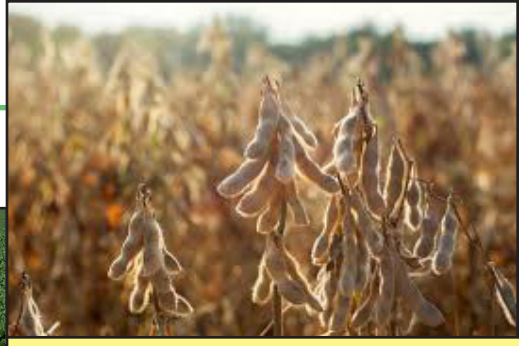
ProfitProAG

JUNE 2021
2ND QUARTER

FARM INSIGHT



FARM INSIGHT Featured Content

In Next Month's FARM INSIGHT

* How to Reduce Tillage Cost
* Midwest drought update

MINIMIZE PLANT STRESS

Are you Farming the Controllables?

"Recipe for Success"

The key controllables that impact profitability include:

- ✓ **Manage crop residue**
- ✓ **Optimize crop stands**
- ✓ **Boost soil health & plant health**
- • **Minimize plant stress** *(hint – discover the value of ethylene inhibitors)*
- • Reduce tillage cost
- • Utilize crop rotation & cover crops
- • Biologically treat manure

Minimize Plant Stress This Summer, Maximize Crop Yields This Fall

Got moisture in your area? The U.S. Drought Monitor shows that drought conditions are fairly widespread—and quite severe in some areas—from Iowa to the Dakotas to Minnesota.

"Our concern is that there's not a lot of sub-soil moisture available in many areas," said Dennis Klockenga, a crop specialist with ProfitProAG. "That makes timely rains more critical."

While we can't make it rain, we can help you learn more about plant biology, specifically the role that ethylene plays in a plant's response to dry conditions. We can also help you find ways to *Farm the Controllables* (and yes, that includes ethylene and the plants' response to dry conditions). But first, let's dig into a little biology 101.

Continued on the next page...

Stress produces ethylene

Although plants are rooted in place, they've developed fascinating mechanisms to detect and adapt to environmental conditions. Plants sense drought primarily through their roots. Then root-to-leaf signaling triggers the stomata to close, especially on hot days. (The stomata are pores in plants' tissues that allow the exchange of carbon dioxide and water between the plants and the environment.)

When plants become stressed, they also produce ethylene. These gaseous molecules regulate many diverse processes throughout the plant's life cycle, from seed germination to leaf growth to reproduction. Too much ethylene can harm plants' growth and development. "One of the best examples of ethylene production is observed when you put a banana into a brown paper bag," Klockenga said. "The ethylene is trapped in the bag and ripens the banana."

Some studies suggest that ethylene shuts down leaf growth quickly after a plant senses stress, such as limited water availability. This curtails maximum photosynthesis, which hurts yield potential.

What can you do?

Fortunately, there are steps you can take to *Farm the Controllables* that impact yield potential. They include harnessing the power of microbes to break down crop residue efficiently (our product **BioRegenerate** makes this simple), and building soil health through the use of cover crops—all of which make your crops more resilient.

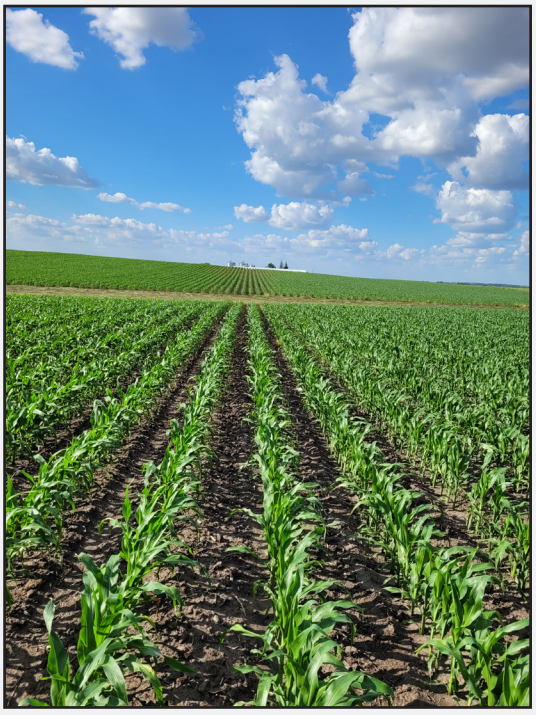
These strategies are part of ProfitProAG's Full-Circle System for maximum productivity and profitability. This system also includes in-season solutions to keep crops green and healthy, including **BioEnergy+**. The ethylene inhibitor in BioEnergy+ hinders the plant's ability to produce ethylene, so the plant can continue to grow, develop and produce a higher yield. "This product helps keep ethylene production in check, which buys you some time until the next rain comes," Klockenga said.

