



AgVantage Green Notes



Volume 15, Issue 11

Ceres Solutions “High Yield Club”

Introducing Ceres Solutions “High Yield Club”

- Compete with area growers in achieving high yields with Croplan Genetics corn and soybeans using advice from your local seed advisor and Agrisolutions crop protection products and foliar micronutrients for great prizes including a Browning Citori IV Lightening Shotgun (\$3000) or 300 acres of Ceres Solutions AgVantage soil testing and crop advisory program (\$3000) or a hunting/fishing trip with your Ceres Solutions Seed Advisor (Up to \$3000 paid for) or a Caribbean vacation (Up to \$3000 paid for).

So what is considered local? There will actually be three “High Yield Clubs” called zones. Zone 1 will be any field north of SR 16. Zone 2 will be between SR 16 and I-70. Zone 3 will be any field south of I-70.

So how do you become a member? Plant a non-irrigated 40 acre block of corn or soybeans with Croplan Genetics corn or soybeans (Of course you can compete in both a corn and soybean club.). Use Agrisolutions crop protection and micronutrient products on the 40 acres. Work with you Ceres Solutions Seed Advisor and implement the R7 strategy to maximize yield (the R7 strategy is to plant the right genetics, in the right soil type, at the right population in the right cropping system, with the right traits, protected with the right crop protection, fed with the right plant nutrition). Yield requirements for the club include a 215 bu/A corn average and a 60 bu/A soybean average across the whole 40 acres.

Any other benefits to being a member of the club? - You will receive a T-shirt with the name of :”Club” you are in. “Clubs” will break at 10 bu/A corn (cont. pg 4)

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Sulfur Nutrition Becoming More Important Again

Sulfur is a nutrient not thought of as being limiting in Indiana. However tissue samples from several stunted yellow corn plants in sandy fields with low CEC’s this past growing season revealed that sulfur was deficient or low. Sulfur was low enough in these tissue samples to have a negative impact on yield.

An article in the Wall Street Journal entitled “Farmers Seed Sulfur As Acid Rain Declines” indicated what we saw this spring was happening to several others in the Midwest. The following is information about sulfur, it’s importance to corn, soybeans, wheat, and alfalfa, why we are seeing sulfur deficiency and suggestions of crop nutrient products containing sulfur we can add to ensure sulfur is not limiting especially when the size of the corn ear or wheat head is being determined. The good news is the expense to add a sulfur containing fertilizer to your fertilizer program is not expensive.

Sulfur is a secondary nutrient needed by all crops in relatively high amounts. For example a 200 bu/A corn crop will remove 16 lb/A of actual S from soil. An 80 bu/ A wheat crop will remove 7 lb/A in the grain and 2.8 lb/T of actual S in the straw. And a 60 bu/A soybean crop will remove 11 lb/A of actual S.

Sulfur resides mainly in organic matter unavailable to crops until soil microbes mineralize the organic matter and release plant available sulfate. Sulfate like nitrate nitrogen is negatively charged and can move easily with soil water. Frequent rain, reduced use of fertilizers containing sulfur, improved air quality with reduced sulfur load in rain,

improved yield requiring more sulfur and reduced early season soil temperatures in no-till resulting in slower mineralization have all contributed to seeing sulfur deficiency in corn the past few years.

Sulfur deficiency characteristics include spindly light green plants with stacked internodes and interveinal chlorosis in the upper leaves. Deficiency symptoms will most likely be seen in the light-textured, low organic matter sandy soils first.

Soil testing is a very unpredictable method to determine sulfur deficiency. Plant analysis along with the N:S ratio is much more reliable. If plant tissue is less than 0.15% sulfur, the plant is considered deficient. If plant tissue is between 0.15-0.2% in sulfur and the N:S ration is greater than 20:1 the plant will respond to added sulfur.

Yield can be drastically reduced in both corn and wheat if sulfur is deficient. Each day corn is deficient past ear determination 1-2 bu/A is lost. Since yield is determined so early in corn and wheat, by the time sulfur deficiency is identified crop yield has already been lost. So it is important to plan sulfur applications so that it is available early in the season. Once a deficiency is identified it is still important to apply sulfur since some yield can be recovered.

