

FOR THE
RECORD:

Data from OARDC Fremont, Matt Hofelich

May Rainfall: 6.06"

Cumulative GDDs: 418

Soil Temperature: 71.3

Websites of Interest:

www.widmerassoc.com

www.weather.com

<http://vegnet.osu.edu>

<http://corn.osu.edu>

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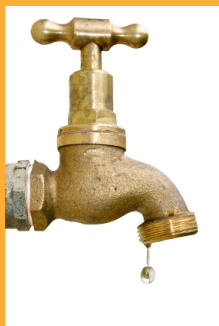
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The W&A Q&A

Dedicated to Excellence in Growing Crops



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Farmers aren't the only ones under stress this spring!

Dusty Sonnenberg, CCA

It is amazing how quickly we can go from a planting season that started in early April with soils in near perfect condition; to one of questions and concerns over missed plantings, and constantly saturated soils.

While this spring has become very stressful for most farmers, the crops that did go in the ground are also under a good deal of stress. From the cool and wet conditions we had during early and mid-May to the warm and wet weather we've experienced in late May and early June ... environmental stress is very present in many fields. Saturated soils lacking sufficient

oxygen, initially cool temperatures, the general loss of nitrogen, all make-up the



environment which is one side of the Disease Triangle plant pathologists refer to.

Another side of the triangle is having a susceptible host. The saturated soils have resulted in weakened seedlings and shallow root systems.

The roots are often referred to as the "brains of the plant". Healthy roots are a key to the long term success of any crop. A shallow root system may be very problematic if the summer turns dry.

The third side of the disease triangle is the pathogen. We have several pathogens ever present in our soils, especially in no-till and reduced tillage fields where the residue from the previous crop overwinter the diseases. While there is very little we can do to get rid of the pathogen, or change the environment, we can take steps to make the "host" less susceptible. The following pages contain some thoughts from our W&A Agronomists.

Food Safety & Traceability - Rex Marquart, CCA

Water Usage

- 1) Water can be used for irrigation, frost protection, rinsing the crop and a carrier for pesticides, fertilizers and growing aids.
- 2) Water can be a vector for microbes including human pathogens (E. coli, cholera, listeria, salmonella, etc.)
- 3) Water can be sourced from District pipelines, wells, open surface sources (ponds), rivers and ditches.
- 4) Water is to be sampled at the beginning of each growing season and sampled monthly after planting if a surface water source is used.
- 5) If a filtering system is used, the sample should be taken after the filters.
- 6) If a filtering system is not used the sample should be taken at some point after the pump. Ideally at the water entrance to the field.
- 7) The samples are to be analyzed for Generic E Coli. If there is a

positive detection of Generic E Coli, the same sample is to be tested for E Coli 0157H7

- 8) The water can be treated with a chlorination system as a possible mitigation measure. The water then needs to be re-sampled after the chlorination process.
- 9) The risk of most concern is the water that comes in contact with the edible parts of the vegetables and fruits

GPS Tech. Tips

The management of AB lines is a task that can be troublesome to any size operation. When we run equipment with different widths, inevitably we will have multiple AB lines in all our fields. Naming them in such a manner that we can identify which ones go with which operations is the key. Including a letter in the name, such as "P" for planting, "S" for Spraying, "H" for harvest, and "D" for the drill is one tip which may save frustration later.

What is Hook?

"HOOK" is a product offered by W&A that is actually an adjuvant capable of spreading and enhancing chemical penetration into the plants. It is capable of making the active ingredients in your spray mixture behave as a surfactant.

"HOOK" offers superior adhesion to plant surfaces, improved contact activity which means more efficient spreading and penetrating power to your active ingredient without adding a lot of soap.

Disease Triangle Continued...What can you do?

Dusty Sonnenberg, CCA

Environment

Having good surface and subsurface drainage goes a long ways in years like we are experiencing. Not only does it allow you remove excess water and get into the fields in a more timely fashion, but it also creates a more favorable environment for the plant roots to live and thrive. Soil type also plays a large role in this. Many of our heavier clay soils are most at risk.

Pathogen

Very little can be done to reduce the pathogen from the disease triangle equation. If you know a field had a disease issue the previous fall, tillage is often the best option to bury the residue and destroy the pathogen. While this is not possible in no-till systems, cropping decisions should factor in any high disease level potentials prior to planting a crop.