He also recommends **StressAway**, a potassium fertilizer solution (0-0-20) from ProfitProAG that inhibits ethylene production. This product not only helps plants protect themselves from environmental stresses, but it builds plants' tolerance against physical and mechanical injury, as well. StressAway promotes plant growth (through carbon fixation) while decreasing stress-induced photorespiration. StressAway also increases the sugar content within the plant, leading to a healthier, more vigorous crop.

StressAway can be applied as a foliar or a soil application to all crops. Applications can be made at planting (if applicable) and as often as every 10-14 days throughout the growing season, as needed.

Let's start the conversation

Although it can seem like you're at the mercy of Mother Nature, we encourage you to consider looking into ways you can *Farm the Controllables*. For more information, contact a member of the ProfitProAG team. We look forward to hearing from you.



Secrets from a Top Soybean Grower

New York state isn't known for being a soybean production powerhouse, but it boasts some award-winning soybean growers. Among them is John Zittel, who has won the New York Soybean Association's yield contest for two years in a row.

His latest win came in at **87.99 bushels per acre**—almost 6 bushels higher than the second-place entry. "Our passion for farming has been handed down through six generations," said Zittel, who farms with his family near Hamburg, New York. "We believe in hard work and family values."

The Zittel family's farming heritage dates back to 1881. John Zittel, a fourth-generation farmer, began his career as a dairy farmer in 1977. He helped expand the farm's dairy herd and now operates a diversified farm with beef cattle, other livestock and crops including soybeans.

Zittel Family

He follows some proven basics to maximize his soybean yields, including:

- **Seed treatment.** Zittel favors **ProfitCoat™ PB + OSI** from ProfitProAG. This effective seed coating helps seedlings emerge faster and kicks off a season-long plant health enhancement system. "Getting a good start out of the ground is key," Zittel said. "Healthy seedlings grow into healthy plants. Healthier plants mean we don't have to spray for bugs."
- **Effective weed control.** Weed control is essential from the start of the growing season, but you don't want to stress your crops with AMS. It's no secret that the high salt content of AMS and glyphosate can cause crop stunting and yellowing. **Herbolyte ™ Plus** is a low-salt adjuvant that includes a micronutrient blend to keep crops greener and less stressed after spraying. It works with soybeans, corn, canola, cotton and alfalfa. "We've had yellow flash in the past with AMS products, but with the Herbolyte Plus, we just get healthy plants that keep growing," said Zittel, who mixes Herbolyte Plus with glyphosate. "I see better weed control when I include Herbolyte Plus, plus the plants stay green. More chlorophyll keeps the plant healthier."
- **In-season plant nutrition.** Zittel uses a foliar product called **GroPAL™** from ProfitProAG. This ocean water concentrate undergoes a number of natural processes to reduce sodium levels while providing a solution that's packed full of other minerals and essential trace elements. Naturally balanced by nature, GroPAL helps maintain and enhance soil quality over time, when used as part of a sustainable soil health program. "I call this product 'pond water,'" Zittel joked. "When I apply it as a foliar, my soybeans are a nice deep-green color. I see better plant health and have beans that pod really well." Zittel also adds **Molybdenum 3%** to the foliar application with the GroPal to enhance soybean nodulation.

