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Virginia Soybean Update

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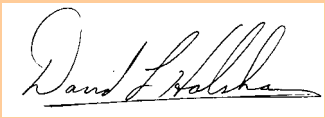
Dear Reader,

I had originally planned to dedicate space for an article on soybean rust for this issue, but with the lack of activity, I decided otherwise. We've made it to June without any significant movement of soybean rust. This could quickly change since Hurricane Alberto moved through the southeast, giving much of the region needed rainfall. So, after a prolonged dry period, conditions are again favorable for soybean rust development.

Actually, the first confirmation of rust on soybean in 2006 in the continental U.S. was on June 15 on a sentinel plot in Martin County, FL. Keep in mind that this is well over 600 miles from Virginia. Rust has been confirmed on numerous kudzu patches in Florida, Alabama, and Georgia and the recent weather conditions seem to be stimulating its growth.

Regardless, we are on the job. We're scouting over 40 commercial fields and 10 sentinel plots in Virginia. We'll keep you updated.



Extension Soybean Specialist

In This Issue

Evaluate Existing Stand Carefully Before Replanting

Poor stands occur nearly every year in one field or another. With the cost of Roundup-Ready soybeans, fewer producers will decide to replant as compared to 5 years ago. But, a thorough evaluation is needed to make a replant decision. The decision is not always a simple one. If stands were reduced uniformly, then the benefit of replanting is not great. But, poor stands usually include small and large gaps in addition to merely a lower plant population. In addition, one may have a 75-80% stand in parts of the field, while other parts may suffer a 75-80% loss.

So, what do you do? First, realize that the plants growing in the field are going to be higher yielding that any that emerges after replanting. If you destroy those plants, you've just writing off some profit.

Do you leave those in the field, and plant through them? In many cases, this is a possibility. If you're using wider rows, then split the rows with the new plants. You may want to choose a variety about ½ a maturity group earlier so that harvest maturity will match better. A general rule of thumb is that a 5-day delay in planting (after mid-June) will result in a 1-day delay in maturity. Therefore, planting a ½ group earlier variety 1 month later should bring the harvest maturity of the old and new plants into better sync. If you originally planted a variety with a relative maturity of 5.0, then replant with a 5.0 if replanting 1 month later.

On the other hand, a drill will cut up many healthy plants and make them less productive than the ones that you just replanted. I do not suggest planting through the old stand with a drill.

Also realize that you'll need a higher plant population when planting late. Your final stand with a June planting should be 160 to 200 thousand plants/acre, depending on yield potential and maturity group (see Soybean Update Vol. 9, No. 2 for recommended seeding rates).

But, how do you decide whether or not to replant the whole field? Below are some guidelines that incorporate plant population with gaps in the field. We've found that large gaps cause as much or more yield loss that from low plant populations.

1. **Determine the cause of the poor stand.** Was the poor stand the result of poor seed quality, cold wet soils, hot dry soils, planting too deep or shallow, soil crusting, herbicide injury, insect feeding, poor soil to seed contact, or disease infection? Determine if the cause can be corrected to avoid a similar situation. If certain insect feeding or disease is the cause, then you might expect poor stands again.
2. **Estimate the stand and percent stand loss due to gaps.** Pace off the sections of row 20 paces long in at least 6 areas of the field. Determine (in number of paces) the total length of row lost to gaps. Then determine the percent of row lost to gaps. In addition, count and determine average number of plants per foot in sections of row not reduced by gaps. Count only healthy plants capable of recovery. Use Table 9.4.1 to determine remaining plant population. Or, you could simplify your calculation by counting plants in a length of row equaling 1/1000 of an acre. For instance:

   36-inch rows = 14.5 feet
   30-inch rows = 17.5 feet
   20-inch rows = 26 feet
   15-inch rows = 35 feet

– continued on page 2

Replanting (cont')

Then, you just multiply your counts by 1,000 to get plants per acre. Or use "hula hoop" method (Table 9.4.2) to determine population if rows cannot be distinguished. This involves placing a circular measuring device such as a hula-hoop on the ground and counting the plants contained within.

