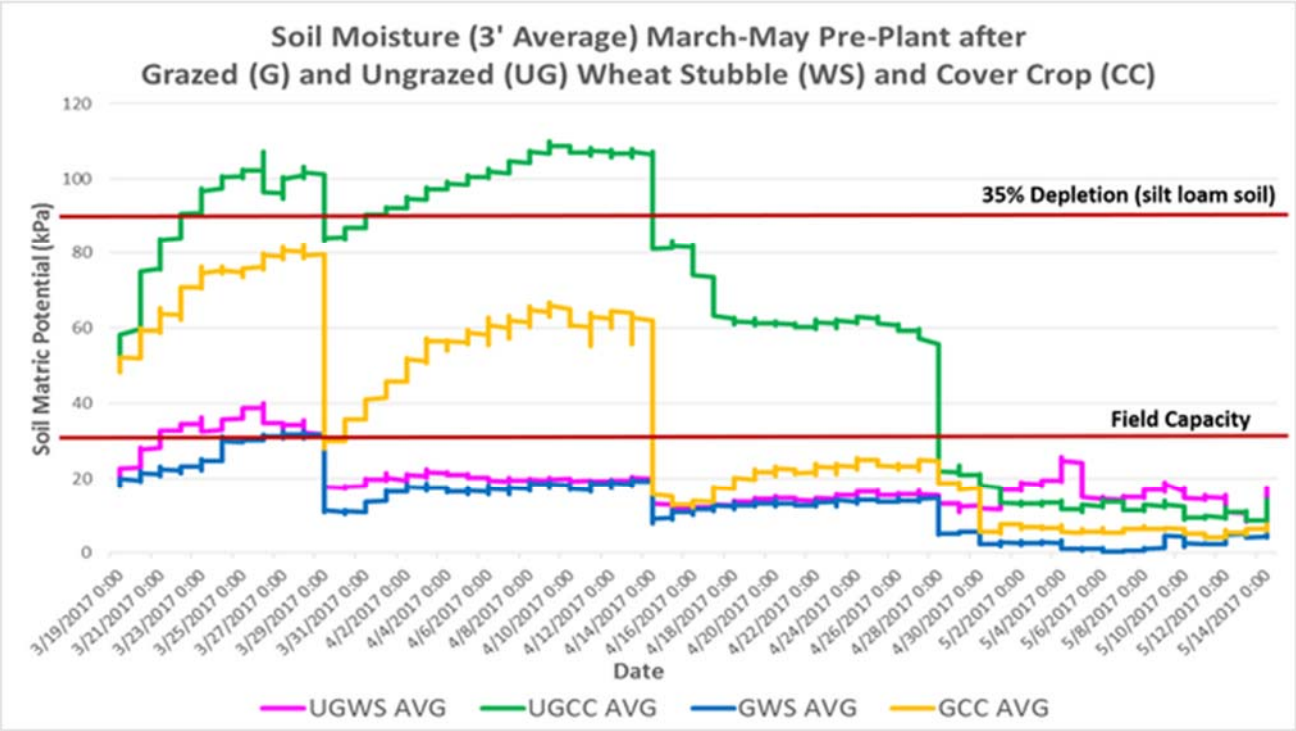
Jennifer Rees @jenreesources · 18 Aug 2016

Took drill/auger to install sensors in long term cover crop plot-dry 3' down #nebext @UNL_CropWatch @OnFarmResearch

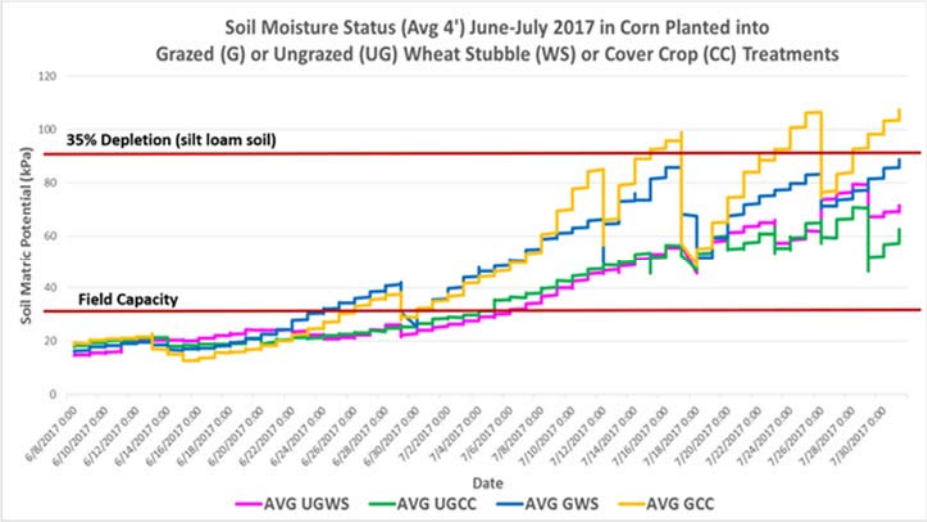
Photo taken Sept. 21, 2016

Photo showing corner of 4 plots after grazing. Cattle were hard on my dataloggers but I had chosen to not fence them off as I wanted the true grazing data! Grazed treatments in background and ungrazed in forefront (cover crop left side and wheat stubble right). The cattle didn't really graze the wheat stubble-tended to lay there as it wasn't bumpy like cover crop area. Ultimately this led to bare soil in this area and we will not have this treatment in future years.

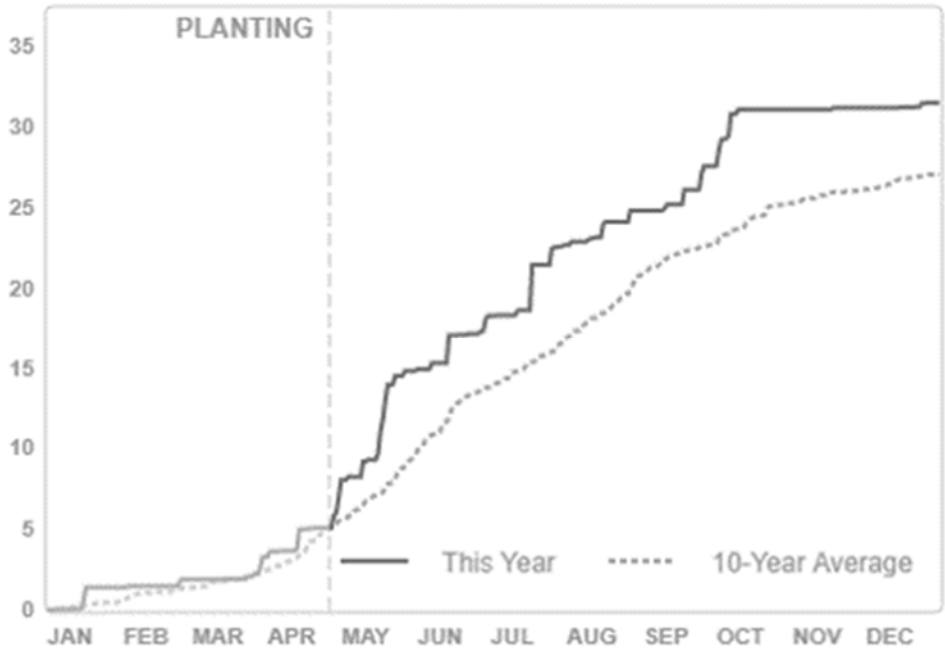
Observation showing importance of bare soil on Palmer germination: the grazed wheat stubble treatment turned to bare soil from where the cattle lay (not intended and something we learned). Could tell the treatment difference to the line even at harvest. June 8th: few Palmer plants in ungrazed wheat stubble (forefront) compared to in bare soil area (foreground). June 15 (3 days after June 12 hail storm): still only a few Palmer plants in ungrazed wheat stubble but it exploded in the bare soil area. These observations show what research has also shown regarding importance of light on Palmer germination and bare soil. There was minimal Palmer in the grazed cover crop area and was comparable to the ungrazed wheat stubble and cover crop areas. The Palmer put on 2 leaves from June 12-June 15. The corn barely grew in the whorl in that same time-frame. Corn dicamba product did a great job in killing the Palmer after allowing the corn plants to recover a few days & this situation was common throughout the area in 2017.



Always learning with on-farm research! I didn't ask how corn fertilizer occurred so we had to remove sensors and re-install upon spring anhydrous application. Beginning soil moisture data shown here is from anhydrous app to day before planting. Cover crop treatments were at or close to 35% depletion (where we would typically trigger irrigation for silt-loam soils). Wheat stubble treatments had full soil moisture profile this entire time period.



Late April and May rain events (8" of moisture in May) allowed for a full soil profile at corn planting for all treatments with separation of treatments not occurring till mid-July.



2017 vs. 10 year average rainfall for this area of the State-blessed with rainfall in 2017.

Grateful March is here! With the warm weather the past few days and geese flying, spring will be here before we know it.

Wheat Stem Maggot Webinar: With that in mind, several with cover crops have asked if we have an update on wheat stem maggot and the timing of termination. If you recall, last year we saw wheat stem maggot move from wheat and rye cover crops into newly emerged corn in some fields where the cover was terminated at or after planting. We've had several farmers in the area who have went to the later termination and it seemed to have worked well prior to last year. While I wonder if it was more of a fluke due to a warm February in 2017, Dr. Justin McMechan, Extension Crop Protection Specialist, collected maggots from infested fields and reared them to better understand their life cycle. I asked him to share a webinar on what he's learned including recommendations and information on insects of cover crops in general. If you're interested, please join us Wednesday, March 14th from Noon-1 p.m. at the following weblink: https://unl.zoom.us/j/976118766.

Dicamba and 2,4-D: Also received a number of calls last week regarding clarification on training required for dicamba and 2,4-D. There is no required additional training to apply 2,4-D products or any dicamba products other than the RUP dicamba products XtendiMax, Fexapan, and Engenia.

National Spray Drift Webinar: Join pesticide spray applicators from across the nation on March 15 for a webinar on "Strategies for Managing Pesticide Spray Drift" being presented by Nebraska Extension Weed Scientist and Application Technology Specialist Greg Kruger. The webinar is tailored to growers, pesticide applicators and other interested stakeholders who use pesticides and pesticide application equipment. It will be held from 10:30 to noon CT on that Thursday. Pesticide spray drift is the movement of pesticide dust or droplets through the air — at the time of application or soon after — to any site other than the area intended. Spray drift can affect people's health, damage nearby crops, and pose a risk to non-target organisms. Kruger manages the Pesticide Application Technology Laboratory at the university's West Central Research and Extension Center in North Platte, where he uses a wind tunnel to test pesticides and spray adjuvants for drift. Kruger has a BS from the Ohio State University, where he studied agribusiness and applied economics, and an MS in plant pathology and a PhD in weed science from Purdue University. This EPA program is geared toward reducing spray drift from pesticide applications to crops, fruits and vegetables, and aerial applications. It will cover general pesticide applications with a focus on agricultural applications. The EPA program is free, but participants

are asked to register in advance
here: https://register.gotowebinar.com/register/1526938365731023875.

Kiwanis Club of Seward and SCCDP Ag Banquet: The 50th Annual Kiwanis and SCCDP Agricultural Recognition Banquet will be held Monday, March 19, 2018 at the Seward County Ag Pavilion at the fairgrounds in Seward, NE. The banquet is held during this time in honor of National Ag Week, March 18-24, 2018. The event kicks off with a social hour of wine and cheese beginning at 5:30 p.m. followed by a Prime Rib Dinner beginning at 6:30 and Awards Presentation beginning at 7:00. Mike Meyer, radio announcer, will serve as the evening emcee with Governor Pete Ricketts as the featured speaker. Cast Family Farms (Roy, Doug, David, Patrick, Nathan, and Dustin) will be honored as the 2018 Seward Kiwanis Outstanding Farm Family of the Year. Bill White with The Austin Company, will be honored as the Seward County AgriBusiness of the Year. Tickets cost $25.00 and can be obtained by contacting Shelly Hansen at the Cattle Bank at 402-643-3636.

Farmer Appreciation Open House will be held for the public at the York County USDA Service Center in York March 5-8 from 8:00 a.m.-4:00 p.m. The Farm Service Agency, Natural Resources Conservation Service, Upper Big Blue NRD, and Nebraska Extension will have informational booths. Light refreshments and door prizes will also be available.

Pruning Trees: Kelly Feehan, Extension Educator in Platte County shares, "With shade tree pruning commonly started in March, there is a general rule for when to start pruning young trees. After planting a tree, avoid pruning for a few years; especially avoid removing the lowest limbs. Leave lower limbs until they are about one inch in diameter. It is fine to remove double leaders and dead or damaged branches at planting, but otherwise avoid pruning newly planted trees for about three years. From four to ten years after planting is the most important time for pruning young trees to develop a strong branching structure and to remove branches when small. Ideally, prune branches before they reach two to four inches in diameter. Smaller wounds seal and callus over quicker than large wounds and more efficiently produce chemical walls that prevent the spread of decay within a tree. It is important to avoid pruning too much at any one time so remove a few branches each year."

Crop Insurance and Tax Information: This week's UNL CropWatch at http://cropwatch.unl.edu has several timely articles regarding crop insurance and tax information. Please be sure to check them out!

Wheat Stem Maggot Webinar: For those of you with small grain cover crops with plans to plant corn into them, a reminder of the wheat stem maggot webinar we're having this Wednesday, March 14 from Noon-1 p.m. CST. The webinar link to join is: https://unl.zoom.us/j/976118766. There's also an article from Dr. Justin McMechan, who will also be presenting the webinar, in this week's CropWatch regarding reasons to not use an insecticide application during time of termination. Basically he and Dr. Bob Wright share that in doing so, there's no guarantee the wheat stem maggot is present and one may just kill off beneficial insects. Instead, it's encouraged to scout fields for the wheat stem maggot adults or larvae. There's also not good data regarding when the maggots leave the cover crop and move into the wheat; thus, it's hard to ensure an insecticide will have enough residual for that time period. Instead, they're recommending if finding wheat stem maggots via scouting, to terminate the cover crop at least 14 days prior to planting. If weather or other circumstances don't allow for that, they're recommending to apply the insecticide around 11 days after the glyphosate application. This recommendation has been shown effective for common stalk borer and they're hoping it may work for wheat stem maggot as well, but it's not guaranteed. Justin and Bob will be sampling for the next several weeks and will continue to post updates to the CropWatch website, their Twitter and the CropWatch Twitter accounts.

Economics of Annual Forages Recording is now available for all who've been asking! You can find it at: https://beef.unl.edu/economics-producing-forage-cropland along with excel spreadsheets and resources mentioned in the webinar. While this didn't appear incredibly favorable with the scenarios presented, it's encouraged to look at the numbers for your own operations. I still feel this can be economical/comparable when you look at scenarios of a few forage crops/year on a piece of ground and look at ways to spread out the cost of equipment (such as custom farming, etc.). When I was working on budgets with individual farmers, I didn't account for fewer acres covered on the equipment dedicated to corn, so that's where my numbers differed the most in addition to including the value of the cattle. As individuals, you can be more specific for your operations than they could do in the scenarios that were being generalized for the purposes of the webinar. I still think this is something for consideration, especially if you have cattle and own ground. With Nebraska being surrounded by drought in states around us, it may be helpful to have some additional feed grown this year.

Frogeye Leaf Spot Fungicide Resistance in Iowa: For those of you who've attended my pesticide trainings, I spend time on resistance management because it's so important. I had mentioned that *Cercospora sojina* that causes Frogeye leaf spot in soybean was found to be resistant to the strobilurin (quinone outside inhibitor QoI, Group 11) chemistry of fungicides in several Southern U.S. states. This winter, Iowa State and the University of Kentucky confirmed this resistance in Iowa as well. You can read the full article here: https://crops.extension.iastate.edu/cropnews/2018/02/frogeye-leaf-spot-fungicide-resistance-confirmed-iowa-soybean. This is a difficult situation because the strobilurin chemistry

can be found in a number of fungicide products we use in corn, soybean, and wheat and has a high ability for fungal resistance to occur. Frogeye tends to occur more regularly in eastern Nebraska where there's higher humidity.

I've been watching updates on this situation because *Cercospora* is the genus to which the fungus *Cercospora zeae-maydis* causing gray leaf spot in corn also belongs. We definitely don't wish to see *Cercospora zeae-maydis* develop resistance to the strobilurin chemistries! Thus, besides the reason that Nebraska research doesn't show an automatic yield response to fungicide application at tassel in corn, it's also a resistance management strategy to not apply a fungicide unless you need it. The same goes for soybean and wheat; only use fungicides when we really need them in order to prolong their effectiveness against fungal pathogens.

Worker Protection Standard: Also in pesticide training we shared updates to the Worker Protection Standard. This applies to those who hire workers or handlers in your operations (outside of immediate family members) when the Worker Protection Standard is mentioned on pesticide labels (often in the Agricultural Use Requirements section). The Pesticide Resources Educational Collaborative (PERC) has developed a library of information on their front page to make it easier to train workers/handlers. You can find these resources at: http://www.pesticideresources.org/. There's also a course by Certified Training Institute (CTI). You may have received a postcard from them in the mail regarding online private applicator training. Technically, they are not the only approved online training option for private applicator training in Nebraska as UNL also has an online training option for $60. But CTI also has an online training option for the Worker Protection Standard and cost varies depending on number of employees; UNL doesn't have an online option for that. So you may wish to look them up if you don't wish to do the training yourself or use the PERC website.

On-Farm Research: It's been fun discussing on-farm research projects and putting together protocols with growers the past few weeks! Some have asked if there's already projects for which we need cooperators. We do have those and we also custom develop protocols depending on the question(s) you wish to look at. For those curious about protocols developed, you can view some at: https://cropwatch.unl.edu/farmresearch/extensionprotocols.

One question I've received quite a bit the past few years is about establishing cover crops into V5-6 corn. We don't have on-farm research data yet for this study topic, but perhaps this year a few of you will consider it! The thought is to get the cover established, even though it won't grow much during growing season, and hopefully provide for faster growth after harvest. I have developed an on-farm research protocol if growers are interested in trying this (it can be found at the same website listed above). In our brainstorming session, growers talked about interseeding via retrofitting equipment to put seed on similar to Y-drops, using a coulter, or seeding during cultivation. There is also a field day on March 21 to discuss what one farmer has tried the past three years regarding different seeding mixes and ways of establishing the cover at V6. If you're interested in attending, it will be held at 4th Ave and 1/4 mile north on Arthur Road near St. Libory, NE from 1:30-3:30 p.m. The following website has more information regarding this field day: http://cpnrd.org/wp-content/uploads/2018/03/Cover-Crop-Field-Day-Flyer-March21.pdf. If you're interested in attending, please RSVP Dean Krull: dkrull1@unl.edu. Please let me know if you're interested in the V6 cover crop protocol as well! Also just a note, this protocol can also be adapted for any of you looking at applying nutrients during that V5-V6 time-frame. The plot pattern would be the same; the objective and perhaps some of the data collection would change.

Soil Moisture Status in Non-Irrigated Fields: This week I plan to install soil moisture sensors into some non-irrigated fields in the southern area of counties I serve. I'm just curious where we're truly at for soil moisture deeper in the soil profile knowing Kansas is in drought and moisture this winter has been spotty. I did this in 2013 as well to see where we were at after the drought of 2012; it showed we didn't have a full soil profile going into the growing season. If you have moisture sensors, you may wish to consider doing this as well for your fields or pastures to know where you're at. It may influence cropping decisions for 2018. If you connect sensors to dataloggers, you will want to also install a temperature sensor to allow the datalogger to base the moisture readings on the current soil temperature.

Check out this week's UNL CropWatch at http://cropwatch.unl.edu for information on averaged land values dropped by 3% from 2017, negotiating fair leases, assessing alfalfa winterkill, interseeding into thin alfalfa stands, and more.

Innovative Youth Corn Challenge: Nebraska Extension and the Nebraska Corn Board are offering the seventh Innovative Youth Corn Challenge contest. This contest, open to 4-H members (age 10 & older as of Jan. 1st) or FFA members (in-school members), guides participants through all aspects of corn production, as well as agricultural careers related to corn production. As a team (2 or more participants), youth will be challenged to implement a production practice different than normal to determine if they increased their yield. Economics and sustainability of the practice will also be considered. Yields, cropping history, and production information will be collected in the Corn Yield Challenge management summary. Cash prizes and plaques are given. First place

receives $1,000, second place receives $500, and third place receives $250. Sustainability, crop scouting and "extra mile" awards are also given as cash awards. To participate in 2018, youth must complete and return an entry form by APRIL 1st to the Fillmore County Extension Office in Geneva, NE. Forms can be downloaded at https://cropwatch.unl.edu/youth/cornchallenge. For more information, contact Brandy VanDeWalle at brandy.vandewalle@unl.edu.

Horticulture Information from Kelly Feehan, Platte County: "Interested in getting an early start on vegetable gardening? You don't need a greenhouse; just check out row covers that can be placed over plants to provide some protection from cold temperatures. Row covers are spun-bonded or woven polyester or polypropylene material that can be placed over plants to extend the growing season by retaining heat. Row covers are permeable and allow in light, water and air for plant growth. Depending on the weight of material used, between 2 and 8 degrees of frost protection can be gained, allowing earlier planting in spring or later planting in fall to move the harvest season up by a week or two or extend it a week or two later in the fall. Row covers can be draped over plants and secured with bricks; or they can supported by hoops, in which case they're called low tunnels. Low tunnels are an easy and good season extender for home gardeners to use.

Rhubarb is a perennial that can live for years; however, plants should be dug and divided every 5 to 10 years. This is best done from late March into early April. Dig rhubarb plants, then use a sharp knife or axe to cut crowns into sections, each containing two pinkish buds. Incorporate organic matter into soil; then replant divisions 2 to 3 feet apart. Plant shallow so buds are only one-half to one inch below soil. Do not harvest newly divided or planted rhubarb the first year to allow plants to establish roots and recover from division or transplanting. During the second season, harvest only a few stalks to allow plants to continue to build up energy reserves. For three year or older plants, the harvest season can last up to 8 weeks. Harvest the largest rhubarb stalks by pulling them slightly to the side so they break away from the plant. Avoid harvesting more than one-third of rhubarb stalks at one time so plants are not weakened."

April 1, 2018 - Hope you had a blessed Easter! The Wheat Stem Maggot in Cover Crop Webinar can now be viewed at: https://www.youtube.com/watch?v=XGjuzMlrjhQ&feature=youtu.be. The link for the survey mentioned in the webinar is no longer available but you are welcome to contact Dr. Justin McMechan for additional comments/questions. He goes through a number of insects to watch for and his ultimate message is to scout to determine termination timing.
Cover Crop Interseeding: A few weeks ago I attended the interseeding cover crops field day which had a really good attendance for March! For those of you considering this, I learned it's best to start earlier than V6…consider V3 and if it's wet, you have a better chance of actually getting interseeding accomplished by V6. This is year 3 of their study. The first year they used a spreader to seed the mixes. The second year they found utilizing insecticide boxes for the seeding when they cultivated worked the best. The third year they used a Hiniker inter-row seeder which they purchased.

Regarding mixes, most of them included annual ryegrass or cereal rye. There's a Penn State mix (27# total of annual ryegrass, red clover, and hairy vetch) that has been successful in northern U.S. states. Very little cover was observable this spring,

but from a photo provided, it appeared growth came on during corn senescence and after harvest last year. Fall biomass wasn't measured last year which will hopefully be measured in the future to obtain more data on the success of the mixes. My take, if your goal is early spring grazing or early spring cover, I'm unsure that much can beat cereal rye, even if it was dormant seeded. If you're looking for a way to get some cover established prior to corn harvest for either fall grazing or just fall soil cover, interseeding with a mix containing the annual ryegrass looked good from the pictures they showed. If you're interested in any cover crop or other on-farm research studies this year, please let me know!

Tree Care Workshop: Trees are very valuable in our landscapes. They provide us with beauty, shade, oxygen, and better resale on our homes. These trees need our help to ensure they have healthy growth. When they have a disease or insect problem, it is up to us to manage those pests to help them live many years. On Wednesday, April 18th from 5:30-7 p.m. at the Fairgrounds in Clay Center, Nicole Stoner will teach us what to do with our trees. Nicole is a Horticulture

Educator from Gage County. This tree program is $5.00 and will cover light refreshments and your educational materials. Nicole will cover watering, insect and disease problems, general care, and planting of trees. Please pre-register by April 13th with Nebraska Extension in Clay County by calling 402-762-3644 or emailing dpeshek2@unl.edu.

Spring Affair Plant Sale: Spring Affair, the Midwest's largest plant sale and gardening event, will be Saturday, April 28 at the Lancaster Event Center in Lincoln from 9 a.m. to 2 p.m. More than 700 different varieties of perennials, herbs, grasses, trees, shrubs and other plants will be available. They are selected for regional suitability, uniqueness, popular demand and provided by Bluebird Nursery, Inc., of Clarkson, Neb. It is sponsored by the Nebraska Statewide Arboretum as an educational tool, fundraising event and to promote regional plants. For information and inspiration, half hour plant talks will be offered at:

- 10:00 – "Nebraska Native Plants for Birds" by Jason St. Sauver, Spring Creek Prairie Audubon Center
- 11:00 – "Gardening 101: I've got my plants, now what?" by Justin Evertson, Green Infrastructure Coordinator for the Nebraska Statewide Arboretum
- 12:00 – "The Guilt-free Garden" by Mark Canney, Park Planner & Designer for Lincoln Parks & Recreation

Admission to the sale is free. The plant sale, presentations, educational booths and vendors of garden-related items are all in Pavilion I of the Lancaster Event Center with plenty of free parking. For more information, visit https://plantnebraska.org/spring-affair.