More flowers, nodes and pods = more profit

Speaking of soybean nodes, did you know that most soybeans contain 17 nodes? What if you could add one more pod with three beans per pod? How much would this boost your yield and profit?

"If you got an extra 35 bushels per acre, you grow them on 100 acres, and you estimate $10-per-bushel beans, that's an extra $35,000," said Dr. Jim Ladlie, Owner of ProfitProAG.

Also, did you know that soybean plants normally abort about 75% of their flowers? "If you use a foliar

Continued on the next page...

feeding program, you'll take a big step to keep the plants as healthy as possible," said Dennis Klockenga, a crops specialist with ProfitProAG. "That helps soybean plants hang onto more flowers, which ultimately means more yield."

All this fits into the "Recipe for Success" that defines ProfitProAG's system of *Farming the Controllables*—and enhances Zittel's winning soybean yields. "Our mission is to raise high-quality crops and livestock," Zittel said. "ProfitProAG helps us reach this goal."

Higher soybean yields must retain more pods per plant.

Example

Add 1 pod to each main stem node on a plant that has 17 nodes
Each pod contains 3 average size seed (2,900 seed per lb)
Final stand of 120,000 plants/A
+35 bu/A

The soybean "Recipe for Success" results in more pods per plant & enhances yield!

Let's Talk Yield

Intrigued by some of the ideas you've seen here?
Want to know more about how to put the Farming the Controllables "Recipe for Success" to work on your acres?
Talk with a representative today to customize your "Recipe for Success"

507-373-2550

Beyond-the-Barn INSIGHT

Chris Chodur, ProfitProAG Manure Management Consultant ◆ **507-402-4195 (cell)**

Fight Flies with Smart Manure Management

It's one thing to have some flies around the farm. It's another to have so many that they buzz around your head constantly and practically fly into your mouth, if you're not careful.

"I used to have a terrible fly problem," said Steve Jaster, who has a 4,000-head swine finishing operation near Medford, Minnesota. "The ceiling in the hog barn would be black, since there were so many flies buzzing around."

He knew there was a connection between the flies and the solid crusts in his manure pits. "I called those crusts 'tabletops,'" said Jaster, whose feeder-to-finish swine farm is one mile west of the outlet mall in Medford near Interstate 35. "Even if you tried to break them up, they'd just form again and keep floating around in the pit."

Steve Jaster
Medford, MN

Jaster turned his attention to managing the flies. He tried using fly bait to insecticide sprays. While some products helped a little, the flies always came back in a couple weeks. He didn't want the flies at his house, which is north across the road from his swine barns. He also didn't want the flies to become a problem to the people who live in a mobile home park near his farm.

"I tried everything I could think of, but nothing really worked," said Jaster, who grew up on his family's farm near Medford. "I just couldn't get ahead of the flies."

As Jaster observed the flies' lifecycle, two things became clear. "After we washed out the hog barns, maggots would start crawling out of the pit, and then they'd go back. About two weeks later, the flies would become a huge problem."

When a ProfitProAG sales representative urged Jaster to try **Manure Master™ Plus–PA**, a blend of digestive microbes that enhance manure digestion, he was intrigued. The product helps liquefy the manure, which reduces top crusting and bottom solids. Jaster decided to give it a try. "I could tell that things were getting better as we kept using Manure Master Plus–PA each month."

Not only did the product eliminate crusting in the pits, but it has controlled the farm's fly problem, too. "We have a lot fewer flies, and they don't bother us at our house," Jaster said.

This became a big factor when the Jasters decided to host their daughter's high school graduation reception in their garage. "While my wife suggested getting screens for the garage doors to keep out flies, I told her we don't need to spend money on screens," said Jaster, who has worked with ProfitProAG for more than a decade. "The flies aren't a problem anymore."

How much are flies robbing from you?

Flies are a part of any livestock farm. They assist with the natural decomposition process and are attracted to manure and dead animal carcasses. When a farm isn't managed properly, however, flies can quickly get out of control.

