North Dakota State University
CROP & PEST REPORT
NDSU EXTENSION

No. 13 August 1, 2024

Inside this Issue...

2024 NDSU ANNUAL FIELD DAYS

The field days are open to the public.

August 1 - NDSU Oakes Irrigation Field Day
The tour starts at 9 a.m. Topics include:

- Potato breeding updates – Asunta Thompson, potato breeder
- Robotic weeding solutions and monitoring – Evans Wiafe, graduate student
- Soybean disease under high moisture conditions – Wade Webster, soybean Extension Soybean Pathologist
- White mold management in soybeans – Michael Wunsch, CREC research plant pathologist
- Dry bean variety update – Juan Osorno, dry bean breeder
- Organic matter matters – Carlos Pires, soil fertility specialist

https://www.ag.ndsu.edu/news/newsreleases/2024/july/ndsu-oakes-irrigation-field-day-set-for-aug-1

Entomology

RED SUNFLOWER SEED WEEVIL SCOUTING & THRESHOLD

The first seasonal record of red sunflower seed weevils (RSSW) was reported on early planted sunflowers at R4 near Steele in Kidder County last week. The recent hot temperatures will speed up adult weevil emergence. Red sunflower seed weevils are usually concentrated on the field edges. Early scouting the field margins can increase your chances of finding them in the field, so you know if they are present or not. However, scouting to determine which fields need to be treated should begin when yellow florets are showing around the outer perimeter of the sunflower head (R5.1). Send in your weevil scouting reports including locality and numbers per head as you start finding them.

Red sunflower seed weevil on R2 bud stage sunflower. Photo courtesy of Marc Michaelson, former IPM scout.

Identification: RSSW are small (⅛ inch long) weevils with a snout and are reddish-orange.

Scouting: When sampling, use the W pattern and begin counting at least 75 to 100 feet into the field. Rub your hand vigorously across the sunflower face. Count the number of RSSW adults on 5 plants at 5 sites for a total of 25 plants per field. RSSW is attracted to early blooming sunflowers, as females must imbibe pollen before laying eggs. A NDSU YouTube video is available on ***Scouting for Red Sunflower Seed Weevil in Sunflowers***.

Scouting should continue until the economic threshold (Tables 1 & 2) is reached or most plants have reached 70% pollen shed (R5.7) or later crop stages. At 70% pollen shed, plants are no longer susceptible for egg laying or significant damage. On older flowering plants (after R5.7), larvae of RSSW (and banded sunflower moth larvae) will be feeding inside the seeds and are protected from the insecticide. By then, much of the feeding damage on kernel has already occurred.

2024 RSSW Economic Threshold (average # weevils per head)

Oilseed sunflower at 18 cents per lb:
22,000 to 18,000 plants per acre
$18 insecticide cost per acre – 9-11 weevils per head
$20 insecticide cost per acre – 10-12 weevils per head

Confection sunflowers:
1 weevil per head

Here's the E.T. formula if you want to calculate your own threshold. **The cost of insecticide treatment includes the cost of insecticide per acre and the cost of insecticide application per acre.**

$$\text{Threshold (weevils per head)} = \frac{\text{Cost of Insecticide Treatment}}{(\text{Market Price} \times 21.5) \times (0.000022 \times \text{Plant Population} + 0.18)}$$

The ideal plant stage for treatment is when most individual plants are at 40% pollen shed (R5.4). However, we recommend that treatment be considered when three out of 10 plants are just beginning to shed pollen in part, on the fact that aerial applicators have a busy schedule or adverse weather may prevent timely application at the ideal stage of sunflower development. Treatment at the early bloom stage should allow growers a sufficient window of time to have their fields treated. Growers must be aware, however, that if weevil populations are high and/or spraying is done too early, a reinfestation may occur and a second insecticide application may be necessary.

Thanks for support from the National Sunflower Association for our red sunflower seed weevil research.

Early bloom stage sunflower. Photo courtesy of Hans Kandel, former NDSU Extension Broadleaf Agronomist.

Table 1. Economic Threshold for Oilseed Sunflowers - Number of adult red sunflower seed weevil per head when the cost of control equals $18.00 per acre ($6.00 for insecticide and $12 for aerial application costs).

Market Price	Sunflower Plants per Acre (x 1,000)									
$ per lb	16	17	18	19	20	21	22	23	24	25
0.18	11.7	11.1	10.5	10.0	9.6	9.1	8.8	8.4	8.1	7.8
0.19	11.1	10.5	10.0	9.5	9.1	8.7	8.3	8.0	7.7	7.4
0.20	10.6	10.1	9.6	9.1	8.7	8.3	8.0	7.6	7.3	7.1
0.21	10.2	9.6	9.1	8.7	8.3	7.9	7.6	7.3	7.0	6.8
0.22	9.8	9.2	8.8	8.3	8.0	7.6	7.3	7.0	6.7	6.5

Table 2. Economic Threshold for Oilseed Sunflowers - Number of adult red sunflower seed weevil per head when the cost of control equals $20.00 per acre ($8.00 for insecticide and $12 for aerial application costs).

Market Price	Sunflower Plants per Acre (x 1,000)									
$ per lb	16	17	18	19	20	21	22	23	24	25
0.18	13.0	12.3	11.7	11.1	10.6	10.2	9.7	9.4	9.0	8.7
0.19	12.4	11.7	11.1	10.6	10.1	9.7	9.3	8.9	8.6	8.2
0.20	11.8	11.2	10.6	10.1	9.7	9.2	8.8	8.5	8.2	7.9
0.21	11.3	10.7	10.2	9.7	9.2	8.8	8.5	8.1	7.8	7.5
0.22	10.8	10.3	9.7	9.3	8.8	8.5	8.1	7.8	7.5	7.2