Depending on the soil, anywhere from 10-25 lb/A of actual sulfur should be applied to wheat and 10-30 lb/A should be applied broadcast to corn. Low organic matter sandy soils should lean towards the high rate of sulfur in either crop.

We have several sulfur containing fertilizers as well as (cont. pg 4)

Zinc Analysis Added to Ceres Solutions AgVantage

We can often find zinc deficiency in some fields every year. Symptoms of zinc deficiency are more common in high phosphorus testing soils with higher soil pH levels when growing conditions are slowed due to cool, wet or compacted soils.

Ceres Solutions has been tissue sampling several corn and soybean fields at critical growth stages within the Ceres Solutions territory the past couple of years. The goal of tissue testing was to understand how well our crops are able to access important crop nutrients. The results of the project indicated we were finding low zinc tissue tests at the V5 sample timing as well as some low zinc soil tests. In 2008, 32.7% of the tissue samples were low at V5; in 2009 15 % of the tissue samples were at the lowest limit of the normal range or below. Several soil tests also revealed deficient or low zinc status also.

So as a result of the tissue testing we have added the zinc soil analysis to our Ceres Solutions AgVantage program. Included in the map package will be a contoured map with the zinc soil test results. If zinc is recommended there will be an application map included.

Agronomic research indicates as both soil P and pH increase in soil the amount of zinc must also increase for adequate zinc nutrition in corn. Our recommendation for zinc will depend on the level of zinc, P and pH in the soil. So if a soil looks at first glance to be low in zinc, we then consider the soil pH and P level before zinc will be recommended. Research from the University of KY indicated that zinc recommendations made considering the soil P and pH level accurately determined the need for zinc 81% of the time.

So if I have a field with a zinc recommendation what product choices do I have and where do they fit? We have several dry and liquid sources that can be applied any number of ways. Most of the products we have available offer short term, year to year solutions,

however they remain available for plant uptake from planting through the heavy zinc use rate time in corn. Specific product recommendations follow

If you use **liquid starter** we have three choices available, Origin 9% EDTA, Origin 10% and Corn Mix EDTA. All of these products can be applied in row starters or pop-up fertilizers depending on the products used for the pop-up application. Origin 9% EDTA and the Corn Mix EDTA will work with all starters whereas the best fit for Origin 10% is with 10-34-0 or 11-37-0. It is important to note that Corn Mix EDTA contains half the zinc as Origin 10%; however manganese and copper is also included in the mix. The use rate for these products is 1 qt/A which provides zinc equivalent in activity to 1 pound per acre available zinc.

If the customer uses **dry starter** the choices are Origin 10% LS or Origin Zinc Sulfate 33-35%. The use rate for starter is 1 pound of available zinc per acre. Origin 10% LS probably fits best for this situation as it is formulated to resist being complexed with soil metals and remains available from planting through the heavy zinc use rate time in corn.

If the customer does **not use starter** then Origin 10% LS or Origin Zinc Sulfate 33-35% can be mixed with other dry fertilizers such as DAP or potash and applied with either fall or spring fertilizer applications. The use rate for surface applied products will be at least 10 lb/A zinc and could be more depending on soil test results.

We also have Max IN ZMB a foliar product containing nitrogen, zinc and manganese. It is best used to supplement zinc nutrition and is not recommended to replace any of the aforementioned products if zinc is identified as being low. For questions or more information please consult with you local Ceres Solutions professional.

Control of Marestalk in No-till Soybeans

Marestalk Biology - Marestalk (also known as horseweed) is one of the most problematic weeds in no-till soybeans in Ohio and Indiana.

- Marestalk has two primary periods of emergence – from late summer into fall, and from late March through June. It is one of the first annual weeds to emerge in the spring and is present before crops are planted.
- Marestalk plants remain in the low-growing rosette stage through late April, followed by stem elongation (bolting) and growth to an eventual height of 3 to 6 feet. Plants that emerge the previous fall will start stem elongation earlier than spring-emerging plants.
- Marestalk competes with the soybeans during the growing season, reducing yield. It matures in late summer or early fall, late enough to interfere with soybean harvest.