"Flies have a lifespan of 28 to 30 days," said Chris Chodur, manure and livestock specialist with ProfitProAG. "On average, flies have an opportunity every two weeks to multiply."

Flies go down into manure pits to lay their eggs. Pits offer a perfect place for this, since they provide a moist, nutrient-rich environment filled with organic matter. "We see a lot more fly challenges where pits have crusts and a lot of solid matter," Chodur said.

A rampant fly problem can:

- **Damage hog carcasses.** When flies bite hogs, it's irritating and painful for the animals, plus it can cause swelling. Damaged carcasses cost you money. "If the packing plant docks you $14 to $15 per hundredweight, this can cost you $40 to $50 per pig," said Chodur, a former hog buyer.
- **Spread disease.** Flies traveling from barn to barn can transmit harmful viruses and pathogens that can make pigs sick.
- **Cost you money.** "Flies can have a negative impact on your animals' well-being and your farm's profitability," Chodur said. "Since we have to live with flies, we have to manage them properly."

Control pH to manage flies

Many places can harbor flies, including cracks and crevices in building foundations, holes in bulk bins, and weeds and junk around the farm. Proper sanitation can help manage these potential trouble spots.

It's also important to provide proper ventilation in your hog barns. "It's a key to your hogs' health and helps manage flies, since flies don't like air circulation," Chodur said.

Above all, focus on effective manure management. Manure pits with an alkaline pH level are the most prone to fly problems, since insects' digestive tracts are primarily alkaline. "If you can maintain a slightly acidic pH, it will help you manage a lot of fly problems," Chodur said.

This requires a pH range of 5.8 to 6.2. Pits that spawn fly problems, however, tend to have a pH range of 7.5 to 8. For new clients facing this situation, Chodur mixes a solution of Manure Master Plus–PA microbes in a low pH (2.8 to 3.1) formulation. "We'll push 300 gallons through a 2-inch hose and hit all the pumpouts to break up the crust. You'll see thousands of maggots crawling out of the pumpouts within seconds, because it's that acidic to their bodies."

"While this mixture kills most of the maggots, the solution is safe for people and pigs, since it uses organic acidifiers," Chodur added. "It's great to tell customers, 'I killed a few thousand potential flies for you today.'"

Fewer flies, fewer worries

Ensuring that the manure won't crust anymore takes longer, but it will happen when you use Manure Master Plus–PA consistently. If you feed distillers dried grains, pay extra attention to managing solids in your manure pits. "It takes longer to digest these ingredients and to break them down in the pit," Chodur said. "This can allow more flies to come in."

ProfitProAG can formulate the right Manure Master Plus–PA mix for your needs. Totes of the pre-mixed product can be shipped to your farm so you can add the product to the pits yourself. Other farmers prefer to let ProfitProAG handle monthly manure treatments for them.

Jaster appreciates the convenience, while his manure pumping crew likes the results. "They comment on how easy it is to agitate the manure," Jaster said. "There aren't solids floating on the top anymore, and there's no pile of solids that can't be pumped out of the pits. The more liquid manure you can pump, the better."

"While Manure Master Plus–PA takes a modest investment of money and time to work, the long-term results are worth it," Jaster said. "Some farmers are always looking for the cheapest product or a silver bullet to control flies. My advice is to get Manure Master Plus–PA and stick with it. When you manage flies from the start, you have one less thing to worry about."

Dennis' In-the-Field INSIGHT

Dennis Klockenga, CCA, *ProfitProAG Crop Management Consultant* • **320-333-1608 (cell)**

Crop Staging + Foliar Feeding = Higher Yield Potential

While healthy plants start from the roots up, now's the time in the growing season when foliar feeding is key. The foliar uptake of nutrients is much faster than root uptake, meaning foliar feeding is the most efficient choice to feed your crop and keep plants healthy.

In order for foliar feeding to be successful, you have to be able to stage the crop correctly. Not only is staging important for foliar feeding but for applying herbicides at the correct stage to get the best efficacy.