3. **Estimate the yield of the poor stand.** Use Table 9.4.3 to determine percent of yield potential for full-season plantings and Table 9.4.4 for double-crop plantings. Multiply this percentage by the expected yield. This is the yield to expect from the deficient stand.
4. **Estimate the yield from replanting.** After mid-June, decrease the expected yields an additional ½ bu/A per day delay in planting. This is the yield to expect from delayed planting.
5. **Determine the gain or loss from replanting.** Subtract the expected yield of the poor stand (step 3) from the yield expected from delayed planting. This is the gain or loss in bu/A from replanting. Multiply this number by the expected price ($/bu), using future prices, to obtain gain or loss in $/A.
6. **Estimate the cost of replanting.** Include per acre cost of tillage, herbicide, fuel, seed, and labor.
7. **Determine profitability of replanting.** Subtract your cost of replanting from your estimated gain from replanting.

Table 9.4.1. Plant populations of different row spacing with different plant counts per foot.

Plants / foot	Row Spacing					
	36	30	24	20	15	7.5
	----Plant Population (1,000's/acre)----					
1	15	17	22	26	35	70
2	29	35	44	52	70	140
3	44	52	65	78	105	210
4	58	70	87	105	139	278
5	73	87	109	131	174	---
6	87	105	131	157	209	---
7	102	122	152	183	244	---

Table 9.4.2. Hula-hoop method for determining drilled soybean populations.

No. of Plants	Inside Diameter of Hula Hoop				
	30"	32"	34"	36"	38"
	*(Plants in 1,000's per acre)**				
6	53	47	41	37	33
10	89	78	69	62	55
14	124	109	97	86	77
18	160	140	124	111	100
22	196	172	152	136	122
26	231	203	179	160	144

* Plants/acre = no. plants ÷ (3.14 * r^2 ÷ 43,560 ft^2) where r = radius of hula hoop in feet.

Table 9.4.3. Yield response (% of maximum) of full-season soybeans to deficit stands[1].

% Stand lost to gaps[2]	Remaining Plant Pop (1,000's/A)		
	140	105	70
0	100	97	95
10	98	96	93
20	96	93	91
30	93	90	88
40	89	86	83
50	84	81	78
60	78	75	73

[1]Source: Pepper and Wilmot. Managing Deficit Stands. 1991. Illinois Cooperative Extension Cir. 1317.
[2]Gaps of 12 inches or more; 30-inch rows

Table 9.4.4. Yield response (% of maximum) of double-crop soybeans to deficit stands[1].

% Stand lost to gaps[2]	Remaining Plant Pop (1,000's/A)			
	200	160	120	80
0	100	95	87	74
20	91	86	80	67
40	78	73	69	58
60	71	66	62	53

[1]Source: 2001-2004 experiments, Suffolk, VA (preliminary analysis).
[2]Gaps of 3 feet; 15-inch rows; MG 4 variety.

Adjust Planter or Drill to Insure Good Double-Crop Stands

Bobby Grisso, Extension Ag Engineer
David Holshouser

Replanting double-crop soybeans almost never pays for itself. The yield of a July-planted crop will almost never exceed the yield of a June-planted crop, even when poor stands are present. Therefore obtaining good soil-to-seed contact is much more important when planting after wheat harvest. Below are some pointers in insuring a good stand. Always remember the basics of 1) residue management; 2) handling and cutting the residue; 3) penetrating the soil to the proper depth; and 4) insuring good soil-to-seed contact. Also remember that each step depends on the previous one. Unless residue is managed, cutting through it is difficult, and unless the residue is cut, good soil-to-seed contact will be compromised.