Herbicide Activity and Resistance in Marestalk

- Herbicide programs must consist of a burndown to ensure that the field is free of marestalk at the time of soybean planting, and residual (PRE) herbicides to control marestalk for another 6 to 8 weeks. Where marestalk emerge between an early spring burndown and planting, additional burndown herbicide should be applied before soybeans emerge.
- Marestalk is most readily controlled when in the rosette stage, and herbicides should always be applied before plant height exceeds 4 inches. Larger plants become difficult to control, even when not herbicide-resistant.
- Marestalk populations with resistance to glyphosate or ALS inhibitors (e.g., Classic, FirstRate) are widespread throughout Ohio and Indiana,

which increases the difficulty of control. Populations with multiple resistance, to both glyphosate and ALS inhibitors, have also been confirmed.

- Only a few POST soybean herbicides have activity on marestalk – glyphosate, Ignite, chlorimuron (Classic), and FirstRate. POST herbicides are effective primarily when plants are newly emerged and several inches tall, and only in populations that are not herbicide-resistant, with the exception of Ignite in Liberty Link soybeans.

Key Points for Controlling Marestalk in No-till Soybeans

- Do not plant into existing stands of marestalk. Start weed free at the time of planting by using tillage or a preplant herbicide treatment of one of the following, applied when marestalk plants are less than 4 inches tall.
 - * 2,4-D ester plus glyphosate (1.5 lb. ae/A)
 - * 2,4-D ester plus Gramoxone (3 to 4 pts./A) plus a metribuzin-containing herbicide
 - * 2,4-D ester plus Ignite (29 to 36 oz./A) plus a metribuzin-containing herbicide
 - * Sharpen (1 oz./A) plus either glyphosate or Ignite
- The burndown effectiveness of any of these can often be improved by including a residual herbicide that contains chlorimuron (e.g., Canopy, Valor XLT, Envive) or cloransulam (e.g., Gangster, Sonic, Authority First).
- Use the highest rate of a 2,4-D ester product that is allowed, based on the interval between application and soybean planting. For all 2,4-D ester products, rates up to 0.5 lb. active ingredient per acre must be applied at least 7 days before planting. Rates between 0.5 and 1.0 lb.

Soybean Bronzing? Could be Cercospora Leaf Blight

Many of you asked about how several of the late planted soybeans matured weirdly this year. The whole field took on a yellow then bronze color. The following article from Don Hershmann of U of KY explains what could have been going on.

Considering the cool, wet, and late year we have just experienced, it should not come as a surprise to anyone that certain late-season soybean fungal diseases were more extensive than usual. In a more typical year, crops that mature in late summer, especially early maturing varieties planted early, tend to experience the most intense foliar, stem and pod fungal disease pressure. This is because those crops are filling pods and maturing at a time when conditions tend to favor disease development (hot and wet). Normally, doublecrop and other late-planted crops are less susceptible to late-season fungal diseases because they mature in September-mid-October when conditions tend to be dry. Not this year!

Every year we have some pod and stem blight and anthracnose. However, these diseases usually come in late and tend to be superficial. As a result, they often look more damaging than they really are, as long as affected crops are harvested in a timely manner. If crop harvest is significantly delayed, however, the diseases can impact seed quality (especially pod and stem blight). Just looking around, I do not get the sense that either anthracnose or pod and stem blight are especially problematic despite the season.

The disease that seems to have impacted late planted soybeans the most this season is *Cercospora* leaf blight (CLB). CLB, caused by the fungus *Cercospora kikuchii*, is usually first noticed by producers when the upper leaves in the canopy begin to turn yellow, often with a bronze tint. A close inspection of affected leaves reveals very small, dark lesions that are frequently on or near major leaf veins and on petioles. "Bronzing" is the result of a multitude of lesions that have coalesced. When symptoms are severe, the upper surface of affected leaves has a puckered, leathery appearance. Severely affected leaves are blighted and eventually drop off the plant. Blighting of up-

per canopy leaves was rapid in some fields this year due to the unusually wet late-season conditions. Some producers suggested that the visual impact was akin to frost injury or "sunburn".

Pods are also commonly infected and both pods and seed can have purplish discoloration. The purplish discoloration of seed is known as "purple seed stain". Extensive purple seed stain can reduce grain marketability, and planting severely infected seed can result in stand reductions in subsequent soybean crops

The pathogen produces a light-activated plant toxin called cercosporin. Cercosporin is red, which accounts for the tendency of diseased tissue to develop a purplish discoloration. The toxin causes plant cells to rupture and die. This is what causes most the symptoms we see.

