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AgVantage Green Notes

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First Soybean Rust on Soybeans Identified

Dr. Clayton Hollier, Louisiana State University (LSU) Extension plant pathologist, has documented the first find of soybean rust on soybeans in Louisiana and the U.S. for 2009.

"Soybean rust has been found in a soybean sentinel plot maintained by agricultural consultant Blaine Viator in the upper portion of Iberia Parish near Coteau, LA," according to Hollier. Viator made the discovery on June 6.

"The variety is unknown at this point but the crop is in the R4 growth stage," says Hollier. "Incidence and severity are low currently. Confirmation was done in the field by Patricia Bollich using the Envirologics Quick-stix test."

Don Hershman, University of Kentucky Extension plant pathologist, talked to Viator about the finding. "He said that the find was in a sentinel plot at the R4 stage," says Hershman. **"That is a fairly early stage for a first find of soybean rust and it is cause for some concern -- but NOT alarm.** Usually, the first find has been made in beans that are at a later stage of development.

"Blaine told me this is the first time that soybean rust has been found in soybean BEFORE his growers had a chance to make fungicide applications," adds Hershman. "His point was not that they have 'missed the boat,' but rather to indicate the earliness of this find relative to what they are used to seeing in southern Louisiana. To back up his statement, he told me about a rather large kudzu patch near an local apartment complex that LSU scientists regularly monitor, and that historically developed massive soybean rust infections later in the summer. He said that patch is now heavily infected and is showing profuse sporulation."

Weather conditions in much of Louisiana have been

Inside this issue:

Corn And The Ugly Duckling

- .By Bob Nielsen, Purdue University—Ugly ducklings can change into beautiful swans.

What little corn that was planted back in late April and early May is beginning to reach an important milestone in its development. Recognition of this event helps explain the annual transition from a slow-growing, often ugly, field of corn to one that grows like wildfire.

Every year, for the first five weeks or so after corn planting is finished, the guys down at the Chat 'n Chew Cafe complain royally about the looks of the crop. Gripes about uneven stands, poor color, and slow growth abound around the tables as everyone airs their concerns about the looks of their neighbors' fields.

Then suddenly one day, the tone of the conversation in between the coffee and sweet rolls perks up. Almost overnight, the crop has taken off like a rocket. The color of the leaves turns a dark, almost-blue green and they develop a distinct shine. What happens?

During the first five weeks or so after planting, the corn plant is going about the business of creating all of the leaves it will ever have. A few of these leaves are visible, but most are wrapped tightly deep inside the whorl, biding their time until its their turn to emerge.

Some root development is also occurring during these same first five weeks. In fact, the successful development of the first three or four sets of nodal roots during this time will go a long ways to ensuring successful stand establishment of the crop.

Even though new leaves and some roots are developing during this time, the rate of increase in total plant dry matter is relatively slow. The photosynthetic 'factory' is small, as is the size of the raw material accumulator devices (the roots).

Once the corn plant reaches the five or six leaf stage (determined by number of visible leaf collars), a miraculous turn of events occurs. The final leaf is created at the main growing point of the plant (near the top of the 'pyramid' of stalk tissue) and the plant turns its attention toward developing the reproductive structures known as the tassel and ears.

At the same time, the size of the photosynthetic 'factory' and its supporting staff of roots is reaching a critical mass that is finally capable of manufacturing greater and greater amounts of energy. With greater amounts of available energy, the 'factory' begins to convert more and more of the incoming nutrients and carbon dioxide into sugars, starches, and other plant dry matter.

Subsequently, the stalk begins to elongate rapidly, the roots begin to develop rapidly, the tassel develops rapidly, the tiny ears within the ear shoots develop rapidly, and suddenly the plant is growing like wildfire. From about knee-high corn to the onset of pollination, the corn crop progresses through its most rapid growth phase (above- and below-ground), including the uptake of the lion's share of soil nutrients for use during the grain fill period.

By now you may be wondering what's the moral of this story? Primarily, it's a reminder to take time once in a while to look at this King of

Harvesting and Storing Suspected Vomitoxin Infested Wheat

Sam McNeill, Extension Agricultural Engineer, University of Ky

Background -Fusarium head blight (FHB) can be found at various incidence levels in wheat in southern and central IN. Since fusarium head blight can develop into a poisonous mycotoxin it is important to understand how to hand harvest and storage of infested wheat.