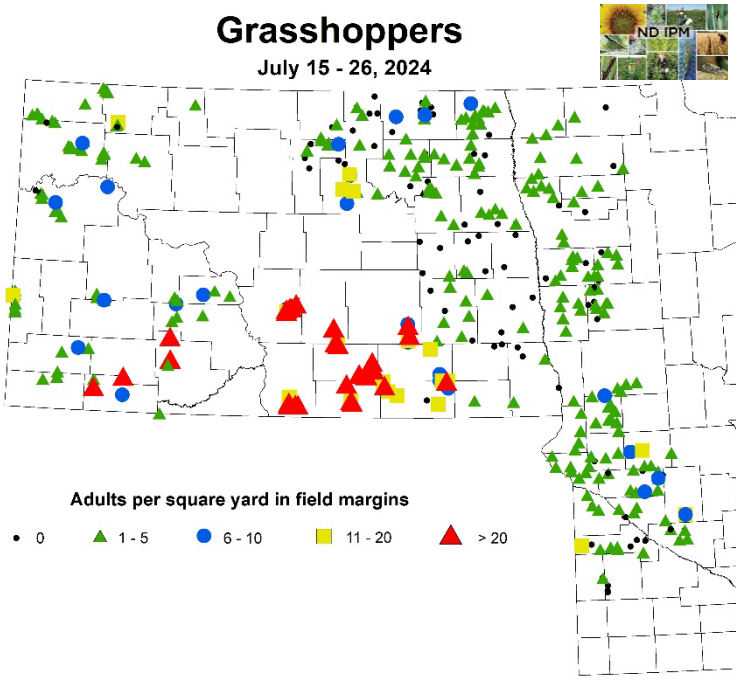
GRASSHOPPERS INCREASING

Adult grasshoppers are being observed in fields now. Continue to scout and be aware of mixed populations of nymphs and adults. Adults are mobile since they have wings and can fly to find greener fields as wheat and other cereal grains are harvested. Adults often move to later maturing row crops like corn, flax, soybeans, sunflowers and others.

The grasshopper economic thresholds are listed in Table 1.

Table 1.	Nymphs per square yard		Adults per square yard	
Rating	Margin	Field	Margin	Field
Light	25-35	15-25	10-20	3-7
Threatening	50-75	30-45	21-40	8-14
Severe	100-150	60-90	41-80	15-28
Very Severe	200+	120+	80+	28+

ND and MN IPM scouts recorded grasshoppers in 80% of 294 fields scouted in wheat, barley, sunflower and soybean last week. About 20% of fields scouted had no grasshoppers present, 62% light grasshopper densities, 16% threatening and 2% severe.



Janet J. Knodel
Extension Entomologist

Patrick Beauzay
State IPM Coordinator& Research Specialist

plant pathology

SUNFLOWER RUST

We encourage growers to scout for sunflower rust as the crop approaches bloom. Confection-type sunflowers are often particularly sensitive to rust, but yield losses can occur in oilseeds sunflower as well. If rust is found above the threshold (below), a fungicide application at R5 can prevent or limit yield loss.

Risk of Rust.

Sunflower rust infection is favored by moderate to warm temperatures and frequent leaf wetness (dew, fog, etc); conditions that have been common in the last few weeks. The threat of rust infection often begins when the pathogen overwinters in North Dakota, which is likely more common during years with a mild winter (which we had last year). With the help of NDSU Extension County agents, Ph.D. student Zach Ittel confirmed rust in 41 of 43 ND sunflower fields surveyed last year, so the pathogen was widely present last fall. Taken together, we likely have a higher risk of rust appearing than in recent years.

Signs and Symptoms.

Frequent dews and moderate to warm temperatures have resulted in favorable environments for infection. Consequently, sunflower rust is commonly first observed near shelter belts (or other areas of a field with longer dew periods) and in the lower canopy (favorable microclimate). As the sunflower rust pathogen overwinters in our climate, it is common to first find sunflower rust near last year's sunflower residue or wild/volunteer sunflowers. Pustules are cinnamon-brown and dusty, with spores that can be easily rubbed off the leaf (Figure 1). If an epidemic occurs, pustules may be found on stems, petioles and leaves.

Management.

Timing. If rust reaches approximately *1% severity on the upper four fully expanded leaves at or before bloom (R5)* a fungicide should be considered (Figure 2-3). Notably, in a recent study, severity less than 1% at R5.2 resulted in yield loss. At R6 or later (after bloom) fungicide applications have not had an impact on yield in our trials.

Efficacy. DMI [FRAC 3: Triazole] and QoI fungicides [Strobilurin: FRAC 11] and fungicides containing mixtures of those modes of actions are among the most effective on rust in our trials.

