Field Crops Newsletter

Granville and Person County
Mikayla Berryhill

JUNE 2024

Agent Notes – I'm Back in Town!

Left – Mikayla Berryhill, Tammy and Tommy Graham on the Isle of Skye in Scotland.
Right – View from a "Pony and Trap" on Inishmore, an Aran Island in Ireland.

I had a great trip with my parents but am very happy to be back home! It sounds like there was quite a bit of rain while I was away, which sadly could mean that there will be an onset of early diseases. This *may* not be the case if we get those roots aired out and things growing again, but it could be a possibility. If you see anything you don't think looks quite right, do not hesitate to reach out to me!

Especially give me calls if you see any issues with your soybeans. I am working with Dr. Rachel Vann on a project call "Beans Gone Wild", which is a website where folks can look at a map of North Carolina and see issues that are occurring in their area. This can be any issue, from deer damage or drowning to a disease or nutrient deficiency. I will just come out and take a few pictures and samples to submit to the site. The data is collected at the county level, so it will not be associated with your farm specifically on the website! You can find Beans Gone Wild here: beansgonewild.ces.ncsu.edu

I look forward to seeing you in the field this summer. If you have not already done so, please join the Granville/Person County Field Crop Extension group to get regular updates this summer about things happening in the field and events from the extension office!

www.facebook.com/groups/persongranvilleextension/

Tobacco Connection: Vol. 1, Num 1 *Summary*

The following article is a summary of the Tobacco Connection: Vol. 1, Num. 1 by Drs. Daisy Ahumada (pathologist), Lorena Lopez (entomologist), and Matthew Vann (agronomist). Locally important topics from this update are included for Granville and Person County Farmers. The full bulletin can be found at tobacco.ces.ncsu.edu/2024/05/tobacco-connection-1-1/.

If you discover you have any of the symptoms described in the following article, PLEASE reach out to me to help diagnose the issue!

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This newsletter is designed to give you up to date information on crops from NC State University and other sources. For more information:

Contact
PERSON COUNTY
304 S Morgan Street
Roxboro, NC 27573

PH: 336.599.1195
person.ces.ncsu.edu

GRANVILLE COUNTY
125 Oxford Outer Loop
Oxford, NC 27565

PH: 919.603.1350
granville.ces.ncsu.edu

MIKAYLA BERRYHILL
mikayla_berryhill@ncsu.edu

Tobacco Connection: Vol. 1, Num. 1 *SUMMARY*

By: Drs. Daisy Ahumada, Lorena Lopez, and Matthew Vann

High levels of rainfall across the state delayed planting progress in the month of May. Drought conditions persisted from the onset of transplanting through about May 4th, but those conditions are in the rearview mirror…for the time being.

The extended period of cool, cloudy and damp weather has increased the risk of many visual growth disorders developing, typically in the form of leaf spots.

The remainder of this article aims to aid in identifying the cause of these leaf spots. These causes can be biotic (living) or abiotic (non-living) factors. Biotic factors include diseases, both fungal and bacterial. Abiotic includes things like nutritional deficiencies, pesticide application injury, or ozone exposure (weather fleck).

Major diseases

Target spot

Figure 1. Target spot with circular, concentric rings and cracked centers.

Target spot, caused by *Rhizoctonia solani*, is the most common and yield-limiting foliar disease in North Carolina tobacco. The disease appears as small, brown, circular spots scattered on the lower leaves. As the disease develops, the spots will grow larger, developing rings, which give the lesions their 'target' appearance and the center may crack off (Figure 1). The spots may spread from the lower leaves to the mid and upper leaves. Warm, wet weather has led to reports of target spot in young tobacco. Azoxystrobin (Quadris® Flowable) is labeled for use in the field and greenhouse, and mancozeb (Manzate® Pro Stick™) has a 24c and 2ee label for use in tobacco in North Carolina. Both fungicides are moderately effective for reducing target spot, with a possible yield increase of 5%. However, timing is important. Since fungicides labeled for target spot are preventative, it is most effective to spray before the observation of leaf spots, typically at 4-5 weeks after transplant. Learn more about the three-pronged, preventative approach to reducing target spot in your tobacco field: https://pitt.ces.ncsu.edu/2024/05/preventing-target-spot-in-flue-cured-tobacco/

Tomato spotted wilt virus (TSWV)

Figure 2. TSWV showing necrotic veins.

Figure 3. Brown streaks on stalk associated with TSWV.

