

**York and Seward County Fairs:** Here's wishing the best to all the youth competing in the York and Seward County Fairs this week!



One group of youth competing at the York Co. 4-H Trap Shooting competition today.

**Crop Update:** It's unfortunately not hard to find southern rust in fields anymore as I'm finding it in every field I walk into. Incidence is mostly confined to lower canopies with the highest I've seen so far on the ear leaf. What's concerning to me is the amount of rust I'm seeing (ear leaf and below) in canopies of fields that have already been sprayed. Some fields sprayed in mid-July will be out of residual soon, which is also concerning to me. Physoderma brown spot, which moves with water and isn't a significant pest, can be confused with southern rust. While it can look bad, a major difference with Physoderma is that there's no raised pustules (bumps) on the leaves. I haven't seen gray leaf spot at ear leaves or above yet. I've added pictures of what I'm seeing on my blog at [jenreesources.com](http://jenreesources.com). There's been some questions about 'late season' Nitrogen applications. I've had to ask how late is 'late season'; brown silk has always been the latest I recommended. Most University research considered 'late season' as by tassel time. I haven't found any University research that has said applications should be made later than brown silk or would be beneficial past this time.

In soybeans, there's a disease called *Phyllosticta* leaf spot that I had never before seen.



*Phyllosticta* leaf spot. Photo courtesy John Mick, Pioneer.

It's one caused by a fungus that begins often as brown lesions on leaf margins and can move between leaf veins. In learning more about it, it can be residue born or seed transmitted. It doesn't sound like anything to be too concerned about, just something different that's been seen in some fields this year.

**Painted lady butterflies** are the orange and brown butterflies that are flying now that are often confused for monarchs. A painted lady female can lay up to 500 pale green eggs on plants individually instead of in egg masses. The larvae (called thistle caterpillars) hatch in around a week and can feed from 2-6 weeks depending on weather conditions. They feed on around 100 different host species including thistles, soybeans, asters, zinnias, etc. These butterflies are often used in schools to teach students about complete metamorphosis using the life cycle of a butterfly.



Painted lady butterfly (underside) on soybean leaf.

**Soybean Defoliators:** In addition to thistle caterpillars, other defoliators including various worms, grasshoppers, Japanese beetles are also present. Thresholds for damage for all soybean defoliators is 20% defoliation of plants during the reproductive stages. If you're unsure what 20% defoliation in soybean looks like, check out the graphic in CropWatch at: <https://go.unl.edu/7qjg>. It's actually a good graphic to keep on one's phone as it's very easy to over-estimate 20% defoliation.

**Unsolicited Seeds from China:** I haven't heard of anyone in this area officially receiving a packet yet. USDA is aware that people across the country have received suspicious, unsolicited packages of seed that appear to be coming from China. USDA's Animal and Plant Health Inspection Service (APHIS) is working closely with the Department of Homeland Security's Customs and Border Protection, other federal agencies, and State departments of agriculture to investigate the situation. Anyone in Nebraska who receives an unsolicited package of seeds should immediately contact Julie C. Van Meter at 402-471-6847) or Shayne Galford at 402-434-2346. Please hold onto the seeds and packaging, including the mailing label, until someone from your State department of agriculture or APHIS contacts you with

further instructions. Do not plant seeds from unknown origins. At this time, there's no evidence indicating this is something other than a "brushing scam" where people receive unsolicited items from a seller who then posts false customer reviews to boost sales.

**Squash Vine Borers** tend to be a problem at some point every year. If you're seeing zucchini, squash, or pumpkin plants looking wilted and suddenly dying, check the stems at the base of the plant. If you see insect frass (like sawdust), squash vine borers are most likely the culprit. You can remove the plants and discard if you're done with them. Otherwise, you can also slit the stems and kill the larvae. Then cover the stem base with soil to encourage new root growth. There's only one generation a year and it's too late to apply insecticides (should be applied to plant base beginning in late June-mid-July). Some master gardeners also say wrapping the base of stems with aluminum foil discourages moths from laying eggs.