Wheat kernels that are infected early (while the head is maturing) will likely be smaller in size, have a shrunken appearance and slightly discolored. However, with wheat heads infected during field dry down, kernels containing mycotoxins may look normal to the naked eye resulting in the possibility of leading one to a false sense of security.

Prolonged conditions in the right combination can result in elevated levels of FHB (and other diseases). Molds responsible for mycotoxin production generally prefer warm, humid conditions (temperatures > 60o F and relative humidities > 70%) for extended periods of time to actually produce vomitoxin, (zearalenone or fumonisin). However, under ideal conditions that are specific to each type of mold, mycotoxins can be produced in a matter of hours!

For this reason, diligence is essential when managing any crop that is suspected of being contaminated with mycotoxins. Extra care must be taken when harvesting, handling, drying and storing the crop to minimize the cost penalties associated with discounts from excessive toxin levels or poor wheat quality. Test kits are available to determine mycotoxin levels and should be used to screen any suspected fields for damage (see accompanying article from North Dakota State University Extension Service).

Harvesting Consider harvesting wheat early if drying capacity is available on the farm or commercially. Early harvest may help reduce the spread of head scab and other diseases within individual fields, and can also prevent field sprouting, boost test weight and perhaps most importantly, increase soybean yield when double-cropping. Also consider segregating wheat by field or variety to prevent mixing sound wheat with diseased wheat. It may be best to harvest diseased wheat last to avoid the task of cleaning out the combine, carts/wagons, trucks, conveyors and other handling equipment between fields.

Proper adjustments to the sieving and cleaning section on a combine are critical when dealing with a contaminated wheat crop. Most wheat diseases turn plump healthy kernels into small, shriveled/ “tombstone” kernels, so typical recommendations for a conventional combine are to increase fan speed and manage the load of straw, chaff, weeds and foreign material on the sieves. If the fan is set too low, the walkers/sieves will fill up with straw and all wheat kernels will ride out the back on a mat of chaff. If fan speed is too high it will blow sound and shriveled kernels out the back.

Under normal harvest, fan speed should be set to provide good separation between sound kernels and straw or chaff. With ‘scabby’ wheat that may contain vomitoxin, fan speed should be increased to remove light weight kernels. Operators should monitor grain in the tank often to determine machine settings for best performance, and recall that ground speed should be adjusted to match yield within fields so that a near constant feed rate is achieved through the combine.

Drying Wheat fields that are suspected of having high levels of vomitoxin or fumonisin should be scouted or monitored prior to harvest to determine if segregation or early harvest is needed. With the right combine adjustments, wheat can be harvested above 20% moisture if sufficient drying capacity is available on the farm or commercially. Contaminated wheat should be dried to 13% within 24 hours and held separately from the rest of the crop. High temperature bin dryers or standalone automatic batch or continuous flow grain dryers are all adequate for drying high moisture wheat quickly. [For bin drying, grain depth must be managed to provide a minimum airflow rate of 5 cubic feet per minute (cfm) per bushel. A general rule of thumb for a given amount of airflow is that doubling the depth of grain requires 10 times more fan horsepower. For example, delivering 5 cfm per bushel (cfm/bu) in a 30- foot diameter bin filled with 3 feet of wheat (1700 bu) requires a 2.5 HP fan…but a depth of 6 feet in the same bin (3400 bu) requires 25 HP! Thus, bin dryers are limited to small batches for timely processing with limited heat to prevent over-drying the bottom layer of grain. Several bins are needed to add drying capacity.]

In contrast to bin dryers, self-contained automatic batch or continuous flow dryers have inherently high airflow rates (50 to 125 cfm/bu) so drying wheat in these units is done with little or no additional heat. If heat is used, limit drying temps to 120 0F (110 for seed wheat).

Storing It is best to store sound wheat separately from diseased wheat and clean handling equipment between loads to avoid contamination. The next best option is to clean mixed wheat as it is moved into storage to remove shriveled kernels. If this isn’t practical for your farm, keep in mind that lighter wheat kernels will tend to collect in the center of a storage bin during filling, which restricts airflow in this region. For wheat that isn’t cleaned, core the bin soon after filling to remove trash and smaller kernels to improve airflow. Also, don’t fill a bin past the top ring to allow room for adequate ventilation in the head space and for grain inspections. Always be aware of the entrapment hazards associated with flowing grain and wear dust protection masks when working inside bins and other enclosed spaces where grain is stored. More information on harvesting, drying and storing wheat is available at county extension offices and online (www.uky.edu or http://www.bae.uky.edu/ext/Grain_Storage/PDFs/

Wheat_HDS_ID-125.pdf).