DriftWatch/BeeCheck: Nebraska Department of Ag (NDA) encourages pesticide applicators to check out DriftWatch/BeeCheck at http://driftwatch.org to minimize pesticide drift. It's important for those with sensitive sites such as organic, bees, vegetables, grapes, etc. to add them to this website and important for all applicators to check this website for sensitive locations around our fields. Several states have been added to DriftWatch/BeeCheck in the last year and a few more are in the works, making it more beneficial to applicators working near the state line or those working in multiple states. FieldWatch, the company that manages DriftWatch/BeeCheck, now offers data subscriptions for obtaining data files for GIS maps or live stream data through several mapping software providers. It will be rolling out a new mobile app very soon, FieldCheck, for applicators who have registered as an applicator (which is free to do). You can also view the most recent edition of NDA's Plant Health Protection Update at: https://us14.campaign-archive.com/home/?u=eb13611bfcca17410ce5c5f52&id=10756f8d33.

4/8/2018 Reducing Soybean Seeding Rates: Can I reduce soybean seeding rates and still maintain yield? It's a common question from soybean growers, especially those seeking to reduce input costs. Every year during winter meetings I share what our growers have found. We now have 11 years of On-Farm Research proven data.

The findings? Reducing soybean seeding rates from 180,000 or 150,000 seeds/acre to 120,000 seeds/acre doesn't statistically reduce yields in 30- or 15-inch rows in silty clay loam and silt loam soils in south-central and eastern Nebraska. Results of 18 studies showed for seeding rates of 180K, 150K, and 120K seeds per acre, average yields were 69.0, 68.7, and 68.4 bu/ac, respectively (*Figure 1*). The early studies within this dataset all had seed germination of at least 90% listed on the seed bag. In all but two situations (seeded at 180,000 and achieving 88% germination), the growers were able to achieve 90% or greater of their planted stand.

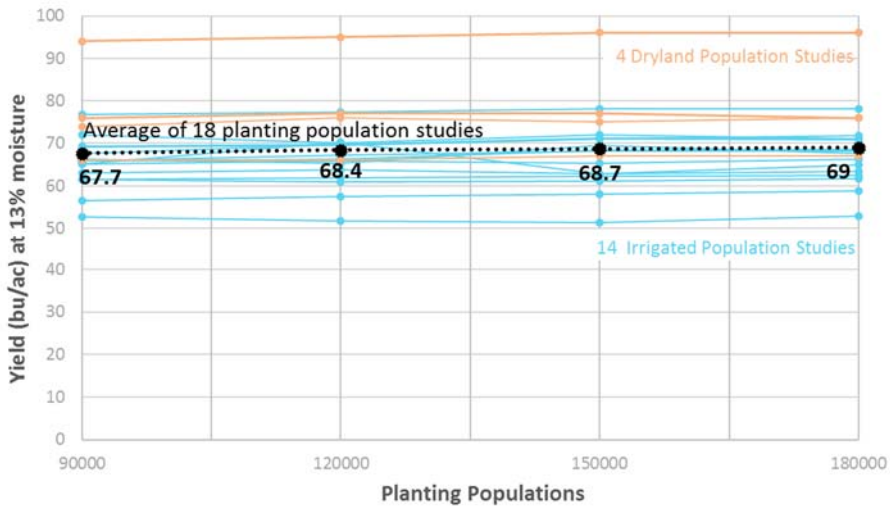


Figure 1. Yield results of on-farm seeding rate studies from 2006 to 2017 (15″ and 30″ rows). Average final stands: 90,000 = 83,067 plants per acre (ppa); 120,000 = 106,863 ppa; 150,000 = 132,700 ppa; and 180,000 = 157,924 ppa

As I share this data, I've often heard "but I seed higher rates because of X, Y, or Z…"; however, this dataset includes a lot of those reasons without negative yield consequences! I've worked closely with these studies in walking the fields; taking notes and pics; counting plants, pods, and seeds; so I'm really confident of the research and the fact that soybeans truly compensate for reduced populations! Outside of this research, I've also observed this in many soybean hail, crusting, and PPO inhibitor seedling damage situations. This dataset includes:

- The latest soybean varieties as the research was conducted from 2006-2017.
- Erect and bushy type varieties in growth architecture.
- Higher and lower yielding situations.
- Fourteen irrigated fields and four non-irrigated.

- Hail events occurring from cotyledon stage to R2 in some of these fields.
- Crusting in some non-irrigated fields.
- Seed treated in some fields and others without (determined by grower's planting date).
- In some years, pod and seed count data were also collected; the data showed similar numbers of seeds/acre and ultimately yield per acre.
- Observations of increased plant branching at lower seeding rates and difficulty in telling the seeding rate treatments apart as the season progressed.

Our research data for 11 years shows no statistical yield differences in seeding rates from 120,000-180,000 seeds/acre in 15- or 30-inch rows in silty clay loam or clay loam soils. Thus, reducing seeding rates is a way to consider reducing input costs for 2018 without impacting your yield. If you dropped your seeding rate from 150,000 seeds/acre to 120,000 seeds/acre, you could save $10.08/acre, assuming a yield loss of 1 bu/ac, a seed cost of $60 per 140,000 seeds, and a savings of $25.71/ac on seed.

- Thus, if you plant between 140,000-160,000 seeds/acre, consider dropping your seeding rate to 120,000 and aiming for a final plant stand of 100,000 plants/ac based on our research findings.
- If you plant at 180,000 or more seeds/acre, consider dropping your seeding rate to 140,000 seeds/acre as a step-wise increment.

Still hesitant? Consider trying this yourself for your location! Consider using either this Two Population Treatment Design or Four Population Treatment Design. You also can download the Nebraska On-farm Research app, available in Apple and Android, to help you set up your plot design to obtain scientific results. If you have questions or need help setting up your research project, please contact me or anyone involved with our Nebraska On-Farm Research Network. To view all the graphs and additional data regarding 15″ row spacing with reduced seeding rates, please check out this week's UNL CropWatch at http://cropwatch.unl.edu.

Beginning Soil Moisture: On Good Friday, I installed soil moisture sensors down to 4′ in non-irrigated no-till fields at Bladen and Lawrence. Last week I added three more sites at Clay Center, Superior and Byron. Thus far, the 3′ and 4′ are dry in all those locations other than Clay Center (only dry at 4′). At Superior, I could only get the soil probe in the ground 6″ into actively

growing rye and 1′ in cover that winter-killed. I was just curious what kind of moisture existed currently in the southern tier of counties. I realize planting plans are in place and that we often receive rains in April/May. Hopefully it provides information that can be helpful in how to use that soil moisture. If we don’t get necessary rains, you may consider switching to a different crop, growing feed if you have cattle, or not terminating actively growing rye as originally planned but perhaps using it for feed. Will share graphs next week and I appreciate the growers allowing me to install these in their fields!

JenREESources 4-15-18

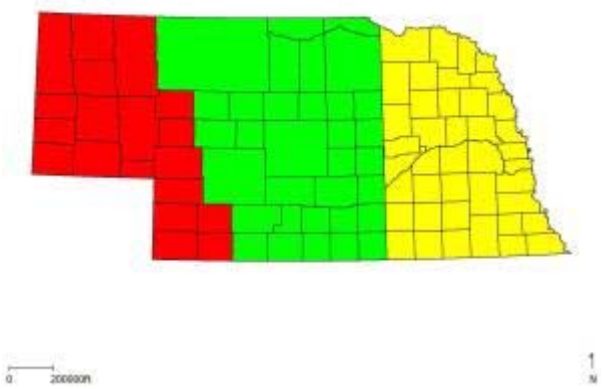
Well, winter seems to be sticking around. My thoughts and prayers have been with those of you calving with the difficult conditions this year.

I provided an update regarding soil moisture status in non-irrigated fields both in this week's UNL CropWatch at cropwatch.unl.edu and my blog at jenreesources.com. We'll see what happens with moisture in the next few weeks and I'll post updates to my blog.
Very few have tried planting in this part of the State that I know of. Grateful for all of you who keep me updated on what's going on through your questions and comments! In this week's UNL CropWatch, Dr. Roger Elmore took the lead on an article addressing corn planting. The message is to ideally wait till soil temperatures reach 50F with weather conditions allowing soil temperatures to remain at 50F or higher for the next 48 hours. We've observed when seed was planted and a cold snap with cold rains was received within 48 hours, some problems with seed germination and emergence. Hybrids vary in cold tolerance and seed companies are a great resource for that information as to which hybrids could be planted first in colder soils. Soil temperature information can be found at the UNL CropWatch site at: https://cropwatch.unl.edu/cropwatchsoiltemperature. We'd also recommend you take the soil temperature in the field before you plant and can do so by using a meat thermometer.
Last year I remember receiving questions from April 21-24 regarding planting corn and soybeans with an anticipated cold snap later that week. At that time, I was recommending growers switch to soybeans. The reason? Soybeans imbibe (uptake) water more quickly than corn seeds and while we hear 48 hours to be on the safe side, the critical period is more like 24 hours. Also, several years of both small plot and on-farm research in Nebraska has shown the primary way to increase soybean yields is to plant early. Dr. Jim Specht's research showed soybeans produced a new node every 3.75 days once V1 occurs. The nodes are where pods and seed occur. Our on-farm research planting date studies also showed regardless if the spring was cold/wet or warm/dry, the early planted soybean always out-yielded the later planted with a total average across trials of 3 bu/ac. The data ranged from 1-10 bu/ac. We never planted early without using an insecticide/fungicide seed treatment to protect that seed, so we recommend you add that if you do plant early.
Our recommendation would be to plant the last week of April or as close to May 1 as conditions allow. We've also seen good results after April 20 in years if the soil temperatures were around 50F with good weather conditions at least 24-48 hours after planting to maintain that soil temp. It's important to know your level of risk, though. Crop Insurance planting date for replant considerations is April 25 and there may also be replant options from your seed suppliers. We never replanted any of our studies and I have only observed frost on soybean cotyledons one year where growers planted early with soybeans coming out of it. We had the largest number of acres I've seen planted by April 24 last year with thankfully no issues and they were able to take advantage of a high-yielding bean year. Perhaps this is something you wish to try for yourself this

year? Consider planting some passes of soybeans early and come back with some passes three weeks later. You can use this Soybean Planting Date Protocol if you're interested in trying this for yourself. Please let me know if you're interested in this!

Depending on the number of acres you have, some growers are now planting soybeans first. Others are planting corn and soybeans at the same time by either running two of their own planters/drills or custom hiring someone to plant soybeans for them. This also spreads risk and can help with harvest. Regarding maturities, a study conducted at UNL East Campus compared a 2.1 vs. 3.0 maturity group variety at 10 day intervals beginning April 23 through June 19. Yield was highest for early planted soybean and a yield penalty of 1/8 to 1/4 bu/ac per day of delay in planting for MG2.1 and MG3.0 varieties, respectively was found. The study also indicated that yield of the MG3.0 variety was higher relative to the MG2.1 variety in early plantings (late April and early-mid May), but the opposite (greater yield in MG2.1 versus MG3.0 variety) was found for late plantings (late-May and June). In our part of the State, we've observed really high yields from strong genetics in the MG2.4-2.5 varieties when planted early; so I have a hard time automatically recommending later MG varieties without more data. Thus, I would love to work with anyone interested in planting early comparing a high yielding MG2.4-2.5 vs. a high yielding MG3.0-3.5 to obtain more data. Here's a Soybean Maturity Group Comparison with Early Planting protocol to consider and please let me know if you're interested in this!

Wheat: My colleague, Dr. Nathan Mueller in Dodge County, has taken the lead on



Nebraska crop reporting districts for wheat. The yellow area is considered 'Eastern Nebraska'.

sharing wheat information for Eastern Nebraska. He's put together an excellent resource on his blog at http://croptechcafe.org/winterwheat/. Every Friday he's sharing an update called "What's up this Wheat". He also started an Eastern NE wheat listserv and his website explains how to subscribe to it. Grateful for his effort in this as we both have goals of increasing crop diversity in the areas we serve and there are many benefits to wheat in rotation!

Crabgrass prevention in Lawns: Just a quick note that while our Extension lawn calendars promote applying crabgrass preventer in mid-April, our horticulture experts say to wait till soil

temperatures are 55F on a seven day average and we are currently far from that! Check out https://cropwatch.unl.edu/cropwatchsoiltemperature for soil temp info.

April 22, 2018 Planting Considerations: This email newsletter reaches a wide area of the State, so soil temps vary quite a bit and some of you may be in better planting conditions than others. We still recommend planting into soil temps as close to 50°F as possible, check weather conditions for next 48 hours to hopefully maintain temps 50°F or higher, and avoid saturated soil conditions. If planting a few degrees less than 50°F, make sure to check with seed dealers on more cold-tolerant seed. This is most likely common sense, but I still feel worth mentioning. Everything we do at planting sets the stage for the rest of the year. We're blessed to have equipment that can allow for many acres to be planted in a short amount of time. And…we also have the ability to mess up a lot of acres in a short amount of time.

Planting depth is also key. Aim to get corn and soybean in the ground 1.5-2" deep. This is critical for correct root establishment in corn to avoid rootless corn syndrome. Rootless corn syndrome is when the nodal (crown) roots don't get well established and successive brace roots can't establish either. This allows the seedling to whip around in the wind, potentially being dislodged, become weak or die. With center-fill planters, when adjusting down-pressure on the go, sometimes the planter ends may not always be seeding as deep as the center. Too often I've seen that resulting in seed 1" or less and the field pattern can be observed the entire growing season with potential yield impacts. So don't just rely on the monitor. Take the time to dig up seed behind the planter and at spots along the whole planter length to ensure the proper seeding depth. And do this with every field, particularly with different tillage/residue situations. I realize this takes time, but you'll be glad you did to catch any issues before too many acres are planted incorrectly.

With cold temps or higher soil moisture conditions, it's still important to get that seed at least 1.5-2" in the ground. Planting 1.5-2" deep helps both corn and soybean to have that seed in even soil temperature and moisture conditions. You may be surprised on that recommendation for soybean, but I think it's even more critical with planting early. In fact, UNL research near Mead compared planting depths of 1.0, 1.25, 1.5, 1.75, 2.0, 2.25, and 2.5 inches in 2011 and an additional planting depth of 2.75 inches was added in 2012 and 2013. The study found lowest yields when soybean was planted 1.25" or less or 2.25" or greater with the highest yield at 1.75" deep. One of that study's hypotheses was that planting deeper would buffer soil temperature and moisture and protect newly emerged seedlings from frost and freeze damage, particularly when planting early in the season.
Hopefully planting soybean early is still something you're considering for this year! We wrote a CropWatch article this week at http://cropwatch.unl.edu to provide some updated research on amplifying the effects of planting early. There's so much research regarding how early soybean planting increases yield that we wanted to share new research regarding maturity groups, etc. Essentially, what it appears from the research thus far, is that it's more important to choose a consistent, high-yielding soybean for your area, regardless of specific maturity group. We'd like to get more specific data and have on-farm research protocols available to compare MG2.4-2.5 vs. MG3.0-3.5 and Dr. Jim Specht would also like to collaborate with us on documenting various

factors. Please let me know if you're interested in this! There's also a protocol for comparing early vs. late planting of soybean.

Soil moisture conditions didn't improve this week at the six sites I'm monitoring in Webster, Nuckolls, Thayer, and Clay counties. You can find the chart comparisons on my blog at http://jenreesources.com. Last weekend's blizzard didn't provide significant moisture in this area. With pastures slow with growth and drought increasing in Kansas, discussions with farmers have included cover crop termination, grazing rye that's had anhydrous ammonia applied to it (with the original intention of termination and planting to corn), and grazing wheat. Most of these topics are included in this week's UNL CropWatch at http://cropwatch.unl.edu. The articles are too long with too many considerations for me to add them in this news column, so please do check them out if you're interested in these topics. Another topic I've had several questions about is regarding how temperature and rain affect burn down herbicide applications. Dr. Amit Jhala, Extension Weed Specialist, addresses that in this week's CropWatch as well, so please check that out. Here's wishing everyone a safe planting season with conditions to get #plant18 and #grow18 started off well!

4-29-18 Crop Update: It's nice to see some signs of spring with planters going this week/weekend, crabapples and flowering pear trees in bloom, and tulips budded! The York County Corn Grower plot got planted on Saturday and grateful for Ron and Brad Makovicka's efforts with that and for all our participating companies!

Rain did help the top foot of sensors in some locations I've been monitoring for pre-plant soil moisture. The graphs will be up at http://jenreesources.com by noon on Monday. The cooperators have all been interested in continuing to monitor moisture in these fields post-planting, so will plan to do that and add a York and Seward location too. I'm noticing in York as lawns are greening up, that portions are looking gray-green in color where trees are located in them.

As of April 26th, I hadn't found any wheat jointing yet. The growing point was just approaching ground level in several fields I checked. We also need to keep an eye out for stripe rust as incidence is increasing in Kansas fields. There's articles focusing on winter wheat in this week's UNL CropWatch at http://cropwatch.unl.edu including nitrogen management and Nebraska wheat progress.

Wheat Stem Maggots (WSM) in Rye/Wheat Cover Crops: I meant to provide an update in last week's column. Dr. Justin McMechan has been scouting wheat and rye cover crop fields for wheat stem maggots. So far, he captured one adult wheat stem maggot on April 16 in 100 sweeps from a wheat cover crop planted in late September at the Eastern Nebraska Research and Extension Center near Ithaca. He shared that "adults have been consistently collected at this location since first emergence with one to two found per 100 sweeps. This first occurrence of adults matches closely with data collected in 1933 by Merle Allen from Kansas State University. Our latitude north of Kansas and cold spring suggests this emergence might be earlier than Allen's data. On April 23 two adults were collected at Clay Center and a single adult was collected near Marquette. Cover crops in these fields were less than 6 inches in height, with the field near Marquette grazed to approximately 3 inches in height. Sweeping these fields is challenging due to the height of the vegetation so adult captures are not likely to represent true numbers in the field. If you are skilled with a sweep net, we encourage you to sweep your wheat, rye, or triticale cover crops for wheat stem maggot adults." At this point we're not recommending any insecticide treatments. An interesting observation that a couple of Clay and Adams county farmers mentioned to me last year was they noticed the presence of a lot of flies as they planted corn into green rye and terminated at or after planting corn. The adult WSM is a small fly and you can see photos in Justin's report in this week's UNL CropWatch at http://cropwatch.unl.edu.

Which dicamba product before Xtend soybean: This has been a fairly common question this spring which Dr. Amit Jhala addressed in this week's UNL CropWatch. I've also provided his answer here. "I recently received several phone calls from growers with questions on terminating broadleaf cover crop species and broadleaf weeds using dicamba products. They were particularly interested in whether dicamba products such as Banvel, Clarity, DiFlexx, etc. can be applied to terminate broadleaf cover crop species such as hairy vetch, field peas, or mixtures and broadleaf weeds such as henbit, field pennycress, or marestail immediately before planting Xtend soybean. The answer for the dicamba-based herbicides listed above is NO. Their labels have soybean planting intervals of 14 to 60 days, depending on the product and its use rates.

For example, for Clarity to be applied at 16.0 fl oz/acre, there would be a 28-day soybean planting interval after an inch of rain. If Clarity were to be applied at 8.0 fl oz/acre, the soybean planting interval would be 14 days after an inch of rain. The Clarity label also specifies: "Do NOT make Clarity burndown applications to soybeans in geographic areas with average annual rainfall less than 25 inches."

If DiFlexx is applied burndown at 24 fl oz/acre or less, the planting interval for soybean is 60 days. This longer planting interval must be applied because Xtend soybean is not listed on Banvel, Clarity, DiFlexx, or other dicamba products.

Dicamba-resistant soybean, also known as Xtend soybean, became available commercially for the 2017 growing season. Three dicamba products (FeXapan, Engenia, XtendiMax) are labeled to be applied pre-plant, pre-emergence, or post-emergence (up to R1 soybean growth stage) for broadleaf weed control in Xtend soybean. You can use FeXapan, Engenia, or XtendiMax as per label requirements in burndown application and plant Xtend soybean without a planting interval.

If you apply 2,4-D prior to planting soybean, be sure to adhere to the planting interval specified on the label. Several 2,4-D products have different planting intervals for soybean, ranging from 7 to 30 days depending on product and application rate. (See this Crop Watch article.)"

What a beautiful weekend! It was a welcome change from the winds we received last weekend and early week. The high winds early in the week created difficult situations from many perspectives-soil loss, visibility, accidents, and drying out the seed bed.

Great to see several on-farm research plots going in and to have some new cooperators this year! I also started a very small soybean planting date demo at the York County Fairgrounds on April 24. A farmer on Twitter was encouraging other farmers to try planting a few seeds every week for yourselves in a garden plot and count the nodes and pods. Thought it was a great idea and will have it signed at County Fair regarding soil temps for first 48 hours and nodes. Thanks to Jed Erickson from Pioneer for the seed!

Rain events on May 1-2 allowed for some soil moisture recharge in the first and second feet in some locations. Unfortunately, the rainfall was still fairly spotty. We could really use rain overall for getting moisture back into drying seedbeds, activating herbicides, and settling dust. Pivots are running in some fields because of these factors. I provided an update on the locations I'm monitoring regarding soil moisture as of 5/3/18 on my blog at http://jenreesources.com. The farmers were interested in continuing this monitoring throughout the growing season this year, so will continue sharing as often as I can.

Wheat: Wheat's joined in the area and ranges in height depending on soil moisture. For the past few weeks we've been noticing yellowing leaves. Some of that may have been due to cold temperatures. I was also seeing powdery mildew within the canopy of several fields I looked at. No rust has been observed yet in Nebraska fields. I also noticed tan spot in wheat on wheat fields. One concern was the cool weather has allowed for bird cherry oat aphids in area wheat. My concern is that they can vector barley yellow dwarf virus which is one we see when the flag leaf emerges. According to K-State, there's not strong developed thresholds. They're recommending if 20 or more aphids are observed per tiller with lady beetles observed on fewer than 10% of tillers, spraying may be justified.

Lawn and Garden Information: With this year's cool spring, crabgrass preventers can still be applied the first few weeks of May. Germination begins with soil temperatures around 55F but prefers warmer soil temps. UNL Lawn calendars for Kentucky Bluegrass, Tall Fescue, and Buffalograss and all UNL lawn resources can be found at https://turf.unl.edu/turf-fact-sheets-nebguides. Mowing heights should be maintained at 3-3.5″ for the entire year. We also recommend just mulching clippings back into the lawn to allow for nutrient recycling. If you like to use mulch for your gardens, it's important to read pesticide labels on products applied to your lawn. Some labels say it is not safe to use the clippings as mulch. Others say to wait at least three mowings before using the clippings as mulch.

Garden centers have been busy with the warmer weather and some have asked about temperatures for hardening off transplants. Kelly Feehan, Extension Educator in Platte County shares, "May is planting time for most annual flower and vegetable transplants. To avoid transplant shock and stressing young plants, wait for soils to warm up and take time to harden off

transplants. Soils are colder than average this year so waiting to plant will be beneficial. And then, plants moved directly from a warm, moist greenhouse to windy and cooler outdoor conditions will be stressed by transplant shock. This can negatively affect plant growth, flowering, and vegetable production. Harden off transplants by placing them outdoors, in a protected location, for at least a few days before transplanting outdoors. Another way to harden transplants is to plant them in the garden, then place a cardboard tent or wooden shingle around them for a few days to protect them from full exposure to wind and sun. Planting young transplants on an overcast, calm day or during the evening also reduces transplant shock." Specifically when it comes to tomatoes, it's best to wait till mid-May otherwise "gardeners who plant earlier need to be prepared to protect tomato plants with a floating row cover or light sheet if cold threatens. To help tomato transplants establish quickly, begin with small, stocky, dark green plants rather than tall, spindly ones. Smaller plants form new roots quickly and establish faster than overgrown transplants. Do not plant too deep or lay tomato stems sideways. Although roots will form on stems below ground, this uses energy better used for establishment. Use a transplant starter solution after transplanting tomatoes to be sure roots are moist and nutrients are readily available in cool soils. Wait until plants are growing well before mulching or mulch will keep soils from warming and may slow tomato growth."

It was great to see so many fields of corn and even soybean emerging throughout thearea this past week! Also grateful for the rain we received in York and for those who received some in other areas. There are still areas who continue to miss rains and I remain concerned about the soil moisture situation. I have another soil moisture update this week at http://jenreesources.com if you're interested in checking that out.

Thursday night/Friday morning's high winds caused some damage with overturned pivots/corner systems and tree damage. We also saw newly emerged corn and even soybean cut off or buried due to blowing debris/soil, particularly in soybean stubble. It will be important to watch the plants in these fields the next several days. By late Friday afternoon, I was already seeing new growth occur, which is good. Typically, that has been the response in the past-new regrowth in corn as the growing point is still below ground. However, it will be important to watch the corn plants for any bacterial issues that may kill seedlings. One can also split open a few plants and look for a healthy growing point. Regarding the soybean, I have seen soybean lose cotyledons due to hail, crusting, freeze, and wind damage, and still produce a plumule at the top of the soybean stem. It's just hard to know for sure what will happen so it's best to watch the plants in the fields.

Corn plants were buried or cut off by blowing residue/soil. A few remaining plants in this area of the field can be seen.