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Southern rust: Small, orange to tan clustered pustules primarily on the upper sides of leaves.



Physoderma brown spot: the tiny clustered tan spots (below mid-rib) and purple blotches on mid-rib that also occur around leaf axils and on outer stalk tissue. Upper left-hand corner of this picture is bacterial leaf streak.





Physoderma brown spot on outer stalk tissue. It looks bad but not penetrating beyond the outer stalk tissue.



**Fair:** As fairs wrapped up in the area, in my opinion, it was a great way to cap off the summer for the youth. So much has been taken away from them and I really appreciate Ag Societies working hard with Extension staff to give the youth an opportunity to showcase their projects! There were several moments throughout fair where I thought “this is why we do this”...to watch youth and adults so excited to see the ribbons on projects, watching siblings and club members supporting each other, families helping other families, and friends catching up. Fair did look different this year. But it forced us to think about things differently with the blessing of some changes may be kept as a result! Thank you to all the Ag Society, 4-H Council members, Extension staff, newspaper staff, and volunteers who gave youth and adults alike the opportunity to showcase projects and safely gather at fairs! Thank you also to health departments for advising on directed health measures and providing PPE and nurses who helped with screenings!

**Crop Updates:** I didn't get into the field much this past week but the primary questions I received were regarding tip back on corn, spidermites flaring, and if it was too late to spray fungicides in corn. The answer to the latter is no. If southern rust is showing up pretty good low-mid canopy of your field, it's something to consider to help with stalk strength as that's my concern. I'm hearing of some guys having to apply a second round of fungicide due to rust. Hard for me to see guys spending the money to do that thus prefer avoiding automatic tassel applications. While I'm not aware of research to prove it, I think coverage is another issue. Consider asking the aerial applicator to use 3 gallons/acre to increase coverage. I hear some are refusing to do more than 2 gallons/acre and I think that's part of the problem. Some farmers are also chemigating fungicide and insecticide through the pivot in hopes of improving coverage.

Typically we'd say southern rust occurs on the top side of leaves unless severe, whereas common rust typically occurs on both sides of leaves. On leaves that were flipped over from the wind, I'm seeing southern rust spores (confirmed via microscope) on the undersides of leaves that are now technically facing upward, but not on the 'normal' top side of leaf (an interesting observation that a crop consultant asked me about and then I also saw this week to confirm it truly was southern).

Spidermites continue to flare 7-10 days later because most of the products used don't kill eggs. Sometimes second applications are needed. Insecticides with activity against eggs and immature stages (not adults) include Zeal, Oberon, and Onager whereas the pyrethroid (Bifenthrin products like Brigade in corn and soybeans) and organophosphate products (like Lorsban used in soybean) can help with adults but not eggs. Product has to come in contact with the mites. Thus at least 3 gallons/acre are

recommended with aerial applications. Entomologists share aerial applications early in the morning or late in the evening can be more effective to avoid hot rising air away from plants (be careful of inversions). With twospotted spider mite, perhaps all that can be accomplished is to slow the rate of population increase.

Tip back on corn occurs most often from some sort of stress. For this year having good pollination weather, some are surprised regarding how much tip back we're seeing. It's important to count kernels long as there may be more kernels than one realizes in spite of tip back occurring. You can tell approximate timing of stress events by the appearance of the kernels. If kernel formation isn't evident, the stress occurred before or during pollination. If kernels are very small or appeared to have died, the stress was after pollination as the kernels were filling. Water stress is a major stress outside of temperature as to kernels not pollinating and/or aborting. Each ovule (and later, each kernel), competes for water and nutrients. Water and nutrients are necessary for pollen tube formation down silks to fertilize ovules. Water and nutrients are necessary to fill individual kernels with the tips being sacrificed for filling kernels at the base of the ear first.

**CARES Act Tax Planning for Farmers:** The CARES Act included the Payroll Protection Program (PPP) and Economic Injury Disaster Loans (EIDL), which many farmers utilized. However, several other provisions didn't get as much attention. For tax planning this fall, check out this helpful info. from Tina Barrett: <https://go.unl.edu/re6e>.

