

Virginia Soybean Update

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Dear Reader,

The drought continues to take its toll on Virginia's crops. The hope of a decent soybean crop continues to fade with no rain. Our double-crop soybeans could still benefit from some rain. Plus, we'll need a shower to get the wheat in the ground.

To add insult to injury, I've heard reports of green soybean seed due to the drought. This is something I've never seen. I have seen green soybean seed due to an early freeze, killing the crop before it was mature; but not due to drought. Yet, it makes perfect sense; if the crop dies before it matures, the seed will remain green. Green seed will discolor the oil and give it an off-flavor; so end-users may not accept the crop if above their seed damage standards.

But, I've decided to look ahead to the future. Soybean prices are very good as far as the eye can see. I've also taken a little turn from the normal format of this newsletter. I've asked Drs. Thomason, Maguire, and Alley to write an article on wheat. With today's wheat prices, I suspect there will be as many acres planted as there is available wheat seed. In addition, there should be some fertilizer carry-over in many of our fields; we should be able to capitalize on that. But, at the same time, we shouldn't cut corners on our preplant N fertilizer. So, with a little more rain than this year, I look forward to a profitable wheat-soybean crop in 2008.

Extension Soybean Specialist

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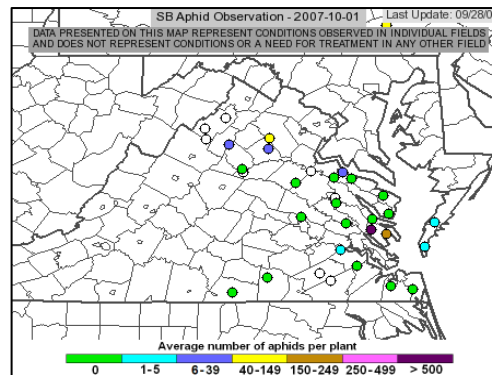
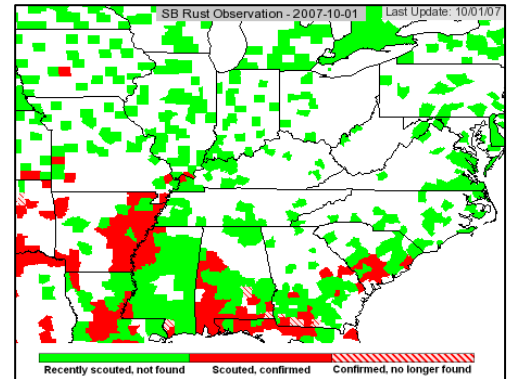
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Soybean Rust and Aphid Finally On The Move

The dry and hot weather kept soybean aphid and rust in check this year. Personally, I'd rather have the rain, disease, and aphids. But, both pests are starting to increase in incidence.

At the end of September, we finally found a field in Gloucester County that aphids reached economic threshold. This was not unexpected since cooler weather will favor their development. These double-crop fields were in the R5 stage (beginning seed), which is still susceptible; however, less damage would be expected that if the pest would have moved in earlier. Like most insects, every field in the area was not infested at economically damaging levels. So, scouting individual fields, instead of depending on what we find, is still recommended. Below is a map of our findings as of Oct. 1.

pass. Remember that R6 is the last growth stage that any fungicide can legally be applied. Below is a map of the current situation.



Wetter conditions in the Great Plains and Delta regions caused soybean rust to move up the Plains and the Mississippi River before it started tracking up the Mid-Atlantic coast. With cooler weather, conditions for rust development are likely to be more favorable. It is likely that rust will move northerly and eastward over the next week or so. As for Virginia we need to take a "wait and see" attitude. We will continue to closely monitor and track the disease. Our full-season soybean crop has reached the point where economic losses are not likely if rust is detected. Some double-crop plantings may still be in susceptible growth stages, but that will soon

The dry conditions this year mean that

Soil Sampling Should Reap Rewards

much of the fertilizer applied in 2007 is still there. The crop took up less than usual and there was little leaching of nutrients. But, we should not necessarily assume that this means a lower fertilizer bill next year. The only way to know for sure is to sample your soils. Therefore, soil sampling is more critical than ever. Keep in mind that high-yielding crops need nutrient levels in the medium + to high soil test range. We should be striving for no nutrient deficiencies during any time in the growing season. This means applying fertilizer if necessary and according to the soil test recommendation. October through December is a good time to sample your soils, but I suggest doing it the same time each year (i.e., if you normally sample in the spring, continue to do so).

