Chlorotic Wheat
Josh Bushong, Northwest Area Agronomist, Oklahoma Cooperative Extension Service

Why is my wheat turning yellow, halted growth, or just looking puny? Many fields, especially further out west, have these symptoms of stress on their wheat. Most of the fields with yellowing wheat have been a result a possibly three issues: lack of nitrogen, lack of oxygen, or toxicity to nitrous oxide.

Producers that have applied a majority of this crop’s nitrogen preplant might not be as far ahead as they once thought. Following gracious amounts of rainfall combined with warm soils might have been an ideal scenario in which a significant portion of the preplant applied nitrogen has left the system and no longer available to this year’s crop.

It is hard to determine exactly, but a significant portion of the anhydrous ammonia has already been converted to nitrate. Once in the plant available nitrate form, nitrogen can leave the system much more easily. Two major pathways for nitrate to leave the system would be from leaching and denitrification. Since nitrate is negatively charged, just like soil, it becomes mobile and can be leached out. Meaning it can be moved by water flowing through the soil profile. It might move deeper into the subsoil out of reach from plant roots, or hit a limiting layer in the soil and be deposited down slope often out terraces.

Denitrification is a natural soil microbial process where nitrate is reduced, converted to gaseous forms of nitrogen, and no longer plant available. This process often occurs in warm, wet soils with an abundance of nitrate. Due to waterlogged soils, a variety of bacteria no longer have access to oxygen for respiration so the bacteria takes an oxygen from nitrate. Once nitrate is converted to gaseous forms of nitrogen like nitrite, nitric oxide, and nitrous oxide (N2O) it can be lost to the atmosphere. N2O is toxic to plants and can cause the wheat to turn yellow.

OSU Precision Nutrient Specialist, Dr. Brian Arnall, has estimated that as much as 20 to 50% of the anhydrous applied preplant could already be lost. Amounts depend on how early the anhydrous was applied, how much rainfall has been received, and soil texture and slope. (Cont. Pg. 3)

EPA Announces Changes to Dicamba Registration

On October 31, 2018, U.S. Environmental Protection Agency (EPA) announced that it is extending the registration of dicamba for two years for “over-the-top” use (application to growing plants) to control weeds in fields for cotton and soybean plants genetically engineered to resist dicamba. This action was informed by input from and extensive collaboration between EPA, state regulators, farmers, academic researchers, pesticide manufacturers, and other stakeholders. (Cont. Pg. 3)
Some of northwestern Oklahoma and the panhandle have already experienced a frost or freeze from the last cold front. However the rest of the state has yet to experience the first real frost of autumn 2018. Soon a cold front will bring near-freezing to sub-freezing nighttime temperatures to the rest of Oklahoma.

It was discovered in the early 1900s that under certain conditions sorghums are capable of releasing hydrocyanic acid or commonly called prussic acid. Prussic acid when ingested by cattle, is quickly absorbed into the blood stream, and blocks the animal's cells from utilizing oxygen. Thus the animal dies from asphyxiation at the cellular level. Animals affected by prussic acid poisoning exhibit a characteristic bright red blood just prior to and during death. Lush young regrowth of sorghum-family plants are prone to accumulate prussic acid especially when the plants are stressed such as drought or freeze damage. Light frosts, that stress the plant but do not kill it, are often associated with prussic acid poisonings.

Producers should avoid grazing fields with sorghum type plants following a light frost. The risk of prussic acid poisoning will be reduced, if grazing is delayed until at least one week after a “killing freeze”. A hard freeze is a period of at least four consecutive hours of air temperatures that are below 25 degrees Fahrenheit. Many plants can survive a brief frost, but very few can survive a hard freeze. As the plants die and the cell walls rupture, the hydrocyanic acid is released as a gas, and the amount is greatly reduced in the plants. One can never be absolutely certain that a field of forage sorghum is 100% safe to graze.