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True topside of leaf that was flipped over with windstorm to be on underside. Can see indentations of lesions but not pustules.



True bottom side of leaf that after being flipped over with windstorm was showing as the top side. Notice the pustules on this side of the leaf.



Under the microscope, the spores were truly southern rust (oval-shaped). Common rust pustules are circular in shape.



**Crop Updates:** For the past week, crops used around 0.22" per day in the York area, around 0.20" as one goes east towards Ithaca and closer to 0.25" per day going south towards Harvard and Guide Rock (based on High Plains Regional Climate Center data posted on CropWatch).

As we think about water use the finish the year, the following come from the

NebGuide [Predicting the Last Irrigation of the Season](https://go.unl.edu/k74n) found at: <https://go.unl.edu/k74n>:

- Corn at Beginning Dent needs 5" of water (approximately 24 days to maturity)
- Corn at ¼ milk needs 3.75" (approximately 19 days to maturity)
- Corn at ½ milk (Full Dent) needs 2.25" (approximately 13 days to maturity)
- Corn at ¾ milk needs 1" (approximately 7 days to maturity)
- Soybean at beginning seed (R5) needs around 6.5" (approx. 29 days to maturity)
- Soybean at full seed (R6) needs 3.5" (approx. 18 days to maturity)
- Soybean with leaves beginning to yellow (R6.5) needs 1.9" (approx. 10 days to maturity)

Spent a lot of time last week looking at ear development in fields, particularly those impacted by the July 8th windstorm. Also appreciated a long conversation with John Mick with Pioneer on what he was seeing. For the most part, I'm seeing a lot of 'normal' ears that vary in the amount of tip back from lack of pollination and/or kernel abortion. Less commonly seen are ears with 3/4 husks. On plants that were pinched, continue to see messed up secondary and/or tertiary ears after the loss of the primary ear. On plants that bent and righted themselves, seeing a variety of things. Some are more 'normal' while other ears are much smaller that either didn't pollinate well and/or had kernel abortion.

Last month, had mentioned a curious thing regarding how many hybrids are putting on multiple ears on the same ear shank, on the primary ear node. It's far more than I've ever seen before. In sharing some observations with Dr.'s Tom Hoegemeyer and Bob Nielsen, they share it's most likely a genetic X environmental response under excellent growing conditions or some other phenomena. As I continued to see these ears in fields and husk them back, for the most part, they don't appear to be detrimental to the main ear, which is good. So it's more of a curiosity than anything.

Many of us probably don't examine ear shanks much in comparison to the ears. However, when one does look at ear shanks, one will observe they are similar to the corn stalks in that there are nodes and internodes. Each node also produces a leaf (in this case a husk leaf) instead of a collared leaf such as what happens on the main stalk. And each node (on stalk and on ear shank) has an axillary meristem which allows for ear development. Normally, there must be genetic or hormonal suppression so that only one main ear is formed on a shank at a stalk node. It's not uncommon for us to observe an ear on different nodes of the stalk (ex. Nodes 12 and 13). What is more uncommon is to observe multiple ears on different nodes of the same ear shank, such as what is being observed this year.

**Renovating Lawns:** If your lawn is in need of repair, now through mid-September is a great time-perhaps the best time-to do so! This resource, [Improving Turf in the Fall](https://go.unl.edu/rz9z) at <https://go.unl.edu/rz9z> is a great one to walk you through renovation depending on your situation. Some lawns can be easily improved by adding fertilizer this fall and/or overseeding. Some may need total renovation, which starts with a glyphosate (Roundup application) followed by waiting at least a week to then prepare the soil for planting.

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Multiple ears on the same ear shank (with husk tissue on left and husked on right). Doesn't appear to be impacting main ear in most fields I've seen these in. And, this is occurring on primary ear nodes and within fields (not just in endrows or in lower population areas).



Pretty impressive brace root development on leeward side of plants that tried righting themselves.