Host

Most all farmers agree that the genetics we have today allow us to establish crops in environments that would never have been possible in the past. A working knowledge of the strengths of your varieties is very important. Having an understanding of products on the market that are available to help relieve stress and provide much needed nutrients in a usable form can help.

- *Widmer and Associates works with our clients to evaluate current crop conditions, variety traits, and products available to help reduce unnecessary stress on your crops.*

Manganese Deficiency - Doug Mitchell, CCA

Besides being a necessary component in Chlorophyll reactions, Manganese (Mn) also plays a role in disease resistance. Manganese activates several enzymes responsible for the synthesis of amino acids and secondary products such as lignin and flavonoids. Low concentrations of lignin and flavonoids in Manganese deficient plants are responsible for a decrease in disease resistance (Gordon, 2006). Flavonoids in the roots of legumes also stimulate nodulation.

Soil Manganese becomes less available for plant uptake when soils are dry. Last year's dry weather caused Mn deficiency symptoms in soybeans to show up early and be more visually pronounced. In some ways the easily noticed symptoms

were helpful, as they caused growers to make corrective applications of foliar Mn while it was still relatively easy to get through the field. The abundance of moisture so far this season may not be conducive to development of a good size root system, but it has kept soil Mn in solution. Manganese should be available for uptake by whatever roots we have so far, unless soil Mn is extremely low or soil pH is very high. This may keep the onset of obvious foliar symptoms of Mn deficiency at a minimum. Unfortunately, that does not mean Mn deficiencies won't occur later when plants are bigger and harder to apply corrective sprays to. A combination of a mid-season dry spell and underdeveloped root systems may inhibit Mn

uptake after field operations to apply sprays are practical. Add to that, research that supports the theory that applications of Roundup to Roundup Ready soybeans adversely affects Mn metabolism in the plant. We have a lot of soybean fields that will require multiple Roundup applications to clean up less than perfect pre-emergent weed control. Chances are very good that application of supplemental foliar Manganese will give a positive yield response even when the classic foliar symptoms of deficiency are not there early to tip us off.



Mn

W&A's K-Man is made with a specific form of Mn that will mix with glyphosate, and contains a low pH fertilizer containing N, P, K, and other micronutrients.

Good Root Health - The Key to Success, Mike Netz, CCA

Many fields of corn remain stunted, yellow-green, and otherwise very uneven in their appearance. The question on everyone's mind is "Why have these fields deteriorated instead of improving?" Furthermore, sometimes ugly fields are across the road from beautiful fields. What's up with that?

The majority of problem fields & poor areas within a field, can be explained by looking at the condition of the corn plants root system. Excessive rains have deteriorated the crops roots. Water & nutrients can only be taken into a plant thru the very small area at the end of a root, called the root cap. In order for any plant to grow normally there needs to be constant growth & extension of the root tips. Excessive soil moisture prevents the normal function of a plants root system. When this happens many negative things start to take control of our crops. We start to see nutrient deficiency problems, herbicide uptake / damage & fungal root diseases etc. . . . The decline of the above ground portions of a plant has a direct relationship to the health of our roots. The degree of "ugliness" is very much dependent on the timing and duration of the cause of the problem "excessive soil moisture" for any given field.

Here is a short "laundry list" of the stressors contributing to the many problems early in this growing season. Mix and match them to help diagnose the combination of factors for any given field. The negative effect of many of these stressors will be greater the younger the crop was when they occurred. Hybrids naturally differ for tolerance to these stressors, which adds to the confusion when comparing one field to another. Finally, remember that stressed plants that have not had time to recover do not tolerate subsequent stress as well as healthy plants. Consequently, fields with healthy root systems "turn the corner" quicker and severely stressed fields with poor root systems "stall out" and remain ugly. Below is a list of some of the crop stressors that we have had to deal with so far this spring. Take note on how all of these known crop stressors have a negative impact on a plants root system or is caused by a plants poor root system.