Wheat Fertilizer Considerations Following Drought Affected Corn

Wade Thomason, Extension Specialist – Grain Crops; Rory Maguire, Extension Specialist – Nutrient Management; and Mark Alley, W. G. Wysor Professor of Agriculture, Virginia Tech

Corn in many areas was impacted by drought this summer. The current statewide yield forecast is 80 bu/ac which is about 66% of our long-term average corn yield in Virginia. Low crop yields during a drought year mean that significant amounts of unused nutrients may remain in the soil at the end of the growing season. A number of corn acres will be planted to wheat this fall and many growers are interested in reducing fertilizer applications to wheat if carryover from the low-yielding corn crop is truly available. Although this article is aimed at planting wheat after corn, the same principles could be used for considering nutrient needs for other crops.

PHOSPHOROUS AND POTASSIUM CARRYOVER

If phosphorous or potassium was applied but not used because of lower than expected yields, it usually remains plant available and in the top few inches of soil. The unused portion can be credited against nutrient needs for the upcoming wheat crop (Table 1).

Table 1. Estimated corn stover and nutrient uptake for various corn grain yields.

Grain Yield	Equivalent Stover Dry Weight	Estimated Nutrient Use		
		N	P	K
-bu/ac-	--tons/ac--	-----lb/ac-----		
40	2.4	40	11	71
80	4.0	80	19	120
120	5.1	112	26	156
160	6.9	150	35	208

A routine soil test is the best option for detecting carryover nutrients, especially if large amounts of fertilizer were applied. But since it takes a relatively large amount of fertilizer to change P and K soil test values, a single year's application may not be detectable. Therefore, if you have recent soil tests for your fields and applied the recommended rate of fertilizer to your corn, your soil test would still be valid for the wheat. One exception to this may be where you had a 'Low' soil test level, as a single application of fertilizer at the recommended rate may or may not be sufficient to raise the soil test level for the second crop. In this situation a second soil test would be desirable. In general it is recommended that you soil test every 2 to 3 years, with shorter intervals on sandy soils and longer intervals on heavy or clay soils. The soil samples should be taken to a depth of 6" or 8" for conventionally tilled soils and to about 2' to 4" for soils under conservation or no-tillage.

Alternatively, the amount of unused phosphorus and potassium can be calculated based on the ratio of the actual yield and the yield goal used to determine nutrient application for the corn crop. For example, if the actual yield is 2/3 of what was expected, we could anticipate that 2/3 of the applied P and K were used by the corn crop and that 1/3 remains and will be available to the following wheat crop. The remaining nutrient levels can then be subtracted from the total fertilizer application planned for the wheat crop.

SOIL pH AND LIMING

Maintaining appropriate soil pH is crucial for maximizing the uptake of essential plant nutrients. Optimum plant uptake of most nutrients occurs at a soil pH near 6.2. If needed, based on soil test recommendations, lime should be applied at the appropriate rate prior to planting. High rainfall tends to leach out calcium, while under drought conditions the soil pH will not change greatly. Therefore, if anything, this year's drought will decrease the need for lime. Again, soil testing every 2 or 3 years is the best way to evaluate lime requirements, with sandy soils requiring the most frequent testing.

NITROGEN CARRYOVER

The majority of carryover nitrogen exists in the nitrate form with some in the ammonium form. Nitrate is soluble in water and mobile in soil so leaching below the root zone does occur, especially if rain occurs after corn matures and stops taking up nutrients. This factor makes the determination of carryover N much more difficult. A preplant soil nitrate test can be used to determine how much N remains following the corn crop. Sample as closely as possible to wheat planting but before any preplant N is applied. Sample soil by taking 15 to 20 cores across the field to a depth of 0-6 inches and 6-12 inches, or as deep as possible and divide samples into one foot increments below the surface samples. Thoroughly mix the soil from each depth and collect a subsample to be sent to the lab. Sample between rows to avoid starter fertilizer bands and areas where roots have depleted soil N. Combine, mix, and air dry samples as quickly as possible by spreading the mixed soil in a thin layer on newspaper or other clean surface. Samples can also be dried in an oven at low heat (200 to 225 °F) or in a microwave for 5 to 8 minutes at the high power setting. Always immediately -air dry or freeze samples. Do not store or send moist composite samples to the lab. If samples can't be taken to the soil testing lab within one day after collection, they should be air-dried or frozen immediately after collection.