Residue Management. Cut the small grain high. Better yet, use a stripper header. Planting into standing straw is much easier than straw lying on the ground. If using a conventional header, uniformly spread the wheat straw. The best planter cannot plant into mats of straw and chaff.

Cut and handle the residue. Residue must be cut and not pushed down into the soil. Residue in the soil only takes away moisture from the germinating seed. You want soil, not straw, contacting the seed. Wait for the residue to dry and become crisp. The best coulter or disk opener will not cut tough, wet residue. In addition, throughout this process of adjusting your drill or planter, keep in mind that the weight of the drill or planter and pressure from the down-pressure springs are essential for cutting residue, penetrating the soil, and preventing the seed openers from bouncing over residue.

First, level the planter or drill in the field, making sure that the toolbar is at the proper height and leveled front-to-rear, perhaps even slightly "tail" down. This allows for the full range of movement of the parallel links on the row units, helps keep the planter on the row, and aids in seed-to-soil contact. In addition, make sure that the planter carrying wheels are exactly centered between the rows and that they are carrying some weight. This is especially important if there are any ridges in the field from cultivation or harvest.

Whether using coulters in front of the planting unit or just the disk opener, the blades must remain sharp. Also, there should be no gap between the two disks of a double-disk opener where it contacts the soil; they should work as one cutting edge. Operate all coulters close to seedling depth to avoid excessive soil movement and to limit the formation of air pockets below the seedling depth. This also positions the blade at the best angle for optimum cutting. Placing the coulters or disk openers in the proper cutting position requires awareness of our next subject.

Penetrate the soil to the proper seeding depth. We've found that any depth between ½ and 1 ¼ inches is adequate for soybean emergence. If you have plenty of moisture or are confident of coming rainfall, then ½ inch is OK. You may want to plant 1 ¼ inches deep if the soil in the top ¾ to 1 inch is dry. Never plant deeper than 1 ½ inches.

Once the planter is leveled, try "blind" planting with empty seed boxes. Stop with the planting units in the ground and check to see if the depth gauge wheels are in firm contact with the soil surface. If they are not, tighten the down pressure springs and try planting again. You may have to add weight to the planter for the springs to work against and to keep the drive wheels firmly on the ground. By putting a small amount of seed in a couple of rows, seed-to-soil contact and seed-vee closing can be observed as well. However, all these items should be rechecked when actual planting begins and as conditions change during the planting season.

Depth control of most no-till planter/drill systems come in two methods: 1) gauge wheels adjacent to the seed furrow device; or 2) press wheel behind the seed furrow opener. We prefer the former just because, with that setup, you're controlling the depth at the same location where you're planting the seed. Still, both systems work well if adequate down pressure is applied.

Insure good soil-to-seed contact and close the seed vee. By following the first three steps, you're well on your way to obtaining good soil-to-seed contact. Keep in mind however that sufficient force must be applied to the closing wheel to ensure firming of the seed into the soil. Remember that wet soil is easily compacted and care must be taken not to over-pack the soil, making it difficult for seedling roots to penetrate the soil and the cotyledons to emerge. So, back off on the closing wheel pressure in wet conditions, if separate adjustment to these wheels is possible. In dry conditions, extra closing force may be needed. The key is to evaluate the soil-to-seed contact, not the top of the seed vee.

Wide-flat press wheels are unacceptable for no-till since they will ride on the soil adjacent to the seed furrow and will not firm the soil around the seed. A wide press wheel equipped ribs that run on the sides of the seed furrow or a rib that runs directly over the furrow to press the seed is adequate. If using angled press wheels, ensure that pressure is not placed on the seed furrow to the point that a ribbon of soil move the seed up. Adjust spacing between the wheels such that the angle of the press wheels meets at the seed depth. Many angled press wheels on planters are factory set for planting corn at much deeper depths than soybeans; that's not where the setting should be.