Figure 1. Dusty cinnamon-brown rust pustules on a sunflower leaf

Figure 2. Approximately 1% rust severity on a fully-expanded sunflower leaf

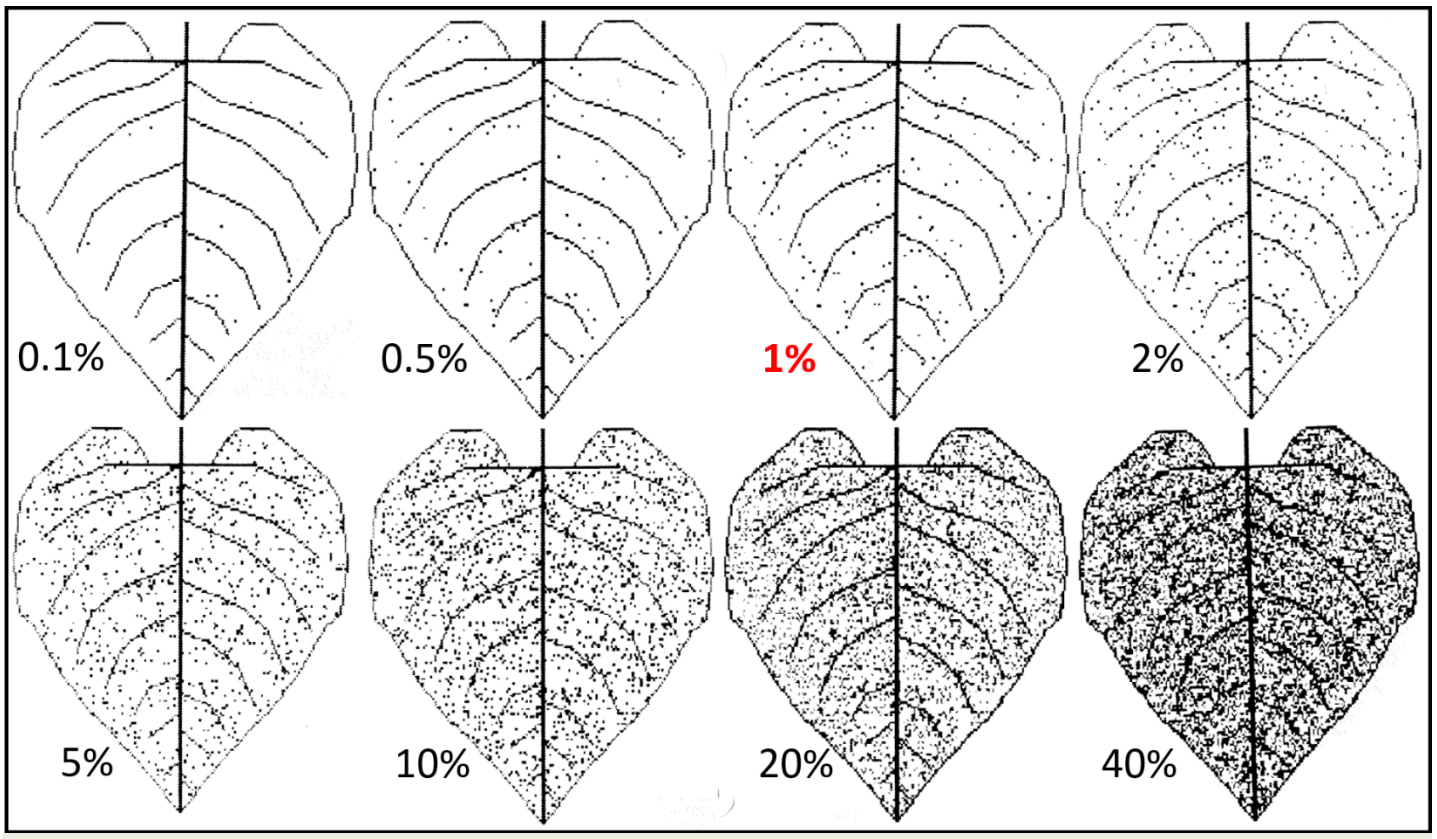


Figure 3. Sunflower rust severity assessment diagram; 1% severity in red

Sam Markell
Extension Plant Pathologist – Broadleaf Crops

Zachary Ittel
Graduate Research Assistant

DRY EDIBLE BEAN RUST

Frequent dews and moderate-warm temperatures over the last few weeks have provided a very favorable environment for dry edible bean rust. We encourage dry edible bean growers to consider scouting for dry bean rust.
Rust is capable of causing yield loss, especially when it first occurs in the early to middle of the growing season. However, rust can be managed with fungicides, so scouting for the disease is encouraged.

Signs and Symptoms. Dry bean rust is usually first found on the lower leaves of bean plants in 'hot spots', which are clusters of plants with relatively severe damage (Figure 1). Hot spots are often small (a few feet to several yards in diameter) and can occur anywhere in a field, but are more common near shelter belts or other areas prone to long dew periods. Rust is usually first observed on the upper sides of the leaves and appear as dusty cinnamon-brown pustules that may be surrounded by a small yellow halo (Figure 2). Pustules on the undersides of the leaves may appear more robust and lack the yellow halo (Figure 3).

Figure 1. Close up of a rust hot spot in dry edible beans

Figure 2. Dusty cinnamon-brown rust pustules the upper side of a dry edible bean leaf

Management. Importantly, dry bean rust does not occur in every field, every location or every year, so scouting is very important. If rust bean rust occurs early enough in the growing season and conditions remain conducive for infection and spread, the disease can cause significant yield loss. A hot-spot can turn into a full blown epidemic in just a couple weeks. The best timing for a fungicide application to manage rust is shortly after it is first found, up until the later growth stages when fungicides no longer have a benefit (such as when pintos begin to stripe). QoI fungicides [strobilurins: FRAC 11] (such as Headline, Quadris, Aproach, etc.), DMI fungicides [Triazole: FRAC 3] (such as Proline, Quash, tebuconazole, etc.) and mixtures containing these groups (such as Priaxor, Propulse, etc..) have been the most efficacious in our trials. Fungicides with other modes of action, some of which are more commonly applied for white mold may still reduce disease severity, but are often less effective in our trials. Exceptions have occurred.

Figure 3. Pustules on underside of dry edible bean leaf

Sam Markell
Extension Plant Pathologist, Broad-leaf Crops

FUSARIUM HEAD BLIGHT IN WHEAT AND BARLEY FIELDS

The past two weeks of phone calls, texts, emails and field days has largely been dominated by the question: "How much Fusarium head blight (scab) is out there?" Compared to the last five growing seasons, we will see higher levels of scab this year. However, this doesn't mean every field will have a problem, and even in the fields where we see scab, it is still unclear how much of an impact it will have on yield and quality. I know there are some great looking small grain fields out in ND and hope most fields will have a low incidence of scab. We will see scab differences that are attributed to planting date (ie: escaping high scab risk), genetic resistance (ie: susceptible varieties will have higher levels of scab), and fungicide use (ie: our best fungicides provide 45-60% suppression). Most of these differences will become apparent as we harvest the 2024 crop.

Figure 1. Severe Fusarium head blight damage in a research plot of spring wheat. Notice the amount of white (scabby) spikes in the susceptible spring wheat variety that did not receive a fungicide.