TSWV is mostly transmitted by thrips. The disease appears as yellow stippling (small dot pattern) next to the leaf veins. As the disease develops, the yellow stippling will turn reddish to brown, and may develop rings. The veins of infected leaves may also turn reddish to brown showing necrotic areas. This symptom is also known as bronzing (Figure 2). The stalks may also display brown streaking or bronzing (Figure 3). TSWV can be damaging when the disease develops within the first six weeks following transplant.

Management of TSWV relies on controlling thrips. The Tobacco Thrips Flight and TSWV Intensity Predictor determines when thrips generations (or "flights") may occur. Imidacloprid (Admire Pro®) and Actigard® (Acibenzolar-S-methyl) applied to transplants in the greenhouse are the most used TSWV management measures. While drench treatments 48-72 hours before transplant are preferred in other areas across the state, our region tends to have a lower TSWV and thrips pressure, so a transplant water application is sufficient. One treatment with either of these insecticides should be enough to protect seedlings.

Other leaf diseases

Other leaf spot diseases, such as brown spot (Figure 4), frogeye leaf spot, and angular leaf spot are less common in North Carolina, but have been identified in the Granville/Person area over the past two growing seasons. Brown spot may look similar to target spot, but the spots are often more irregularly shaped and do not

Figure 4. Brown spot symptoms showing irregular brown spot with concentric rings.

crack. Frogeye leaf spot will start as small, sunken white/tan spots, and will not grow larger than 1 cm. Angular leaf spot will often lead to spots around the veins, like TSWV, but the spots will be brown and the veins will not redden. While there are no effective chemical management options for these diseases, cultural practices that reduce moisture on leaves and improve plant health (proper nutrition) can reduce the risk of these diseases.

Nutrient Disorders

Figure 5. Manganese (MN deficiency in older tobacco. ©2016 Forensic Floriculture, Dr. Brian Whipker – NC State University

Manganese (Mn) deficiency (Figure 5) is the most consistent nutrient issue that leads to leaf spotting, but this is not common in the flue-cured tobacco regions of North Carolina. Manganese deficiency can occur when soil pH is higher than 6.2 and when root growth is limited by poor conditions or chemical damage. The deficiency is most likely to occur in the period of growth between transplanting and layby (~5 weeks after transplanting). Soil and tissue samples should be taken to determine if Mn deficiency is the cause of symptoms. If Mn is deficient, one foliar application of 0.5 lbs Mn/acre should improve plant growth and vigor. Higher application rates should be avoided to prevent the development of Mn toxicity.

Phosphorus (P) deficiency also causes spotting in the lower, older plant tissue. P deficiency is very uncommon due to high levels of phosphorus fertilizers being applied to grower fields. Fertilizer applied in accordance with routine soil samples should not experience P deficiency. If soil and tissue samples show that there is a P deficiency, 20 to 40 lbs. P_2O_5/acre should I have gotten some questions in the recent weeks about making fertilizer adjustments be sufficient for plants to regain normal growth.

Chemical Injury

Agrochemical, or pesticide, applications are a useful tool in tobacco, but can cause injury (Figure 6). Herbicides are the most likely group of pesticides to cause injury. Protox-inhibiting (PPO or Group 14 herbicides) herbicides present the greatest risk for injury. The active ingredients carfentrazone (Aim® EC) and sulfentrazone (Spartan® 4F) are two examples of PPO-inhibiting herbicides, both of which are labeled for use in tobacco. Carfentrazone is a contact herbicide, meaning it is foliar absorbed and does not have residual activity. In contrast, sulfentrazone is applied prior to weed emergence, has excellent root uptake, and provides good to excellent residual weed control. Injury from both herbicides induces a leaf spot appearance. Other herbicides that are not labeled for use in tobacco which may result in leaf spot symptomology include, but are not limited to: fomesafen, gramoxone, and glufosinate.

In some situations, insecticides can also cause leaf spot injury. In those cases, systemic insecticides (usually imidacloprid or thiamethoxam) were applied at a high rate as a greenhouse tray drench or were misapplied altogether. These issues are typically amplified during periods of cool, damp environmental conditions during and after transplanting. Additional factors that negatively impact root health may enhance systemic insecticide injury, such as leaving treated seedlings in float trays for more than 72 hours after insecticide treatment. Tobacco seedlings require at least 48 hours to absorb the systemic insecticide product through the roots, but more than 72 in insecticide-treated cells may exacerbate the risk of phytotoxicity. However, as growing conditions normalize, recovery is quick and should not affect yield.

Fungicides, specifically those within FRAC Group 11 (strobilurins) are known to produce leaf spots on tobacco as well. Injury from strobilurins (ex. azoxystrobin) develop within a few days after application and are enhanced by warm, humid conditions when tobacco is turgid and tender. Injury can be mitigated to some degree by using a low to moderate fungicide application rate, higher carrier volume, and treating when air temperature is <90°F.