Wheat in Nuckolls, Thayer, and Webster counties ranges from elongation to near boot and is turning blue-gray from moisture stress. Wheat is a crop that I'm always learning about-it can look really bad (or really good) and then end up surprising a person regarding yield either way. Lower leaves in fields are turning yellow-brown. Some of this is due to moisture stress while there's also powdery mildew pretty thick in lower canopies of wheat that had more tillers. A few have talked with me about using the wheat for hay or silage and then potentially going in with short season corn, sorghum, or a forage crop. Our forage specialists would recommend that if the wheat variety has awns, it's best to either take for hay or silage at the boot stage so the awns don't cause issues with livestock feeding. Todd Whitney, Extension Educator in Phelps/Gosper counties, had worked with a feedlot using an awnless wheat

variety. Because of the additional growth that occurs in wheat (and other small grains) from boot to full head elongation, they found biomass production may be increased 25% if the forage was harvested during the later pollination period.

Evergreen Trees: There's also been a lot of evergreen tree questions. For those noticing spruce trees looking kind of yellow with early morning sunlight, spruce spidermites have been working hard with the cooler, dry weather. They tend to build populations in spring and fall. You can check for spidermites by taking a white piece of paper and banging the needles on it. Then look for the presence of tiny dark green to nearly black spidermites crawling on it. Rainfall is a great way to wash them off of trees as are strong streams of water (easier done with smaller trees). There are also a number of miticides available that homeowners can purchase from lawn and garden stores (look for products that say they can be applied to trees for control of spidermites). A great brochure on insect pests of evergreen trees can be found at: https://nfs.unl.edu/documents/foresthealth/insectevergreen.pdf.

Many of us also noticed our spruce trees turning red/brown/purple/yellow in color last fall. This is most likely a disease called needle cast of spruce and can be prevented by spraying trees now (mid-May) with a product containing copper sulfate. Regarding Ponderosa or Austrian pines, if you look closely at the needles and observe dark bands or rings on them followed by death of the needle either direction from the band, the tree problem is most likely due to a fungal needle blight like dothistroma or brown spot in Scotch pines. They can all be prevented by spraying a fungicide containing copper sulfate now. The following brochure on diseases of evergreen trees is really helpful: https://nfs.unl.edu/documents/foresthealth/diseasesevergreen.pdf. Sometimes the problem is finding the products listed on these brochures in our smaller towns as these brochures were developed in Lincoln. If these specific products aren't available from your local lawn/garden store, box store, or coop, I would recommend looking at the products available and look for a product that says it is effective against needle blights on trees. Not all the products I'm seeing have copper as an active ingredient, but other fungicides are listed and the key would be the fact that the site (trees) and even better, the site with problem (trees with needle blights), is listed on the label.

We also continue to see pine wilt affecting our Scotch (short needles in groups of 2) and Austrian pines (long needles in groups of 2). Pine wilt disease is caused by the pinewood nematode that is carried within the gut of a long-horned beetle. The beetle is what creates the 'shotholes' often seen in bark of infected trees. The nematode is native to Nebraska, as are Ponderosa pines (long needles in groups of 2 and 3). This is why we don't see the problem in Ponderosa pines but do in Scotch and Austrian, which are non-native to Nebraska. A tip, if you're trying to distinguish Ponderosa vs. Austrian pines, anytime you see needles with a group of 3 it's a Ponderosa. Pine wilt is caused by beetles carrying pinewood nematodes vomiting them into the water-carrying vessels of the tree (xylem). The tree senses the nematodes and essentially blocks water to those

branches. Often you will observe a branch then perhaps a side of the tree and eventually complete death of the tree within 6-9 months. While I have diagnosed many samples of pine wilt, more often when I visit homeowners the tree problems are due to fungal diseases which occur on the needles.

Lawns: Please remember the importance of sweeping or blowing fertilizer and pesticide products back into the lawn instead of leaving them on sidewalks. Leaving them on the sidewalks puts them in contact with people and pets walking on sidewalks and moves them into storm water systems via rain that can eventually end up in streams. I'm also seeing a number of 2,4-D/dicamba products being sprayed around tree bases to kill weeds which is affecting the new growth emerging on trees. Consider applying a wood mulch layer around the base of trees to help avoid this situation in the future and be sure to read and follow all pesticide labels.

Crop Update: So grateful for rain and truly hope those who wanted and needed rain received it! An update to soil moisture profile as of 5/17/18 can be found at http://jenreesources.com. A number of crop issues surfaced this week. One being root burn and wilted-looking corn seedlings from anhydrous ammonia applications with the dry winter/spring we've had thus far. Anhydrous ammonia can expand in soils 2.5-3" in all directions and potentially more in dry soils. Pivots were running to help with that and hopefully rain events will help non-irrigated fields that were suffering in this way. Another problem observed in some non-irrigated corn fields has been fomesafen carryover injury from products such as Flexstar, Reflex, Prefix, etc. These products have a 10 month planting window back to corn which is fine in most years, but dry conditions didn't allow for the herbicide to break down in all situations from applications last June. This active ingredient is in Group 14 (PPO inhibitors) and the injury from this particular active ingredient is unique in that it causes yellow/brown striping of the veins themselves instead of interveinal chlorosis/necrosis. Seedlings most affected right now are found on field edges or wherever there was overlap of application. Hopefully corn should grow out of this injury in time. Herbicide carryover may be a something to watch for in soybean as well from other active ingredients. We also saw regrowth occurring on plants affected by wind/dust/debris damage but there are situations where replanting will be needed on endrows, etc. Roger Elmore has a photo gallery explaining regrowth in this week's CropWatch at http://cropwatch.unl.edu.

Another situation that surprised me this year was finding seed corn maggot damage in

Seed corn maggot feeding on soybean seed. No insecticide was included in the seed treatment.

Seed corn maggot affecting soybean seedlings by feeding on cotyledons and hypocotyls. The brown grain-like structure in the bottom of the picture is a seed corn maggot that is pupating. These seeds did not have an insecticide in the seed treatment.

soybean. At first I was puzzled as the beans were clearly treated but then learned the beans didn't have an insecticide added to the seed treatment. In scouting a number of fields, I've actually seen quite a bit of seed corn maggot damage, particularly in tilled fields and those with manure applied or those with cover crops that were green or where termination included tillage. I've also been surprised how many have told me they don't use an insecticide seed treatment on early planted beans. We didn't have any research in our early soybean planting studies without insecticide + fungicide seed treatment so we just automatically recommend both. Unfortunately this year we're seeing what can happen without it with higher insect pressure in some fields. For seedlings with the insecticide seed treatment, I'm seeing light scarring on the cotyledons and hypocotyls but no maggot penetration. In fields without the seed treatment, I'm actually seeing penetration of the cotyledons and hypocotyls. The good news is that most of the maggots were also pupated, pupating or will be soon. But it is something to watch for, particularly in fields that have been tilled and especially if manure was applied or they were tilled and had a cover crop on them. They are not as attracted to no-till fields. Regarding stands, from my experience with soybean pops and stand loss due to crusting, hail, herbicide injury, etc., I keep stands of 60,000 plants/acre or more. It really stinks to talk about replanting anything right now with guys still trying to finish planting. If you choose to replant soybeans, consider proving it to yourself by planting strips and leaving strips. If you're interested in that, I'd be happy to work with you. You can learn more about seed corn maggots

here: https://crops.extension.iastate.edu/cropnews/2016/04/look-seedcorn-maggot-corn-and-soybean.

Wheat in the area ranges from boot to flowering. A couple of wheat fields I know of

Wheat field cut at boot stage for hay.

were taken for hay. For those still considering silage, check out the CropWatch article this week where Todd Whitney shares data on wheatlage (wheat silage): https://go.unl.edu/qkbr. The rainfall will greatly help our wheat right now. And, rainfall at heading to flowering makes me think about the potential for Fusarium Head Blight (scab). The wheat scab prediction monitor http://www.wheatscab.psu.edu/ is predicting medium to high risk for scab in Nebraska for the next 48-72 hours. Some years I feel the model is delayed in prediction, but I still feel it's a good tool and resource. Scab is caused by *Fusarium graminearum* and is favored by warm (70-80°F temps), humidity, and rain events before and during flowering. Once wheat begins flowering (Feekes 10.5.1), many foliar wheat fungicides are off-label. In fact, recent research presented at the 2017 Fusarium Head Blight meetings shows that in general, strobilurin products can actually increase the presence of deoxynivalenol (DON) in wheat if applied at full heading (Feekes 10 or 10.5). Thus, your better fungicide options for preventing scab are Caramba and Prosaro and these products can also kill any fungal diseases present on leaves (such as powdery mildew, tan spot, and rust). These products aren't 100% for scab prevention due to the variation of heading and flowering that occurs in so many fields. Better efficacy is obtained with more uniform plants which begins at seeding time. So I would recommend watching the growth stage in your fields, the weather, and the prediction tool regarding if you feel you need to treat any fields this year to prevent scab. Research has shown best efficacy to be obtained when at least 50% of the plants are at 1/3 flowering. Flowering begins with yellow anther sacs in the middle of the head with

flowering continuing throughout the head from there. Once the pollen is released, the anther sacs turn white.

LBNRD Open House Public Hearing: The Little Blue Natural Resources District (LBNRD) is hosting a public hearing on May 29th from 6:30-9:00 p.m. at the Davenport Community Center in Davenport, NE. The purpose of the hearing is to provide information and receive testimony on proposed amendments to Groundwater Management Rules and Regulations. The hearing will be an open house format allowing individuals to ask questions of the NRD staff, look at exhibits, and offer testimony. The proposed rule changes and additional information can be found on the LBNRD website at: http://www.littlebluenrd.org/. Please contact the NRD with any questions at (402) 364-2145.

Crop Update: Wheat is mostly in various stages of heading through pollination in this part of the State. The wheat scab risk prediction model (http://www.wheatscab.psu.edu/) was forecasting higher potential for scab in portions of Nebraska last week with a relax in the model this week due to higher temperatures and no moisture. Please keep an eye on your growth stages, the weather, and the model for risk of scab in your wheat.

Don't have too much in the way of corn and soybean updates other than it's good to see guys finishing planting and getting herbicide applications down. Waterhemp and palmer range in size from emergence to 4 inches from what I was seeing this past week.

Also a reminder to install irrigation scheduling equipment soon. It's always easier to install earlier than when plants get larger! Check out this week's CropWatch article at https://go.unl.edu/n0u0 which shares additional information about ET gage sites; reminders and tips for installing ET gages and watermark sensors.

Wheat and Field Pea Field Days: There are 11 upcoming wheat field days throughout the State, many of them coupled with field pea/pulse/cover crop field days as well. During the field visits participants will be able to learn more about different varieties of wheat, field peas, chickpeas and forages. Depending on the location, field visits will also include demonstrations of other specialty crops (lentils, winter canola, forages, cover crops) and effects that different agronomic practices (planting dates, seeding rates, fertilizer management, etc.) have on crop yield and yield quality.

Besides field visits, the field days will feature indoor sessions with a free lunch, a 30-minute networking session, and brief research updates. Networking sessions will allow participants to meet with seed, processing, and marketing businesses critical to pulse cop industry development in Nebraska. The research updates will include: Production and marketing of pulse crops, Incorporating cover crops in wheat and field pea cropping systems, and Wheat production – management for higher yield and grain protein. Area dates/locations are listed below and all flyers with additional information can be viewed at: https://go.unl.edu/vto8.

- May 30: Wheat Field Day, 6:30 p.m. at Fairbury, RSVP rpryor1@unl.edu
- June 12: Wheat and Pulse Crops, 9 a.m. at the UNL ENREC near Mead, RSVP nathan.mueller@unl.edu
- June 18: Wheat and Pulse Crops, 9 a.m. near Callaway and at North Platte (UNL WCREC), RSVP sstepanovic2@unl.edu
- June 19: Wheat and Pulse Crops, 8:30 a.m. near Grant (UNL Stumpf Wheat Center), RSVP sstepanovic2@unl.edu
- June 20: Wheat and Pulse Crops, 9 a.m. near Alma and Bladen RSVP sstepanovic2@unl.edu

Nebraska Field Pea Field Days are free, thanks to sponsorship by the Sustainable Agriculture and Research Education (SARE) in Nebraska, the Nebraska Environmental Trust, and the pulse crops seed and processing industry.

South Central Ag Lab (SCAL) Weed Science and Cover Crop Field Day: View demonstrations of new technologies and herbicides for weed control in corn, soybeans, and sorghum and effects of cover crops on soil health and pest management at the June 27 Weed Management and Cover

Crops Field Day. It will be held at the South Central Ag Lab near Clay Center. The day begins with registration and rolls at 8 a.m., followed by weed management tours from 8:30 a.m. – noon, and cover crop demonstrations from 1 to 3 p.m. A free lunch will be served. In addition to the field demonstrations, Jim Specht, University of Nebraska-Lincoln professor emeritus, will presented on "Optimizing Soybean Planting Date, Seeding Rate, and Seeding Depth in Nebraska." CCA credits will be available. Please pre-register at: https://agronomy.unl.edu/fieldday. The South Central Ag Lab is 4.5 miles west of the intersection of Hwy 14 south (to Clay Center) and Hwy 6 or 12.4 miles east of Hastings on Hwy 6. GPS coordinates: 40.57539, -98.13776.

Tours Include:

- Comparison of Herbicide Programs for Weed Control in Soybean including Roundup Ready 2 Xtend and Liberty Link Soybean, Examples of spraying the wrong herbicide on wrong soybean herbicide-resistant cultivar, Weed removal at different growth stages and yield impacts, and Understanding multiple herbicide-resistant soybean herbicide programs.
- Comparison of Herbicide Programs for Weed Control in Corn including glyphosate and glufosinate-resistant corn in addition to several new corn herbicides, response of white and yellow popcorn to various herbicide chemistries and off-target movement, control of volunteer corn in Enlist Corn, and Weed Control and Crop Response in INZEN sorghum.
- An Overview of the Effects of Cover Crops on weed suppression, pests (particularly wheat stem maggot) and beneficial insects. Cover Crop Effects on Soil Health, including changes in soil microbial communities and soil physical properties with a focus on cover crop root biomass.

JenRees 6-3-18

Crop Update: So grateful for some rain for much of the area last week! Updated soil moisture status at http://jenreesources.com. The crops are rapidly growing now as are the weeds. Some were seeing Palmer shooting heads at soil level already…last year we

Palmer shooting a head at the soil surface. Photo courtesy Matt Kirchhoff.

didn't see that till late July. Many have been in the process of postemergence herbicide applications. We revisited a CropWatch article regarding best management practice considerations for postemergence dicamba-based applications to corn based on the research that is available. Please see the full articlewith more explanation at http://cropwatch.unl.edu. Briefly, those practices include:

- Consider a quick irrigation (rainfast/irrigation timing based on label requirements for the product you're applying) of only 1000 gal/ac to help reduce any potential volatility.
- Don't use dicamba products in both corn and soybean to reduce selection pressure and resistance.
- Check for temperature inversions and wind speed. Temperature inversions can be tested by using Innoquest SpotOn® inversion tester and testing the temperature at 1 meter and 3 meters. If the temp is cooler at 1 meter than 3 meters, a temperature inversion is occurring and spraying is not recommended.
- Consider using the more restrictive RUP dicamba requirements regarding wind speed, boom height, etc. Also consider not using AMS with **any** dicamba product even though it is labeled for use in some of the corn dicamba products. This may result in you needing to increase the glyphosate rate to the highest labeled rate to increase efficacy. Amit Jhala will showcase research on efficacy of dicamba products with and without AMS at the South Central Ag Lab Weed Science Field Day on June 27.

Volunteer corn is also a major issue in many corn and soybean fields in the area and there's two articles in CropWatch at http://cropwatch.unl.edu addressing this topic. A number of grass herbicides are available for control in soybean. The challenge is in the continuous corn fields. If you had glyphosate resistant corn last year and used a different technology such as Liberty or

Enlist, you have some other options this year. For Liberty Link corn this year, two applications, each of 32 to 43 fl oz/acre, could be made. Remember that Liberty will NOT be effective if Roundup Ready + Liberty Link hybrid corn was planted last year. Regarding Enlist corn, Assure® II is the only grass herbicide labeled to control volunteer corn with this technology. It can be applied at 5 to 12 fl oz/acre in Enlist Corn for selective control of volunteer corn. Please be sure to read and follow all label requirements. A few farmers have also discussed their past experiences with cultivation, using either one or two passes and their concern about the soil moisture situation this year.

So how much yield loss can be anticipated from volunteer corn? Perhaps more than one would think with more loss occurring in soybean! Studies were conducted in several mid-western states at various densities including 3500, 5000, 7000 and greater volunteer corn plants per acre. To envision this, imagine 3.5, 5, and 7 volunteer corn plants respectively in 1/1000 of an acre (17'5" in 30" rows). Some fields this year have much higher densities than this! Clumps of corn impact yield more than individual plants.

UNL research found a volunteer corn density of 3500 plants/acre led to 10% yield reduction in soybean. Doubling the density to 7000 plants/acre led to a 27% yield reduction. South Dakota State University data revealed similar trends. A volunteer corn density of 5000 plants/acre resulted in a 20% yield reduction (12 bu/acre yield loss in 60 bu/ac soybean).

Clumps of volunteer corn in soybean led to greater yield loss as they were more competitive than individual plants. In the UNL study a density of 3500 clumps of corn/acre resulted in a 40% yield reduction. Researchers in Minnesota and Illinois also found increased competition with clumps of volunteer corn versus individual plants. Clumps of corn (7-10 plants/clump) were established at different densities. Depending on the location and year, soybean yield was reduced 1% for every 75-115 clumps/acre.

A recent UNL research study found highest yield reduction occurred when volunteer corn was left uncontrolled or when it was controlled too late at the R2 (full flower) soybean growth stage. The combined density at this greatest yield reduction was at 24,710 volunteer corn plants per acre plus 1,235 volunteer corn clumps per acre.

In corn, UNL research found a volunteer corn population of 3500 plants/acre resulted in a 2% yield reduction in corn. Doubling the density to 7000 plants/acre caused a 5% yield reduction. Clumps of volunteer corn led to greater yield loss as they were more competitive than individual plants. A density of 7000 clumps of corn/acre resulted in a 14% yield loss compared to a 5% yield loss with individual plants. So volunteer corn in general can be fairly competitive especially to our legume crops. It can also be a problem regarding harboring corn rootworm in soybean fields, reducing the advantage of the rotation from that perspective.

Also, an update on my soybean planting date demo at the fairgrounds: I wasn't counting on rabbits! All the soybeans were reduced to stems below the point of recovery. So there is no demo but the groundskeeper preferred they took out my soybeans instead of his petunias Will try again next year.

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JenRees 6-10-18

Thank you to Tena with Faller Landscape in York and to all the youth who participated in our 4-H landscape design workshop and helped plant the Nebraska area! It will hopefully be beautiful for fair!

Crop Update: Rain continues to be spotty and windstorms have resulted in various levels of greensnap in some fields. Overall crops are growing and getting a decent canopy. It's been interesting watching the radar on weather apps as so often they look like precipitation should be occurring yet that's not always the case. Grateful for all of you who share crop updates-including things such as impacts on hay crops, pastures, etc. and for our farmers working with me on soil moisture monitoring. I was told this past week of the impact of our groundtruthing on the drought monitor; radar would make it appear we're not as dry as we truly are. So just wanted to share that with you-that your input is important as we then share that input with those who work with the models and maps! I plan to get soil moisture sensors installed in non-irrigated fields in York, Seward, and Clay this week as well.

Soil Moisture Sensors Tips: With cultivating and hilling progressing, some are now looking at getting soil moisture sensors installed. If you utilize watermark sensors, the following are some tips I've learned.

Test sensors with wet/dry process to remove all air bubbles:

- **First,** make sure sensors read 199.
- **Then,** soak sensors for at least 24 hours. They should read 10 or less (Jenny's note-I realize they may read this in a matter of minutes to hours but it's our best practice recommendation to ensure all air bubbles are removed).
- If they don't read 10 or less, gently rub any soil loose on them with your fingers (don't use a brush) and allow to continue soaking for another 24-48 hours. If they still don't read under 10, I don't use them.
- **Best practice** is to then allow the sensors to completely dry out again to 199 to complete the wet/dry process. (Jenny's note: I realize, due to time constraints, many sensors get installed once they have been soaking and never go through the complete drying process).

Installation:

- Avoid installing sensors in saturated soil conditions in clayey soils. Doing so allows a thin clay film to develop on the sensors which then affects readings .
- Prior to installation, the sensors should be soaked again and installed wet. The soaking process only takes a matter of minutes to get back to 10 or below. I carry the water bucket with sensors with me into the field.
- When soaking, water moves into the PVC pipe, thus it can take time for the water to drain providing accurate readings if not removed. Some sensors have a hole drilled in the PVC pipe above the sensor to allow water to drain. Otherwise, it's important to remove the caps and tip the sensors over to dump any water that has accumulated in the PVC pipe during the soaking process. I then put the cap back on, take my hand and wet the PVC pipe with water so it pushes in easier. Some like to use WD-40 but my concern with that is it getting on the sensor affecting readings.
- Install all sensors where the sensor itself sets using an ag consultant tube (can be 12 or 18 inches). An ag consultant tube has a slightly smaller diameter that provides a tight fit for the sensor. Use a regular soil probe for the foot above that. For example, for 1' sensor, I use ag

consultant tube. For 2' sensor, I use regular probe for first foot and ag consultant tube for second foot. For 3' sensor, I use regular probe for first 2 feet and ag consultant tube for third foot. The reason for this is in clayey soils that are wet, there's greater resistance to pushing in that sensor, so this is one way I've found which is easier for someone like me to push them in. (Jenny's note: many have installed sensors with a regular soil probe through the years and that's also fine. Just know that you may see more water run along side of tube before soil makes a tight fit around where sensor is located. I've just found less issues with this when I use the process described above).

- NEVER pour water into the hole or make a slurry. Make sure the sensor hits the bottom of the hole as air gaps can make the sensor readings inaccurate. Some people find it better to not remove the entire amount of soil for a specific depth and then push the sensor the rest of the way till the correct depth is obtained. I'm not always strong enough to do that so do what works for you as long as the sensor is at the correct depth and there's no air gaps.

After Installation:

- Make sure to fill in any gaps around the sensor with soil and make sure there's no soil cracks around the sensors.
- Make sure to mark each sensor and flag them well.
- Sensor readings should equilibrate with the soil within 48-72 hours but especially within a week.
- If a sensor starts reading really dry, before replacing it, I often remove it and reprime it in the field. This can be done by re-soaking in water for 1 minute or so till it goes back below 10 and then reinstalling in same hole. If it doesn't go below 10, I replace it. If it reads strange the next week, I also replace it.

ET gages:

- A reminder to use distilled water in the tube and to fill the ceramic top when you're also filling the main tube. I usually fill the ceramic top and wait for it to soak up a little then fill again.
- Prime the ET gage ensuring no air bubbles are in the second tube with the stopper. I always overfill the ET gage to help with priming and ensuring there's no air bubbles.
- Excess water can be removed and also air bubbles can be removed by gently pulling down on the glass site gauge tube at the rubber base and releasing extra water from it. Air bubbles can also be released in this process. Place the site gauge tube back in place when you are at a water level between '0 and 1'. Then place one red marker ring on that beginning start level.
- I always plan to refill the ET gage when it gets down to '9' on the site tube.
- The green canvas cover should be replaced at least every 2 years and be sure to dust it off and the white membrane below it.

In another column I'll share how to use the two tools together for irrigation scheduling. All videos and charts with more information can be found at:https://water.unl.edu/category/nawmn. This is a checklist I made awhile back with Daryl Andersen which has more detail and could honestly be updated:http://www.littlebluenrd.org/pdf's/forms/etgage_sensor_checklist.pdf but may also be helpful.

Tree Damage: Recent windstorms have caused for many downed branches and even some trees. When removing broken branches or dead branches, it's important to prune correctly for tree health. Correct pruning of larger branches can often involve 3 cuts per limb. The first two cuts are made away from the trunk of the tree to remove most of the weight of the limb. The third cut is

near the trunk itself at the bark collar ridge where the tree will eventually seek to heal. I like this Backyard Farmer YouTube video as a good visual of correct pruning:https://youtu.be/9cl0Qxm7npk. Pruning is best done in the dormant season of February and March. It's best avoided in April and May when trees are putting energy into new leaves and in the fall as fall pruning can result in growth instead of the tree preparing for and going into dormancy. Some great resources with more information on proper pruning are:https://go.unl.edu/v9uf, https://go.unl.edu/gdb9, and this blog post https://jenreesources.com/2014/04/20/proper-tree-pruning.

JenRees 6-17-18

This past week contained many off-target herbicide concern calls. Prior to Memorial Day I had made a note that post-herbicide applications to corn began in much of the area and anticipated phone calls to begin in about two weeks. Most of the conversations this week were more FYI to let me know they had soybean leaf cupping.

Here's a few things to consider if you are having soybean leaf cupping.