If laboratory analysis for nitrate is not possible, the Nitrate Quick Test Kit used for the pre-sidedress soil nitrate test for corn can be used. If nitrate in the top 6 inches of soil is greater than 30 parts per million (ppm), then no nitrogen is needed at planting. If the soil nitrate test level is less than 30 ppm, apply 20 to 30 pounds of N. It is critically important for high yields to have N available for young wheat plants to develop fall tillers as shown in the picture on the next page.

Early season wheat growth with deficient (left) and adequate (right) preplant nitrogen.

With the relatively high price of nitrogen and disappointing corn yields, it will be tempting to delay or skip preplant N applications to wheat. Again, adequate fall N is very important for high wheat yields. Nitrogen stress early in the season will prevent adequate tillering and root development which reduces overall yield potential. See table 2 below for an example of wheat response to N. Since the level and availability of carryover nitrogen is difficult to predict and because 20 to 30 pounds of preplant N per acre is generally sufficient to promote maximum growth and tillering, N should be applied to most field regardless of the performance of the preceding corn crop.

Table 2. Spring tiller counts, plant height, and ground cover as affected by nitrogen timing for a wheat cover crop planted October 20, 2006 following cotton. (courtesy of Cyndi Estienne, VCE Greenville/Emporia).

Treatment	Tillers per square ft. March 30, 2007	% Cover	Plant Height, inches
Zero Nitrogen	22	58	8
Early Nitrogen	70	66	14
Late Nitrogen	47	81	11
LSD	7	7	1

Early Nitrogen: 30 pounds of N applied 12-15-06.

Late Nitrogen: 30 pounds of N applied 2-22-07

It's Not Too Late to Sample for Nematodes

This year's dry weather should enhance certain pest problems, especially those problems that are root-related. You may notice spots in soybean fields with poor growth, yellowing, or even early death. These spots might be infested with nematodes. So, some sampling would be in order.

It's also important to know what species of nematode you have. A cyst nematode-resistant variety will do you no good if the field is infested with root knot or stubby root nematodes. Likewise, a southern root-knot nematode resistant variety would do you little good if the field is infested with northern root knot. To make matters more complicated, some nematodes have different races. Soybean cyst nematode is a prime example of this. For example, in the field below in Essex County, the middle streak is planted with a nematode-susceptible variety. But, it's not as you might think. This variety is actually resistant to race 3 cyst nematode, but the field is infested with race 1 and 3. The surrounding soybeans contain multiple-race resistance and are nearly double the height. So, why not just plant this variety all the time when nematodes are suspected? This multiple-race variety is not one that I or the company would recommend to a field not infested or just infested with race 3; it just doesn't yield that well under nematode-free conditions. So, it's not one of the top-selling varieties for obvious reasons. But, as you can see, it has its place. Most of our soybean varieties with cyst nematode resistance are just resistant to races 3 and 14. But, we have documented race 1 and 4 as well as race 3 in Virginia. I suspect there will be a 20 bushel yield difference between the varieties in this field. So, it pays to know what you have.

I could show other similar examples with root knot nematode. Most of our varieties don't have root-knot resistance, but there are a few that do. Yield differences would be similar. Also, corn no longer has resistance to root-knot nematode either; so rotation to corn is not as valuable as it used to be.



Photo by Keith Balderson

This year, your Virginia Soybean Board funded a nematode survey for corn and soybean. This funding will not only allow us to determine what species of nematode are infesting Virginia, but also what race of cyst nematode is predominant in cyst-infested areas. We still have some grant money available for sampling. Therefore, if you suspect nematodes, contact your county agent, Wade Thomason, or me to get your field sampled. Keep in mind that this is not a random sample, but one directed to fields where a problem is suspected. Sampling for nematodes can take place through November.