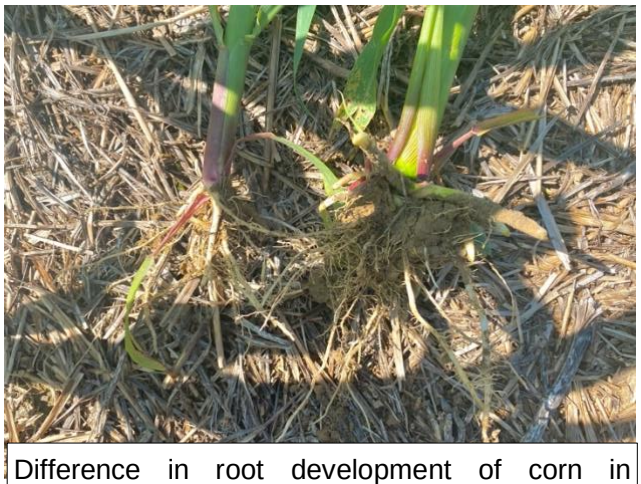
Figure 6. Chemical injury from the herbicide carfentrazone (left), the insecticide thiamethoxam (middle), and the fungicide azoxystrobin (right).

Fertilizer Leaching Adjustments

By: Mikayla Berryhill

Over the past few weeks, I have gotten many questions regarding making fertilizer adjustments due to the high level of rainfall that we have gotten in May. With reports of 8-15 inches of rainfall within 3 weeks in our area, it is very reasonable to assume any pre-plant or at-plant nutrients that were applied are likely either reduced, or not there at all. You can see the impacts of this much rain in the photos to the right. Here are some things to think about when deciding what to replenish, and how much.

Corn with significant color variation due to high rainfall, resulting in Nitrogen and Zinc deficiency.



Difference in root development of corn in saturated, low-lying areas of a field (left) compared to high lying areas of the field (right).

Yield Goal

For grain crops (corn or soybeans), your yield goal should be considered when making nutrient adjustments. Know your bottom line, how much money you have spent on the crop, and what yield you need to achieve to at least break even based on these numbers. As much as I hate to say it, with us getting so far into the season, it may not be worth it to make fertilizer adjustments in some situations. Depending on the level of deficiency you are seeing, and the damage done to the roots during the period of saturation we endured, some tough decisions may need to be made.

Soil Type

Keep in mind your soil type as you read through the rest of this article how your soil type will impact the movement of nutrients. Sandier soils do not hold nutrients well and will have a higher leaching potential than silty and clay soils. Clay soils have more places for nutrients to hold on to and will result in less leaching. Organic matter buildup, more common in continuous no-till land, will also allow the soil to hold on to nutrients a little more tightly. If you look at your soil test results, cation exchange capacity (CEC) is a good indicator of how “good” your soil is at holding on to nutrients. Typically, a higher CEC means it is more likely to hold on to nutrients.

Lime

One good thing is that lime is not something you need to be worried about! Lime is typically immobile in the soil, so it should still be working to raise the pH of our soil and supply calcium and/or magnesium (depending on your lime source) despite the high levels of rainfall.

Nitrogen

The big question is nitrogen. Nitrogen is very mobile, volatile, and just plain moves around a lot in our soils.

Tobacco – the NC State Flue-Cured Tobacco Guides have a chart in them that is very useful for tobacco nitrogen leaching adjustments. After a conversation with Matthew Vann, I found out that growers can likely reduce the percentage of applied nitrogen to replace after transplanting by about 10%, due to the more vigorous varieties available to growers since this data was collected. So, in the chart on the next page, if you have a soil with less than 10 inches to clay, with 3 or more inches of water percolated through the soil 4-5 weeks after transplanting, you could replenish 10% of your nitrogen rather than 20% based on his recommendation. Please see the following chart for assistance with tobacco nitrogen replacement.

Topsoil Depth	Estimated Water Percolated Through Soil	Percentage of Applied Nitrogen to Replace after Transplanting*		
		1-3 Weeks	4-5 Weeks	6-7 Weeks
Less than 10 in. to clay	1 in.	0	0	0
	2 in.	20	10	0
	3 or more in.	30	20	0
10 to 16 in. to clay	1 in.	30	20	0
	2 in.	45	30	10
	3 or more in.	60	40	15
17 or more in.	1 in.	50	25	15
	2 in.	75	35	20
	3 or more in.	100	45	25

*Apply about one lb. of potassium (K2O) for each pound of nitrogen used as a leaching adjustment if the topsoil is deeper than 10 in.