As we approach harvest, it would be a good idea to scout fields for the presence of scab (and ergot too) and develop a harvest strategy plan. Dr. Jochum Wiersma provided a summary of harvest management tips for scab (U of Minnesota Extension Minnesota Crop News: Small Grains Disease and Pest Update 7/18/2024) in MN Crop

News. One of my favorite reminders involves avoiding the comingling of diseased grain with high quality grain. Limiting the amount of comingling at the farm level will reduce the risk of creating additional problems at the point of sale.

There have been several questions on yield loss and deoxynivalenol (DON/vomitoxin/VOM) associated with scab. On the most susceptible spring wheat and durum varieties, yield loss values *can be* greater than 90%. For example, in one of our research trials in 2024, scab incidence on a susceptible spring wheat variety that did not receive a fungicide application was 92% with an average spike damage of 65% (**Figure 1**). This type of damage would be pretty rare to see across an entire field, but does provide an example of how damaging scab can be when prolonged periods of conducive conditions occur. Scab damage in barley (**Figure 2**) tends to sporadically infect one kernel as the crop has natural resistance to prevent *Fusarium* movement along the spike. In these cases, yield loss is not as severe when compared to spring wheat and durum.

Figure 2. Fusarium head blight on two-row barley. Notice sporadic and single kernel damage on the spike.

Figure 3. Fusarium head blight and kernel damage on two hard red spring wheat spikes. Notice extremely shriveled kernels and fairly plump kernels that will vary in their level of DON.

The level of DON associated with scab in a field does not always have a clear answer. We can assume the more scab in a field, the higher the risk for elevated DON levels. However, this isn't always the case. Sometimes we can have "late" infections that manifest during years of high humidity as the crop approaches maturity, or we have situations where severely damaged kernels never make it into the grain tank. When late infections occur, we may observe low levels of scab in the field (and higher yields), but conducive conditions allow the *Fusarium* fungus to colonize healthy kernels increasing DON levels in the grain lot. We observed these types of infections during the scab epidemics of 2015 and 2016. It is also possible to see early infections severely restrict grain development with most (if not all) shriveled kernels exiting out the back of the combine. In this case, DON levels could be lower than expected as the heavy DON kernels are removed from the grain lot. To further demonstrate what may occur, **Figure 3** shows two spring wheat spikes with about 90% of the spike damaged by FHB. Notice the heavily shriveled kernels towards the bottom with plump kernels towards the top of the spike and green plump kernels at the very bottom of the spike. It is likely the shriveled kernels will be sent out the back of the combine, but the fairly plump kernels will be harvested and likely contain varying levels of DON.

Andrew Friskop
Extension Plant Pathology, Cereal Crops

plant science

WHEAT HARVEST IS STARTING AND CORN MATURITY IS HIGHLY VARIABLE

Winter wheat harvest is starting this week across southern North Dakota. The NDSU Winter Wheat Breeding Program started harvesting their plots on Monday and the small grain agronomy program plans to harvest their winter wheat plots on Friday, August 2nd. Spring wheat harvest is still likely a week to two weeks out for most fields, however, I've observed wheat changing color quickly over the past 7 days with the high temperatures and sunny conditions. I'm expecting generally good yields from our wheat crops this year as our long, cool spring, while challenging for corn and soybean planting, benefitted the small grains.

As I've driven around more of the Red River Valley over the past two weeks, the variability in growth stages of the corn crop is striking. I saw fields that were V10-V14 and not yet tasseling, fields with tassels just starting to emerge (VT), fields with tassels out and pollen shedding, silking (R1), and silks starting to dry down (turning brown) in their early grain fill stage (getting close to R2). I am concerned that fields that are not yet silking will not make it to black layer (physiological maturity) before our first frost. I spent some time looking at the Corn GDD Tool available through the High Plains Regional Climate Center. This online tool allows you to select your location on a map, enter in your planting date, and select your corn hybrid relative days to maturity. It then generates a figure showing corn growing degree day accumulation for this year along with the 30-year average for comparison. Based on the planting date and days to maturity selected, it provides an estimate of when the corn will reach black layer. Below is an example from Casselton, ND using a planting date of May 1 and a corn RM of 85 days.

The thick black vertical line is the prediction for date of reaching black layer. In this example, black layer is predicted on September 9th and average first fall freeze is October 8th. A 90 day hybrid with a May 1 planting date is predicted to reach maturity on September 19th. Keep in mind that at maturity, corn grain is around 32% moisture. Corn grain is usually best harvested around 20% moisture to avoid excessive drying costs and mechanical damage and/ or field loss. How quickly the corn dries down in the field depends on the weather: daytime temperatures, relative humidity, and wind are the major factors influencing how quickly the crop will dry. Sunny, hot, and windy days can dry corn as quickly as 1% of moisture per day, but cooler, cloudy, and/ or humid conditions can reduce the rate of dry down substantially and even stop it. Very little drying occurs at temperatures below 40° F. A more "typical" rate of dry down to use for planning purposes is 0.5% per day in our area. So, if we use the 85 day corn in my first example that reaches black layer on September 9th and is at 32% moisture, the field will need approximately 24 days, or 3.5 weeks to reach 20% moisture. 24 days after September 9th is Oct 3rd. I'm optimistic that corn will make it. On the other hand, the 90 day hybrid likely won't be at a harvestable moisture until mid-October. That may be okay if we have a long, warm fall, but an early frost or snow storm could create a big headache for corn farmers this year. Here's hoping for a long fall and a late frost!

Clair Keene
Extension Agronomist Small Grains and Corn

DICAMBA DRIFT OR RAPID GROWTH SYNDROME IN SOYBEANS?

Some farmers have spotted some blistering on the newer leaves of their soybean crop. This effect is usually attributed to growth regulator herbicide drift, such as dicamba.

To provide some context, this season began with wet and cool conditions but experienced a sudden shift to temperatures above 90°F in the past weeks. While these higher temperatures are favorable for accumulating the necessary heat units, the abrupt change can lead to rapid growth syndrome, resulting in leaf strapping and blistering.