Ears from the plants with the brace roots from above photo. These are pretty decent with some tip back, but otherwise more 'normal'. Other plants like this have ears that have poor kernel set.



Seeing some ears with 3/4 husk.



Bent plant that tried righting itself with a 'zippered' appearance to ear and poor pollination in addition to kernel abortion.



Plant with loss of the primary ear showing multiple ears on the secondary and tertiary ear nodes.



Leasing land for solar development is a topic landowners in the McCool Junction and Lushton area are facing. This is a guest column by my colleague [John Hay](#), Nebraska Extension Energy Educator.

Renewable energy has increased significantly in recent years and the number of wind farms and the size of wind turbines are a visual reminder of renewable development. Due to higher development cost, solar electric systems, also called solar photovoltaic (PV), have lagged in commercial electric development. In recent years, the dramatic price decline of solar PV has led to greater interest in utility-scale solar development. For instance, consider a 5-Megawatt system similar to the one constructed West of Lincoln North of I-80. Based on solar cost benchmarks published by the National Renewable Energy Lab, a 5-Megawatt system constructed in 2010 would have cost \$27.6 million, compared to \$5.65 million to construct the same size project in 2018. Combine this with the 26% federal tax credit and the economics of utility-scale solar is sufficient for major development interest across the nation. The federal tax credit is currently 26% and set to decline to 22% in 2021, then 10% for future years.

Utility-scale solar farms are constructed on the open ground generally near access to the electric transmission grid. Other considerations for siting solar farms may be the solar resource, proximity to electricity demand, other local incentives, and regional value of electricity. Access to land is an early step in utility-scale solar development. Farmers and landowners in Nebraska are being approached to lease land for solar development and these landowners are facing important long-term decisions about the future of their land. When considering a solar leasing contract many factors should be considered. According to the Farmland Owner's Guide to Solar Leasing published by the National Agricultural Law Center, these considerations are Length of the commitment, Who has legal interests in the land?, Impacts on the farm and land, Family matters, Property taxes, Government programs, Liability and insurance, and Neighbor and community relations.

Utility solar farmland leases are long term contracts and need to be reviewed by a qualified attorney. In Nebraska, these leases can be as many as 40 years and longer if extended. For many landowners, this long-term contract may extend into the next generation and should be discussed with the family. Landowners at times feel pressured to sign contracts and this can be stressful. Take the time to review and negotiate these contracts and always know that saying "no" is an option.

Solar leases can be attractive to landowners as they can offer long term income and profitability on the leased land. A study in Michigan of landowners with wind farm

leases showed farmers with leases invested more in their farms than farmers without leases. This suggests the lease income may influence farm stability and longevity. Solar farms like wind farms add to county tax income. These developments are exempt from property tax and instead have a nameplate capacity tax paid each year in place of the property tax.

Utility-scale solar farms are unlike wind farms in some ways. For example, wind turbines may take only 1-2 acres out of production per turbine because farmers can farm around the base of the turbine and turbine access road. In comparison, a 1,000-acre solar farm will take all 1,000 acres out of production. Solar farms are low to the ground and have less impact on the skyline. Generally, solar farms will be fenced with vegetation growing amongst the solar panels. Vegetation could be perennial pollinators, grass, or weeds. Common management is periodic mowing to ensure plants do not disrupt solar operation and production.

Landowners approached about solar leases should seek advice from an attorney and take time to thoroughly consider the contract and its implications to their farmland. Review of the Farmland Owner's Guide to Solar Leasing published by the National Agricultural Law Center will help frame the issues and considerations for solar leases. This can be found at [https://farmoffice.osu.edu/sites/aglaw/files/site-library/Farmland Owner's Guide to Solar Leasing.pdf](https://farmoffice.osu.edu/sites/aglaw/files/site-library/Farmland%20Owner's%20Guide%20to%20Solar%20Leasing.pdf). For additional questions about solar leasing, please see <https://cropwatch.unl.edu/bioenergy/utility-scale-solar>, or contact John Hay, Extension Educator at 402-472-0408 or [jhay2@unl.edu](mailto:jhay2@unl.edu).