- First, was a post-herbicide application made to your soybeans? If so, check for any potential tank contamination (Check out this CropWatch article: https://go.unl.edu/fnig). If not, check out this publication (http://ipcm.wisc.edu/download/pubsPM/dicamba2004.pdf) to determine if any of the criteria mentioned could possibly be contributing to the problem.
- Determine how old the plant is by asking when the soybean was planted and even better when it emerged. A soybean plant will produce a new node every 3.75 days.
- To determine the timing of damage, I count the total number of nodes on the plant to the last trifoliolate where leaf edges are not touching. The total number of nodes may differ in different parts of the field such as irrigated and non-irrigated especially after herbicide damage and drought-stress (Example 8 nodes irrigated and 6 non-irrigated). Take the number of nodes X 3.75 to get total approximation of plant age. Then count back on the calendar to determine approximate emergence date. If I use 8 nodes in this example X 3.75 = around 30 days ago the plant emerged.
- I then count the number of nodes to the very first damage I see on leaves (Example 3). Multiply this number of nodes times 3.75 and count forward on the calendar from emergence to that date. For instance, in this case, damage occurred around 11 days after emergence.
- I also like to count how many completely unfurled trifoliolates are affected (Example 6 trifoliolates). Take that number and multiply by 3.75 (Example 6 X 3.75= approximately 23 days ago the damage occurred).
- In this example, it worked to count either direction (from emergence and from current date) to determine approximate timing of off-target movement occurring. In all the situations I've looked at thus far, the timing goes back to around Memorial Day with post-dicamba herbicide applications applied to corn.
- Auxin-like herbicides affect only cell division. Thus, fully developed leaves (no longer expanding via cell division) are not affected even though they may be expanding by leaf cell enlargement. Only the tips of the newest exposed soybean leaves may experience damage to dicamba as they are still undergoing cell division. Otherwise, it can take 7-14 days for leaf damage from dicamba injury to appear on susceptible plants and damage will occur typically 4-6 nodes. This is because dicamba is also translocated once inside leaf cells. Thus it impacts cell division of the leaf primordia at the stem apex. We may not even see those leaves yet because they are still enclosed in the stem apex tissue.
- In a matter of weeks, affected fields can go from appearing to have minor damage, to looking really bad, to growing out of damage. It looks worst when those affected nodes push upward giving the field a grayish/white cast to it as the leaves become much reduced in size and are

tightly cupped. Eventually the leaves will begin to look more normal again in time (as long as a second off-target movement doesn't occur).

What can you do? Water via irrigation and/or rainfall is the best recovery tool for dicamba damage. Waiting is another. We're blessed to grow indeterminate soybean in Nebraska which continues to produce nodes and leaves upon flowering which allows our soybean to grow out of damage.

- Wait till harvest to determine any yield impacts if there are areas impacted vs. those which aren't. Otherwise, field-scale damage is difficult to discern yield impacts.
- You can talk with your neighbors/ag retailers regarding what they sprayed. In our area of the State, it's often difficult to pinpoint the source of off-target movement with so many applying dicamba products to corn for palmer control often around the same time-frame. Now that post-apps to soybean are also occurring, that may also become a challenge. Of all the fields I visited last year, less than a handful of farmers sought any sort of compensation and those were more often due to tank contamination issues. If you wish to pursue that route, you need to file a complaint with the Nebraska Department of Ag.
- For future dicamba applications, check out these best management tips: https://go.unl.edu/97ok.
- For those of you reading this in a source outside of my blog, I created a video to hopefully be more visual and clear on understanding this method of diagnosing timing. You can check it out at my YouTube site: https://www.youtube.com/user/jenreesources.

Bagworms: It's June and one of my top questions has been "Have I found bagworms yet?" Well, they're now feeding and forming new bags on junipers and spruces. What you're looking for are not the old bags at this point, but very small (fingernail size) new bags that move as the caterpillar is feeding and making the larger bag. This video from Backyard Farmer (https://youtu.be/05A2quj9nO4) does a great job of showing various stages of bagworms and sharing on control methods. Check it out!

Irrigation Scheduling Workshops: Steve Melvin, Extension Educator in Hamilton/Merrick Counties asked I share about upcoming irrigation workshops hosted by UNL and Upper Big Blue NRD. The program will focus on installing the equipment and making irrigation scheduling decisions using the data generated by Watermark sensors. The workshops will be held from Noon-1:30 p.m. on June 25th at the Corner Café, 221 Main St in Stromsburg and also at the same time June 28th at the Hordville Community Building, 110 Main St. The Upper Big Blue NRD will provide the lunch. The first presentation will be Installation of Watermark Sensors and Data Logger presented by Dan Leininger, Water Conservationist with the Upper Big Blue NRD. The second will be Deciding When and How Much Water to Apply Using Watermark Sensor Readings presented by Steve Melvin. The irrigation scheduling strategies presented in Steve's presentation can be used with any soil water monitoring equipment data. More information is available by calling Steve Melvin at (308) 946-3843 or visiting https://extension.unl.edu/statewide/merrick/.

JenRees 6-24-18

Crop Update: What a blessing to have rain this past week! Grateful for how it provided much needed moisture into the top two feet in many cases. Updated soil moisture status will be at http://jenreesources.com. Some in our area and in other parts of the State received wind, hail damage, and flooding to crops. This week's CropWatch at http://cropwatch.unl.edu shares information for those situations. A few summarizing points: for those with greensnap or with severe hail damage, you may wonder what potential yield may be based on your planting date and current plant stand. The following chart from Iowa State University and explanation of how to understand it may be helpful: https://crops.extension.iastate.edu/cropnews/2009/05/assessing-corn-stands-replanting.

TABLE 1. RELATIVE YIELD POTENTIAL OF CORN BY PLANTING DATE AND POPULATION

	Planting Date				
POPULATION	April 20–May 5	May 5–15	May 15–25	May 25-June 5	June 5–15
(PLANTS/ACRE)	Percent Maximum Yield				
45,000	97%	93%	85%	68%	52%
40,000	99%	95%	86%	69%	53%
35,000	100%	96%	87%	70%	54%
30,000	99%	95%	86%	69%	53%
25,000	95%	91%	83%	67%	51%
20,000	89%	85%	77%	63%	48%
15,000	81%	78%	71%	57%	44%
10,000	71%	68%	62%	50%	38%

Source: Iowa State University

For those with flooding, corn in the V7-10 leaf stage can survive for about 7-10 days in flooded water. Temperatures above 86F can result in greater stress on those plants than if the temps remain cooler than that during that time. Another consideration for the future, it's not uncommon to find a disease called 'crazy top' of corn when the tassels begin to emerge. We've seen this the past several years where creeks or areas along waterways or field edges were ponded. There's nothing you can do to prevent this.

For those with hail damage, damage from V7-10 leaf corn can result in a number of situations depending on the severity of hail. Minimal yield loss is assumed for leaf damage in crop insurance charts. Final plant stands will be important which will account for broken off plants that don't recover. Stem bruising also isn't factored in. For corn, bacterial diseases tend to be my larger concern at these growth stages. Bacterial top rot is one in which the plant dies from the top down and has a strong odor to it and creates a soft, slimy mess. Goss' wilt is another concern-

particularly systemic Goss' wilt. You can check for this if you have a dying plant that doesn't have a soft rot by taking a

Cross-section of stem showing systemic Goss' wilt in the discolored vascular bundles.

cross section of the stem and looking for discoloration of the vascular bundles. You can also send plants like this to the Plant and Pest Diagnostic Lab in Lincoln for confirmation.

Regarding fungicide use on hail damaged corn, Iowa State and the University of Illinois did studies finding similar results. Both found no statistical difference in applying a fungicide vs. the untreated check in spite of small numerical differences. Regarding timing, the Iowa State study simulated hail damage at tassel and applied fungicide an average of 3 days and 8 days post-hail. There were no statistical differences on yield of the timing of the applications either. They did find statistically less fungal diseases in the hail-damaged plots vs. the non-hail damaged plots and speculated it was due to more air flow and less leaf area available for disease to occur. I have observed that fungicide can help with stalk strength and maintaining whatever green tissue remains when we had the 2013 hail storm in Clay County at brown-silk to blister corn. But this early, it's hard to justify a fungicide application based on the data that's available. If you're interested in testing this for yourself, the following is an on-farm research Fungicide Protocol for Hailed Corn and Soybean.

For hail damage on soybean, many of the beans are at flowering or approaching flowering. Again, stem bruising isn't counted in crop insurance assessments. I haven't really observed bacterial or other disease issues necessarily from stem bruising in soybean. What tends to be more of an issue is those plants hardening off and becoming brittle to walk through. For soybeans, the blessing is that often new buds form and you will see increased branching which can help with canopy closure…it just can hurt right now when soybeans were already near canopy and we're trying to

reduce additional inputs for weed control. Things to consider are that pods may be closer to the ground from this increased branching and you may need to harvest earlier to help with getting beans that become brittle before snapping off in wind storms. I leave plant stands of near 60,000 plants/acre based on our soybean pop studies that received hail damage. If you want to prove any replanting differences to yourself, you may wish to consider the following Soybean Replant Protocol. We'd recommend waiting on herbicide apps till some new growth occurs, which is difficult when I've watched palmer essentially be not affected by hail and put on two new leaves within a few days in the past. Last year we started making herbicide apps 5-7 days post-hail.
Additional hail resources are at a new resource called 'Hail Know'
at: https://cropwatch.unl.edu/hailknow. There's a lot of info I haven't transferred to this site yet…but you can view photos and comments on hail recovery at numerous growth stages over time at my blog under the 'Storm Damage' category: https://jenreesources.com/category/storm-damage-2/.
Last week I shared the following video regarding determining timing of off-target dicamba movement to soybean: https://youtu.be/rQid7-vX-TU. Sharing again with an increase in the number of fields that were experiencing cupped symptoms last week.

JenRees 7-1-18

Last night brought much-needed rain and grateful for that! From driving today, also saw some crop damage due to flooding, hail, and greensnap. So sorry for those of you most affected by greensnap and hail!

Last month I focused on counting my blessings-which are many! One has been the wonderful rains we've received at critical times of being so dry. The crops overall are beautiful right now regarding overall color and especially soybean weed control! Another blessing has been the opportunity to serve people in several counties the past 2+ years. I'm grateful for the extra time to serve my former area while also getting to know people in my new one! Grateful that relationships can be maintained and built regardless of where a person works or lives! I'm also grateful that we've been able to hire an individual who I believe to be a good fit for the Clay County Crops/Water Educator position with accountability region of Nuckolls, Thayer, and Fillmore counties. Michael Sindelar begins this new role on July 2. Michael conducted graduate research at South Central Ag Lab (SCAL) near Clay Center, so he is familiar with the area and with SCAL. His major advisor was Dr. Humberto Blanco, UNL Soil Scientist, and one of their projects was looking at soil impacts on corn residue removal and any impacts of adding cover crops into that system. I asked Michael to provide a brief background so I could introduce him to you.

"Hi, I am Michael Sindelar, the new cropping and water systems educator based out of Clay Center, Nebraska. I was born and raised in Lincoln, Nebraska. However, I was exposed to

agriculture at a young age as my father would take me to the family farm located near Richland, Nebraska in Colfax county to "help" with the farm work. I joined the Navy in 2005 and served until 2010. I was a cryptologist collective (CTR) and worked in military intelligence. I was stationed out of Hawaii for my enlistment. I had the opportunity to see parts of the pacific and spent one year deployed in Afghanistan where I collected intelligence and conducted combat operations. After having fun for a couple of years I got my act together and earned a bachelor's degree in Agronomy from the University of Nebraska. This spring I completed my master's degree in Agronomy with a specialization in soil and water science from the University of Nebraska. I spent most of my master's degree studying how changes in soil management affect soil water storage, recharge, and heat as storage and transfer through the soil. I look forward to starting my new position on Monday. I sign most of my emails using V/R which is a carryover from the military meaning very respectfully."

There will still be a transition time of various projects currently underway with July 4 this week and Clay County Fair the next. Please be sure to introduce yourself to Michael when you see him!

When I transitioned to York/Seward a few years ago, I wrote a column entitled "Blessed". I've been blessed to serve the people of Clay/Nuckolls/Thayer/Fillmore Counties a few extra years. And, I will always be grateful for relationships built and the opportunity you gave me entrusting me to help you with diagnosis and farming decisions! I hope you will also give Michael that same opportunity as he begins in this new role!

Tree Branches: Many of us had tree branches down again after the winds. After the last event, a few farmers mentioned to me that it's frustrating when town people dump their branches in their farm ditches leaving the farmers to pick them up. So, while it's only common sense and respectful to not do this, I said I'd mention to please not do this (although I'm uncertain if they would be reading my column)!

Glyphosate Resistant Palmer Amaranth Field Day: View field demonstrations and hear from experts at the Glyphosate-Resistant Palmer Amaranth Management Field Day Wednesday, July 11 at Carleton. The event is free and will be held from 8:30 a.m. (Registration) with program from 9 a.m. to 1 p.m. Keynote speaker will be Aaron Hager, associate professor and Extension weed scientist at the University of Illinois at Urbana-Champaign. He will speak on the biology of Palmer amaranth and current research on its control in corn and soybean, including in new technologies such as Xtend and Enlist soybeans. Populations of Palmer amaranth in Nebraska have been found resistant to glyphosate, atrazine, HPPD, and/or ALS herbicides, said Amit Jhala, field day coordinator and Nebraska Extension weed specialist. Demonstrations include:

- How row spacing and herbicide programs can affect glyphosate-resistant Palmer amaranth control in Roundup Ready 2 Xtend Soybean;
- Management of Palmer amaranth in: Balance GT/Liberty Link Soybean (resistant to isoxaflutole and glufosinate) and Enlist E3 Soybean (resistant to 2,4-D choline, glyphosate, and glufosinate;
- Critical period of Palmer amaranth removal affected by residual herbicides in Roundup Ready 2 Xtend Soybean.

These in-field demonstrations and research projects were funded by a grant from the Nebraska Soybean Board. Register online at http://agronomy.unl.edu/palmer to ensure appropriate meals and tour rides. Three Certified Crop Advisor (CCA) credits will be available for attending. If there are questions about registering, please call 402-472-5656. Directions: From Geneva go south on Hwy 81 for 14.6 miles. Turn west onto Hwy 4 and go 5.3 miles. The field day will be on the south side of Hwy 4 between C Street and Renwick Street in Carleton. (GPS: 40°18'24.7"N 97°40'29.0"W). Partial funding for this field day was provided by the Nebraska Soybean Checkoff and Nebraska Extension.

JenRees 7-8-18

Crop Update: A few diseases started showing up the past few weeks in various portions of eastern and south central Nebraska. Phytophthora root rot in soybean is perhaps the

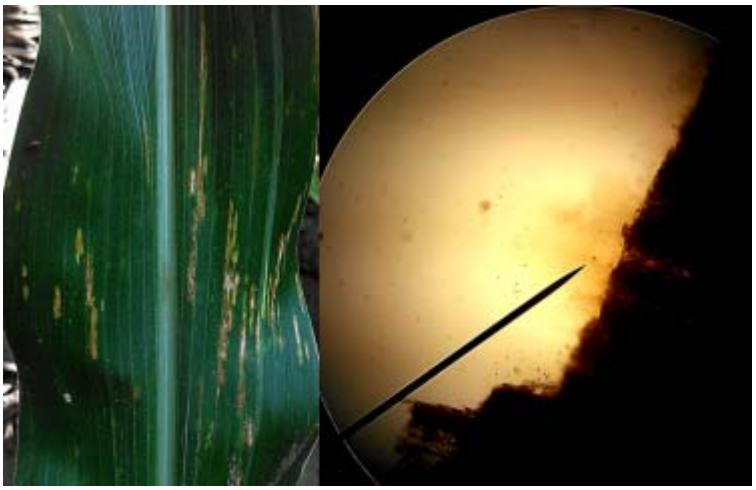
Phytophthora root and stem rot in soybean. Notice wilted plant with leaves hanging on turning yellow/brown. Also notice characteristic brown lesion from base of plant up a good six inches on this plant. This affected plant is surrounded by healthy plants.

most common in both areas. We normally think of this disease as seedling damping off and death; however, it can also affect plants later in the season. What surprised me was how much we are seeing it this year in higher ground and sidehills instead of the typical lower ground we often see it on. Dr. Loren Giesler, Extension Soybean Pathologist said that in situations where we've had dry conditions followed by heavy rains (as we have this year), especially on clayey or soils prone to compaction, Phytophthora can also affect plants. He has a few videos along with additional

information at the following website: https://go.unl.edu/tdfh. Symptoms characteristic at these growth stages include wilting of plants during the day with leaves eventually turning yellow-brown-gray and remaining on the plants. Also, look for a brown stem lesion that goes from the soil line upward about 4-6". Some of these plants are also snapping off at the soil line. For those experiencing Phytophthora this year, future management includes:

- Using resistant varieties including a combination of good partial resistance and an Rps gene. Partial resistance alone will not be as effective during early growth stages or under high disease pressure.
- Cultural practices include anything that can improve soil drainage and compaction.
- Seed treatment fungicides containing mefenoxam or metalaxyl should be used and you may need to consider a higher rate of them.

Regarding corn diseases, bacterial leaf streak (BLS) has greatly increased on more



Bacterial Leaf Streak (BLS) in corn. Lesions are elongated and skinny staying between the leaf veins, similar to gray leaf spot (gls). However, leaf margins are wavy and diagnostics under the microscope show the presence of bacterial streaming from the leaf veins. With gray leaf spot, there will be the presence of fungal spores. Thus, the importance of correct diagnosis when considering fungicide applications.

susceptible hybrids since rain events. Early lesions can look very similar to gray leaf spot, so it's important to correctly identify the two. The margins of BLS are wavy vs. those of gray leaf spot are more blunt. Both can have yellow margins when backlit by the sun. Fungicides are not effective against BLS and hybrids do vary in their tolerance to this disease. It's important to scout fields as we may see an increase in fungal diseases due to the humidity, leaf wetness, and recent rain events. Southern rust has taken awhile to develop in the southern U.S., which is somewhat unusual, yet many states have been in drought this year too. As of July 5th, southern rust has been confirmed in Georgia with one suspected sample in a Missouri county. You can watch the map at: http://ext.ipipe.org/ and follow @corndisease on Twitter for the latest on corn disease findings in the U.S.

Trees: With numerous wind storms, the following resource has a lot of great information regarding pruning storm damaged trees correctly and questions to ask tree care services regarding tree pruning: https://go.unl.edu/94fm.

Agronomy Youth Field Day: All youth ages 9-18 years old are invited to the 3rd Annual Agronomy Youth Field Day. Youth will have exciting educational experiences while discovering Science & Agronomy/ Irrigation / Mechanized Agricultural careers for producing Nebraska crops! The field day will be held Wednesday, August 8 from 9 a.m.-3 p.m. at Nebraska College of Technical Agriculture Educational Center in Curtis, NE.

Hands-on activities (for all age levels) will focus on pest management, equipment technology, crop growth, soil management, precision farming & center-pivot irrigation technology. Several Nebraska Extension Cropping & Water Systems and 4-H Youth Development Educators along with Nebraska College of Technical Agriculture in Curtis Agronomy / Ag Mechanics Department professors will be sharing the researched based information with the students.

Participants will gain important life skills while discovering the science behind producing Nebraska crops. The six-hour field day is a great opportunity for ALL the youth to learn more about the agronomy industry and increase their basic understanding of science, ag literacy, a technology & STEM while exploring careers. Parents/Adults are welcome and lunch will be provided.

Reserve your spot today by registering online at: https://go.unl.edu/agronomyyouthfieldday **by August 3, 2018.** For more information (or if trouble with registration) contact Nebraska Extension Frontier County at 308-367-4424 or email 4-H Educator Kathy Burr at kathy.burr@unl.edu.

JenRees 7-15-18

Crop Updates: A great deal of timely information was provided in this week's CropWatch at http://cropwatch.unl.edu including information about high heat and pollination, applying fertilizer during pollination, western bean cutworm scouting, forecasted yields, etc. Please check it out!

Several called me asking about applying fertilizer during pollination. I shared that while

I wasn't aware of research, I personally was concerned about anything potentially interfering with pollination and that I do recommend 30 lbs of N at brown silk if needed or if you were originally planning split nitrogen apps. This is based on research from Purdue sharing today's hybrids use 30-40% of their total Nitrogen from flowering through maturity. After discussing with Dr. Tom Hoegemeyer, Adjunct UNL Professor of Practice, he offered the following insights: "Pollination mostly occurs between 8:30 a.m. and Noon. Thus, as a precaution, I would not run a pivot on pollinating corn from 6 a.m. to Noon. When the temperature is 90°F to 95°F, the pollen is killed by heat and is seldom viable past 2 p.m. That leaves lots of time to run pivots, apply N, etc. when it won't harm pollination. Silks tend to be viable for three or four days at these temperatures, so if a plant isn't pollinated one day, generally the next day will work just fine. (If nitrogen is needed), I'd recommend that nitrogen go on as soon as practical. Corn nitrogen use is very high during the pre-tassel growth phase and again at kernel growth, from one to three weeks post

pollination. About seven to ten days post pollination (before brown silk) lower N will start causing kernel abortion and serious yield loss in corn." The UNL recommendation for fertigation is to use 30 lb of N with 0.25″ of water or 50-60 lb of N with 0.50″ of water.

Last week also brought questions regarding thresholds and difficulty in finding Western Bean Cutworm egg masses with moth flights at their peak. You can view light trap data from UNL's South Central Ag Lab thanks to Terry Devries at: https://scal.unl.edu/ltr2018.pdf. There's also a great article in this week's CropWatch on how to scout for them, insecticide options, and additional recommendations. Thresholds for western bean cutworm are 5-8% of corn plants in the field containing egg masses or larvae. Egg masses can be difficult to find during pollination with pollen hiding them. 'Typically' egg masses are found in the top third of the plant on the upper sides of leaves and near midribs or leaf axils. However, with higher heat, I tend to find them closer to the ears and have even seen masses laid on the ear husks and on the backsides of leaves (not common). While larvae are generally known to move up the plant to feed at the tassels, I've seen high heat force larvae into ears earlier. It typically takes 5-7 days for larvae to hatch and the egg masses turn purple just prior to hatching. A number of insecticide options are available for both aerial application and via chemigation; these products are listed in the CropWatch article.

With insecticide applications occurring in corn for both western bean cutworm and also corn rootworm beetles, many have also called or talked with me about the recommendation of fungicide applications. Right now, I haven't found gray leaf spot above 3 leaves below the ear leaf in several counties. There's been some mis-diagnosing bacterial leaf streak as gray leaf spot. Southern rust was just confirmed in a Kansas county this week, but we still have yet to confirm it in Nebraska. Even the longest residual products won't get us through August if a fungicide application occurs now. I can appreciate that economics are tight so the thought is to save an additional application cost by applying a fungicide now with the insecticide. And, I can appreciate economics are tight regarding why apply a fungicide right now when disease pressure doesn't warrant it? Perhaps, at least those of you with the ability to chemigate could consider waiting till disease pressure warrants it for your field, if it does. Always in the back of my mind is the need for late-season protection with southern rust eventually showing up and gray leaf spot often worse then.

My perspective is from a resistance management and research-based one. We have 5 total modes of action for fungicides with 2 of them being in nearly every fungicide product we use in corn, soybean, and wheat because they work against foliar fungal pathogens. At some point, our pathogens will also adapt, as we've seen our weeds and insects do…it would be like losing our ability to control gray leaf spot and southern rust similar to palmer amaranth on the weed side. In Nebraska, Dr. Tamra Jackson-Ziem's research has not shown an automatic yield increase to fungicide application in the absence of disease. And, it has also not shown an automatic yield increase when applied at tassel. In a high heat and low disease year like 2012, there were no statistical yield differences with fungicide application vs. the untreated control. Even in years

with some disease pressure such as 2008-2010, she found no statistical yield differences between when various products were applied from Tassel through Dough stages. In high disease years, her research shows the benefit of fungicide application for reduced disease pressure and increased stalk strength. Fungicides are great tools to help us with disease pressure and stalk strength. Just would encourage all of us to consider when we really need to apply them and to understand that research in Nebraska does not automatically show increased yields with the use of them or with the timing of Tassel/Silking vs. later in the year. Also, hybrids may vary in their response due to disease susceptibility and other factors. Not all her data is listed at this site, but you can view it for yourself at: https://go.unl.edu/ni3y.

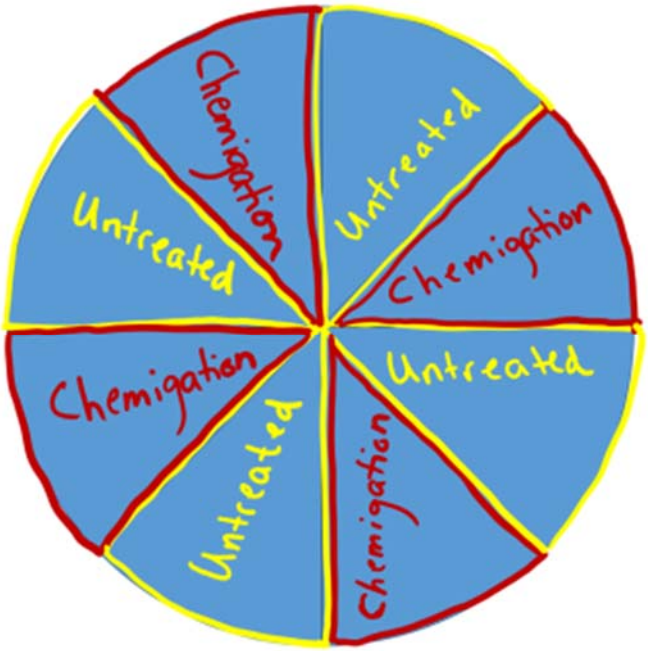
Bagworms: I've been seeing shelter belts and various trees turning brown from heavy

Severe bagworm infestation on arborvitae. Photo via Kelly Feehan, Extension Educator Platte Co.

JenRees 7-22-18

Crop Update: This past week was fairly interesting with southern rust being confirmed in a few Fillmore, Thayer, and Saunders County fields. We would recommend to continue scouting fields as the disease was low incidence at all these sites. There also were a number of questions regarding fungicide applications.

