

David Hallauer
District Extension Agent, Crops & Soils

Stressing the Corn Crop

Fortunately for us, corn originated from a tropical grass and has been observed to withstand temperatures upwards of 112 degrees F – for short periods. Even as we hope to avoid 112, we unfortunately may see multiple days of triple digits.

Withstanding high temperatures and *thriving* during them are two different things. Plant growth typically decreases as temperatures exceed 95 degrees F. If moisture is adequate, we don't see a lot of decline in plant photosynthetic capacity from 'normal' summer temperatures. Plants continue to grow and yield isn't greatly affected. Ninety-five degrees and above, is a different story.

While heat and drought stress don't *always* occur simultaneously, drought stress typically closely follows heat stress periods – especially when they last for a time. Leaf rolling will be the obvious first sign as the plant attempts to limit leaf moisture loss (transpiration). As it does so, photosynthesis is reduced. If that occurs only for a few hours in the heat of the afternoon, there's little concern. The earlier it starts in the day and the longer it persists, the greater the potential for yield losses to occur.

Multiple studies over time have attempted to quantify the yield loss resulting from stresses. One study found losses of three to nine percent per day possible when the crop experienced drought stress and leaf rolling for *four or more consecutive days*. Milk and dough stage losses can reach six percent. With any luck, recent moisture will help mitigate this to a degree (daily water use requirements from early tassel until blister stages average almost a third of an inch). Soil moisture levels that rebounded with moisture since mid- July are trending downward again. With close to 10 inches of water needed from early tassel to the end of the blister stage (and another nine plus inches until maturity...), rains are needed. A 'missed forecast' with temperatures lower than expected would be helpful as well.

It is that time of year – but it's still never pleasant to see the crop 'tested'. For more information on crop growth stage to see where you're at, check out KSU's *Corn Growth and Development* reference at: <https://bookstore.ksre.ksu.edu/pubs/MF3305.pdf> .

Ross Mosteller
District Extension Agent, Livestock & Natural Resources

Nitrate Poisoning in Livestock

July rain has been a welcomed gift for agriculture producers, but one issue that might pop up because of them, is something livestock producers need to be aware of. Livestock nitrate poisoning can be an issue in some forage crops, especially after extended dry periods. Folks have asked if grazing or haying of some of our summer annuals is safe now, so this feels like a topic to address this week.

The potential for high nitrate concentrations in crops such as corn, sorghum, brassicas, cereal grains, and some grasses, in addition to non-cultivated plants like pigweeds and Johnsongrass, occurs after exposure to drought, hail, frost, cloudy weather, or soil fertility imbalance. Nitrates accumulate in the lower portion of these plants when stresses reduce yields to less than those expected, based on the supplied nitrogen fertility level. Feeding harvested forages or grazing plants that are high in nitrates can be toxic to livestock because the metabolism products from nitrates interfere with the ability of blood to carry oxygen, causing asphyxiation. Lack of oxygen in the tissues can cause abortions and death.

Nitrates are usually highest in young plants and nitrates decrease as plants mature, unless growth stress is encountered. Nitrate is not necessarily toxic, at normal levels. When high nitrate forages are consumed the nitrate is converted in the rumen into ammonia and used by ruminal microbes as a protein source. An intermediate product in this process is nitrite, when too much nitrite is produced it is absorbed into the blood. Nitrates may cause death within 30 minutes to 4 hours after symptoms appear.

It is important to use caution in your feeding programs when known nitrate accumulators are undergoing stress before harvest or grazing. Forage suspected to contain high nitrate levels should be tested by a laboratory before feeding to livestock. Please note that not every lab reports levels on the same scale, but all test can be converted to determine if it is safe to feed. Generally speaking, ppm Nitrate (NO₃) levels of 3000 are safe and over 9000 are dangerous, with some ability to manage in between that range.

Preventative measures should be taken to help prevent loss in your herd. This includes things such as; gradually adapting to high-nitrate feeds, dilute with other feeds, feed a balanced ration, don't feed higher nitrate feeds to stressed livestock, don't feed to hungry livestock and keep plenty of clean fresh drinking water at all times. If you suspect that you have an animal with nitrate poisoning, quick intervention from a veterinarian can help to reverse symptoms and possibly save the animal's life.

In summary, here are some of the main points to remember about nitrates and livestock. Pay close attention to potentially troublesome plants, such as sorghum, sudangrass, other summer annuals, and brassica species. Avoid excessive application of manure or nitrogen fertilizer. When harvesting high-nitrate forages, raise the cutter bar. Harvest plants containing high levels of nitrate as silage rather than as hay. Finally, have representative samples of suspect forage analyzed before feeding.

If you need help with sampling and testing forages for nitrates, please reach out to your local Extension office. The K-State publication [MF-3029 Nitrate Toxicity](#) is available for more in depth information.

Laura Phillips
District Extension Agent, Horticulture

The Emerald Ash Borer Confirmed in Northeast Kansas

You may have heard of a destructive invasive pest known as the Emerald Ash Borer (EAB) that is devastating ash trees across the US. The EAB can infect species of North American Ash trees and is a death sentence for the trees unless treated. It has killed over 10 million trees across the U.S. in the past 20 years and continues to expand its geographic region.