The impact of CLB is highly variable and can range from no significant impact to substantial yield and grain/seed quality reductions. The foliar phase of the disease contributes the most to yield loss when the disease is extensive. The time of disease onset relative to crop growth stage, and the speed with which the disease develops, are the key factors that determine crop impact. If blighting occurs while pods are filling, then significant yield loss can be anticipated. However, if pod fill is mostly complete prior to the onset of blighting, than damage will be minimal.

In most years, in most fields, CLB is a minor problem. Past experience and observations suggest that most commercially available soybean varieties have at least some resistance to CLB. However, no varieties are immune. Fungicides can reduce CLB, but no fungicides are highly effective. In general, strobilurin fungicides do a slightly better job than triazoles or thiophanate-methyl. Also, single applications applied at the R5 (beginning seed) growth stage tend to perform better than applications made at the R3 (beginning pod) stage. Of course, multiple applications perform better than single applications, but even then, results are marginal.

Penn State Cover Crops Update

Many growers are becoming more interested in cover crops for a multitude of reasons from scavenging nutrients, to improving soil biology, to reducing the effects of compaction. And several acres of covercrops were seeded in September this year. The following are some comments of cover crop seedings in Pennsylvania.

Cereal Rye While the rye plots aren't as tall as the oats, the wheat or the triticale, they are found to be exhibiting some allelopathy against other species growing with the rye. The tillage radish that is being grown with rye in one strip is markedly shorter than the radish being grown with spring oats. Both plots have tillage radish drilled at the same five pounds of seed per acre. The growth of weeds in and around the rye is often noticeably less than those same weed species found outside the plots. Small flower galinsoga growing under rye at one location is one-third to one-half as large as plants growing where there is no rye.

Wheat We may need to rethink using this species for an early planted cover crop. Why? This species planted as early as late August could serve as a host for Hessian Fly. While it is true that fly damage in a wheat cover crop is not much of a problem, the fly may travel in the spring to wheat fields being grown for grain production.

Tillage Radish This entry is looking very good. Drilling five pounds per acre in combination with either rye or oats has resulted in plots where there isn't excessive competition between the radish and small grain. Earlier work indicated that radish, with its rapid growth and characteristic large leaves, can easily dominate a mixture. Ten pounds of radish drilled alone is showing signs of nitrogen deficiency,

indicating this species' ability to take up and hold on to nutrients soon after establishment.

Crimson Clover This species looks very good at all locations. We drilled it at 15 pounds per acre into plots with oats (40 lbs per acre) and into other plots with annual ryegrass (10 lbs per acre). Early indications are that, at least for earlier seedings, we may be able to reduce the seeding rate below 15 pounds per acre. It will be interesting to see how good the 15 pound rate looks when drilled in late September.

Red Clover I am normally not a fan of red clover planted much after early August, as the plants often don't get large enough to provide the soil cover that we need to minimize winter soil and nutrient losses. However, this year with ample moisture at most locations, this species is showing itself very well. Plants are already large enough that overwintering will not be an issue, and with a few more weeks of growth, should provide an acceptable amount of biomass to protect our soil resources.

Hairy Vetch This species also looks unusually good at most locations. The 15 pound seeding rate has provided good plant density, and early plant vigor is great. Will an abnormally late killing frost at some of the southern locations result in so much fall aboveground biomass that overwintering ability may be compromised? We'll know in the spring.

Grain Update

USDA Summary—Nov 10,2009

Estimates in Million Bushels

Corn	Nov	USDA—09/10	Oct	USDA-09/10
Carry-in	1674		1674	
Production	12,921		13,018	
Total Supply	14,605		14,702	
Feed and Residual	5400		5400	
Ethanol	4200		4200	
Exports	2100		2150	
Total Use	12,980		13,030	
Carry-out	1,625		1,672	
Soybeans				
Carry-in	138		138	
Production	3319		3,250	
Total Supply	3465		3,398	
Crush	1,695		1,690	
Exports	1,325		1,305	
Seed	94		94	
Residual	81		79	
Total Use	3195		3169	
Carry-out	270		230	
Wheat				
Carry-in	667		657	
Production	2,216		2,220	
Total Supply	2,983		2,987	
Food	955		955	
Seed	78		78	
Feed & Resid	190		190	
Exports	975		900	
Total Use	2098		2123	
Carry-out	885		864	

“High Yield Club” cont...

and 5 bu/A soybean yield increments with a minimum of 215 bu/A for corn and 60 bu/A for soybeans. You will have the opportunity to test new innovative products on your farm and have a chance to win one of the aforementioned prizes valued at \$3000.