For those asking about chemigating fungicides, it's important to ensure the fungicide



On-Farm Research design for those considering chemigation vs. none of fungicide (could also use this for 2 different irrigation amounts instead). Can have more pies than this for smaller area if desired-we would just need at least 4-5 pies of each of same area. Data can be collected throughout field normally during harvest via yield monitor and we can use software to determine yields within the pies as long as we know the angle degrees you used.

product label allows for chemigation and to follow the recommended irrigation amount if specified on the label. If an irrigation amount isn't specified, Tamra Jackson-Ziems and I were talking about trying to apply with as small amount as possible (perhaps like 0.25″). She has chemigation data at 0.25″ vs. 0.50″ vs. ground application from 2005-2007, but not vs. aerial application. The data had a high degree of variability numerically in the yield data in spite of non-statistical differences. The only other info I could find was the University of Georgia recommends only 0.10″ on chemigation using fungicides, but they didn't show any data. I encourage those who can to please consider doing this as an on-farm research study where chemigation occurs in pies throughout the field with other pies left untreated. I realize it's not popular to leave areas untreated, but it may be of interest to you. For those asking about comparing aerial vs. chemigation for corn, that would be very difficult with one pivot with true research involving

replication. Perhaps it could be done if a producer had a couple of quarters side by side, planted the same day with same hybrid and crop rotation where we could truly compare via research. If you do and that's of interest to you, please contact either Tamra or myself. A couple have also discussed maybe applying half a pivot aerially and the other half via chemigation and just taking observations, which may also be beneficial to you.

We also released a few CropWatch articles this week on differentiating growth regulator herbicide injury in soybean and using a forensic method to diagnose off-target dicamba

Dicamba on Soybean: Because dicamba negatively affects leaflet margin cell division, direct dicamba exposure to nearly fully developed leaflets results in in a "draw-string" injury symptom at the leaflet tips, thus shortening the leaflet length. Keep in mind, however, that the translocation of dicamba from directly exposed leaflets to very young leaf primordia developing at new nodes at the main stem apex will also induce leaf cupping in those yet to emerge leaflets, even though these very young leaflet primordia were not directly exposed to dicamba. The same can be true for new trifoliolates occurring from additional stem branching at lower nodes. Photo via Purdue University.

injury in soybean. Please check them out at http://cropwatch.unl.edu. I hadn't heard anyone really explain the difference between 2,4-D and dicamba in how they work in plants so felt that information was important in addition to the fact dicamba is highly translocateable and 2,4-D isn't. That also has been important in home-owner discussions regarding off-target movement to garden produce. And, a reminder to all home-owners that weed control products used in lawns

and empty lots often contain dicamba and/or 2,4-D…so it's important to read those labels regarding environmental conditions in applying them and also when you can/can't use grass clippings as mulch.

Buzzing Beetles: This past week, several people came to the office or called

2,4-D on Soybean: 2,4-D impacts cell division in the more central (major vascular) portion of the leaflet. Low-dose 2,4-D exposure induces injury that results in a "narrowed, strap-shaped" leaflet in which the leaflet veins are made more parallel. This 2,4-D-induced injury is often accompanied by a rugose leaf surface — a botanical term describing a rough leaf surface of irregularly spaced bumps/wrinkles and prominent ridged/corrugated leaf veins. Low-dose 2,4-D exposure will also lessen leaflet area, but differently, by narrowing/elongating the leaflet. 2,4-D is also not highly translocatable, wheras dicamba is. Photo via Purdue University.

regarding large green beetles flying around that sounded like bumble bees. These are called Green June beetles. They only fly during the day. There are also smaller green beetles with white spots (tufts of hair) around the abdomen; those are Japanese beetles. Japanese beetles feed on crops in addition to favorites such as Linden trees and knockout roses. Both have larval forms that are white grubs and both have a one year life cycle. In the beetle form, both adult beetles are fond of ripe fruit such as grapes, berries, plums, and peaches. As larvae, the grubs feed on decaying organic matter and grass roots in the soil. However, the June beetle larvae can reach 2″ long creating larger tunnels in lawns and pastures as they move in the soil.

Some have said, "I thought June beetles were golden/tan!" And you would be correct! There's several types of "June" beetles. The most common and perhaps most damaging is known as the June beetle or masked chafer which is golden/tan in color and has a one year life cycle. There's also a May/June beetle(also known as the 3 year grub) which tends to do more damage in range/pasture ground. Those beetles are tan to brown/near black in color.

When it comes to damage, start looking for browning areas of turf occurring late July, throughout August, and early September. The turf may look like drought stress or fungal disease; however, if you can gently roll the turf back like a carpet, it's most likely grubs (and you should also find the presence of grubs). Other signs of grubs can include birds, skunks, etc. tearing up your lawn. White grubs in general feed on decaying organic matter, lawn and ornamental roots in the soil. Grubs don't tend to be an issue in fescue lawns or lawns that are low maintenance or newly established. They tend to prefer Kentucky bluegrass lawns that are highly maintained with fertilizer and irrigation. They also may be spotty in their feeding such as under yard lights or on irrigated slopes. The threshold level for turfgrass damage by masked chafer larvae is 8-10 white grubs per square foot of lawn…so I would assume that to be the case for all grub species. One or two grubs per square foot is normal and does not require control. If grub control is needed, products like Sevin or Dylox provide the best control for mature grubs and should be watered in after application.

Green June Beetle (left) and Japanese beetle (right). Photo via Purdue Entomology.

Masked chafer (June beetle). Photo via UNL Turf.

May/June beetle. Photo via UNL Turf.

JenRees 7-29-18

Crop Update: By the time you read this I truly hope and pray we've received some rain for the entire area who receive this! Al Dutcher and I have been somewhat frustrated regarding the drought monitor reacting to short-term precipitation events over long-term trends. We both spoke at a meeting this week where he shared parts of this area have 6-8″ deficits dating back to the beginning of our water year (October 1). The soil moisture sensor ground-truthing I've been doing with area farmers shows that the larger rains only helped the top two feet of the profile and rains have been spotty since. I think the driest portion of the area seems to be from Lawrence to Bladen south. Drought monitor did put a portion of our area back into 'abnormally dry' again and you can see the updated soil moisture readings for the region at http://jenreesources.com.

We were blessed with cooler temperatures which helped slow the crop progression. The heat was pushing crops along quickly which can negatively impact yields as we discussed in a recent CropWatch article. The cooler temps with humidity and leaf wetness also favored gray leaf spot, though, and I've seen it move up to a leaf below the ear in several fields in several counties this past week. Every field situation may differ so it's important to check your specific fields.

Soybean Management Field Days: It's hard to believe but this is the 20th year of Soybean Management Field Days! They will be held August 7-10 at four locations across the State beginning with 9 a.m. registration and concluding at 2:30 p.m.:

Kenesaw — Tuesday, Aug. 7, Dean Jacobitz Farm

Albion — Wednesday, Aug. 8, John and Mike Frey Farm

Hartington — Thursday, Aug. 9, Ed Lammers Farm

Cedar Bluffs — Friday, Aug. 10, Ray Jr. and Kevin Kucera

The field days are sponsored by the Nebraska Soybean Checkoff in partnership with Nebraska Extension in the University of Nebraska–Lincoln's Institute of Agriculture and Natural Resources, and are funded through soybean checkoff dollars. The efforts of the checkoff are directed by the United Soybean Board promoting progress powered by U.S. farmers. For more information about the field days and maps to sites, visit enre.unl.edu/soydays. Presenters include university specialists, educators and industry consultants. Topics include:

- Marketing, Risk Management and Farm Policy
- Weed Management: Cover Crops and Weed Control, Conventional vs. Traited, Soybean Variety Production
- Cover Crops: Managing Soybean Insects and Pathogens
- Cover Crops and Soybean Production Irrigation Management, Soil Fertility, and Cover Crop Research

Horticulture Update: It's been a tough year for garden produce! The heat has affected flower set, pollination, and fruit production on many types of plants. I've also received many questions about tomato leaves curling. Leaf curling can be due to many things such as water stress, virus, and herbicides. Much of what I'm seeing now is water stress-related where uneven watering is occurring or because of the amount of leaves present (especially on heirloom plants) and the plant's inability to keep up with transpiration. Have also received questions on bumpy tomato stems. The 'bumps' are actually adventitious roots (also known as tomato stem primordia) where if they touch the soil they'd form roots. Above ground, they are just these bumps and are

present when we have high humidity or overwatering. These conditions are also being favored by the heavier one-time rain events that have been received during the growing season this year.

Squash vine borers causing tunneling in crown and vines of zucchini plants.

Also lots of questions this week regarding cucumber, squash, and melon vines dying! There's a number of potential culprits. Most affected zucchini (including mine) and pumpkins contain squash vine borers. The female moth lays eggs at the base of plants where the eggs will hatch and the caterpillars will bore into the stem. The borer is white or cream colored with a brown head and can get to be 1″ long. They tend to prefer squash over melons and cucumbers. So what can you do now? Kathleen Cue, Extension Educator in Dodge County shares "If plants look good but holes in the stem indicate infestation, a knife can be used to cut with the grain of the stalk to find the borers. Use the point of the knife to pierce them and don't be surprised if more than one borer is found in a stem. Once the borers are removed, cover the cut area with soil to encourage new roots higher up on the stem. Champion pumpkin growers will place soil over many nodes (the place where leaves emerge from the stem) along the length of vines to encourage lots of rooting. This gives plants greater resiliency if the squash vine borer has destroyed the crown of the plant." So, if you're still desiring more squash and pumpkins, that's one option for you. If your plants are completely destroyed, you can just remove all the dead material to remove any actively feeding caterpillars as well. For next year, make sure to rotate the area where you plant your vine crops. Area master gardeners have shared they put aluminum foil around the stem base of vine crops to keep the borer larvae from penetrating the vines. Another option is to apply insecticides like carbaryl or permethrin around the base of stems. Trapping the adults in June by using yellow-colored containers filled with water can provide an indication when the moths are flying. You can then use floating row covers over the plants to prevent egg laying and remove them once flowering begins to allow pollination to occur. I will discuss other vine crop problems next week.

JenRees 8-5-18

Thank you to all who made the York County Fair go so smoothly! It's always a joy to see the 4-H and FFA youth and families rewarded for the hard work they put into their projects!

Crop Update: I didn't get out to the field much this week with fair but did spend a few

Bird cherry oat aphids on ear husks and green leaf aphids on leaves of plants in this non-irrigated field. Lady beetle larvae predators also present.

hours one afternoon. There are portions of the area I serve that have been blessed with rains and look really good. The main thing that I'm seeing a lot more of this week is aphids in corn fields. This can be common in fields where fungicide is applied as the fungicide kills a beneficial fungus that attacks aphids. Some aphid species are also attracted to moisture stressed crops. The heat has also pushed the crop along quickly. We have another yield forecasting article in this week's CropWatch at http://cropwatch.unl.edu where we talk about the impact of the heat on yields. As of right now, based on comparing this year to 30 years of weather data, it's appearing corn may reach maturity 1-3 weeks early. Irrigated yields are estimated to be near average and above to near average for non-irrigated corn (where drought is not a factor). These yield forecasts are

based on simulations under 'perfect conditions' (with no nutrient loss, disease etc.) but they can give us an indication of what may happen if we continue with higher heat conditions.

Unfortunately, pockets in the area continue to miss rains. The drought monitor still is not

Drought-stressed soybean field.

reflecting the drought in this part of the State; at this point, I'm unsure what else either Al Dutcher or I can do about this. One farmer reminded me drought occurred in the same area in 2006, 2012, and now 2018-six years apart each time. Driving the area, hardest drought-stressed crops really took a turn this past week with corn in hard dough to early dent with some kernel abortion and soybeans are beginning to abort pods and quit filling seeds. One question has been on weighing taking corn for silage or not. If you have at least an estimated 50 bu/ac grain in most of the field other than highly compacted areas, it may be more profitable to keep for grain (unless you're looking for cattle feed). The following are some resources to consider further:

- July 2018 BeefWatch article on considerations for green chop/silage for cattle feed, include best management practices, etc.: https://go.unl.edu/e3y5
- July 2018 K-State article for considerations on taking corn for silage or grain: https://enewsletters.k-state.edu/beeftips/2018/07/02/considerations-for-use-of-drought-stressed-corn-for-cattle/
- All UNL Drought Resources: http://droughtresources.unl.edu

Dicamba: We've often mentioned the research showing a soybean plant producing a new node every 3.7 days upon reaching V1 stage. And, I've used that in the forensics assessment for determining a timing for off-target dicamba movement. One question I've had was "*Do soybean plants continue to produce a new node every 3.7 days upon being affected by off-target dicamba*?" My assumption in the forensic analysis I have used is that a new node continued to be produced every 3.7 days in spite of off-target dicamba. However, the only way to really test this would be to have the same soybean variety in both an Xtend and non-Xtend version. We will release a CropWatch article next week in which a situation like this occurred at the Eastern NE Research and Extension Center. Dr. Jim Specht counted nodes in both the non-Xtend variety with off-target dicamba and the Xtend variety that wasn't affected. *He found the same number of*

nodes in spite of the dicamba affected non-Xtend variety being shorter in height and having less canopy. So that in itself is good information for use in forensic assessments. However, he also found plants in which a higher off-target dicamba dose affected the top-most growing point. When that occurred, the number of nodes was affected.

Last year, a group of us released a dicamba survey during Soybean Management Field Days. Reminder those are upcoming this week (https://enre.unl.edu/soydays)! The survey helps us understand your perspectives about dicamba and this year we've added questions regarding using Xtend technology. Hopefully it will provide helpful information for all of us and the results will be shared via CropWatch and winter meetings. We'd encourage and be grateful for any soybean growers to participate at: https://www.surveymonkey.com/r/JWDCY3C.

South Central Ag Lab Field Day: Please hold August 29, 2018 for UNL's South Central Ag Lab (SCAL) Field Day near Clay Center! Attendees can choose which sessions you would like to attend. Options include the latest SCAL research in the areas of Irrigation/Water Use; Nutrient Management; Weed, Disease, and Insect Management; Cover Crops; and Cropping Systems. CCA credits will be available and there's no charge to attend. Will have more specifics for you next week but please hold the date for now!

Vine Crop Problems: The following resource explains options for diagnosing various problems with cucumbers, squash, and melons: https://hortnews.extension.iastate.edu/2011/8-24/cucurbitwilt.html.

JenRees 8-12-18

Crop Update: I'm so sorry to all affected by Monday night's hail/wind storms! For those reading this before Monday, a reminder of hail damage meetings we're having Monday Morning, 10 a.m. at the Utica Auditorium and Monday Afternoon, 1:30 p.m. at the Fairgrounds in Central City. I will post key points of what's discussed at http://jenreesources.com after the meetings. Please also check out our Hail Know Website at https://cropwatch.unl.edu/hailknow and take the survey on the page to help us better know how to serve you with that resource.
This week's CropWatch at http://cropwatch.unl.edu shares two different dicamba-related articles. One is a case study to walk through the forensic analysis for off-target dicamba movement showing how it originated from a corn field. The other goes into more detail regarding soybean still producing a new node every 3.7 days upon off-target dicamba movement (as long as the apical meristem has not been killed). It's truly a significant piece of information, because without it, the assumptions within the forensic analysis don't work!

Also, you have an opportunity to share your voice and input. This past week we've heard that EPA is planning to make their decision by mid-August on whether or not to extend registrations of XtendiMax®, Engenia®, and FeXapan® in order to help inform the seed and chemical industry for next year's purchases. Some of you have called or talked with me about this. A few have understandably been pretty upset that these products are getting so much blame when, in this part of the State, much off-target dicamba movement starts from corn applications. That doesn't get as much press nationally. While I've tried hard to share the story here and am grateful to our media partners who have helped me, I'm one very small voice. I have no idea what will happen; my concern is the bigger picture-potentially losing dicamba period as a tool in our toolbox.

So you have an opportunity to share your voice in Nebraska Extension's survey that will be shared with the EPA: https://www.surveymonkey.com/r/JWDCY3C. Share your opinion on Xtend technology. Share your opinion on where you've discovered off-target movement from in 2017 and 2018. Share your opinion on dicamba. The results will also be compiled and shared on CropWatch and winter meetings. Thank you for considering this!
Aphids and Frogeye: I've also received a handful of questions regarding corn leaf aphids in corn and frogeye leaf spot in soybean. Both have rapidly increased in some corn and soybean fields. At beginning dent and various stages of starch-fill corn, I just have a hard time putting anything else into this crop. So I haven't been recommending insecticides and there's no thresholds this late to support it. In fields I checked from last week to this week with corn leaf and bird cherry oat aphids, I've also seen an explosion of beneficial insects and mummification occurring of aphids, which is helpful. Regarding frogeye, it's one where we recommend a product containing a high amount of strobilurin at R3 or R5. Many beans are at R6 or almost there, so again, I'm having a hard time putting any more money into this. High humidity and leaf wetness for 12 hours or more will rapidly increase frogeye, so the worst situations I've seen through the years are in gravity-irrigated fields. Also, seeing a number of soybean defoliators in fields. Please check out this

CropWatch article at: https://cropwatch.unl.edu/2018/soybean-defoliators to better help understand how much defoliation can occur in soybean.

Lawn Renovation: For those seeking to improve your lawn or get one established, August is a great time to do so! I really like this resource for this purpose: https://go.unl.edu/rz9z. If you'd prefer to watch videos, Backyard Farmer has a series of Lawn Renovation videos, but this link gets you to the most recent one regarding fall renovation: https://youtu.be/Fxd1NUQ8ScQ.

Hail Damage Info: Thank you to all who attended our hail damage meetings last Monday and we truly hope the information was helpful. It was a lot of information at one time, so I have compiled it at: https://jenreesources.com/2018/08/14/late-season-hail-damage-resources/.
The 'blessing' in the timing of these later-season storms is in the reduced kernel moisture and shorter length of time till harvest. This is important to reduce the time for fungal growth in the ears. If you missed the meeting, presentations and information are at the link above. The main key I will stress: Please, ask your crop insurance agent how he/she wants to handle grain quality at harvest. Does the agent want to take samples for mold/potential mycotoxin? Does the agent go off of COOP samples? Does the agent require samples prior to going in the bin? These are key questions as we do know there is fungal growth on damaged ears. The presence of fungal growth does not automatically mean the presence of a mycotoxin. However, if grain quality isn't handled and documented correctly at harvest, it can mean the loss of compensation if grain goes out of quality in storage. If anyone is taking hail damaged corn for silage, Dr. Mary Drewnoski is interested in samples prior to and after ensiling and is willing to help with sample analysis cost. Even if silage has already occurred, we'd be interested in samples after ensiling. Please contact me if interested. I will share additional considerations next week, but please check out the weblink above (or if it's easier just go to http://jenreesources.com). Please let me know if you have any questions!

One week after the August 6, 2018 hail storm, stalk rot is setting in where stones hit the stems. This is regardless if fungicide was sprayed on fields at some point this season.

Soybean plants vary in damage. Many pods have moldy seeds where hail affected them or where they are no longer able to fill. We don't tend to worry about molds in soybean and our experience has been these become light-weight and blow out the back of the combine at harvest.

Seven days after the August 6, 2018 storm, fungal growth and mold is present on ears, but pretty much only the places where hail stones hit the kernels. Corn was at late dough to early dent at the time of this storm. The growth is minimal compared to what I've seen on ears when damaged

earlier than this when more moisture was present in kernels. Fusarium which is fluffy and white/pink in color, is what I'm seeing mostly on the specific hail stone or any insect damage on ears (I took this pic after the ears were passed around at the meetings, so the fungi don't show up well). Fusarium has the potential to create the mycotoxins vomitoxin or fumonisin-but the presence of Fusarium (or related fungus Gibberella) does not automatically mean the presence of a mycotoxin. Diplodia (white growth see at top of photo near base of ear) is showing up more now with the additional moisture events. Diplodia does not have a mycotoxin associated with it. However, it will greatly explode on an ear creating light-weight ears and kernels and can be a problem in grain storage. It is what caused the most problem in the 2013 and 2014 hail storms. It also creates problems in tight-husked ears that remain upright and moisture gets into the base of them.

York County Corn Grower Plot Tailgate will be held from 5-7 p.m. on August 23rd. The plot is located east of York on Road 14 between Roads O and P on the north side of the road. View hybrids and visit with company representatives. Also, provide your estimate of the highest yield of the plot without going over. The winner will be awarded a Yeti cooler at the York County Corn Grower banquet in November. Pizza and beverages will be provided. Hope to see you there!

South Central Ag Lab Field Day will be held Wednesday, Aug. 29 from 8:55 a.m. to 4 p.m. at 851 HWY 6 near Harvard, NE. The day will begin with registration at 8:30 a.m., followed by tours of research sites through 4 p.m. Keynote speaker for the lunch is Mike Boehm, University of Nebraska-Lincoln Harlan Vice Chancellor for the Institute of Agriculture and Natural Resources and University of Nebraska vice president. Participants will be able to choose from four of the following six tours during the day. View program brochure for schedule.

Topics include the latest research in: Cover crops to corn issues; Corn insect management; Comparisons of variable rate irrigation and fertigation to fixed rate and impacts of cover crops on soil quality; Nitrogen fertilizer management (inhibitors and sensors) in irrigated corn; Corn and soybean disease updates; and Opportunities and challenges for weed control in soybean. CCA credits have been applied for. To register, please go to: https://go.unl.edu/2018scalfieldday by Aug. 26 for lunch planning purposes. Directions: 13 miles east of Hastings on Hwy 6 or 4.5 miles west of the intersection of Hwy 14 and Hwy 6. north of Clay Center.

Hamilton County Corn Grower Plot Tour will be held August 29th beginning at 11 a.m. The field location is just west of M Road and Hwy 34 on the south side (4 miles west of the Hwy 34 and 14 junction in Aurora), just past the viaduct. The program will feature Tom Hoegemeyer talking about the history of corn and how plant breeders have improved the yields. Kelly Brunkhorst, Executive Director of the Nebraska Corn Board will round out the program with an update on trade, the farm bill, and tariffs. Lunch starts at noon at the Oswald Farm followed by the featured speakers. The farm is located from L Road and Hwy 34 (5 miles west of the Hwy 34 and 14 junction in Aurora), 1 mile south to 12th Rd., then 1/2 mile west on the south side of the road.

Irrigation Field Days: Field days on Aug. 27 and 28 will demonstrate soil water measuring tools in production fields designed to help growers feel confident with their irrigation scheduling decisions. The demonstrations will show several irrigation scheduling equipment systems that were installed in the field this summer and have been recording data. Field Days will be located:

- **August 27 – near Broken Bow.** The August 27 presentation will be part of the Custer County Corn Growers 2018 Field Day at the Jeremy Coleman farm near Broken Bow. The tour will start at 5:30 p.m. at the field site, located five miles west of the intersection of Hwy 2 and Callaway Road then south ¾ mile on 433 Road. A meal will be served about 6:30 p.m. at Coleman's shop one mile east of the field on Road 798. The educational program will be presented during the meal.
- **August 28 – near Bradshaw.** The August 28 tour will start at 12 p.m. with field demonstrations of the irrigation scheduling equipment, followed by a meal and presentations in the farm shop. The Bruce Hudson farm is at 2405 Road G, Bradshaw. That is 3.5 miles east of Polk on Hwy 66 to Rd G and 2 .7 miles south or from Benedict (Hwy 81 & State Spur 93C) 6 miles west to Rd G and 2.25 miles north.

Jenny Rees 8-26-18

Reminder of South Central Ag Lab Field Day August 29th from 8:25 a.m.-4 p.m. (Registration at 8 a.m.)! 10.5 CCA credits have been applied for. More information at: https://go.unl.edu/zvwx
Crop Update: The rain last weekend was a blessing to many. It along with cooler temperatures has allowed for deeper kernels and delayed corn maturity. In fact, if we were to stay at the high temperatures we were experiencing, the Hybrid Maize model was predicting maturity in our area anywhere from 1-3 weeks early. Now, it's mostly just predicting one week early (for anything that isn't already mature). It also is showing above average yields for non-irrigated corn where drought-stress and hail weren't a factor. Irrigated yields are showing near average according to the model for most fields in the area. You can see all the graphs and read more in this week's CropWatch at http://cropwatch.unl.edu. Corn has reached black layer in many of the hail damaged fields I've looked at and some of the drought-stressed fields will begin harvest in a few weeks. The rain also greatly helped the soybeans, even in drought-stressed areas.

However, the rain also greatly increased stalk rot in fields, particularly in hail damaged ones. We weren't seeing a large amount of mold in the first 7-10 days post-hail in hail damaged fields that were late dough to early dent. Now, nearly 21 days later, we're seeing fungal growth increasing with the moisture and humidity within the husks of corn ears. It will be very important to check your fields to determine worst ones and worst areas of fields regarding stalk rot and kernel damage. Those areas should be harvested first if they're being taken for grain and we're recommending to fill any contracts with grain from those areas first. In checking for stalk rot, I prefer a 'pinch test' compared to a 'push test'. With the pinch test, take your thumb and first finger and pinch the stalk internode that occurs between the lower nodes above the soil line. Do this for 20 plants in an area and get a percentage for those that crush. Then do this for several areas of your field. This gives you an indication of the level of stalk rot for your field and worst affected areas.