- Frequent and / or heavy rain events that kept surface soils saturated for lengthy periods of time.
- Leaching of mobile nutrients, like nitrogen, below the root depth of the young corn plants.
- Several weeks of cool and cloudy weather that certainly was not optimum for root growth & photosynthesis production in leaves.
- Herbicide injury due to slow corn plant metabolism during cool, cloudy weather.
- Above-ground frost damage; especially if multiple occurrences.
- Above-ground damage to blowing sand / soil particles; aka "sand blasting"; especially if multiple occurrences.
- Damage to kernels or a seedlings roots from a number of pests including insects, seedling blights, and other fungal disease pathogens.
- Soil microbes responsible for decomposing residues & activating & releasing many nutrients are not active in excess soil moisture conditions.
- Soil compaction from last fall's late, wet harvest; aggravates the saturated soil problem.
- Soil compaction from tillage and planting operations this spring; aggravates the saturated soil problem.
- Natural variability within fields for soil drainage characteristics.
- Natural variability within fields for soil color; affects early soil temperatures and seedling root development.
- Tile drainage systems that are non-existent, inadequate or poorly functioning.
- Excessively low soil pH; affects early root development.
- No starter fertilizer or inadequate starter fertilizer rates, are very obvious, under the current adverse conditions.

The question on many growers minds currently is, "Is there something I can do that will help my corn crop turn the corner quicker?" The answer is "Yes there is." There are several products that Widmer consultants recommend that can speed up & improve the health of a crops root system. One product is called BioForge & the other is called X-Cyte. Both of these products need to be applied as a foliar spray & can be combined along with a planned herbicide, fungicide or insecticide spray.

BioForge contains a chemical molecule that is a strong antioxidant & stress reducer. It causes a dramatic reduction in the levels of stress ethylene that builds up in a plants cells, when they become stressed from adverse conditions. BioForge attaches to the same binding sites as does ethylene. Therefore BioForge purges stress ethylene from a plant. With the absence of stress ethylene, a plant will rapidly improve & start to function normally. What you will see after a BioForge application to a stressed plant is, rapid growth of roots & above ground plant parts. Increased activity of plant buds which were driven to dormancy by excessive ethylene build up at the cellular level.

X-Cyte contains the natural hormone produced in healthy roots called cytokinin. Cytokinin is primarily produced in meristematic tissue of roots. Cytokinin is necessary for normal cell division & the normal growth of new roots, leaves, flowers, fruits & branches. By supplementing the cytokinin that is not being made by poor compromised roots, a plant will start to function normally quicker. A foliar application of X-Cyte will translocate throughout the plant & cause an increase the growth & activity of new roots & apical stem points.

For more information on these products, ask a Widmer crop consultant. We would be happy to assist you in helping your corn crop turn the corner quicker!

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Reducing Stress in Late Planted Corn—Patricia Lawson, Stoller USA

Farmers are working against the clock and Mother Nature to plant corn. As weather challenges continue, farmers are looking for ways to protect their yields and profits. An increasing number are turning to StollerUSA's Bio-Forge®.

Bio-Forge is the flagship product in Stoller's extensive yield-enhancing line up of micronutrients and specialized foliar products. It's an antioxidant that purges plant cells of stress ethylene. The groundbreaking technology has been validated by university studies to significantly increase yields of food, feed, and bio-fuel producing crops.

Unlike other products that suppress all ethylene production--Bio-Forge is proven to manage only the stress ethylene and other plant hormones at an optimal level through a variety of stress conditions. It has been successfully used by growers to counter the impact of stress like the wet conditions that growers in the Midwest are struggling with.

Late-planted corn performs poorly having a shorter growing time to reach full maturity. This problem of delayed maturity can affect a grower's bottom line. Many farmers think Stoller USA's Bio-Forge might be just the solution to their current challenges.

Bio-Forge allows corn plagued by late-plant issues and high moisture conditions to bolster stress tolerance and manage primary sugars to fill out the ear and ear kernels for higher yield.

"The ability of Stoller technology to balance hormonal activity is key. It considers the factors that impact a plant's growth cycle and works to enhance the genetic expression while nullifying the impact of stress issues," explains CEO and world-renowned agronomist Jerry Stoller, "Products like Bio-Forge focus on how to maximize the performance of plants--even with late-plant issues like those farmers are facing this spring."

Stoller has invested heavily in university research and conducted field trials with growers across the nation. "This year margins are too tight for farmer's to experiment with untested products," points out Dave Redmond, StollerUSA's national sales manager. "With Bio-Forge, farmers can be confident they are using a university tested product, proven to enhance yields even in some of the most challenging growing conditions."