Cattle that must be grazed on forage sorghum pastures during this time of year should be fed another type of hay before turning in on the field, and should be watched closely for the first few hours (Cont. Pg. 5)
The early heavy rains and several overcast days this fall has caused the wheat to show these symptoms more than typical. The yellow wheat has been caused by a lack of plant available nitrogen (from being lost or stunted roots), lack of soil oxygen (limiting root and plant growth), and/or toxicity from N2O (leaf burn). Most of the wheat will eventually try to grow out of it, but forage production has been greatly reduced. Acidic soils, soil texture, and shallow soils can amplify these symptoms and issues.

To insure adequate fall pasture wheat needs more nitrogen near planting. Conversely, this is a great year to apply nitrogen rich (N-Rich) strips in every field to monitor nitrogen deficiencies throughout the growing season, either visually or with a handheld greenseeker sensor. Every OSU Extension office has access to simple push spreaders and handheld sensors if wheat producers are interested in trying N-Rich strips this year.

If wheat pasture is needed, additional nitrogen may need to be applied this fall or early winter. Recent trials at OSU indicate that for grain only wheat production it is much more economical and efficient if a majority of the nitrogen is delayed until spring. These trials show that topdress applications made at or near first hollow stem or jointing can maximize grain yield and protein with a single in season application.

EPA Announces Changes to Dicamba Registration (Cont.)

“EPA understands that dicamba is a valuable pest control tool for America’s farmers,” said EPA Acting Administrator Andrew Wheeler. “By extending the registration for another two years with important new label updates that place additional restrictions on the product, we are providing certainty to all stakeholders for the upcoming growing season.”

The following label changes were made to ensure that these products can continue to be used effectively while addressing potential concerns to surrounding crops and plants:

**Dicamba registration decisions for 2019-2020 growing season**

- Two-year registration (until December 20, 2020)
- Only certified applicators may apply dicamba over the top (those working under the supervision of a certified applicator may no longer make applications)
Horticulture Tips for November
David Hillock, State Master Gardener Coordinator

Lawn & Turf
- Fertilize cool-season grasses like fescue with 1 pound nitrogen per 1000 sq. ft.
- Continue to mow fescue as needed at 2 inches and water during dry conditions.
- Control broadleaf winter weeds like dandelions (HLA-6601).
- Keep falling leaves off fescue to avoid damage to the foliage.

Tree & Shrub
- Prune deciduous trees in early part of winter. Prune only for structural and safety purposes.
- Wrap young, thin-barked trees with a commercial protective material to prevent winter sunscald.
- Apply dormant oil for scale infested trees and shrubs before temperatures fall below 40 degrees Fahrenheit. Follow label directions.
- Continue to plant balled and burlapped and containerized trees.
- Watch for arborvitae aphids, which tolerate cooler temperatures in evergreen shrubs.

Flowers
- Tulips can still be successfully planted through the middle of November.
- Leave foliage on asparagus, mums, and other perennials to help insulate crowns from harsh winter conditions.
- Bulbs like hyacinth, narcissus and tulip can be potted in containers for indoor forcing. (Continued on Pg. 5)

EPA Announces Changes to Dicamba Registration (Cont.)
- Prohibit over-the-top application of dicamba on soybeans 45 days after planting and cotton 60 days after planting
- For cotton, limit the number of over-the-top applications from 4 to 2 (soybeans remain at 2 over-the-top applications)
- Applications will be allowed only from 1 hour after sunrise to 2 hours before sunset
- In counties where endangered species may exist, the downwind buffer will remain at 110 feet and there will be a new 57-foot buffer around the other sides of the field (the 110-foot downwind buffer applies to all applications, not just in counties where endangered species may exist)
- Clarify training period for 2019 and beyond, ensuring consistency across all three products
- Enhanced tank clean out instructions for the entire system
- Enhanced label to improve applicator awareness on the impact of low pH’s on the potential volatility of dicamba
- Label clean up and consistency to improve compliance and enforceability

The registration for all dicamba products will automatically expire on December 20, 2020, unless EPA further extends it. EPA has reviewed substantial amounts of new information and concluded that the continued registration of these dicamba products meets FIFRA’s registration standards. The Agency has also determined that extending these registrations with the new safety measures will not affect endangered species.