Corn - Tobacco is not the only crop to suffer from leached nitrogen levels corn has about a 1:1 ratio of pounds of nitrogen applied to bushels of grain, meaning that you need at least one pound of nitrogen to produce one bushel of corn. A good way to determine if your corn is suffering from low or deficient levels of nitrogen if the visible symptoms are not clear is with a tissue sample. One concern I have heard with replenishing corn fertility is that if dry fertilizer is used, the nitrogen will be available to the crop too late in the season. This is not the case, because corn needs nitrogen up to the tassel growth stage. We typically get fertilizer on corn earlier in the season because of how quickly corn grows too tall for most equipment to get over it. If you have equipment that will go over your corn, get that dry fertilizer out! It will still benefit your crop, and likely do a lot of good being available close to grain development!

Potassium and other micronutrients

Other nutrients that tend to come up when discussing high levels of leaching is potassium (K) and some micronutrients, like sulfur and zinc. Before re-supplying fields with these nutrients, I would suggest getting another round of soil samples and some tissue samples. All of the crops in the ground or going into the ground now, tobacco, corn, and soybeans, need these nutrients to be successful, but the addition of these nutrients when the soil or plant is not at least low or deficient is not impactful on yield. These nutrients, when visual deficiency symptoms are seen, can be supplied with foliar applications. In some cases, potassium will need to be applied to the soil, especially in very sandy land where leaching potential is high

If you come across lime green, yellow, or purpling plants, please give me a call so we can get some samples in and nutrients on your crop as soon as possible!

Deadline Extended for $5000 Grant for Small Farmers in NC

By: Dinner in the Meadow

The Leonard-Mobley Small Farm Grant, which is supported by the Dinner in the Meadow fundraiser, was established to support and cultivate small farms in our region of North Carolina. Founded in 2014, the Fund works to aid the development and long-term sustainability of small farms through an annual grants program. The purpose of the grant is to improve the operations of the recipient farm to insure the continuation and long-term success of the farm.

Funding: One grant of $5,000

Eligible Counties: Franklin, Granville, Person, Durham, Vance, Warren, Wake, Nash, Halifax, Chatham, and Wilson.

One of the key initiatives of the Dinner in the Meadow event is to fund the annual Leonard-Mobley Small Farm Grant. This competitive grant recognizes and supports small farm owners in eastern and central North Carolina who demonstrate exceptional dedication and commitment to their craft.

Currently, the Fund is accepting grant applications until June 9, 2024 from small farms located in one of the following 11 counties to be eligible: Franklin, Granville, Person, Durham, Vance, Warren, Wake, Nash, Halifax, Chatham, and Wilson. The $5,000 grant aims to enhance the recipient farm's operations, ensuring its longevity and success.

Learn more about the Grant Fund at: https://dinnerinthemeadow.org/about-us

Apply online at: https://dinnerinthemeadow.org/grant-application

Upcoming Events:

Pond Management Workshop

June 8th, 2024 @ 9AM

- Join us at the Person County Office Building (304 S. Morgan Street, Roxboro, NC) Auditorium. Registration will be at 8:30, and the first speaker will start at 9 am. Topics to be covered include:
  - Aquatic weed identification and control
  - Fish management for both new and existing ponds
  - Managing water quality for both existing and new ponds
  - Government Programs and assistance
  - Pesticide credits (A, D, N, O, and X) are pending. Snacks and drinks will be provided.
- ** Bring your pond weed for identification! *
- Registration required: go.ncsu.edu/2024.pond.person

Landscape Pesticide Update

June 25th, 2024 @ 6PM

- IN PERSON at the Person County Office Building (304 S. Morgan Street, Roxboro, NC)
- Topics include fire ant control, diagnosing plant problems, fungicide use, and pesticide drift.
- Registration required: https://go.ncsu.edu/pesticide.june.2024

Tobacco Field Day

July 17th, 2024 @ 9AM-12PM

- IN PERSON at Cunningham Research Station (200 Cunningham Rd, Kinston, NC 28501). Registration begins at 8:30am and a program starting at 9:00am that will conclude at noon with a lunch provided on-site.
- Registration required: tobacco.ces.ncsu.edu then click on "Tobacco Field Day" at the top of the page to find the registration link.

Oxford Grains Field Day – SAVE THE DATE!

Saturday August 3rd, 2024

- Join us at the Oxford Tobacco Research Station – CURRIN FARM (2511 US-158, Oxford, NC) for a field day highlighting local research and current farm problems with multiple extension specialists and industry partners. Lunch and pesticide credits will be offered. MORE INFORMATION TO COME!