If interested contact your local Ceres Solutions Seed Advisor for more details.

Sulfur cont....

times and methods of application to use to ensure sulfur is not limiting. Many of these are also relatively low in cost for the value they bring.

Ammonium Sulfate (AMS) (21-0-0-24S) is a dry nitrogen and sulfur fertilizer that can be mixed with urea and applied broadcast to wheat in the top-dress or to corn at planting. It can also be applied to corn early post emergence with a high-clearance spreader. The nitrogen in AMS can be credited to the total nitrogen program thus reducing the rate in other applications.

K-Mag or Sul Po Mag (0-0-22-11-22) is a dry fertilizer that can be used like AMS. It can be applied broadcast in wheat and corn. Although currently a somewhat pricey form of sulfur, K-Mag also contains potassium and magnesium, other nutrients that are often limiting in low organic matter sandy soils.

Ammonium Thiosulfate (ATS) (12-0-0-26S) is a liquid nitrogen and sulfur fertilizer that is the most flexible of all sulfur containing fertilizers, however it is a little more expensive with a lower nitrogen content than AMS. ATS can be added to the 2X2 starter (it cannot be applied in pop-up starters), or added to 28% N /crop protection / water combinations and applied preemergence to corn. ATS can also be added to 28% as a side-dress, as a chemigation application or even dribbled on the soil surface as a last resort.

In our light textured sandy soils a combination of starter, premerge and/ or side-dress application would in most years be the most agronomically beneficial to ensure sulfur is available to the crop through out the season.

Marestail Cont...

should be applied at least 30 days before planting, with the exception of several products (e.g., E-99, Salvo, and Weedone 650) that allow these rates to be applied 15 days before planting.

- Where it is not possible to use 2,4-D ester, a combination of Sharpen plus either glyphosate or Ignite will effectively control emerged marestail prior to soybean emergence. A combination of Ignite (29 to 36 oz./A) and metribuzin (at least 0.38 lb. ai/A) is also usually effective. Other potentially effective options include combinations of glyphosate plus a herbicide containing chlorimuron or cloransulam (results can be variable depending upon size of the marestail and herbicide resistance).
- Consider the following products for ALS-sensitive populations: Authority Assist, Authority First, Authority MTZ, Canopy DF/EX, Envive, Enlite, FirstRate, Gangster, metribuzin, Pyhton, Sonic, Spartan, Synchrony, Valor, Valor XLT. And for ALS-Resistant populations: Authority Assist, Authority First, Authority MTZ, Envive, Enlite, Gangster, metribuzin, Sonic, Spartan, Valor, Valor XLT
- Where POST treatments are needed, apply when marestail are less than 6” tall. The most effective POST treatment sin Roundup Ready soybeans include combinations of glyphosate plus Classic or FirstRate.

Consider Liberty Link Soybeans Liberty Link soybeans are an effective tool for management of herbicide-resistant marestail populations. The most effective approach includes application of burndown and residual herbicides as indicated above, to ensure a weed free start at planting and residual control. This can be followed with one or tow POST applications of Ignite as needed to control later-emerging marestail, when plants are less than 6 inches tall. The current Ignite label allows use of Ignite in either the burndown or the POST treatments, but not both.

What About Fall Herbicide Treatments? Residual herbicides are most effective and long-lasting when applied in the spring, not in the fall. Fall herbicide treatments can be used to manage emerged marestail, winter annuals, and dandelions, but should generally be followed by a spring preplant treatment that includes residual herbicides (in other words, don't substitute the fall treatment for a spring preplant treatment). Do not expect a fall herbicide treatment to adequately control marestail that emerges in May or June. Where a fall application is necessary, we suggest applying either: glyphosate + 2,4-D; or 2,4-D + a low rate of Canopy EX or Canopy DF. This should be followed with a spring pre-plant application of residual herbicide (plus 2,4-D, glyphosate, Gramoxone or Sharpen as needed).