Protect Soybean Yields from Volunteer Corn

Volunteer corn is tough to control, and controlling glyphosate tolerant volunteer corn can add another level of difficulty.

A U of MN study found that for every 75 volunteer corn clumps per acre there is a corresponding lost of 1% in soybean yield. South Dakota State trials showed that volunteer corn densities up to 4.2 or 5.3 plants per square yard resulted in soybean yield losses of up to 54 and 58% respectively.

As well as competitiveness to the beans, much of our glyphosate tolerant volunteer corn is also contains the Bt protein to resist corn rootworm feeding. So now not only are we placing selection pressure on the corn rootworm larva in corn but also in soybeans (not good for the development of corn rootworm beetle populations that could become resistant to the current Bt protein).

Post emergent grass control herbicides are key to controlling volunteer corn. There are many excellent herbicides for grass control in corn that will also control volunteer corn. Only certain grass herbicides are supported by Roundup Ready Rewards. One of the grass herbicides supported is Agrisolutions Select.

Adjuvant selection is crucial for consistent control as well as rate selection and making a timely application. Control of roundup ready volunteer corn is optimized by adding Superb HC at 2 qt/ 100 gall of spray solution. Apply 4 oz/ A of Agrisolutions Select for volunteer corn less than 12”. Apply 6 oz/A for volunteer corn 12-24” in height.

Various Weed Management Issues and Questions—Mark Loux OSU

1. Is it possible to control marestail in emerged soybeans? In numerous no-till soybean fields, omission of 2,4-D ester in burndown treatments resulted in a failure to control marestail, and soybeans have now emerged. As many growers know from previous experience, it can be almost impossible to adequately control marestail that have recovered from earlier treatments with herbicide. The best case here is that the marestail are not herbicide-resistant, and the soybeans are Roundup Ready, which allows use of a high rate of glyphosate or a combination of glyphosate plus FirstRate or Classic. Resistance to glyphosate and/or ALS inhibitors will limit the effectiveness of these treatments. Control is more difficult in non-GMO soybeans, since FirstRate and Classic are the only options. These two herbicides are not that good on large marestail anyway, and populations in many non-GMO fields are ALS-resistant. All (yes – all) other postemergence soybean herbicides have essentially no activity on marestail, and usually cannot be counted on to even slow the growth .

2 **Giant ragweed in corn survived the first postemergence application of glyphosate – what should I spray now?** The answer to this depends upon how they survived treatment with glyphosate. If most were controlled and the survivors were still substantially affected, then it may be possible to apply glyphosate again and obtain adequate control. The addition of another product with activity on giant ragweed could certainly improve control, however, especially where plants are large. The question here is whether the survival is indicative of a low level of resistance, and an alternative to glyphosate should be used if there are doubts that a second glyphosate application will work.

Where many plants survived the first glyphosate application and showed little response to glyphosate, which is indicative of resistance, it will be necessary to apply a postemergence alternative to glyphosate that is effective on giant ragweed. Possibilities here include Status, Hornet, Impact, Callisto, Laudis, and NorthStar, among others. In Liberty Link corn, Ignite would be an effective option. Impact, Callisto, and Laudis are most effective on giant ragweed when mixed with atrazine. Labeled rates and recommended adjuvants should be used to maximize effectiveness of alternatives to glyphosate. It is possible to add some glyphosate to improve control of other weeds. However, be sure to add crop oil concentrate or MSO if recommended on the label of the alternative herbicide, instead of relying on the surfactant that is in most glyphosate products.

Postemergence Herbicide Applications Timings and Tank Mixes

By Aaron Hager, U of Il -Postemergence herbicides are integral to an integrated weed management program. Applying herbicide after crops and weeds have emerged allows you to identify the weed species present and assess the infestation so you can tailor herbicide selection for each field. Compared with soil-residual herbicides, postemergence herbicides minimize interactions with factors associated with soil (such as soil texture and organic matter content), but they tend to magnify interactions with prevailing environmental conditions. To achieve weed control with postemergence herbicides, the herbicide must come in contact with the target, be retained on the leaf surface prior to absorption into the plant, be able to reach the site of action within the plant, and, finally, induce some phytotoxic response. If for any reason one or more of these steps is restricted or limited, the level of weed control can be expected to decline.