Cover Crops: With recent crop insurance determinations on these damaged fields, I've received an increasing number of questions regarding cover crop use. We're already seeing weeds germinating in these fields due to open canopies, so weed control is one considerations for using a cover crop right now. Other reasons expressed have been for excess nitrogen uptake and also for a forage option. Dr. Mary Drewnoski, Extension Beef Nutritionist, Dr. Daren Redfearn, Extension Forage Specialist, and I talked through options to consider right now.
Always check with your crop insurance agent before seeding a cover crop into hail-damaged fields. It's also important to check replant, forage and grazing restrictions regarding the herbicide program you used and any delay necessary before seeding a cover crop and any forage restrictions to grazing a cover crop. (See Replant Options and Herbicide Rotation Restrictions and Forage, Feed, and Grazing Restrictions for Row Crop Herbicides, both excerpted from the 2018 Guide for Weed, Disease, and Insect Management in Nebraska, EC130.)

In general, we're at an interesting time for making cover crop decisions. Typically we use September 1 as the divider between planting small grains such as oats that will winterkill and winter hardy cereals such as rye or triticale (planted after September 1). Even with brassicas such as turnips, collards, or rapeseed, we'd recommend the cutoff for seeding to be within the next two weeks. Because of this time frame, mixes may be beneficial because they'll take advantage of whatever weather we have for the rest of the season. Simple, inexpensive mixes may allow for at least something to become successfully established. So, for those looking at something to winterkill, oats could be planted yet this week as could a mix of oats and brassicas. However, after this week, we'd be looking at either adding something like rye or triticale to the mix or just switching to the more winter-hardy small grains. And honestly, while it isn't mentioned in the table, if a person's goal is cover the ground for weed management, bin-run wheat is also an inexpensive option. Your local seed supplier can provide seeding rates for cover crop options and we've provided a table with these options, depending on your goals, at http://cropwatch.unl.edu.

Yellow or red tops in corn plants: For a month now, we've observed yellow tops in corn

plants. Plants that contain ears and are turning yellow from the top to the middle of the plant can be occurring because of anthracnose top dieback or another disorder called 'top leaf death or dieback in corn'. Some plants with this discoloration truly do have anthracnose spores present on the stalk and sheaths. However, there have been other situations where I couldn't find the presence of anthracnose spores. In those situations, the plants were often on compacted areas of field edges, always had a nice ear on the plant, and sometimes had tillers as well. Dr. Bob Nielsen at Purdue mentioned they had found what's called 'top leaf death' in corn in situations where they experienced more drought or heat stress. Those plants had leaf discoloration similar to anthracnose top dieback, but without the presence of the spores. So, for those situations where I'm not finding anthracnose spores, I'm calling it this top leaf death

disorder. You can read more about this at: https://www.agry.purdue.edu/ext/corn/news/timeless/topleafdeath.html.

COVER CROP	USE/GOAL	WHEN TO PLANT	HOW TO SEED	RATE (PER ACRE)	ADDITIONAL NOTE
OATS	Weed Management	By Sept. 1	Drill best. Can fly on.	30-40 lbs	*
OATS/RYE MIX	Weed Management	By Sept. 1	Drill best. Can fly on.	30 lbs each	*
OATS	Forage	By Sept. 1	Drill best. Can fly on.	80-90 lbs	*
OAT/RYE MIX	Forage	By Sept. 1	Drill best. Can fly on.	30-40 lbs of rye and 50-60 lbs oats	*
BRASSICAS (TURNIP, COLLARD, RAPESEED)- NOT OILSEED RADISHES	Cover ground, forage, nitrogen uptake	By Sept. 1	Fly on for quicker establishment.	5-6 lbs	—
RYE	Weed management, cover ground, forage, nitrogen uptake	After Sept. 1	Drill best. Can fly on.	50-60 lbs	*

*If adding a brassica to any of these small grain options, only 2 lb/ac is needed. Rapeseed isn't as well known, but is an inexpensive and good option for consideration.

Table 1. Cover crop considerations for late-season hail-damaged crops

Jenny Rees 09-07-2018

By the time this is printed in newspapers, we'll be remembering September 11th. Grateful for all the first responders and all who have served our Country to defend our freedom since that day. Grateful for the sacrifices their families have made as well. Thinking of and praying for the families of those who lost their lives in the attacks and in defense of our Country since. May we never forget!

Encouragement: The wet weather has created challenges with harvest, making silage, increasing ear/stalk rots, kernel germination, and dampening spirits. So seeking to encourage: grateful for the soil moisture profile recharge the rain has provided and how it's allowing pastures to recover and cover crops to grow! It's really special to live in a State where our State Fair is now so ag and family focused! It was wonderful seeing so many farm families during the fair and I look forward to seeing many during Husker Harvest Days too! Thankfully harvest will be here soon and we'll appreciate the sunshine that much more when we see it again!

Sprouted Kernels: I'm seeing and hearing of kernel sprouting in hail damaged and drought stressed corn in addition to corn hybrids that have tighter husks and upright ears. Sprouting is also occurring in soybean. So why are we seeing this?

Prior to full maturity it comes down to a hormonal imbalance within the kernels between gibberellin and abscisic acid (ABA). According to a study by White, et. al (2000), Gibberellin production with the lack of ABA allowed for kernel germination while less Gibberellin and more ABA deterred kernel germination. At full maturity, very little ABA is left in the kernel (in both corn and soybeans) which allows them to germinate in correct conditions after harvest.

These conditions include temperatures above 50ºF and moisture. Thus the continuous drizzle and rain we've experienced can allow for sprouting within soybean pods. In corn, sprouting under those conditions typically occurs at the base of the ear first but we're also seeing it in exposed

ear tips. We've also seen Fusarium and Gibberella ear rot fungi occurring in ears that have been damaged by hail and/or insects in ears. These fungi also produce gibberellins which can aid in the hormonal imbalance and stimulate kernel germination.

If you're seeing kernel sprouting in your field, make sure your crop insurance adjuster is aware of the situation and submit samples for kernel damage due to mold and sprouting. Also check for mycotoxins prior to harvest if ear molds are a problem in your field. The local co-op will decide whether to accept the load based on percent damage and the standards they need to follow. If the load is rejected, contact your crop insurance agent to determine your next step.

Sprouted kernels lead to higher kernel damage and more fines in a load. Keys for harvest will include

- harvesting early,
- drying it to 14%, potentially drying at a high temperature to kill the sprout,
- screening out fines, and
- monitoring stored grain closely for hot spots, mold, and additional sprouting grain.

With the moisture continuing to exacerbate corn ear molds,particularly in hail damaged fields, you may also decide to take the grain for silage instead. More information regarding correctly making silage can be found at: https://cropwatch.unl.edu/2018/silage-hailed-corn.

Husker Harvest Days Cornstalk Baling Workshop: Baling of cornstalk residue has been an increasing topic of interest among growers. Reasons are many including residue management when cattle don't graze a field, use of residue as a feedstuff, and as was the case in 2017, to bale up much of the downed ears with the cornstalks. With this interest, we've had individuals contact us about custom baling residue as an additional income source. With the topic of residue baling comes many questions. These include:

- What is the nutrient value of the residue removed from the field?
- What are the impacts of residual removal on subsequent yields and field soil properties?
- What is the feed value of that residue?
- How do I best set my current equipment to bale corn residue?
- Is my current equipment the best to bale corn residue?

This year, Nebraska Extension, Farm Progress, and several forage equipment manufacturers are partnering in a Corn Residue Baling Workshop at Husker Harvest Days (September 11-13). The workshop will be from 1:30-2:00 p.m. daily in the fields adjacent to the haying demonstrations, which begin at 2 p.m. Equipment manufacturers who have committed to the demonstration include: CNH, AGCO, Rowse Rakes, Vermeer, and John Deere.

Some of the manufacturers will be showcasing the same equipment in this workshop and in the haying demos. Each manufacturer will talk briefly about their equipment and specific settings that might be needed to make their machinery work better on residue. Because of the high moisture content of the corn residue during the Husker Harvest Days Show, equipment demonstrations of baling residue are not a possibility; however, videos of the manufacturers' equipment in action can be viewed in the University of Nebraska Institute of Ag and Natural Resources building.

Great to see many farm families at Husker Harvest Days last week and also great to see harvest getting started! Just a reminder for all of us to watch for equipment on the roads and allow for extra time to slow down, particularly with the speed limit changes. Dawn, dusk, and the evening can be the hardest times to see equipment and it can be difficult to see how wide or long the equipment extends. Harvest is hard work and a lot of hours yet is also a blessing to finish the growing season. Here's wishing everyone a safe harvest season!

Harvest: As storm and drought-damaged corn is being harvested, just a reminder that grain should be tested for presence of ear molds and any potential mycotoxins now in addition to moisture/test weight. I'm hearing some differences in what's all being tested when the harvest sample is taken, so be sure to talk to your insurance agent about this. It's important to also test for mold and potential mycotoxins as that gives you an indication of what's in the grain, particularly if any grain is going into the bin. We'd recommend not binning the worst damaged fields/areas of fields, particularly if you have a lot of diplodia in the field. Drying grain to 14% moisture as quickly as possible will stop most fungal growth and we recommend drying to 13% if diplodia is an issue in your corn ears. I'm also consistently hearing about light test weights in the storm damaged grain. Rapid crop dry down has been a topic of conversation; I'll share more next week. Briefly, grain moisture loss occurs when husks lose their color, when portions of the ear are exposed above the husk, with looser husks around the ears, when ears turn down, and when there's fewer and thinner husk leaves. For those asking about dying patches in soybean fields (in which pods are not filling seeds), I'm consistently finding anthracnose in samples but am unsure it's always been the cause. The concern with rapid dry down in corn is just how quickly these plants are cannibalizing stalks to keep filling ears, the amount of stalk rot in fields, and large ears (watch for potential weakened ear shanks due to various stresses). I test for stalk rot using a pinch test where I pinch the internode between the lower plant nodes for 20 plants and determine a percentage throughout portions of fields. Consider harvesting fields with higher amounts of stalk rot/weakened ear shanks first and also consider harvesting at higher moisture. I'm finding stalk quality quickly deteriorating, even in non-storm damaged fields.

For those with palmer amaranth on field edges, just a reminder that 99% of the seed is still viable going through that combine. Thus, the combine is one of the best ways of spreading palmer throughout your field and from field to field. My recommendation from observing palmer spread the past five years is to avoid combining field edges, strips, or patches where palmer is an issue. Instead, disk down the field edges to bury the seed and then plant an inexpensive small grain like bin-run wheat to reduce early germination next spring. Some have also planted rye. I don't know if shredding vs. one-time disking is as effective this time of year (since palmer shoots seed heads at the soil line too but unsure if if produces viable seed past mid-September here). As I've spoken during pesticide trainings and other meetings, farmers have also shared their experiences. Some farmers shared they took this advice and reduced the problem the successive year and didn't spread it through their fields (even if they were no-till farmers and had to till the field edges one

time). I've had other farmers share they combined that field edge or patch and could tell the following year exactly where the combine went for the first few passes within the field as the palmer was a problem there. So, just another consideration as it takes a system's approach for everything we do including weed management; palmer management begins right now with harvest.

Another management consideration is to harvest soybeans as close to 13% (the elevator standard) as possible. And, I realize this is easier for me to write about than to actually do depending on many factors! Soybeans delivered below or above 13% moisture lose potential profit. At greater than 13% moisture, there is a moisture dock on the scale ticket for delivering wet beans, resulting in a lower price per bushel. And with less than 13% moisture, profit is lost because there are fewer "bushels" to sell rather than a dockage on the ticket. There are fewer bushels because the load weight is divided by 60 pounds per bushel (assuming 13% moisture) rather than by the actual pounds per bushel for the moisture content of the beans at the time of delivery. If you sell soybeans at 8% moisture, you're losing about 5.43% of your yield; at 9% moisture, it's 4.4%; at 10% moisture, 3.3%; at 11% moisture, 2.25%; and at 12% moisture, it's 1.14% yield loss. That doesn't take into account additional risk for shatter losses during harvest. For a field that's yielding 75 bu/ac, harvesting it at 9% results in selling 3.3 fewer bushels per acre based on weight because you're not selling the water that you're entitled to sell if the beans were at 13% moisture. With soybeans priced at $7/bushel, that's a loss of about $23 per acre (with greater loss when soybean price increases).

Fusarium (white/pink/gray) is the primary ear mold on this hail-damaged ear with Pennicillium (blue-green) as secondary.

Gibberella stalk rot (related to Fusarium and looks similar). Gibberella is characterized by breakage at the node with pink discoloration within the pith tissue and black fungal structures (not clear in this photo) on the outside of the stalk node.

Seeing soybeans dying in patches like this in a number of fields where early death led to reduced pod fill. Finding anthracnose on stems but unsure it's always the cause. Not always finding phytophthora or sudden death syndrome either in these patches.

Palmer amaranth is often observed along field edges. Consider not running the combine through edges or patches with palmer to help avoid spreading it throughout your field.

Jenny REESources

It was great seeing harvest progressing this week and a challenge to stay ahead of harvest notes with on-farm research plots coming out! With the craziness of this week, I didn't get a CropWatch article written on rapid drydown of corn and soybean. However, there's a really good resource on this topic from Bob Nielsen at Purdue and you can find it here: https://www.agry.purdue.edu/ext/corn/news/timeless/graindrying.html.

Purple Seed Stain: I meant to write about this last week as I was finding it in fields pre-harvest. So far I've seen or heard it to be mainly in mid-group 2 bean varieties. During early to late seed fill, you may have noticed some reddish/bronzing color on soybean leaves. This can be due to Cercospora Blight in soybean. The disease is also characterized by leaf drop while petioles remain. However, while the same fungus causes both Cercospora Blight and Purple Seed Stain, there's no clear association as to how much seed stain will be observed if the leaf blight also occurred. The fungus, *Cercospora kikuchii*, is related to the fungi causing gray leaf spot in corn and frogeye leaf spot in soybean. Thus, humidity, leaf wetness, rain, and the cloudy conditions experienced in August and early September allowed for Cercospora species in general to increase late this past year. Purple seed stain symptoms appear as pink or purple specks or splotches occurring on the soybean seed. I haven't heard of enough seed symptoms in loads to affect docking, but it could happen if fields were affected severely enough. There are resistant varieties to Cercopsora blight but no known resistance for purple seed stain. The fungus is seed transmitted, so seed infected with purple seed stain should be treated with a fungicide seed treatment if used for seed.

Soybean problems: Diaporthe/Phomopsis complex may be the explanation for those of you who had patches of fields turn brown/gray and die early with pods appearing flat and seeds shrunken/moldy. That's not to say there hasn't been other problems such as anthracnose, phytophthora, and some sudden death syndrome as well. Keeping a few stems and sending them into a diagnostic lab is the best way to tell. The Diaporthe/Phomopsis complex includes a number of diseases including Pod and Stem Blight, Stem Canker, and Phomopsis Seed Decay. Infections can occur at any time on the plants, but infection increases with warm/humid weather close to maturity (as we experienced this year), wet weather during harvest increases pod infection, and high winds/hail/and other events that allow entry-way for pathogens into the plant.
Wheat: It's been great to receive questions the past few weeks on planting wheat! For those seeking resources, my colleague Nathan Mueller in Dodge County has dedicated a section of his web page (http://croptechcafe.org/winterwheat/) to growing wheat in Eastern NE including an email listserv that shares new information. There was also an edition of UNL CropWatch devoted to winter wheat information here: https://cropwatch.unl.edu/2018/august-31-2018. Key points I emphasize for wheat include: killing out volunteer wheat at least 2 weeks prior to planting new wheat, treating wheat with fungicide seed treatment, and ensuring proper seeding depth by ensuring enough weight on the seeder particularly when no-till planting into residue.

I realize the economics for one year don't look great for wheat. However, looking at the bigger picture, what is that wheat crop allowing in adding additional time for a forage or cover crop, breaking pest cycles, and giving you an additional 2-3 months time before needing to apply herbicides for weeds like palmer amaranth? And, what is it providing in residue for the following year to help reduce the number of weeds you see? The following comes from an article Nathan wrote on his website. There's many benefits for adding wheat in rotation and perhaps it's something you wish to consider this year! "Adding wheat to your eastern Nebraska cropping system can offer many other benefits:

1. Additional revenue in utilizing or selling the straw
2. Added profit by growing more late summer and early fall forage crops
3. Ability to more effectively incorporate cover crops
4. Selling grain at elevators with good basis, for example wheat often is 10 cents above futures in Fremont
5. Reducing herbicide cost for troublesome weeds like marestail, waterhemp, and Palmer amaranth, in short, disrupting weed cycles
6. Higher soybean yields in 3-yr rotation due to reduction in pest pressure
7. Potential reduction in yield loss from compaction by not driving on wetter soils during manure application in the fall and spring.
8. Opportunity to contract with feedlots for manure application in the summer months
9. Reduce soil erosion and nutrient loss during high risk months of April-May-June.
10. Improved soil health, soil structure, and infiltration may provide long-term profitability
11. Reduced labor cost through better distribution of workload on the farm.
12. Possible higher cost share for conservation work during the months of July, August, September.
13. Possible higher USDA CSP ranking score for planting winter wheat resulting in additional revenue
14. During periods of dry years, dryland corn yield boost the following year.
15. Demonstrated local success at obtaining high yields (100 bushel/ac)"

Early Leaf Drop: The rain and humidity increased our fungal diseases in shade trees and we're seeing early leaf drop in some species as a result. In particular, I've received calls and looked at ash, maples, lindens, crabapples, and flowering pears. Early leaf drop also may be due to the environmental swings we experienced this year from rain and cooler temps to hot, dry conditions. We don't recommend homeowners do anything about this and it shouldn't impact the long-term health of the tree.

JenReesources 9-30-18

Crop Update: In some ways it's felt like a strange harvest season with how much of the area crop was harvested early due to storm damage and drought, but that's also a blessing. It's also been a blessing to have had surprisingly good test weights from some of the hail damaged corn and low mold damage reported thus far. There's still a lot of harvest to go and I think stalk and ear rots are on the minds of us all.



I've been seeing more 'less common' ear rots this year and starting to receive questions on them. These include Nigrospora ear/cob rot, Cladosporium rot, and Trichoderma rot. These are caused by weaker fungi feeding on ears of plants that were stressed or killed prematurely. So hybrids that had problems with anthracnose top dieback, top leaf death, root rot issues, shortened husks with exposed ear tips, and hail/wind damage may have more problems with these diseases. Symptoms include when the cob feels rotted or falls apart when you break an ear in half. With Nigrospora, the kernels often have black spores on them and the spores can also be noticed on the cob pith as well. With Cladosporium and Trichoderma, the spores appear more green in color. None of the fungi causing these diseases have a mycotoxin associated with them, which is good. The diseases can create lighter test-weight ears and can create more chaff and dust during harvest due to the cobs falling apart. In storage, the biggest problems would be the fines, broken cobs, and extra chaff; keeping the grain below 15% moisture will stop fungal growth.

I've also had people asking for more specifics on conducting the pinch test to determine percent stalk rot in the field. Sometimes it's easier to visualize this versus me keep writing about it. Thus, I created a very short video this week to hopefully help. One note is as you do this pinch test, the stalks may not completely crush, but a stalk with rot has a definite 'give' to it. You can view the video at: https://www.youtube.com/watch?v=7z75VN1c51Q. For those who left hail-damaged soybean standing in fields with yields less than 5 bu/ac, some have asked about grazing those acres. For whole fields, we were recommending seeding a cereal into them (like rye at this point) just to offset the fat content of any remaining beans and provide some cover on the ground. That's still a possibility for those interested in doing this. Some have also asked about grazing the soybean acres adjacent to seed corn residue without adding in a cover crop. That could be an option too and we don't anticipate problems with that situation. When grazing seed corn or corn residue in any fields, it will be important to determine amount of ear loss on the ground prior to grazing. A way to do this is to measure off 100 feet and count the number of ears you find within that distance; do this 3 times throughout the field (for a total of 300 feet). Add the total number of ears found in 300 feet. Then, assuming each ear is about 0.5 bu, multiply the total number of ears by 0.5 to

determine the average bushels on the ground in the field. Normal grazing management can be used if the total is 10 bu/ac or less on the ground. If more than that, different management needs to be considered and the following is a good resource for those considerations: https://go.unl.edu/8j4n.

For those asking about wheat varieties for Eastern Nebraska, the following resource may be of benefit to you at: https://cropwatch.unl.edu/2018/winter-wheat-varieties-eastern-nebraska-fit.

Also, Aaron Berger, Nebraska Extension Educator who conducts podcasts for the UNL Beef website, recently interviewed Chad Dane, a Clay County farmer. You can hear this podcast on "A Row Crop Farmer's Perspective on Cover Crops and Cattle Grazing" at: http://s3-us-west-2.amazonaws.com/unlbeefwatch/2018/Sep_2018_Chad_Dane.mp3.

Jen REESources 10-07-2018
Grateful for the crops that have been harvested thus far! Also grateful for so many paying attention to grain quality coming out of the fields! That's been a large part of the past 10 days for me…obtaining grain samples and pictures to answer grain quality questions from quite an area. So I did a quick literature review to better understand the conditions when various ear rot fungi grow and also put together a blog post to hopefully help all of us better diagnose what we're seeing in grain samples-whether corn or soybean. You can find it at: https://jenreesources.com/2018/10/08/grain-observations/.
Fungal growth in storage is based on moisture, humidity, and temperature. I've heard various numbers being used for grain storage and I'm not a grain storage expert. I can also appreciate it costs you more and takes time with the current weather conditions to dry corn. In general, most Extension publications throughout the U.S. recommend getting grain dried to 15% as quickly as possible and maintaining grain in long-term storage at 13%. Briefly, in looking through the literature, the reason for this advice is because various ear rot fungi can continue to grow on and inside those kernels. There's over 25 species of ear rot fungi with most of them ceasing growth at 15%. The main exception is Aspergillus which has species that can continue from just below 13 to above 14%. Thankfully we don't have a problem with Aspergillus this year. We are seeing a lot of Fusarium and some Gibberella (which may increase with this rain). But we're also seeing some Diplodia and other lesser ear rot fungi such as Penicillium, Cladosporium, and Nigrospora. The thing is that each fungal species has a temperature and moisture range in which they continue to grow. So if one is growing in a kernel, it gives off heat and moisture allowing for changes in temperature, humidity, and moisture within that area which can allow for other fungal species to grow. Fungi grow from one infected kernel to adjacent kernels. Having more 'fines', cob pieces, etc. can increase potential for fungal growth in the bin. Insects also give off heat which changes localized dynamics. Because of these reasons, our recommendation is to get grain dried to 15% as quickly as possible to help stop fungal growth we're experiencing this year, particularly from *Fusarium* species. We're not saying you need to get the grain dried to 13% immediately. It's only a consideration down the road if you're storing the grain till next summer. The following NebGuide is a great resource: Management of In-Bin Natural Air Grain Drying Systems to Minimize Energy Costs: http://extensionpublications.unl.edu/assets/pdf/ec710.pdf. Our grain storage resource page can be found at: https://cropwatch.unl.edu/grain-storage-management.

Also, there's a new app called "Mycotoxins" and it's another resource with ear rot pictures and mycotoxin information put out by several Universities produced for both Apple and Android devices.

Farm/Ranch Transition When You Aren't in Control Nov. 14 York: Passing the farm/ranch on to the next generation is a tough job, especially if the next generation is unsure of what will happen when their parents pass. It is especially for those people, who are wondering what is

going on, that a series of farm and ranch transition workshops are planned at Valentine, Ainsworth, O'Neill, Norfolk and York from Oct. 23 to Nov. 14.

The workshops will focus on the needs of the "sandwich generation" between parents who still own land and children who might want to join the operation, on whom farm/ranch transition and transfer often falls. Lack of communication often hinders transitions. The Gen2, or Sandwich Generation, will learn how to communicate with family to understand the transition and practice asking difficult questions.
Legal topics presented at the workshops will center around Gen2 needs, including elements of a good business entity, levels of layers for on-farm heirs control and access, and turning agreements into effective written leases. Joe Hawbaker, estate planning attorney, and Allan Vyhnalek, Nebraska Extension transition specialist, will share stories and experiences to successfully plan on the legal side. Dave Goeller, financial and transition specialist, will cover financial considerations, retirement, and compensation versus contribution.

Many families struggle to split assets fairly between on-ranch and off-ranch heirs, while continuing the ranch as a business. Goeller will discuss the family side and what to consider when dividing assets. Vyhnalek will also cover less-than-ideal situations, negotiating, and looking for other business options. The times are 9 a.m.-4:30 p.m. at each location. The closest location to this area is November 14 in York at the 4-H Building. Cost is $20 per person. If more than two people are attending per operation, the cost is $15/person. Pre-register at (402) 362-5508 or jrees2@unl.edu for meal count.

Funding for this project was provided by the North Central Extension Risk Management Education Center, the USDA National Institute of Food and Agriculture Award Number 2015-49200-24226.

JenRees 10-14-18

Well, it's been an interesting fall and I wish I had something more encouraging for our farmers this week…there have been some beautiful days/sunsets when the sun shone! Difficult with soybeans germinating in pods, popping pods, and the snow with so much harvest to go…hang in there and be safe when harvest resumes!

Regarding grain drying questions, Dr. Ken Hellevang at North Dakota State University has written several CropWatch articles at http://cropwatch.unl.edu to help us. Here's a few excerpts.

For those with questions about drying soybeans when harvesting at high moisture to get them out of the field: "Soybeans at 11% moisture have storage characteristics similar to wheat or corn at about 13.5% moisture, so 16% moisture soybeans might be expected to store similarly to about 19% moisture corn. It is important to be able to aerate the soybeans to keep them cool.