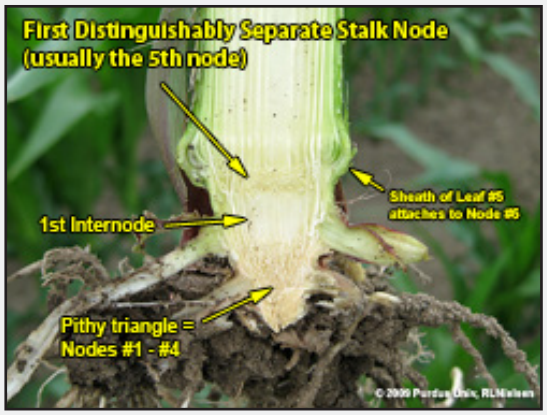
When staging corn, I like to use the "Leaf Collar Method (or LCM)." The LCM stages corn based on leaf collars. Using the LCM, if the leaf doesn't have a collar, it isn't staged as a true leaf.

The first leaf that emerges from a corn seedling has a rounded tip and is called the plumule. The first leaf is the only leaf that has a rounded tip. Subsequent leaves have a pointed tip. Once you find the plumule, start counting the collars of the other leaves up the plant.

A collar is a yellowish ring located just under the leaf where it attaches to the stalk. Once the plant has a collar, it is called a "V" stage, or vegetative. V1 is the rounded tip leaf or the plumule. V2 is the second leaf with a collar, and so on up the plant.

As the corn plant continues to grow, around V6, the plumule will dry up, and you won't be able to use the plumule as your beginning leaf for staging. When that happens, dig up a plant, and slice the stalk down the middle (be careful, as the stalk is sharp!) making sure to keep the leaves intact. Find the lower brownish part at the base of the stalk (around the soil line) and then find the white internode just above that. The white internode is typically where the fifth leaf developed.

Assuming this, you can count up the stalk by finding the leaf collars and be able to stage the older plant. The plant will continue to develop leaves and collars until the tassel emerges and pollination takes place. (see **Table 1** for more details on corn stages.)



Staging soybeans

Soybeans are easier to stage than corn. The first leaves that appear on a soybean plant are cotyledons. The cotyledons are thicker and have a waxy feel to them, compared to normal soybeans leaves.

When the cotyledons emerge, this is called VE. The plant continues to grow and unifoliate leaves will form. When they unroll, that's called VC. The remaining leaves will be trifoliates. The first trifoliate will be V1, the second trifoliate is V2 and so on as the plant progresses.

Around June 21, the longest day of the year, the plant senses that the days are becoming shorter, so it forms its first flower. This is the beginning of reproduction and is called R1. (see **Table 2** for more details on soybean stages.)

Tips for foliar feeding corn

Staging crops correctly is key to successful foliar feeding, which can be 20 times more efficient than root feeding. Science proved the power of foliar feeding roughly 70 years ago. Dr. Silvan Wittner and H.B. Tukey of Michigan State University, in conjunction with the Atomic Energy Commission, conducted extensive research on foliar feeding using radioactive nutrient (phosphate and potash) solutions during the 1950's. They proved that foliar feeding was eight to 20 times more efficient than root feeding. They also found that 95% of foliar fertilizer applied to the leaf is used by the plant, in comparison to 10% of soil applied nutrients. Foliar feeding essentially supplied a nine-fold increase in efficiency.

Foliar feeding can help you achieve more kernels around the ear

For corn, applying a foliar at V5, before V6 when the kernels around the ear are determined, is one of the critical times in a corn plant's life. Remember that rows of kernels are always even, so if you add rows of kernels, you'll be adding two rows at a time. If you add two rows going from 16 to 18 at 32,000 ears/A, you increase yield by 25 bu/A.

Foliar feeding can also add more kernel length. The kernels per row of the ear are determined beginning at V8 and finishing around V12. Let's stick with the example of 32,000 ears and 18 kernels around. If you have 35 kernels in length and add 15 more, you increase yield by 96 bu/A.

Tips for foliar feeding soybeans

For soybeans, the critical growth stages occur during reproduction. R1 is when the first flower appears on the plant. This is a vital stage, since the plant typically aborts up to 75% of its flowers. By foliar feeding, we have a chance to hold onto more of those flowers.