The goal of a postemergence weed management program should be to remove weed interference from the corn crop before the weeds reduce corn grain yield. The key to success is determining when the weeds should be removed via application of the postemergence herbicide(s). Unfortunately, no one can accurately predict which specific day after planting or emergence that weeds begin to reduce corn yield. Weed scientists generally suggest an interval, based on either weed size (in inches) or days after crop/weed emergence, during which postemergence herbicides should be applied to avoid yield loss from weed interference. The interval for corn is often recommended to be before weeds exceed 2 to 4 inches in height. If weeds are allowed to remain with the crop past this size range, the risk of yield loss substantially increases. Apart from preserving crop yield, another advantage of removing weeds at these suggested sizes is that small weeds are usually much easier to control than large ones.

Tank-mixing two or more postemergence herbicides can provide several advantages over single-product applications. Perhaps one of the most obvious is that the spectrum of weeds controlled can be broadened. Before the adoption of glyphosate-resistant crops, tank-mixing postemergence herbicides was common. Grass-control herbicides were often tank-mixed with broadleaf-specific herbicides to create a "one-pass" tank-mix. Tank-mixes generally have been less common in the past decade, as glyphosate alone has been an effective product for control of many broadleaf and grass weed species. However, with the occurrence of glyphosate-resistant weed populations and weed species inherently less sensitive to glyphosate, it will become increasingly common to tank-mix products with glyphosate to control these challenging species. In glyphosate-resistant corn, tank-mixing growth regulators (such as dicamba or 2,4-D) or HPPD inhibitors (such as mesotrione, topramezone, or tembotrione) with glyphosate can improve control of glyphosate-resistant waterhemp and other tough-to-control broadleaf weed species, such as morningglory and giant ragweed. Be sure to follow all label restrictions and additive recommendations when tank-mixing postemergence herbicides.

The labels of most postemergence corn herbicides include application restrictions based on a maximum corn size (specified as corn height, leaf or collar number, or sometimes both). For product labels that indicate a specific corn height *and* growth state, be sure to follow the more restrictive of the two. If these restrictions are not followed, quite often there can be substantial injury to the crop that may lead to yield reductions. Adverse environmental conditions (such as prolonged

First Indiana Sighting of Soybean Aphids—

By Christian Krupke and John Obermer, Purdue—As in the past, our first soybean aphid sighting of the year comes from the northern part of the state, specifically near the St. Joseph/Marshall county line. Thanks to Gary Battles for alerting us to this finding – up to 40 aphids/plant on early V-stage beans. These populations typically peter out before getting near threshold levels, but should be monitored nevertheless.

As many of you know, Indiana is a “second-tier” aphid state in some ways: we typically don’t get the large early infestations that states such as Michigan and Minnesota do, probably because we have less of the overwintering host plant (buckthorn). Therefore, northern areas of the state that are closer to these high-pressure areas will usually report aphids first, and any emerged beans should be scouted in these areas. Populations can build quickly, and treatable infestations (i.e., over 250 aphids/plant) in June are not unheard of, although August is typically Indiana’s heaviest month for aphids. In a couple of weeks, we will begin tracking aphid numbers using our sentinel plots <http://www.sbrusa.net>, and will post frequent updates here as well.

Grain Update

USDA Summary—June 10,2009

Estimates in Million Bushels

Corn	**Jun USDA—09/10**	**May USDA-09/10**
Carry-in	1600	1600
Production	11,935	12,090
Total Supply	13,550	13,705
Feed and Residual	5150	5,250
Ethanol	4100	4100
Exports	1,900	1,900
Total Use	12,460	12,560
Carry-out	1,090	1,145
Soybeans		
Carry-in	110	130
Production	3,195	3,195
Total Supply	3317	3,337
Crush	1,675	1,675
Exports	1,260	1,260
Seed	92	92
Residual	79	79
Total Use	3107	3107
Carry-out	210	230
Wheat		
Carry-in	669	669
Production	2,016	2,026
Total Supply	2,800	2,810
Food	955	955
Seed	78	78
Feed & Resid	220	240
Exports	900	900
Total Use	2,153	2,173
Carry-out	647	637

Soybean Rust cont.

favorable for rust for quite some time and “have been favorable for development and spread,” says Hollier, who recommends that retailers and their grower-customers in southern and central Louisiana and in southern Mississippi should scout their fields.