Grateful Nebraska held our State Fair this year! Seeing the youth competing, showcasing 4-H projects, and the excitement, smiles, and friends reconnecting from across the State this past weekend was heartwarming!

Received many calls about end of season irrigation this past week. Would encourage our farmers to finish the season well! You've been through much in another trying year and the past few weeks have been extra hard keeping up with irrigation, cleaning out bins, and getting combines ready in the heat. It can be tempting to just stop but would encourage you not to quit irrigating too soon, particularly on soybeans. Soybean maturity (R7) is defined when 50% (or all) of the field plants possess one mature pod (when the interior white membrane no longer clings to the seed). In most years, most leaves and pods will have changed color (from green to yellow-green or yellow) by this plant-based R7 date.

The heat has pushed crops along, but we've also had a great deal of humidity. Corn is moving the starch line slower in irrigated fields. That's a good thing for fill and a harder thing regarding labor, time, and money. A lot of corn in this area is 1/3 milk and I just saw a few fields at 1/2 milk over the weekend.

- Corn at 1/4 milk needs 3.75" (approximately 19 days to maturity)
- Corn at 1/2 milk needs 2.25" (approximately 13 days to maturity)
- Corn at 3/4 milk needs 1" (approximately 7 days to maturity)
- Soybean at full seed (R6) needs 3.5" (approx. 18 days to maturity)
- Soybean with leaves beginning to yellow and pod membrane still attached to seeds (R6.5) needs 1.9" (approx. 10 days to maturity)

So, we're potentially looking at one to two more irrigations yet for some of this corn and soybeans depending on the current status of your soil moisture profile, development of the crops in your particular fields, and any rain. It is recommended to allow that soil moisture profile to dry out to 50-60% depletion towards the end of the season to capture moisture in the off-season. So one way to consider this is a step-wise approach. If you typically irrigate at 35% soil moisture depletion and have around 2" left, the next week you could wait till a trigger of 40% depletion with the following week's trigger around 50%. Again, this depends on your individual field's soil moisture status and crop development after a taxing August.

Upon physiological maturity, corn ears begin drooping down. However throughout the area, corn ears are doing this that aren't at 1/2 starch yet. These ears will black layer prematurely at the cost of yield. Dr. Bob Nielsen from Purdue shares that yield penalty can be as much as 40% at denting when there's essentially no milk line visible and

around 12% at half milk. So what causes this? The ear shank can collapse when there's a lack of turgor pressure due to stress from the inability to keep up with crop water demand. August has been abnormally dry with warmer than average temperatures the past few weeks. Sometimes the ear shank also cannibalizes itself, similar to what can happen in stalks. Perhaps part of this can be from poor root development or lack of root development into deeper layers? In areas that have received less rain, perhaps deeper soil layers are drier in spite of having moisture in the top soil layer from irrigation? For those with conventional hybrids, European corn borer tunneling can also cause this type of collapse. There's also some hybrids that I notice this happening more than others; perhaps genetics also plays a roll? That shank is the source for feeding the ear, so when it collapses, it weakens it. Keep an eye on ears in these fields as we approach harvest and consider getting at them sooner if possible.



Drooping corn ears in this irrigated field with green plant tissue above ears. This corn was getting close to 1/2 milk.



Photo by Dr. Jim Specht showing end of season soybean development stages. Notice the white membrane still attached to the seed in R6 stage and how it disconnects at R7 (maturity). Not all pods on the plant may be at R7 at the same time. R7 for all the plants in the field is considered when 50% (or all) of the field plants possess one mature pod (when the interior white membrane no longer clings to the seed). In most years, most leaves and pods will have changed color (from green to yellow-green or yellow) by this plant-based R7 date.



Sudden Death Syndrome (SDS) has been observed for the past several weeks in fields. Thankfully it's been minor this year compared to last year. It's wise to take a soil sample for soybean cyst nematode (SCN) in these areas of the field to determine if you also have a nematode problem. The combination of the diseases has a synergistic impact on yield.