KEYS TO WATCH FOR IN MID-SEASON CORN AND SOYBEAN MANAGEMENT

MID-SEASON GOALS

Limit Stress:
The main goal is to limit stress during the mid-season. Growers build up yield potential through germination to V6; the goal is to preserve as much yield as possible. Drought, insect pressure and disease are all causes of stress; however, the likelihood that these factors will affect yield decreases as the plant health increases. Too much nitrate build-up will cause an unhealthy plant leading to additional stress.

Enhance Photosynthesis Proficiency:
In order for the plant to enhance photosynthesis proficiency a deep green color is desirable. Stomata opening and closing needs to be controlled. Also, soybeans should be branching for sun to reach the newly developing nodes.

Maintaining Nutrient Density:
It is important to hold nutrient density throughout the growing season for as long as possible. Notable nutrient dips are usually present in nitrogen, potassium, calcium and a few other key nutrients. Agronomy 365 recommends building nitrogen and potassium levels up as much as possible before the plant gets to the R1 growth stage.

CORN & SOYBEANS Observations to Train the Eye

Color: How deep is the color of green on the tissue? Are there any interveinal patterns? Is there crinkling of the leaf margins? If so, where are they located? Edge/mid rib/tip? Older or newer leaves? Documenting these key notes before you send in your tissue analysis is a highly advantageous learning tool.

Stress Observations:
Are the leaves on corn closing due to heat and drought? Are the plants showing signs of elongation? If the plant is starting to turn a lighter shade of green or even yellow, is the top section and/or bottom section of the leaves yellow or bottom section of the leaves yellow? Is there any chemical damage/burn from when the grower last sprayed? These are all beneficial observations and questions to ask yourself in the field.

KEY NUTRIENTS

Mid-Season

N-: Nitrogen is essential for plant growth, health and yield gain.

K+: The drought protector, sugar transporter and stomata control nutrient.

S-: Nitrogen's little brother, triggers enzymes and is involved with converting nitrate into protein.

Ca++: Trucker of 7 key nutrients, activates enzymes and is the key to cell wall strength.

P–: The engine of energy.

Mg++: Center of chlorophyl production, sugar loader and transporter.

B–: Steering wheel of the truck for calcium, guides nutrients within the plant, cell wall strengthener.

POTASSIUM

Mid-Season:
Around V6 through the rest of the growing season we would like to see an adequate amount of potassium present in tissue tests in corn ranging from 3.2-4.0 and 2.9-3.5 range in soybeans. Potassium is associated with water, sugar, nutrients, and carbohydrate movement in plant tissue. It is also involved with enzyme activation within the plant, which affects protein, starch and ATP production. Potassium helps plants utilize water and resist drought. The regulation of stomata is governed by potassium as well. Potassium is very antagonistic

with magnesium. It is vital to maintain a 1 to 1 ratio. With having a 1 to 1 ratio studies have shown that phosphorus will be taken up by the plant more readily as well. With too much nitrogen applied in the soil, potassium will be the first nutrient to take out. Visual signs of potassium deficiency will present with a yellow coloring around the edges of the leaf. With potassium deficiency the plant will be more susceptible to wilt on dry, sunny days. The plant will appear droopy and will lead to significant yield loss. This is a great opportunity to evaluate your soil test. We want to maintain a minimum of 40 H3A ppm value in our soil mid-season and prefer close to 60 ppm in a dry environment. Too much potassium can slow down magnesium and calcium uptake.

NITROGEN

Mid-Season:

There are three forms of nitrogen the plant takes up during the growing season. These forms are nitrate (NO3), ammonium (NH4) and amine (NH2). The most abundant form of nitrogen is nitrate. Nitrate promotes vegetative growth by elongating cells and weakening the cell wall, allowing pests and diseases to attack the plant. This is why we want to see a 3 to 1 nitrate to ammonium and/or amine ratio in the plant. The amine and ammonium forms of nitrogen trigger a strong reproductive growth response. Tips for a stronger nitrate to ammonium and/or amine ratio is to make sure your plant has an abundant amount of sulfur, molybdenum and copper available. These nutrients sponsor the enzymes that convert nitrate into ammonium, and then ammonium into a protein. In order for the plant to maximize self-protection this process has to happen quickly. Nitrogen also plays a huge role in the color of the plant. The formula for chlorophyll is C55 H72 O5 N4 Mg. The magnesium atom is the center piece with four nitrogen atoms hooked to it. Without the correct amount of nitrogen atoms present, the plant will not achieve a deep green color like it needs to be to maximize its full photosynthetic potential. Nitrogen is a necessity; however, when over-applied, will affect uptake of potassium, calcium and other key nutrients. Visual signs for nitrogen will first appear on older leaves then continue to move through the plant. Therefore, look for signs of nitrogen deficiency on the tips of the leaves and throughout the midrib.

SULFUR

Mid-Season:

Sulfur, also known as nitrogen's little brother, is essential for plant health and photosynthetic potential. Sulfur is essential for multiple enzymes contributing to nitrogen fixation and conversion into a protein. Nitrate reductase enzymes are responsible for the conversion of nitrate into a protein. Sulfur activates this enzyme comprised of mainly molybdenum. It is very important for this process to happen as quickly as possible. The plants immune system is completely compromised without adequate protein present. Secondary metabolites are also sulfur based. Secondary metabolites are organic compounds that are not involved in the growth of the plant, but instead they provide ecological advantage on stress control. Sulfur is also necessary for chlorophyll formation, and is a structural component for two of the 21 amino acids that form protein. An adequate amount of sulfur will reduce the uptake of sulfur. The ideal sulfur to phosphorus ratio is one to one. Another important ratio is the nitrogen to sulfur ratio. The ideal ratio in the plant is 8 to 10 parts nitrogen to one part sulfur. In a balanced ratio, ratios sulfur increases the efficiency of nitrogen, and nitrogen increases the efficiency of sulfur. Sulfur will also contribute to a reproductive push. Sulfur is a super slow-moving mineral so deficiencies will show up on the new section of leaves.