Recently, Ryan Rastok of the Kansas Forest Service reported the EAB in 13 counties of Northeast Kansas: Atchison, Brown, Doniphan, Douglas, Franklin, Jackson, Jefferson, Johnson, Leavenworth, Miami, Osage, Shawnee, and Wyandotte. We believe the presence of these beetles is not limited to these counties, and residents of Northeast Kansas should report suspected EAB infestations to the Kansas Forest Service by calling 785-532-3300 or sending an email to Rastok directly at rrastok@ksu.edu.

To determine if the EAB has made your ash tree its new home, look for symptoms on the bark and in the canopy. Woodpeckers find the EAB larva quite tasty, so look for light patches of bark and woodpecker holes. The larva tunnel under the bark and feast on the cambium, the layer just below the bark responsible for water and nutrient movement in the tree. Their feeding can cause splits in the bark with S-shaped tunnels underneath. As the tree loses its ability to access nutrients and water, branches of the tree will start to die off.

If you notice the EAB in your ash tree, you need to act quickly to save it. The tree may survive for a few years, but when the tree has lost over 50% of its canopy, the odds of survival even with treatment are very low. Treatments for the EAB include trunk injection, soil drench, or bark spray. These treatments will need to be applied on a regular basis for the rest of the tree's life. Bark injections can provide up to three years of protection but is best applied every other year. Before going out to treat the trees yourself, we recommend talking to a licensed pesticide applicator. The treatments you can find over the counter will not be as effective as those provided by a licensed applicator.

To find out more information about the EAB or report an infestation, contact either the Kansas Forest Service or your local Extension Office.

Teresa Hatfield
District Extension Agent, Family and Community Wellness

Managing Brain Health

Unfortunately, there is no magic pill to help improve our memory. You see claims on television that you need this supplement or that vitamin to improve brain clarity. Be careful with the easy fix. The good news is that there are things you can do to improve brain health.

The brain is an incredible organ responsible for controlling your whole body. Your brain needs the right chemicals and protein to function correctly, and your health could suffer if you aren't getting what you need from your food. The brain is small compared to the rest of the body but can use up to 30% of our caloric intake daily. Your brain also needs adequate blood flow to get the brain to get the nutrients it needs. Some of your brain's blood vessels are so tiny they only allow one blood cell to pass through at a time, so it is vital to keep those vessels open.

Your choice of diet can affect your brain health. When considering your diet, variety is best. Half your plate should contain vegetables, the more colorful, the better, green, red, blue/purple, orange/yellow, white, and brown. One-quarter of your plate should contain a whole grain carbohydrate, like a whole grain bread, rich, or tortilla. The other quarter can be protein, fish, chicken, meat, or beans. You can also include a low-fat dairy and a serving of fruit. Always consult your healthcare provider before making any dietary changes; you may have some special nutritional considerations.

Good blood flow to the brain is critical in keeping our brain healthy. When we start having trouble with our memory, we often conclude that it is Alzheimer's Disease. However, this may not be the case. Some physical conditions can also restrict blood flow to the brain; these include high cholesterol, high blood pressure, and dehydration.

High cholesterol can reduce or stop blood flow in your blood vessels by producing plaque. Clogged blood vessels reduce the blood flow to the heart and brain. These clogged vessels, in turn, can cause problems for our memory and thinking. There are two types of cholesterol. The bad cholesterol is called Low-Density Lipoprotein or LDL; I think it is "L" for Lousy. The other type is High-Density Lipoprotein or HDL; I think of it as "H" for Happy. Diet and exercise can help reduce your numbers. Talk to your healthcare provider; they can advise you whether or not your cholesterol is too high or borderline and what you can do to reduce it.

High blood pressure can damage your blood vessels as well. When the force of the blood is too strong, it can damage your heart and kidneys and lead to hardening of the arteries. This damage, in turn, restricts blood flow to the brain, depleting the brain of the nutrients it needs to function properly. High blood pressure is known as a silent killer as it often has no signs or symptoms. Make sure to check your blood pressure regularly, and if it is too high, work with your healthcare provider to lower it.

Because your body is mostly water, you need to keep hydrated. Water is the fluid part of our blood. Without enough fluid, our blood cannot deliver nutrients and oxygen to our brains. Keeping your body hydrated is vital to good health and well-being. Generally speaking, you will need 64 ounces of fluid daily; this also depends on your activity level and environmental conditions. So, many factors impact brain health. I have just mentioned a few. Contact your healthcare provider if you believe you or someone you know is struggling with brain health. So many things impact our brains that aren't necessarily related to dementia. Keep your brain active and busy. Your brain likes to be challenged, read a book, start a new hobby, or pick up an old one you haven't tried in a while, play some games, socialize, and get some exercise.

Here are a couple of puzzles to get you started. Look at the pictures and decide what they mean.

1. ZERO
Ph.D.
M.S.
B.S.

- 2. ADVER truth TISING
- 3. MAN
BOARD
- 4. R
ROAD
A
D

Answers:
1. Three Degrees Below Zero 2. Truth in Advertising 3. Man Overboard 4. Crossroads

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Cindy Williams
District Extension Agent, Family & Community Wellness

No news this week.