The amount of natural air drying that will occur in late October and early November is limited. The equilibrium moisture content of soybeans for air at 40°F and 70% relative humidity is about 12%. With this air condition drying should occur with soybeans above 12% moisture. However, the drying rate will be slow at typical in-bin drying airflow rates. An airflow rate of 1 cubic foot per minute per bushel (cfm/bu) is expected to dry 18% moisture soybeans in about 60 days. With an airflow rate of 1.5 cfm/bu the drying time is reduced to about 40 days. The drying time for 16% moisture soybean is slightly less. The drying time of 16% moisture soybeans is about 50 days. Adding supplemental heat to raise the air temperature by 3 to 5 degrees will permit drying the soybeans to about 11% moisture in about 40 to 45 days. Increasing the airflow rate proportionally reduces the drying time.

The moisture-holding capacity of air is reduced at lower air temperatures. As average air temperatures approach 35°F, natural air drying becomes inefficient and is not economical. Adding heat would cause the beans on the bottom of the bin to be dried to a lower moisture content and it would increase drying speed only slightly. Cool the soybeans to between 20°F and 30°F for winter storage and complete drying in the spring. Start drying in the spring when outdoor temperatures are averaging about 40°F."-Ken Hellevang NDSU. See more about drying soybeans with heat including considerations for fire risk at http://cropwatch.unl.edu.

Cooling Grain: "Cool grain with aeration to extend the allowable storage time and reduce the potential for insect infestation. Temperatures below about 60°F reduce insect reproduction. Insects are dormant below about 50°F, and extended exposure to temperatures below about 30°F can kill insects. Cooling grain as outdoor temperatures cool will reduce moisture migration and the condensation potential near the top of the grain pile. Also, the grain should be cooled because moisture content and temperature affect the rate of mold growth and grain

deterioration. The allowable storage time approximately doubles with each 10-degree reduction in grain temperature.

Grain should be cooled whenever the average outdoor temperature is 10 to 15 degrees cooler than the grain. Cool it to near or below 30°F for winter storage in northern states and near or below 40°F in southern states. Aeration ducts need to have perforations sized and spaced correctly for air to enter and exit the ducts uniformly and to obtain the desired airflow through the grain. The maximum spacing for aeration ducts is equal to the grain depth to achieve acceptable airflow uniformity."-Ken Hellevang NDSU. You can view Ken's website at: https://www.ag.ndsu.edu/graindrying.

Weed Science School Oct. 31 near Mead will address current weed science issues and recommendations for improving herbicide applications. The school will be held at the Eastern Nebraska Research and Extension Center near Mead, starting at 8:45 a.m. and ending at 4 p.m. Topics include: overview of weed control in Nebraska, NDA procedure to investigate off-target dicamba injury, industry perspective on herbicide discovery, 15 years of researching waterhemp, forensic analysis for dicamba injury, ultra micro rates of dicamba on soybean, weed ID, cover crops and weed suppression, and what does/doesn't work in managing herbicide drift. The school is free and CCA credits will be available. Please register here: https://agronomy.unl.edu/weedscienceschool.

JenReesources 10-21-18

Grateful for beautiful weather and harvest progressing again! We got the York County Corn Grower Plot out on Friday and special thank you to Ron and Brad Makovicka for their work and dedication to that effort! I will share the official plot results next week. The York County Corn Grower Banquet will be held on Thursday, November 15 at Chances 'R in York with social time at 6:30 p.m. and meal at 7:00 p.m. Tickets are only $10 per person for a wonderful meal! Tickets can be obtained from any of the local directors or from the York County Extension Office at (402) 362-5508.Nate Blum from Nebraska LEAD Class 36 will give a presentation on his international tour and there will also be updates from Local, State, and National Corn Directors. For those who estimated yields during the plot tour, you need to be present in order to win the Yeti cooler.

Corn Yields: There's an interesting article in this week's CropWatch at http://cropwatch.unl.edu regarding final yield forecasts. Interesting to me are the box plots showing the range of '30 year average' vegetative and reproductive stages vs. 2018. The high heat in June shortened the vegetative time-frame. However, the silking through grain fill period was relatively typical for most locations and the long grain fill period with lower temperatures allowed for the better yields we're experiencing (where drought and late-season hail wasn't a factor).

Soybean Harvest Losses: Four soybeans in one square foot equals 1 bu/ac harvest loss. Various publications show how to determine harvest losses in areas of 10 to 25 sq. feet. For those with the SoyCorn Pocket Field Guide, page 78 shows estimating loss based on combine header width: http://nebraskasoybeans.org/wp-content/uploads/2017/02/SoyCorn-Field-Guide.pdf.

Evergreen Trees: Some evergreen needles are also changing color right now. It is good to look at your trees to determine the cause of the needle color changes. Evergreen trees actually go through a natural needle drop process with some years resulting in more thinning than others. I think this year may be one of those years as stress events can make needle drop heavier. Needle drop appears as needles turning yellow and falling from the tree. Pine trees may keep their needles for 2-3 or more years while spruce keep theirs for 5-7 years before needle drop occurs. Natural needle drop tends to appear along the main trunk and inside needles of the tree.

I also check for the presence of fungal disease. If the pine tree needles have dark spots/bands on them, it may be a fungal disease like dothistroma needle blight (on Ponderosa and Austrian pines) or brown spot (on scotch pines). The fungi actually kill the needles both directions from the location of the infection. With our heavy rains and high periods of humidity, I'm seeing increased fungal disease in evergreen trees this year. Fungicides applied in mid-May and again in mid to late June can help prevent this.

Pine wilt disease occurs in Scotch and Austrian pines. It's caused by a bark beetle that has nematodes in its gut. The nematodes are native to Nebraska but Scotch and Austrian pines are not. Ponderosa pines aren't

affected because they're native to Nebraska. The beetle 'vomits' the nematodes into the xylem (water-carrying vessels of the tree). The tree senses the presence of the nematodes and shuts down water to various branches as a way to prevent the nematodes from attacking. Thus why one sees a major branch then side of a tree turning gray-green then yellow-brown. Unfortunately, the entire tree will die typically within 3-9 months. Some farmers have tried trunk injections and drenches around their trees in hopes of saving them, to no avail.

On spruce trees, I'm seeing yellow/purple/browning of needles. This often is due to a fungal disease called rhizosphaera needle cast. One way to determine if this is the culprit is to look for tiny black dots on the gray twigs next to affected needles. The black dots are actually fungal structures that allow for infection to occur. Fungicide applied in May and after heavy rains can help. I always intend to spray my spruce tree each May but have failed to get it done the past several years. With recent rains, I'm trying it this fall to see if it can help; will let you know!

There have been several calls about arborvitae rapidly turning brown and I'm seeing evidence of heavy spidermite pressure at one time. Spruce spidermites affect spruce, juniper, arborvitae, etc. The rains and snow washed them off, which is one way to manage them. Evidence can be stippling (tiny yellow-green dots on needles) and also using a magnifying glass, one may see some webbing on undersides of needles. One can also just bang the needles on a white piece of paper to see if any mites are still active. Mites are most active in the cooler times of the season…so August through October in this case. Great resources for additional information include: Diseases of Evergreen Trees and Insect Pests of Evergreen Trees which can be obtained here: https://nfs.unl.edu/publications.

The dark spots/bands observed on these needles are indicative of fungal disease (dothistroma needle blight on Austrian and Ponderosa pines) and (brown spot on Scotch pines). The fungus kills the needle both directions from where infection occurs creating needles that are often part green to yellow-brown eventually becoming yellow-brown.

JenRees 10-28-18

Dates are something I tend to remember. This past week I was reflecting on a year ago: fire dangers with three wind events including the Thursday event that was the final straw, a beautiful Wednesday for getting plots out, and then Friday seeing the massive change in yields due to dropped ears. To me, many challenges began with last year's harvest, and many may wish to forget last year. But reflecting also allows us to learn and count our blessings. Grateful for all the harvest that occurred the past couple of weeks with beautiful weather!…especially since things looked pretty bleak with all the rain and the snow event! Grateful for good yields overall and that we're not dealing with widespread dropped corn ears at this time!

With the challenges on the soybean side, there's two

Soybeans showing discoloration from purple seed stain, Phomopsis seed decay, and potential stinkbug damage.

articles in this week's CropWatch at http://cropwatch.unl.edu that may be of interest. One is about feeding soybeans to cattle. With reports of elevators rejecting soybean loads to the east of our area, we received questions if they could be fed. The Cercospora fungus causing purple seed stain and the Phomopsis fungus causing seed decay do not produce mycotoxins. We're not aware of any soybean mycotoxins. We also don't know how these fungi affect soybean seed quality regarding the feed value. So, we recommend testing for that if you're interested in doing this. Another article is by Cory Walters, UNL Ag Economist talking about crop insurance help with various dockage that one may have received. This fall's weather could trigger indemnity payments due to low quality. This is just a short excerpt of his article. He writes, "The following discussion describes how crop insurance adjusts soybean yield due to quality for a particular county. While I

have not found any differences in discount factors among counties, it is possible. The final outcome depends upon what the county actuarial documents stipulate. Discount rules contain quite a few if/then statements, so final outcomes will depend upon the particular production characteristics.

…Final yield is determined by multiplying the harvest yield by one minus the sum of all discount factors. Factors for each discount type are summarized as follows:

- A sample **grade** outcome results in a 3% discount factor so no discount factors for any other grade.
- For **test weight**, discount factors start at 48 to 48.99 lb with a discount factor of 0.7% that increases to a 1.5% discount factor with a 44 to 44.99 test weight. Test weights lower than 44 are settled through the other category.
- **Damage** discounts start at 8.01% with a 4.4% discount factor that increase to a 25.2% discount factor with a 34.01% to 35% damage. Just like with test weight, damage over 35% are settled through the other category. Damage includes everything except heat.
- **Odor** sample grade discounts are 2% for musty odor, 2% for sour odor, and 4% for commercially objectionable foreign odor (COFO).

For example, suppose your harvest soybean sample comes back as grade 4 with a 48.5 lb test weight and 9.4% damage. The field yielded 50 bu/ac. Yield would be reduced by 5.9% from the summation of 0.7% (test weight discount) + 5.2% (damage discount). Final yield would equal 47.05 bu/ac (50 x (1-.007-.052)). An indemnity will be paid if harvest revenue is less than guaranteed, which will vary among producers with different insurance products, coverage levels, and APHs.

Producers with multiple insurable units, likely coming from optional or basic units, should contact their insurance agent to determine the process for keeping samples of each unit. This is very important when soybeans are going to the bin. Quality discounts found here will likely not cover the entire price deduction found at the elevator. While this is unfortunate, some coverage is better than none. It is possible to get discount factors updated and/or modified for upcoming insurance contracts." For questions and comments please contact Cory Walters at cwalters7@unl.edu and view the entire article in this week's CropWatch.

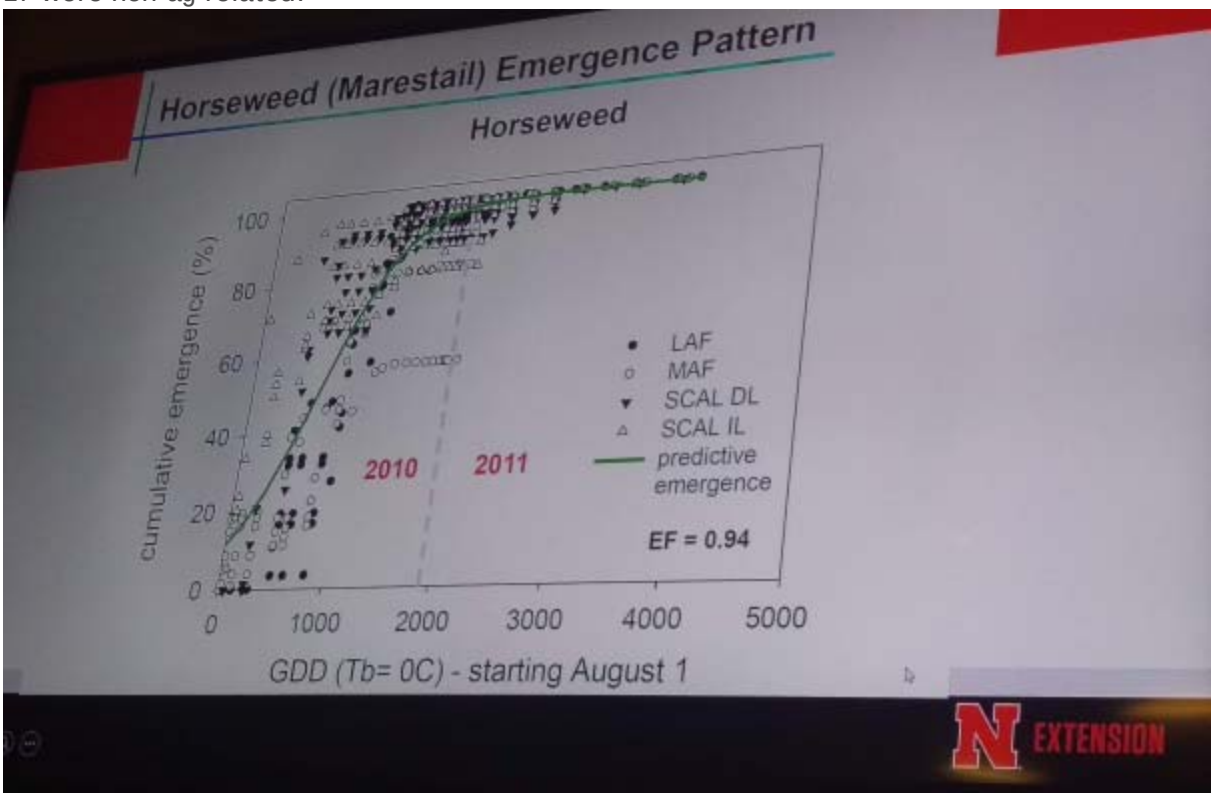
Fall Burndown Apps is something we recommend, particularly if you have a problem with marestail or winter annuals like henbit in your fields. Nebraska data has shown over 60% of marestail germinates in the fall. Amit Jhala, Extension Weed Scientist shared an article in this week's CropWatch. The following is a small excerpt, "Preliminary data for eastern Nebraska suggests that a fall burndown applied with a residual herbicide may eliminate the need for an early spring burndown for marestail control; however, this would not replace an at-planting residual application for management of additional troublesome weed species such as waterhemp and Palmer amaranth. For successful marestail management in the fall, apply herbicides following harvest while weather conditions remain favorable (air temperature above 50°F).

- Glyphosate-resistant marestail is widespread across eastern Nebraska, thus 1 lb a.e. 2,4-D per acre is recommended as the base treatment for marestail burndown.
- Glyphosate or other products such as Sharpen® or Gramoxone® may be tank-mixed with 2,4-D to provide broader spectrum control of winter annuals and certain perennial weeds.
- We generally do not recommend including residual herbicides in fall applications since they provide little benefit in managing weeds that emerge the following spring; however, if infestation of marestail is high in the field and the field has a history of marestail seedbank, it would be advantageous to add a residual herbicide such as Authority® or Valor® or Autumn™ Super, or other metribuzin products.
- Refer to the most recent Guide for Weed, Disease, and Insect Management in Nebraska for more herbicide options.

Fall herbicide application is unlikely to eliminate the need for burndown application at planting. Weeds adapted to cool temperatures, such as marestail, are likely to emerge prior to planting, making it necessary to control them." He also shows photos in this Week's CropWatch article of fall tillage or use of rye cover crop as additional options for reducing/suppressing marestail and other winter annual weeds.

JenRees 11-4-18

Last week I had the opportunity to attend and speak at the Weed Science School. It was an interesting day of learning, discussion, even reflection. Dr. Amit Jhala, Weed Science Specialist, did a really nice job of organizing the day and creating opportunities to hear from University, Industry, and Nebraska Dept. of Ag (NDA) speakers in addition to providing hands-on activities. While dicamba was a topic that was discussed, we didn't hear about EPA's ruling till the following day that the RUP products for soybean will be re-registered. Tim Creger with NDA shared that 6 other dicamba products, most with pre-mixes, will be registered this year. He also shared there are 40 ag labeled dicamba products that are not restricted use pesticides, and as long as they aren't registered for soybean use, he doesn't anticipate they will become restricted use pesticides. Comparing NDA claims from 2017 to 2018, they received 95 claims (24 investigated due to lack of resources) in 2017 compared to 106 (50 investigated but only 31 resulted in full investigations due to desire of the person filing the complaint) in 2018. Of the 106 claims in 2018, 17 were non-ag related.



In last week's column, in sharing about fall burndown apps, I had mentioned that 60% ofmarestail (horseweed) in Nebraska germinated in the fall. An updated number of 90-95% fall germination for Eastern Nebraska was shared. This once again emphasizes the importance of considering fall apps for fields with marestail pressure.

Dr. Kevin Bradley from University of Missouri shared on 7 points he's learned from 15 years of researching waterhemp. They included: Never underestimate waterhemp (I'd say the same for palmer); Era of simple, convenient, quick control is over; Use full herbicide rates and pre-emergence herbicides with residual; Overlap pre + post applications (which we also see with palmer-put that post on a week earlier than you think you need it); Glufosinate, dicamba, and 2,4-D may work now but they're tools being abused; New traits won't solve the problem; and Get

rid of herbicide-centric way of thinking-we need an integrated approach. He thought he was sharing something shocking in that last statement, but I'd say several of us seek an integrated system's approach to what we do, including weed management. So ultimately, herbicides aren't the answer for weed control and we need to be thinking about management from a system's perspective including crop rotation, use of cover crops, residue management, seed destruction, etc. Especially as from the industry perspective presented, it takes an average of 12 years and average investment of $250 million for a new chemistry to be developed. They are seeking chemistries now that work on specific sites of action (how targets within plant) within the mode of action (specific group or chemistry number).

On November 14th, we're hosting a Farm/Ranch Transition workshop at the 4-H building in York. This is the closest location for our area. The workshop will focus on the needs of the "sandwich generation" between parents who still own land and children who might want to join the operation, on whom farm/ranch transition and transfer often falls. The Gen2, or Sandwich Generation, will learn how to communicate with family to understand the transition and practice asking difficult questions. Legal topics will include elements of a good business entity, levels of layers for on-farm heirs control and access, and turning agreements into effective written leases. Joe Hawbaker, estate planning attorney, and Allan Vyhnalek, Nebraska Extension transition specialist, will share stories and experiences to successfully plan on the legal side. Dave Goeller, financial and transition specialist, will cover financial considerations, retirement, and compensation versus contribution. Cost is $20 per person. If more than two people are attending per operation, the cost is $15/person. Pre-register at (402) 362-5508 or jrees2@unl.edu for meal count. Funding for this project was provided by the North Central Extension Risk Management Education Center, the USDA National Institute of Food and Agriculture Award Number 2015-49200-24226.

November 15th is the York County Corn Grower Banquet at Chances 'R in York. Social time begins at 6:30 p.m. with a wonderful meal at 7:00 p.m. We will hear from Nate Blum, LEAD 36, on his international trip. We will also hear from local and state directors. Tickets are only $10 and can be obtained from any of the local Corn Grower directors or from the Extension Office at (402) 362-5508. The winner of the Yeti cooler from guessing plot yields will be announced, and those who guessed need to be present in order to have a chance to win. Plot results can be obtained from the Extension Office. Hope to see you there for a nice evening with a wonderful meal to hopefully celebrate the end of harvest season!

Jenny Rees 11-11-18

Through the years I've been blessed to meet many individuals including farmers/ag industry professionals who served (or continue to serve) our Country in the military. I've observed how service has influenced perspective on life's difficulties for many individuals. And, I've observed how impacts of service have resulted in additional difficulties in life after service for some. There shouldn't be shame regarding the struggle or in seeking help. While it can be scary, healing can come in the midst of honesty and vulnerability. Tonight I watched a special TV interview with four highly decorated individuals of the Iraq/Afghanistan wars-a couple of whom I've read their books. It was interesting hearing their perspectives on combat then coming home, on being in the military and then getting out, and much more. They ultimately shared how difficult it is after war and after service to step into civilian life and how important their military connections were in keeping them going. They also shared how important it was to find a sense of purpose in serving others and living life well in honor of those with whom they served who never made it home. Most likely all of us can think of a family member or friend who has served. Those individuals may have stories and/or wounds without words. Let's be sure to show our gratitude to them for our freedom in America. Thank you to all our Veterans and all those in our Armed Forces for your service! Thank you also to their families!

Fall Applied Anhydrous Ammonia: When I began my Extension career, it was a different perspective for me to experience fall applications of nitrogen. My perspective from our farm was in-season nitrogen applications. Since then, there's been several research based studies regarding the benefits of in-season nitrogen application. I appreciate there's different reasons for the ways farmers approach the decisions within your farming operation. I've also observed more farmers of various operation sizes moving to more in-season applications. The reasons they've shared with me include: wanting to be more efficient with nitrogen application when the plant needs it, worried about any loss in off-season and wanting better water quality for kids/grandkids, research shows hybrids need nitrogen later in season, wanting to find a way to make it work before any potential regulation, and wondering if they can get by with less nitrogen with better timing in season. We also know today's farmers in general have become increasingly efficient in both nitrogen and water use. There's an interesting article in this week's UNL CropWatch (http://cropwatch.unl.edu) where a multi-disciplinary team of authors share on nitrogen application in the fall having enhanced risk due to potential loss. This is due to data on the increase in extreme precipitation events over time that can lead to increased nitrogen loss through leaching and/or denitrification. We also know that there are years, like last winter, where areas I served didn't even receive 2" of precip from fall through early May. So every year is different. Because we can't predict the weather, the authors suggest, "Consider a more robust and less risky N management method that includes: applying a small percentage of N near planting time; follow with sidedress N applied as late as is possible given your equipment capabilities or several fertigation applications that are timed with crop uptake needs; and ensure the final application of N is done before the R3 growth stage." They also suggest the following if you plan to apply N in the fall, "Avoid fall N application for soils of hydrologic Group

A (sand, loamy sand, sandy loam) and Group B (loam, silt loam, silt); Avoid fall application of fertilizers containing urea or nitrate; Apply only when soil temperature is consistently below 50°F to slow nitrification (Last week temperatures fluctuated above and below 50°F at the 4-inch depth.); Use an inhibitor with known efficacy when applying N; and Hope for dry cold weather!". The following is a really good resource if you're interested in different University studies regarding various nitrogen inhibitors: https://www.ag.ndsu.edu/publications/crops/nitrogen-extenders-and-additives-for-field-crops. It's too long to share here. A general summary of studies involving the inhibitor N-Serve used with anhydrous ammonia applications shows that it consistently resulted in increased ammonium nitrate the following spring (thus it worked well as a nitrification inhibitor). Yield increases were inconsistent throughout studies and years due to precipitation differences amongst the years. That resource also discusses research regarding other nitrification inhibitors in addition to urease inhibitors and slow-release N products, so it may be a helpful resource. We've also had farmers conduct on-farm research studies in the past looking at the application of inhibitors in anhydrous vs. none. They also haven't consistently shown a yield increase (and we failed to always take soil samples to document any differences in ammonium nitrate the following spring). But if you're interested in trying a study this coming year looking at nitrogen timing or use of inhibitor, please contact me or your local Extension Educator and we'd be happy to work with you!

Jenny Rees 11-19-18

Wishing everyone a blessed Thanksgiving with family and friends! We have much for which to be thankful!

Last week we held a farm transition meeting in York. I was thinking back to a family gathering we had shortly after one of my dad's farm accidents. We were grateful he was going to be ok. In talking about what needed to be done on the farm, I asked something like, "Does anyone here know what your wishes or plan is for the farm if this had been more serious?" It wasn't the best time and I didn't do this correctly. It did allow for discussion as we never talked about what would happen to the farm before that. I'm grateful my parents responded over time asking each of us kids our intentions/values regarding the farm. They then put their estate plan together and at Christmas one year, went through everything with everyone including any spouses that were present. What I appreciate the most is that they were intentional and there is no secret.

The fact that estate plans can be secret was a common frustration among attendees at the workshop…and as I talk with various farmers. Dave Goeller, emeritus Farm Transition Specialist, shared a sad story about a man in his late 60's whose 90+ year old dad still hadn't transitioned management of the ranch to him. When he asked his dad about the opportunity to manage the ranch in the future, the dad didn't wish to talk and said not to worry. I won't go into the details but when the parents passed away, the ranch was sold. What's sad is that, most likely, the outcome is not what the parents intended, and certainly not what the son hoped. We need to get away from estate plans being a secret.

Consider these questions:

- Have you been able to talk to your parents about what is happening with their estate plans? If not, why?
- What is your biggest concern/anxiety/fear(s)? What are you afraid you might find out?
- What is the biggest obstacle in your family dynamics?
- What do you love about your family business?
- What is the worst situation you can think of which might happen in the future?
- What could you learn that can help you?
- What is your *mission statement* for your farm/ranch? What is your *vision* for the farm/ranch?
- What are your *goals* for your farm/ranch? What will you do to make your vision happen?

Dave shared that while a person may feel like a 'vulture' when asking about the estate plan (as asking can come across as greed), it can really be a question over shared values. As I think about my immediate family, our shared values are faith, family, hard work, sacrifice, maintaining our family farm. I should've broached the subject using shared values instead:

"Dad, I'm so grateful God protected you and you're going to be ok! You and mom have worked so hard and sacrificed so much for us kids and for this farm. We as your children wish to see your legacy live on in keeping the farm in our family. May we please discuss what your and mom's goals and dreams are for the farm in the future?"