So, how can we distinguish dicamba drift from rapid growth syndrome? (**Figure 1**)

- Dicamba injuries are characterized by blistering with upward cupping (outer margins of leaves rolled inward), whereas rapid growth syndrome leads to blistering without cupping.
- Pay attention to the petioles as well; bending and curving of leaf petioles are indicative of growth regulator herbicides, which are not present in cases of rapid growth syndrome.
- Additionally, other effects of growth regulator herbicides include brown or cream-colored leaf tips, and the veins on their underside often become parallel.

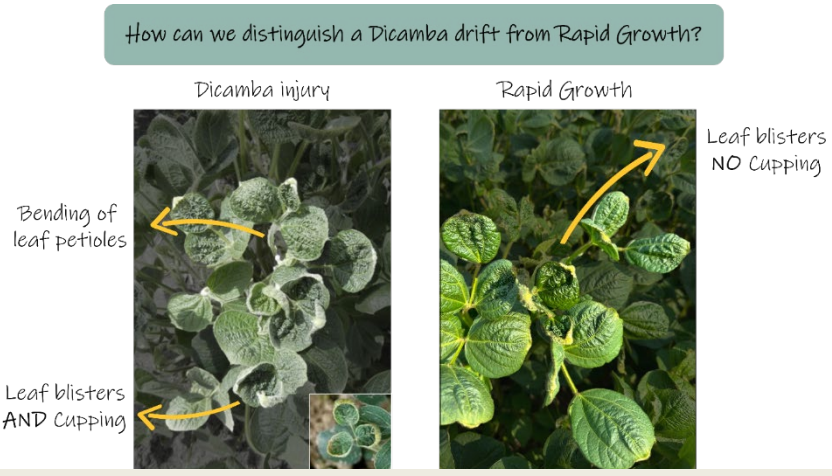


Figure 1: Soybean plants affected by dicamba drift (pictures by Dr. Rich Zollinger, NDSU), and rapid growth syndrome (picture by Dr. Shana Forster, NDSU).

It's important to note that different soybean varieties may exhibit varying levels of rapid growth syndrome expression. If you have any doubts, review the field and chemical histories for signs of herbicide carryover, spray tank contamination, or droplet particle or vapor drift from nearby areas.

Ana Carcedo
Extension Broadleaf Agronomist

SOIL SAMPLING FOLLOWING SMALL GRAIN HARVEST

After small grains, a choice of the next crop might be soybean, corn, sunflower, sugarbeet or even another small grain if disease pressure is not an issue for subsequent small grain choice. Given that a cover crop following small grain harvest is cheapest if volunteers are allowed to grow, soil sampling with the intention to use the nitrate-N value as a credit against next year's N rate would best be delayed until the cover crop is terminated.

A volunteer cover crop would contribute its greatest value up until the 5-leaf stage. Termination of the cover crop at the 5-leaf stage would be advised so the growth does not become too entangled and therefore hard to manage. After termination, from the date the herbicide was applied on, soil sampling that includes analysis of nitrate-N would be representative of residual N for the next crop. In soils in the east where soybean IDC (iron deficiency chlorosis) is common, delaying the soil sampling would also be advised if the next intended crop was soybean, since high soil nitrate will increase IDC severity (not a cause, but a contributor to severity if soil carbonates and other stresses result in IDC). If soil analysis of other factors except for residual nitrate-N are needed, soil sampling directly following small grain harvest is an excellent option, particularly in fields that will be tilled, making a consistent 0-6 inch core very difficult to achieve.

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PRE-HARVEST HERBICIDE APPLICATIONS IN WHEAT

Our small grain crop is maturing fast with the recent heat across the region. As the crop begins to mature, there are many weeds that are a month or two away from maturity, and a pre-harvest herbicide application can help desiccate those weeds and make combining easier. Glyphosate is one of the more popular options as it will help kill off just about any grass, and most broadleaf weeds we encounter in our fields. One of our growing challenges is desiccating glyphosate-resistant kochia and waterhemp with pre-harvest applications. The Group 14 options in small grains, Sharpen (saflufenacil) and Valor (flumioxazin) have been utilized since they cause rapid necrosis and dry-down. However, the utility of those products should be monitored now that we are finding more cases of Group-14 resistant kochia across the state. We have not been able to observe the effect of these products on resistant populations, but there is a high

likelihood of many leaves, and all stems remaining green after application. Kochia response to preharvest applications should be monitored, as any surviving plant should be dealt with after harvest to prevent seed production and prevent further issues in next year's crop.

A list of herbicides, rates, when to apply, and pre-harvest interval (PHI) is below:

SMALL GRAIN PRE-HARVEST WEED CONTROL

Herbicide	Product/A (ai/A)	Weeds	When to Apply	Remarks and Paragraphs
Glyphosate[9] **For HRS, Durum and Winter Wheat and Feed Barley Only.**	Up to 0.75 lb ae **See Remarks.**	Annual and perennial grass and broadleaf weeds including Canada thistle.	Wheat and barley: Hard-dough stage, 30% or less grain moisture. Allow a 7 day PHI.	lb ae/gal lb ai/gal 0.38 ae 0.57 ae 0.75 ae 3 4 = 16 fl oz 24 fl oz 32 fl oz 4/4.17 5.4/5.1 = 12 fl oz 18 fl oz 24 fl oz 4.5 5.5 = 11 fl oz 16 fl oz 22 fl oz 4.8 5.88 = 10 fl oz 15 fl oz 20 fl oz Do not apply more than 0.75 lb ae/season. **Do not apply on wheat or barley grown for seed because reduced germination/vigor may occur.** Apply 0.75 lb ae/A for Canada thistle control. May be applied with 2,4-D or dicamba for improved broadleaf weed control. Add AMS fertilizer at 8.5 lb/100 gal. Refer to label for adjuvant use and application information.
2,4-D[4] ester **For HRS, Durum, and Winter Wheat, Barley, and Rye**	**1.5 to 3 pt 4EC/SL** (0.75 to 1.5 lb)	Broadleaf weeds.	Wheat and oat: Hard dough stage to harvest. Allow a 14 day PHI.	Do not feed straw to livestock. Use only 2,4-D brands labeled for preharvest application. Drift to broadleaf crops is especially hazardous at this time.
Dicamba[4] + 2,4-D[4] **For HRS, Durum, and Winter Wheat Only**	**0.5 to 1 pt 4SL + 1 to 2 pt 4EC/SL** (0.25 to 0.5 lb + 0.5 to 1 lb)		Wheat: Hard-dough stage and green color is gone from the nodes (joints) of the stem. Allow a 7 day PHI.	Do not feed treated straw to livestock. Drift to broadleaf crops is especially hazardous at this time.
Sharpen (saflufenacil[14]) **For HRS, Durum, and Winter Wheat Barley and Triticale Only**	**1 to 2 fl oz** (0.36 to 0.72 oz)	Annual broadleaf weeds.	Wheat: Hard-dough stage and grain with less than 30% moisture. Allow a 3 day PHI.	**Do not apply Sharpen to cereals grown for seed because reduced germination/vigor may occur.** Apply with MSO adjuvant at 1.5 pt/A + AMS at 8.5 to 17 lbs/100 gal or 28% N at 1.25 to 2.5 gal/100 gal. Apply with glyphosate for additional weed control weed and desiccation. Sharpen has no grass activity. Refer to label for crop rotation intervals. **Caution: MRL's may change and growers/exporters are responsible for checking a reliable database to ensure an MRL is in effect prior to export.**
Valor SX **Valor EZ +** MSO adjuvant (flumioxazin[14]) **For HRS, Durum, and Winter Wheat Only**	**2 oz WDG** **2 fl oz EZ +** 2 pt (1.02 oz)	Annual broadleaf weeds.	Wheat: Hard dough stage and grain with less than 30% moisture. Allow 10 day PHI	Apply with MSO adjuvant at 2 pt/A. Spray grade nitrogen source (AMS at 2.5 lb/A or 28% or 32% nitrogen solution at 2-4 pt/A) may be added to spray mixture with MSO. Tank mix with glyphosate to increase control of emerged weeds and aid in harvest.

WEEDS TO WATCH OUT FOR

Every year it seems a few weeds get sent into NDSU Extension for identification that are rare specimens for our state. 2024 is no exception, and we have found a few weeds that are common in other areas of the US, but very rare in North Dakota. If found, these weeds should be monitored, as they are quite problematic in other regions. We do not know how they will ultimately fit in within the state, but awareness is the first line of defense.

Scotch thistle

Most folks are familiar with thistles. We have many native, and several invasive/noxious thistles within the state. Their distinct purple flowers and spiny vegetation make for easy identification. The majority of our thistles fall within the *Cirsium* (Canada thistle, bull thistle, etc) or *Carduus* (musk thistle, plumeless thistle) genera. This week, Scotch thistle (*Onopordum acanthium*) was found in the northwest part of the state. Scotch thistle is not a listed noxious weed in North Dakota, but it is on the noxious list in several states in the western part of the US. It is also a county-listed noxious weed in Bowman County.

Scotch thistle is often identified by its large stature, growing 6-8 feet tall and often as wide. The leaves can be up to 2 feet long, and 1 foot wide. Scotch thistle will also have spiny "wings" all along the stem right up to the flower, whereas other thistles will have a bare stalk just below the flower itself. It is a biennial, meaning that plants that are currently flowering germinated last spring/summer and overwintered.

Scotch thistle in western North Dakota. Credit: Dr. Brian Jenks.

Wild parsnip

Wild parsnip (*Pastinaca sativa*) was recently found in Nelson County along some roadways. This is another biennial weed that is not typically found in our region. Wild parsnip is in the parsley family, which is known for clusters of flowers in umbels. Almost every plant we receive questions on has white flowers (wild carrot, spotted waterhemlock, poison hemlock), but wild parsnip has yellow flowers. Wild parsnip is a common roadside sight driving across the central cornbelt. It is a roadside weed that we do not want to become too widespread, as there are some health hazards associated with wild parsnip. Wild parsnip sap contains a compound that can cause severe blistering in some humans after contacted skin is exposed to sunlight. Thus, one should take precautions when handling this weed to minimize skin exposure. As a biennial, control is easiest in the year of establishment, but an

Wild parsnip flowering along a roadside in Grand Forks County. Credit: Katelyn Landeis.

infestation may not be noticed until flowers are present during the second year. Many broadleaf herbicides (triclopyr, 2,4-D, dicamba) can provide control when wild parsnip is in the first year, growing as a rosette. However, control will be more difficult during the second year and during flowering.

Giant ragweed

Giant ragweed (*Ambrosia trifida*) is an annual weed that is closely related to common ragweed. Giant ragweed is often found along waterways and some field edges in North Dakota. However, in southern parts of Minnesota, through Wisconsin and into the eastern corn belt, it is often one of the most difficult to control weeds within agricultural fields. However, we have been seeing it in more headlands and into fields in parts of eastern North Dakota this spring and summer. Giant ragweed is inefficient at using water, and does not grow well in dry conditions, which likely helps us on an annual basis. However, we were not lacking for water this spring, which is likely part of the cause we are seeing it in late July in many areas we have not traditionally found it.

Giant ragweed is resistant to glyphosate and Group 2 herbicides in areas of the Midwest that build weed management programs around this weed. We currently do not know what herbicide resistance is present in North Dakota giant ragweed. Hopefully this weed does not become an annual problem, because it is one weed I have observed to cause 100% yield loss in both corn and soybean. Fields with giant ragweed in them this year should be monitored in future years to see if this is just a 2024 problem, or a glimpse into the future for some fields.