Learn more: https://www.epa.gov/ingredients-used-pesticide-products/registration-dicamba-use-genetically-engineered-crops
Prussic Acid (Cont.)

after turn in. If signs of labored breathing, such as would be found in asphyxiation, are noted, cattle should be removed immediately. Call your local veterinarian for immediate help for those animals that are affected. Be certain to read OSU Fact Sheet PSS-2904 “Prussic Acid Poisoning” before turning cattle to potentially dangerous fields.

Frosts also stress the plant before a hard freeze kills it. Plant stress from frosts will impair the normal metabolism of the plant. Therefore, the plant continues to take up nitrates from the soil but is inefficient at converting the nitrates to protein. Therefore, nitrate accumulations may reach dangerous levels. Testing the forage before grazing or cutting for hay will provide important knowledge about the safety or danger in the forage. Visit with an OSU County Extension office about testing procedures and read OSU Fact Sheet PSS-2903 “Nitrate Toxicity in Livestock”.

Horticulture Tips (Cont.)

Miscellaneous

• Leftover garden seeds can be stored in an airtight container in the refrigerator or freezer until next planting season. Discard seeds over 3 years old.
• Gather and shred leaves. Add to compost, use as mulch or till into garden plots.
• Clean and store garden and landscape tools. Coat with a light application of oil to prevent rusting. Drain fuel tanks, irrigation lines, and hoses. Bring hoses indoors.

Fruits & Nuts

• Delay pruning fruit trees until next February or March before bud break.
• Harvest pecans and walnuts immediately to eliminate deterioration of the kernel.

Shannon’s Kay County Corner

I hope everyone that needed to get wheat in got his or her wheat planted! Ourselves, with the help of NW Area Agronomist Josh Bushong just got done planting the variety plot in Braman, OK. This is in addition to the Research Plot done in conjunction with Mr. Don Schieber in Kildare. We will use this to do some demonstrations, and visit on the Wheat Tour we plan on doing in March-April Sometime. We also have put up some N-rich Strips and On-Farm Nitrogen Plots, in Newkirk, Tonkawa, Nardin, and Braman.

Not to take away from other demonstrations, but I am especially excited to do a demonstration plot again this year with Newkirk FFA. They will be doing nine Varieties of wheat that have been treated with differing levels of Calcium Silicate. Wayne Foster of Two Rivers Co-Op in Newkirk will be helping along the way and we hope to find valuable results from this demonstration. The plot is located south of the Newkirk High School Softball field for anyone interested in seeing the progress throughout the year.

Kay County Cooperative Extension Service will be holding a Private Applicators Class on Wednesday, December 5, 2018 at 6:00pm in the Kay Room in Blackwell, Oklahoma. Most all current Private Applicator License holders will need to renew their license by December 31, 2018, and this class is a great way to get that taken care of. Josh Bushong will be presenting a class on the Private Applicator Test. The cost of the program will be $25 and will cover the Packet and Supplies needed for the licensing. Helena Chemical of Blackwell, Oklahoma has generously sponsored a meal for all attendees who RSVP through the Kay County Extension Office either in person in the courthouse basement, or via phone (580)362-3194.

The Blackwell Oklahoma Quality Beef Network (OQBN) Sale was this past Saturday, November 17th and was a big success. 1854 head of OQBN calves were sent through the sale ring on Saturday. History has shown that the calves that are verified through the OQBN program will bring at least $0.10/lb. more than calves marketed with no preconditioning, and as much as $0.19/lb. in some years. If you are interested in participating in the OQBN program next year, please contact the Kay County Extension Office and we will be glad to get you set up.