Because of spring conditions, “this earlier-than-usual find does not come as a great surprise,” says Hershman.

A great many U.S. soybean acres have been planted later than normal this year, Hershman notes, but no one should hit the panic button yet. “This could increase the crop risk for soybean rust, but not necessarily so,” he cautions. “We could have a late-season dry period that shuts the disease down; or not. Time will tell, and I cannot rule anything in or out at this time."

Rust was confirmed on June 8 on a sample collected in late May from a soybean sentinel plot in Washington County, AL. Like the finding in Louisiana, it is the first this year on soybeans in Alabama. The earliest the disease has been found in soybeans in the state, the low level incidence was found on beans at the R2-R3 growth stage. The plot is located in near the town of Fruitdale.

Ag retailers servicing soybean growers should regularly check the soybean rust forecast on the ipmPIPE (Integrated Pest Management Platform for Extension and Education). Visit sbr.ipmpipe.org/cgi-bin/sbr/public.cgi and click on the green rectangular button at right.

(Sources: Clayton Hollier, Louisiana State University and Don Hershman, University of Kentucky)

Corn and Ugly Duckling Cont.

Crops in awe and wonder. Secondarily, be reminded that an ugly duckling of a corn crop that reaches the five to six leaf stage in reasonably good condition will usually turn the corner and become a beautiful swan of a corn crop during the next few weeks.

Thirdly, be reminded that true yield potential is just beginning to be determined at the start of this rapid growth phase. Ugly corn up to this point in time has not necessarily lost its yield potential. Ear size is determined from about knee-high to shoulder-high corn. Weather during pollination and grain fill finish off the yield determination. While we often moan and complain about the looks of young corn, it often surprises us with acceptable yields in the fall.

Postemergence Herbicides Cont

periods of cool air temperatures) can sometimes result in corn plants that are physiologically older than their height would suggest, so be sure to accurately assess plant developmental stage (leaf/collar number) in addition to plant height. Also be sure to follow the more restrictive corn growth stage listed when two or more products are tank-mixed. For example, glyphosate can be applied broadcast to glyphosate-resistant corn through the V8 stage or until corn is 30 inches tall when applied alone, but only to corn 12 inches tall when tank-mixed with atrazine.

Corn plants under stress conditions may be more prone to injury from postemergence herbicides. Stress can arise from a number of factors, including cool temperatures and wet soils. Be sure to consult the product label when selecting spray additives to include with postemergence herbicides. Many labels suggest changing from one type of additive to another when the corn crop is under stressful growing conditions.

Tissue Testing to Check Nutrient Status

Your Ceres Solutions professional is becoming more knowledgeable concerning tissue testing and how to check nutrient status of growing crops. We have not used tissue testing much in the past except when we had areas of good and bad crops we wanted to compare.

It is a good diagnostic tool. But just like every other tool it needs to be used with an understanding of what it is measuring. A tissue test measures what the plant is able to access from the soil. Soil measures what is potentially available in the soil, and a tissue test is a reflection of what the plant can access. What a plant is able to access depends on the health of the roots, size of roots and how much of the soil environment the roots are able to access. If roots are growing slow and the root system is small with few root hairs our results may indicate somewhat low levels of certain nutrients that in another year may not be as low. On the other hand with some of our more soil mobile nutrients tissue tests allow us to see deficiencies where the nutrients have been leached through the rooting zone.

In 2008 we started a project called the Nutrient Profile Project. The goal of the project was to understand what nutrients our soils contain and what nutrients or corn and soybean crops were able to access. We found some surprising results. We found than several of our soils are low in boron and several of our corn soil tests in the early vegetative and early reproductive stages are low in boron. As a result we are conducting some tests with foliar applied boron. We also found similar results with zinc, but not to the degree of boron. This year in many of our sandy soils we are finding low sulfur tissue levels along with boron and zinc.

If you wondering if you might have some nutrient deficiencies and would like to do some tissue testing contact your local Ceres Solutions professional.