R3 is another critical growth stage for soybeans. Pods are starting to develop on both the main stem and the branches. Again, it's important to hold on to the pods and not allow them to abort. If we can add one pod to each node on the main stem on a plant with 17 nodes, we can add 35 bu/A, assuming a final population of 120,000. One pod on each node can go a long way towards yield. Foliar feeding can help maintain plant health, which also helps the plant and consequently hold on to the pods.

The final critical stage in soybeans is R5. This is when the seed starts to develop. Foliar feeding will continue to maintain plant health and assure the plant that everything is okay to produce seed.

Protect against plant stress with BioEnergy+

Once you've determined the critical growth stages for foliar feeding, applying the right product is important. ProfitProAG's **BioEnergy+** combines carbon-energy, an ethylene inhibitor, biostimulants, trace elements, sea minerals and chitosan into a liquid mix to stimulate your crop and keep it healthy to maximize yield. We suggest applying it at 15 gallons of water per acre to achieve adequate plant coverage.

How does BioEnergy+ work? Let's look at the ethylene inhibitor. You see the ethylene effect when you put a banana into a brown paper bag. Ethylene is trapped in the bag and ripens the banana.

Plants produce ethylene in stressful situations when there's too much or not enough water, chilling, insect damage or disease to name a few. Ethylene stunts plant growth and development. The ethylene inhibitor in BioEnergy+, hinders the plant's ability to produce ethylene. This allows the crop to continue growing, developing and producing more yield.

Chitosan is also a key to BioEnergy+. Chitosan is one of the most abundant biopolymers on earth. Insects have an exoskeleton called chitin. Fungi and bacteria also have chitin in them. Chitosan breaks down chitin found in insects and disease pathogens, but it won't harm the beneficial insects and microorganisms. Chitosan also stimulates soil and plant microbes.

An effective foliar product like BioEnergy+, applied at the correct stage, can boost your crops' yield potential and provide a variety of other benefits. If you're interested in learning more, you don't have to figure this out alone. ProfitProAG can help you with all of the ins and outs of a foliar program to get the best return on your dollar!

Table 1
Chronological Development of the Corn Ear

Approximate Plant Growth Stage	Approximate Days After Planting (Days after Emergence)	Growth Event	Importance to Final Ear Weight
V3	16 to 19 (9 to 12)	• Ear shoot initiated	• Ear established
V4 to V5	21 to 30 (14 to 21)	• Leaf and ear shoot initiation complete • Tassel initiated in stem apex tip • Stem apex is just under or at soil surface • Tillers are forming • Above ground height is 8 inches (20 cm)	• Number of rows of kernels determined • In normal corn belt hybrids there are 16, 18 or 20 rows of potential kernels per ear
V12 to V14	49 to 56 (42 to 49)	• Ovule number being determined (potential kernels) • Brace roots beginning • Late whorl	• Number of kernels per row determined (will not be complete until V17) • Potential is for about 50 kernels per row
R1 Silking	70 (63)	• Silk emerged • Pollen shed begins • Brace root development complete • Root mass reaches maximum size	• Ovule fertilization (most critical period of yield determination) • On a well developed ear, there are about 750 to 1,000 potential ovules
R2 to R6 Physiological Maturity	81 to 130 (74 to 124)	• Black layer formation	• Kernel growth (R2 to R6) • Maximum kernel and ear weight potential under existing growth parameters reached

Table 2
Soybean Vegetative and Reproductive Stages of Development

Vegetative Stages	Reproductive Stages
VE Emergence	R1 Beginning Bloom
VC Cotyledon	R2 Full Bloom
V1 First-node	R3 Beginning Pod
V2 Second-node (1st Trifoliolate)	R4 Full Pod
V3 Third-node	R5 Beginning Seed
	R6 Full Seed
	R7 Beginning maturity
V(n) nth-node	R8 Full maturity

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FARM THE CONTROLLABLES
Big Yields start with a "Recipe for Success"
to control your profitability

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