For those who have asked me how to have this conversation, perhaps some of these questions found in the Workbook at http://go.unl.edu/FarmRanchTransition may help? I also have copies of this workbook in the Extension Office. The questions cover a range of topics from understanding common values, asking if there are written documents, what is long term health care plan to protect the farm/ranch, contribution of all heirs, etc. Please also consider the Nebraska Farm Hotline at 800-464-0258 as a valuable and free resource for you! This hotline is a confidential resource for talking about stress, anxiety, financial concerns, and also for scheduling a time to meet with Dave Goeller and Joe Hawbaker (Attorney) for free to discuss estate plans and farm transitions. All you need to do is call 800-464-0258. For those interested in meeting regarding estate plans/farm transition, Dave and Joe have promised to come back to York to meet individually with families once they receive at least 5 calls. So, if this is of interest to you, please mention this when you call the hotline.

Final thought, this past year in particular, several farmers have shared with me their children would like to see them retire. I sense a variety of feelings about that from them as I listened. I also asked several questions including, "What does retirement look like to them? What does it look like to you?" Perhaps those and other questions could be asked in an honest conversation together?

Much of our identity, right or wrong, is found in what we do for a living. After all, we tend to ask this question when we meet new people. Through life's circumstances, I've had to learn to seek my identity in who I am. Dave mentioned to think of retirement not as no longer working on the farm or being an important player, but *retiring the management to the next generation.* So, perhaps work out a transition plan that fits your situation where the first perhaps 3-10 years, the older generation is the primary manager in a mentor role explaining why he/she made the decisions a certain way to the next generation. The next 3-10 years, decision making is shared between the older and next generation. After that, decision making is transitioned to the next generation. And, during this entire process, the older generation needs to consider what he/she will be *"retiring to"*…what purpose or meaning can be found to occupy the time that was once spent in managing the farm?

Ultimately, estate planning and farm transition…relationships…are too important to not talk about these topics. Let's no longer keep them a big secret!

Jenny Rees 11-25-18

With harvest finished or wrapping up, focus has shifted to anhydrous applications and managing residue. Corn residue management has been a topic of discussion for years. Research on this topic has included use of tillage, baling, grazing, and use of products like nitrogen.

Iowa State conducted a three year study evaluating the effects of conventional tillage, no-till, and strip-till on residue breakdown on Bt and non-Bt corn residues. They did this by placing bags of residue of Bt and non-Bt hybrids in the three different tillage systems and evaluated decomposition after 3, 6, 9, and 12 months in a corn/soy rotation. The results showed no significant difference between tillage systems or Bt and non-Bt hybrid decomposition. These researchers also studied the impact of nitrogen applications on corn residue breakdown over two years in no-till. Immediately after harvest, three N rates (UAN 32 percent) of 0, 30 and 60 lb N/acre were applied to corn residue. A specific amount of residue was placed in nylon mesh bags and left in the field for 3, 6, 9, and 12 months, after which residue decomposition was evaluated. The different rates of N resulted in no differences in rate of decomposition. In general, the longer the residue remained in the field, the more it decomposed over time, regardless of N rate. Thus the authors shared that applying N after harvest for residue decomposition was not effective nor economical as soil and air temperatures decreased over time after harvest. They shared that in general, decomposition of crop residue is primarily influenced by soil moisture and temperature which allow for microbial activity.

Last year I wrote a series of articles for my news column and shared them in CropWatch regarding cornstalk baling. A team of Extension Specialists/Educators and USDA-ARS also worked together on a workshop at 2018 Husker Harvest Days on this topic. I've received various reactions to these efforts, but my desire is to present the research. My perspective is twofold:

1. Better serving farmers/landowners in helping answer your residue management questions via the research available and
2. With the high winds, dust storms and vehicle accidents last winter/early spring, could we potentially rethink residue management besides so much conventional tillage for this part of the State?

I took this photo Feb. 2018 on I-80.

I'm not saying conventional tillage doesn't have a place, especially as we think of one-time burial of weed seed. I just wonder if we can help reduce soil loss by utilizing other methods of residue management, perhaps including increased use of livestock grazing and cornstalk baling under the right field situations.

Summarizing the research, cornstalk baling is not for every piece of ground or every situation. From the research, our recommendations are that baling of corn residue should only occur on ground with less than 5% slope that yields 180 bu/ac or more, harvesting no more than 2 tons/acre. Retaining at least 2.4 tons of residue allowed for soil carbon maintenance and retaining more residue also reduced erosion. Every 40 bu/ac of corn results in 1 ton of residue at 10% moisture. Baling on fields fitting the above-mentioned criteria should

occur a maximum of every other year in continuous corn or once every four years in a corn/soy rotation (due to reduced residue already present after soybean harvest). The research showed no significant impact on soil properties or soil carbon following those guidelines. Other recommendations would be to use a reduced tillage system in the field where baling occurred and consider planting a cover crop and/or adding manure.

In 239 site-years across 36 studies, corn residue baling resulted in 3% average yield increase where moisture was not limited, most likely due to more uniform stands. The average nutrients found in 1 ton of corn or sorghum residue was 17 lbs of Nitrogen, 4 lbs of P2O5, 3 lbs of Sulfur, 34 lbs of K2O (which due to Nebraska soils being high in K, the value may be 0-50% of this depending on soil test results), and cations equivalent to 30 lbs of lime. There's also research that suggests less nitrogen is needed the following year going into corn due to the change in the C:N ratio and increased mineralization. So corn residue baling, based on the research, can be an effective way of managing residue without significantly impacting soil properties if done using the considerations mentioned above. Many fields I've observed cornstalk baling in the area this year look good regarding these criteria and most took less than 50% residue off the fields.

This year we've also seen a large increase in soybean residue baling in this part of the State. I realize it's mostly being used for livestock bedding. In a future column and CropWatch article, the research regarding soybean baling will be shared in addition to an economics comparison of various residue management strategies. I will also share on grazing research for residue management in a future column.

Jenny Rees 12-2-18

Part 2 of my residue management series focuses on grazing corn residue. We're blessed in Nebraska to have corn, cattle, and ethanol with the distiller's co-product…the golden triangle as it's been dubbed. What's interesting is that a huge feed resource in corn residue is under-utilized each year, with an estimated 52% of our state-wide corn residue being grazed or mechanically harvested.

Because a small amount of residue is removed, many fields in Nebraska have potential for grazing, except for the case of extreme slope and/or very low yields. Regarding stocking rates, Dr. Mary Drewnoski, Extension Beef Nutritionist shares, "Corn residue is about 10% husk and 34% leaf with the remaining residue being stalk and cob. Recommended stocking rates are based on the ability of a pregnant cow to maintain body weight without supplementation of protein or energy. The rates suggest that you can graze a 1200 lb cow for 30 days for every 100 bu. of corn grain produced. This would result in the cow consuming only about 12% to 15% of the corn residue in the field and nearly all would be husk with some leaf. Cob and stalk have less energy available."

Compaction is the main concern I hear for not grazing. An increase in a soil's bulk density and penetration resistance can be indicators of compaction. A summary of Nebraska research studies when corn residue was grazed at proper stocking rates has shown fall and winter grazing:

- do not significantly impact soil properties that would lead to compaction;
- don't result in changes to soil organic matter, N, P, or K (just uneven distribution of the nutrients excreted back onto the land);
- results in maintained or increased yields; and
- increases soil microbial activity.

Grazing corn residue resulted in no detrimental effects on soil properties (sixteen years in silty clay loam soils) including bulk density and penetration resistance. Increase of surface roughness was observed where cattle congregated for water and during wet conditions when soil was thawed. An Iowa study indicated the surface roughness could impact seed placement for the following no-till crop but only found that in one location in one field studied. In another study of five Eastern Nebraska locations, penetration resistance was slightly increased in two of the locations but was below the threshold for impeding root growth and did not carry over into the

next year. There were no yield differences between grazed and ungrazed treatments whether continuous corn (239 bu/ac for grazed and 223 bu/ac for ungrazed) or soybean (grazed 59 bu/ac and ungrazed 62 bu/ac) in the three years at those five locations. Sixteen years of fall grazed corn residue (November to February) resulted in a statistical soybean yield increase of 3.4 bu/ac in Eastern Nebraska. There was also an increase in the soil microbial community in the grazed treatments vs. ungrazed for those sixteen years. Under continuous corn in western Nebraska, five years of fall grazing corn residue did not statistically impact yields (154 bu/ac grazed vs. 148 bu/ac ungrazed).

Some have mentioned that the weather is not allowing them to till this fall. Perhaps cattle grazing is an option? Regarding the questions I'm receiving about this: The tenant in cash rent situation owns the stalks unless the landlord has specified otherwise in the written lease. Specify in the grazing lease who takes care of fence, water, and monitoring cattle. To help connect cattle and crop producers for utilizing residue and forage cover crops for grazing, there's a free resource called The Crop Residue Exchange at https://cropresidueexchange.unl.edu/. After establishing a log-in account, growers can list cropland available for grazing by drawing out the plot of land available using an interactive map. They can then enter basic information about the type of residue, fencing situation, water availability, and dates available and provide their preferred contact information. Livestock producers can log in and search the database for cropland available for grazing within radius of a given location of interest. There's also an 'Other' category where growers can list forage cover crops for grazing. Grazing rates are listed as either a 'per acre' basis or 'rate/head/day'. An excel spreadsheet called the 'Cornstalk Grazing Cow-Q-Later' may be of help to determine rates at this site: https://go.unl.edu/2fb6. There's more I'd like to share but for additional resources, please see my blog site at: http://jenreesources.com or contact your local Extension Office.

Of importance is to double check in-season and fall-applied herbicide labels for any grazing restrictions. These restrictions can also be found in the 'Forage Feed Grazing Restrictions' in the UNL Guide for Weed Management. The forage, feed, and grazing restriction only applies to the crop for which the herbicide was applied. When it comes to grazing cover crops planted into these residues, one must use the replant/rotation restriction guidelines found on the herbicide label and in the UNL Weed Guide: 'Replant Options Rotation Restrictions'. If the label doesn't specify any restrictions, then it should be ok. If you want to be on the safe side, a rule of thumb is to use the pre-harvest interval for the amount of time to wait before grazing stalks.

Jenny Rees 12-09-18

Next week I will resume the residue management topics. For this week, consider catching a UNL CropWatch podcast from Michael Sindelar, Extension Educator in Clay County. He interviews USDA-ARS scientists Marty Schmer and Virginia Jin who have conducted a great deal of corn residue baling research. You can listen to the podcast here: http://feeds.feedburner.com/NebraskaCropwatch. We haven't traditionally had podcasts in CropWatch so Michael is focusing on this new effort.

A few weeks ago we had our South Central Ag Lab advisory committee meeting in Clay

Dr. John Westra, Associate Director of Eastern Nebraska Research & Extension Center, awards Dr. Richard Ferguson with a plaque for his years of service.

Center. We're blessed with the high quality research that takes place there under the guidance of researchers, technicians, and staff with great longevity there. One of those researchers has been Dr. Richard Ferguson, Extension Soil Fertility Specialist since 1985. The past few years he has served as the Interim Head for the UNL Department of Agronomy and Horticulture, and I appreciated how he still responded to Extension questions! Effective January 1, 2019, Richard will be serving as Vice Chancellor for the Rwanda Institute for Conservation Agriculture (RICA). As vice chancellor, Richard will provide direction for the institution, manage fiscal resources, recruit and select faculty and staff, lead development of research and extension programs, and oversee student recruitment. Opening in July 2019, the RICA is an English language institution dedicated to educating and inspiring a new generation of innovators in agriculture in Rwanda. Establishing the Institute is a joint effort of the Government of Rwanda and the Howard G. Buffett Foundation, with the University of Nebraska–Lincoln providing leadership in curriculum development and technical advising. There is a farewell reception to be held on December 13 at the Goodding Learning Center (Plant Sciences Hall) on UNL's East Campus from 3-5 p.m. You are also invited to share on the online guest book if you'd like at: go.unl.edu/ferguson-farewell. A special thank you to Richard for his years of service to Nebraskans and beyond and we wish him all the best in this new endeavor!

Nebraska Soybean Day and Machinery Expo: You may also wish to catch the Nebraska Soybean Day and Machinery Expo to be held at the Fairgrounds in Wahoo, NE on December 13. This year's program has a great lineup of speakers with the program running from 8:30 a.m. to 2:15 p.m. Dr. David Kohl, professor emeritus of Virginia Tech University, will identify financial and risk management factors that place a farm business in the upper 40% of profits and sustainability with practical steps to move into that zone. During his presentation, "Economic

Update and Taking Care of Business," Kohl also will share a domestic and global overview on the factors and transformative trends influencing customers' financials.

Other presentations will include:

- New and Emerging Pests of Soybeans (primarily soybean gall midge) with Justin McMechan, Nebraska Extension crop protection and cropping systems specialist.
- What You Need to Know to Grow and Market Specialty Soybeans to Increase Your Profits with Darwin Rader, international sales and marketing management with Zeeland Farm Services in Des Moines.

- Managing Soybeans in Storage — Is Poor Quality a Concern with Ken Hellevang, extension engineer, North Dakota State University.

- Nebraska Soybean Checkoff Update and Association Information with representatives of the Nebraska Soybean Board and Soybean Association.

Registration is at the door and includes a free lunch. For more information about the program contact Nebraska Extension Educator and Event Coordinator Keith Glewen at (800) 529-8030 or kglewen1@unl.edu. Attendees are encouraged to bring a can or two cans of nonperishable food items to donate to the food pantry. This program is sponsored by Nebraska Extension in the university's Institute of Agriculture and Natural Resources, the Nebraska Soybean Board, Saunders County Soybean Growers Organization and private industry.

Jenny Rees 12-16-18

This year we've seen quite an increase in baling of soybean residue in the area. I've also heard this in other parts of the State. Soybean residue can be used for bedding, or for feed as roughage or mixed with distiller's grains. In speaking with farmers and livestock producers, there's perhaps a number of reasons why we're seeing an increase in soybean residue acres baled this year. While we're not short on corn residue, the late harvest delayed baling of corn residue for some and they were looking for another forage source. Hay prices have been higher this fall and continue to increase, making soybean residue a less expensive alternative. Some crop growers may also have been seeking added income.

Some colleagues and I addressed questions we were receiving in a recent UNL CropWatch article. Questions have centered around the value of this residue. I've shared in previous articles that approximately 1 ton of corn/grain sorghum residue is produced for every 40 bushels. For soybeans, it takes 30 bushels to produce 1 ton of crop residue. So to give an example, a corn field averaging 240 bu/ac would result in approximately 6 tons of residue/acre. In comparison, a soybean field averaging 60 bu/ac would only produce 2 tons of residue/acre.

In general, there's not too much difference in the amount of nutrients removed from corn vs. soybean residue.

- Corn (17 lbs N, 4 lb P2O5, 34 lb K2O, 3 lb S)
- Soybean (17 lbs N, 3 lbs P2O5, 13 lbs K2O, 2 lbs S)

To determine the value of these nutrients, one would need to know the current fertilizer nutrient price per pound. Value also includes maintaining soil properties, which is harder to place a value upon. Based on the research, it's recommended to leave at least 2 tons/acre of residue in the field to maintain soil organic matter. More needs to be retained for many fields to prevent excessive soil erosion and some fields should not be harvested. In previous articles, I shared our best management practices to consider for removal of corn residue. In the corn field example above, 6 tons of residue are available. Removing 2-3 tons of residue still leaves 50% or more residue on this field. In comparison, the soybean field with 2 tons/acre of residue at harvest is already at the 2 ton/acre limit to maintain soil organic matter. Regular soybean residue removal is not recommended as it is expected to result in reduced organic matter and increased soil erosion.

Soybean residue is a lower quality feed than corn, sorghum, and wheat residue. Forage tests show a range of 35-38% total digestible nutrients (TDN) and 3.9-4% crude protein; these numbers are less than wheat residue. For comparison, forage tests from corn residue ranged from 47-54% TDN and 4.5-6.5% crude protein (sorghum residue would be similar). The highest edge of those ranges would be similar to average grass hay.

USDA showed a price of $50/ton for soybean residue. Assuming 88% dry matter (DM), then that is $162 to $189/ton of TDN with 4% crude protein. In comparison, corn residue bales were $60 to 65/ton. Assuming 83% DM and 50% TDN, corn residue is a better deal (on an energy basis) at $150 to $156/ton of TDN with 5-6% crude protein. For perspective, good grass hay is $85 to $100/ton. Assuming 88% DM and 55-60% TDN, it is $160 to $205/ton TDN. A true economic analysis would take into consideration the residue removal costs, nutrient removal, and potential for soil loss (even though it's hard to put a value on that). The 2018 Nebraska Farm Custom Rates shows rates for cornstalk raking and baling. Soybean residue removal numbers aren't provided.

As a source of dry matter, soybean stubble is a low cost source for feedlots. However, soybean stubble is less valuable than both corn and wheat baled residue on an energy basis. The reduced feed quality and higher cost of the feed value doesn't justify the economics of baling and feeding soybean residue for cow-calf producers. From a short-term and long-term soil productivity perspective, including for soil and water conservation, soybean residue removal is not justified for agronomic and economic purposes. Factors such as late harvest delaying baling of corn residue, higher hay prices, and opportunity to sell soybean residue may have resulted in more soybean residue baling this year.

Jenny Rees 12-23-2018
Wishing everyone a wonderful Christmas and time to celebrate this special time of year with family and friends!

With the re-registration of the restricted use pesticide (RUP) dicamba products, I've been receiving questions regarding the training and label requirements. Dr. Rodrigo Werle who is now a weed scientist in Wisconsin put together a really nice blog post to help understand the new buffer label requirements at: http://www.wiscweeds.info/post/dicamba-buffer-requirements/.

RUP dicamba training can be obtained at the Crop Production Clinics (CPC), Nebraska Crop Management Conference (NCMC), Approved Industry Trainings, Extension Trainings, and via an online course. It is not built into our private applicator pesticide training, but many of us are offering it as an option on the same day and at the same location as pesticide training. There is no charge for dicamba training (unless you're taking it at a program that requires a fee such as CPC and NCMC). You have to be a certified pesticide applicator to apply RUP dicamba this year and you need to provide your applicator number for dicamba training.
All information from the Nebraska Department of Ag including labels, best management practices, list of trainings and list of certified applicators who've taken the training, can be found at: http://www.nda.nebraska.gov/pesticide/dicamba.html. The online dicamba training (available after January 1, 2019) and additional informational resources from UNL can be found at: https://pested.unl.edu/dicamba.

I've been thinking about these dicamba buffer requirements in addition to how heavy palmer and other weeds often are on our endrows. Research shows that palmer is sensitive to red and natural light in triggering germination. Research and observation have shown incorporation of a small grain helps with reducing palmer amaranth germination early in the season, and if taken to grain, delays germination till after harvest of the small grain. Chris Proctor, Extension Educator, and I were talking and wondered if we should consider incorporating a small grain into our endrows (especially in soybean fields) or possibly even perennial grasses for situations that would be a better fit? I'm unsure how practical this is for every farmer or every situation, but in floating the idea with farmers as I've presented about palmer, it seems like it may work for some. We've seen from previous years the challenges with weather in being able to spray dicamba and herbicides in general. With the buffer requirements and the fact that endrows often have heavier weed pressure, I just wonder if we need to start looking at treating endrows differently. Would like to hear your thoughts on this and/or other ideas!
We also know from research at the University in Arkansas in greenhouse studies that palmer only took three generations to become resistant to dicamba. Considering three generations, it's like saying dicamba is applied to soybean one year, corn the next year, and soybean again the following year with year 4 showing resistance developing. Dicamba is a great tool in our toolbox and palmer is perhaps our most difficult weed to control right now. Consider choosing which

crops you will use dicamba on this next growing season and think through the next few years' crop rotation and herbicide program on your different farms to help with selection pressure and resistance management.

Area Extension Dicamba Trainings:

- **Jan. 21: York County**, 5 p.m., 4-H Bldg, York
- **Jan. 22: Thayer County**, 5:30 p.m., Community Center, Davenport
- **Feb. 5: Merrick County**, 10:00 a.m., Fairgrounds, Central City
- **Feb. 6: Hamilton County**, 10:00 a.m., Fairgrounds, Aurora
- **Feb. 7: Seward County**, 11:30 a.m., Civic Center, Seward
- **Feb. 12: Kearney County**, 12:00 p.m., Fairgrounds, Minden
- **Feb. 14: Webster County**, 12:00 p.m., Community Center, Blue Hill
- **Feb. 19: Franklin County**, 1:30 p.m., Fairgrounds, Franklin
- **Feb. 20: Clay County**, 2:00 p.m., Fairgrounds, Clay Center
- **Feb. 28: Nuckolls County**, 10:00 a.m., Community Center, Nelson
- **Mar. 5: Hamilton County**, 10:00 a.m., Fairgrounds Aurora,
- **Mar. 11: Adams County**, 4:00 p.m., Fairgrounds, Hastings
- **Mar. 12: Jefferson County**, 10:00 a.m., Fairgrounds, Fairbury
- **Mar. 13: Gage County,** 10:00 a.m., Extension Office, Beatrice
- **Mar. 14: Saline County**, 10:00 a.m., Extension Office, Wilber

Jenny Rees 12-30-18

Happy New Year! The following are upcoming programs you may be interested in attending.

York Ag Expo: Hope to see you at this year's York Ag Expo at the Holthus Convention Center in York January 9 and 10th! The list of sponsors and exhibitors can be viewed at: https://yorkchamber.org/event/ag-expo/. Educational sessions are being offered again at the Expo. On January 9th, Chemigation training (both initial and recertification) will begin at 9 a.m. There is no charge and please bring a calculator with you. If you are coming for initial training, I'd recommend you get the materials before-hand to look through and you can receive them from the Extension Office. At 1 p.m., Brad Lubben, Cory Walters, and Austin Duerfeldt with UNL will share the latest on the Farm Bill, Crop Insurance decisions, and Farm Tax information. Farm Credit Services of America will also share information. On January 10th, I will have a private pesticide training session at 9 a.m. Please bring your barcode letter from NDA if you have it and the cost is $40. Then at 1 p.m., Mary Drewnoski, Michael Sindelar, and I will discuss residue removal considerations via baling and grazing. Tim Mundorf with Central Valley Ag (CVA) will be sharing on the value of manure as well. At 4 p.m. on Thursday the 10th, Chad E. Colby, Ag Technologist and well known on Ag Twitter, will be the keynote speaker. He is being sponsored by CVA. This will be followed by the Celebrating Ag Social Hour sponsored by the Rural Radio Network from 5-7 p.m. Lunch will be served both days beginning at 11:30 a.m. and sponsored by Cornerstone Bank. Hope to see you there!

Pulse Crop Expo: There's been quite an interest in pulse crops the past few years in Nebraska. Some growers are looking at pulse crops to change up labor requirements during the year, looking for a different market and price, or looking for another crop that allows cover crops to be planted and established after harvest. To learn about getting started with pulse crops or how to enhance your existing pulse production, don't miss the 2019 Nebraska Pulse Crops Expo January 7 at the Holiday Inn in Kearney from 9 a.m. to 5 p.m. Lucas Haag, northwest area agronomist with Kansas State University, will be the keynote speaker, presenting on field pea growth and development and management of field peas at critical growth stages. Other presentations include research-based information on production practices, tillage, seeding rates, and irrigation. The 2019 NE Pulse Crops Expo is sponsored by the SARE (Sustainable Agriculture and Research Education), the Nebraska Environmental Trust, and pulse crops industry partners. There is no charge, but please register by going to: https://cropwatch.unl.edu/nebraska-pulse-crops-expo-registration or calling 402-318-1124.

Farmers and Ranchers Cow/Calf College: This annual program will be held at the U.S. Meat Animal Research Center and Great Plains Veterinary Education Center near Clay Center on January 14, 2019 with registration, coffee and donuts starting at 9:30 a.m. The program will run from 9:55 a.m. until 3:30 p.m. This program is sponsored by Nebraska Extension's *Farmers and Ranchers College* and RSVP is needed for the noon meal. Speakers include: Welcome by Dr. Mark Boggess of USMARC and Dr. Dale Grotelueschen, Director of the Great Plains Veterinary Education Center; Mary Drewnoski with "To Graze or Not to Graze? Factors that Affect Risk

Nitrate Toxicity in Annual Forages"; Rick Funston with "Increasing Production Efficiency"; Brandy VanDeWalle on *"Family Farm Stress"; Amy Schmidt with* "Top 3 Environmental Considerations During Short-Term Cow-Calf Confinement" and Dr. Kip Lukasiewicz on "*Animal Husbandry Strategies to Improve One's Efficiency*". Please pre-register by January 8th, to (402) 759-3712. Walk-ins are accepted, but may not get a lunch. You may also complete your registration online at http://go.unl.edu/farmersrancherscollege. Remember, your contact information is required to be on the U.S. MARC property, so pre-registration is helpful and will save you time at the door!

23rd Annual Great Plains Growers Conference: This conference will be held in St. Joseph, Missouri on January 10-12 for anyone interested in growing fruit, vegetable, hydroponics, cut flowers for production. Topics on Jan. 10 include: "Cover Crops and Soil Health"; "Food Safety Modernization Act (FSMA) Grower Training"; "Hops Potential", "Selling Local Foods" and "Honey Bees & Beekeeping". Concurrent sessions on Friday and Saturday Jan. 11 and 12 provide more than 50 presentations on a wealth of subjects. In addition to presentations on conventional and organic vegetable production, there will be tracks on tree and small fruit production; organic and conventional vegetable production; season extension; greenhouse and hydroponics; cut flowers and technology for growers. A full program, registration information and more information can be found at the website: www.greatplainsgrowersconference.org.