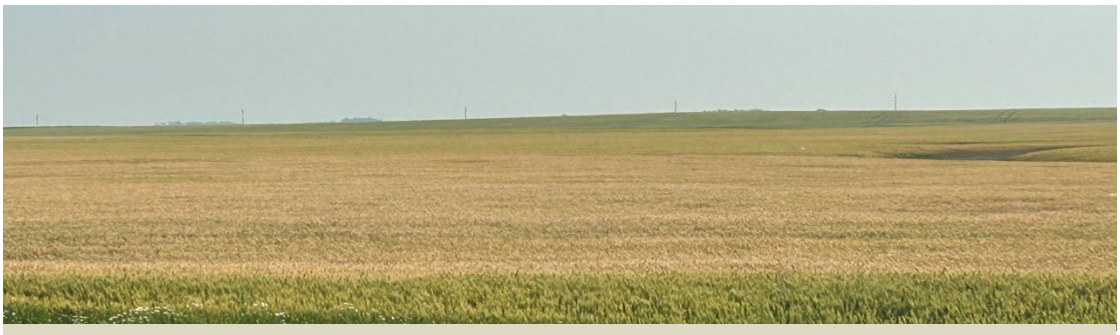
Giant ragweed on a field edge in Cass County, ND.

Joe Ikley
Extension Weed Specialist

around the state

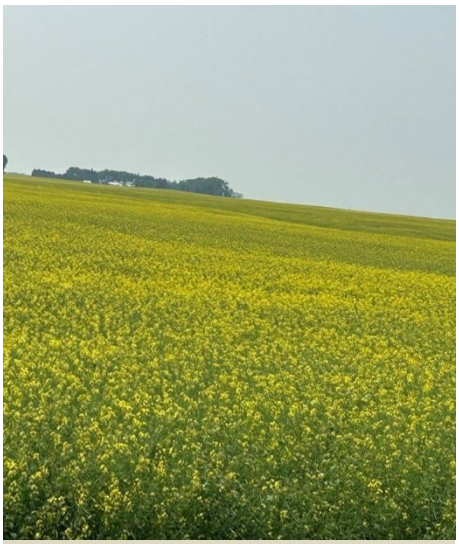
NORTHEAST ND

Crops are progressing fast in the region. Early planted small grains are turning color and are a week to 10 days away from harvest. Late sown small grains are at various stages of grain filling. Field peas are between late flowering to close to physiological maturity. Diseases like white mold and Ascochyta are showing up. Soybeans are at flowering to pin pod stages. Soybean aphids are being reported in many fields at low numbers. Also, brown leaf spot and bacterial leaf spots were observed in soybeans. Canola fields range from flowering to pod development stages. Corn is silking in some advanced fields whereas majority of them are close to or at tasseling stage. Sunflowers are at R1-R2 stages and dry beans are flowering.



Wheat field turning color in Cavalier County. Photo: Anitha Chirumamilla, LREC

White mold in field peas. Photo: Venkata Chapara, Plant Pathologist, LREC



Canola field at late flowering stage in Cavalier County. Photo: Anitha Chirumamilla, LREC

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SOUTH-CENTRAL/SOUTHEAST ND

The region received the more rainfall than the week before, but some areas of the region are starting to suffer from too little of water, but it is a small percentage at this point in time. Rainfall ranged from 0.01 inch near Wing in Burleigh County to 2.02 inches near Edgley in LaMoure County this past week with an approximate average for the region of 0.45 inch. Only locations in Cass, LaMoure, and Traill Counties received greater than 1.0 inch of rainfall over the past week. Average high temperatures for the region were normal to above normal, which is helping crops to grow more rapidly. Some parts of the region experienced hail this past week causing little to significant crop damage.

All hard red spring wheat has headed in the region with the most advanced reaching maturity and being sprayed with glyphosate as a preharvest aid. Hard red spring wheat yields will be highly variable in the region with wheat in some fields negatively impacted by high DON levels from Fusarium head blight to near record yields in other fields. Hard red spring wheat is dying prematurely from several types of root or stem rots in nearly all fields in some parts of the region, such as Griggs County, to vary little in other areas. Many fields in the region will likely have some frequency of Fusarium head blight in them, but the severity will be based upon variety and timeliness of the fungicide application or lack of an application. (See Andrew Friskop's article on pages 7-8.) Weed control in wheat is declining in the region now that weeds are coming out over the top of the hard red spring wheat canopy. Grass species are present in many wheat fields with kochia and waterhemp appearing as well.

Corn, in most parts of the region, are close to silking or have pollinated already. As of July 31st, corn growing degree days are ranging from 1215 GDD's at Robinson in Kidder County, 164 GDD's greater than last week and 55 GDD's greater than the normal, but 102 and 233 GDD's below the 5-year average and 2023, respectively to 1432 GDD's at Mooreton in Richland County, 180 GDD's greater than last week and 14 GDD's greater than the normal, but 80 and 182 GDD's below 5-year average and 2023, respectively! There are concerns for corn in some fields in the region as to whether it will reach maturity in time for a freeze, but most should reach maturity with normal timing of freezing temperature, but corn will certainly be wetter than normal at harvest. Corn is looking amazing in areas of fields with no water damage as there is little or no diseases and insects being present at this time.

Soybeans improved in condition again this week due to the warmer temperature and near normal rainfall for much of the region, except for those fields and areas of fields severely damaged by water earlier in the season. Most soybeans in the region are at the R2 (full flower) flower stage, but some plants in some fields are at the R4 (3/4-inch pods in one of the upper four nodes) stage. Phytophthora root rot is present in some fields across the region and concern for white mold appearing in fields in the region with some farmers applying fungicides to manage the white mold. Soybean aphids are now present in the region from no soybean aphids to fields approaching threshold and being sprayed. Grasshoppers and the red-headed flea beetle are also present causing minor defoliation at the moment, but I saw a significant population of red-headed flea beetles in one field in Griggs County. Weed control in soybeans is highly variable across the region from nearly perfect where multiple preemergence herbicide sites of action herbicides and timely postemergence herbicide applications occurred to weeds already coming over the top of the soybean canopy and not being completely controlled due to large plants at the time of herbicide application.

Dry bean condition has improved again this week in most fields, but like soybean there are areas of most fields with stand loss and/or stunted plants from too much rainfall earlier in the season. If dry bean plants were not harmed by too much water, they are looking amazing. Dry beans in most fields have started flowering now with some fields having pods over 1 inch in length. At least for Griggs County, I'm seeing few if any diseases and insects at the moment, but

farmers are spraying to prevent/reduce white mold issues. Weed control will be worse this year in many fields due to lack of timely postemergence herbicide applications with the wet weather. Kochia, waterhemp, and wild oat will likely be the most prevalent weed species in dry bean fields this year. Wild oat is surviving postemergence grass herbicides due to a combination of antagonism with broadleaf herbicides and increased levels of resistance to Group 1 herbicides.

Fusarium head blight in hard red spring wheat.

Straw-colored plants are dying prematurely from some type of root rot.

Ergot is present in some hard red spring wheat fields as seen in the photo.

Excellent corn producing two ears per plant.

Red-headed flea beetle and damage in soybean.

Kochia plant surviving Liberty plus Enlist One due to the plant being too tall and sprayer travel speed being too fast.

Jeff Stachler
Griggs County Extension Agent

SOUTHWEST ND

Dry and hot conditions were observed in Southwest North Dakota over the last seven days, with maximum temperatures reaching the 100s F last week. Only the southern part of Grant County has seen significant precipitation, with 1.46 inches recorded at the Pretty Rock NDAWN station. Warm and dry conditions are expected to persist during the next seven days. Under these sustained conditions, some crops have been struggling, notably some corn fields showing signs of sunscald (Fig.1). Sustained drought conditions for more than four consecutive days during the vegetative stages of corn can lead to yield penalties of 1-3% per day. During the reproductive stages, the yield penalty can be as high as 3-9% per day.

There has been a lot of activity in the field over the last 7 days: winter wheat and barley are being harvested and baled, and the harvest for field peas has also begun. Spring wheat in the area ranges from finishing flowering to the soft dough stage. Canola is continuing to ripen but remains mostly green. Soybean fields are flowering and setting pods. Sunflowers are between the R1 and R3 stages, with some fields likely to see flowerheads opening soon. Some corn fields have just entered the tasseling stages with many others still lagging behind

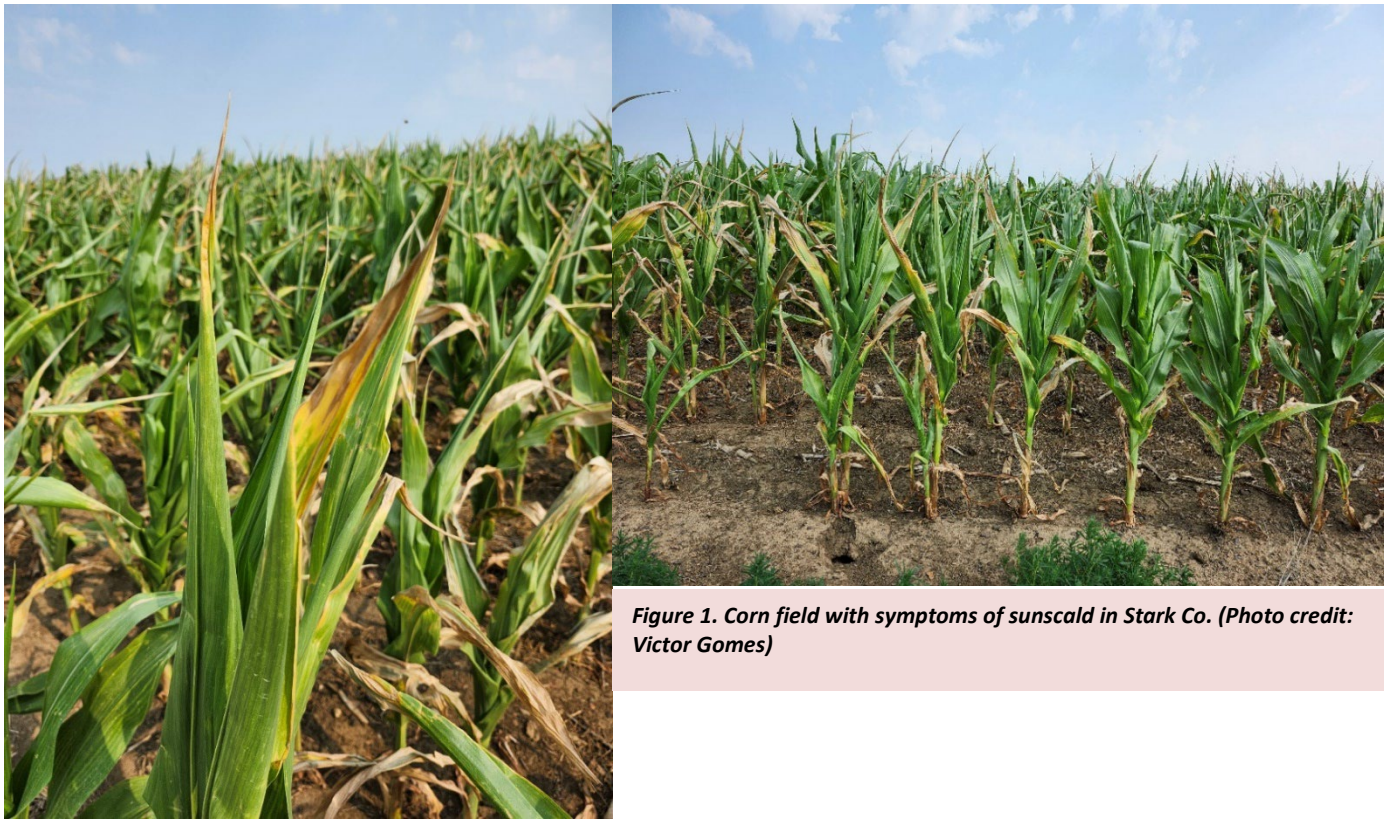

Figure 1. Corn field with symptoms of sunscald in Stark Co. (Photo credit: Victor Gomes)

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