In summary, check your planter's performance by evaluating the functions of your seeding equipment. A good soybean stand will result from managing straw distribution, checking residue cutting ability, penetrating the soil to the proper depth, obtaining seed-to-soil contact, and closing the seed-vee.

With any piece of equipment, the owner's manual is the starting point for the initial settings and for making any adjustments. Valuable recommendations and trouble-shooting tips are in the manuals and also available from others who own and operate similar equipment.

For more information, review VCE publication 442-456, "Equipment Considerations for No-till Soybean Seeding".

http://www.ext.vt.edu/pubs/bse/442-456/442-456.html

Calibrate! Calibrate! Calibrate!

Bobby Grisso

Most have already calibrated their sprayer, but due to the potential for spraying fungicides and/or insecticides later in the yield, a review of calibration is always in order. Sprayers should be calibrated several times per year. Different nozzles will be used for disease sprays; previous calibrations may have changed slightly.

Why calibrate? Calibration is the best way to assure you are delivering the desired rate. The window of opportunity to spray for soybean rust is much narrower than for most pests. You may not have the time to calibrate after the rust has arrived.

Results of many "Sprayer Calibration Clinics" show that only a third of applicators are applying chemicals at

a rate within 5 percent (plus or minus) of the intended rate. Calibration takes about 30 to 60 minutes and requires only three "tools": a stopwatch, a measuring tape, and a jar graduated in ounces. Several calibration methods are available but the one described below is simple, straightforward, and does not require cumbersome equations.

"Ounce" Calibration Method. When the spray tank is clean, fill it at least half full with water since the amount of water in the tank may affect travel speed. Measure the distance between nozzles in inches and then drive a designated distance depending on the nozzle spacing.

For a nozzle spacing of 20 inches, drive 204 feet at normal spraying speed. Drive 136 feet for 30-inch spacing; 113 feet for 36-inch spacing; and 102 feet for 40-inch spacing. Run the parked sprayer at the same pressure level for the same amount of time it took you to drive the designated distance, and collect the output of each nozzle.

Calculate the average nozzle output by dividing the total output from all nozzles by the number of nozzles tested. The average nozzle output in ounces equals the gallons per acre applied. For example, if you catch 20 ounces the rate is 20 gallons per acre (gpa).

The next step is to minimize the application error. If the difference between your intended application rate and the actual rate is greater than ± 5 percent of your intended rate you should make some adjustments. For example, if your intended application rate is 20 gpa, the calibrated rate should be between 19 and 21. For small changes in the application rate try adjusting the pressure. For larger changes either adjust the travel speed or replace nozzles with the appropriate size. You need to repeat the calibration process until your application error is no greater than ± 5 percent.

The "Ounce" calibration method is explained in detail in Virginia Extension (VCE) Fact Sheet 442-453, available from your local Extension Office, or from the VCE web site: http://www.ext.vt.edu/pubs/bse/442-453/442-453.html.

Just spraying the right amount of fungicide on each acre is not enough to achieve effective control of soybean rust. Uniform deposition on the spray target is as important as the total amount deposited. Each nozzle type produces a unique spray pattern. Some nozzles require precise overlapping of patterns from adjacent nozzles. Check the nozzle catalog to find out the appropriate boom height for your nozzle spacing that will produce uniform spraying across the boom.

Calibrate frequently. Again, sprayers should be calibrated several times a year. Changes in operating conditions and the type of chemical used may require a new calibration. A survey showed that the more often a sprayer was calibrated, the more accurate the application rate. Be prepared to spray for soybean rust before it arrives and have your sprayer calibrated.

2006 Virginia Ag Expo

Mark your calendar. The Virginia Corn & Soybean Ag Expo is August 10, 2006. This year the Ag Expo will be held at Brandy Station in Culpeper County. The location is Beauregard Farms managed by our host, James Bowen. The theme is very appropriate for today's agriculture, "Growing Food, Fuel and Forage". The Ag Expo is the largest field day event held annually in the Commonwealth of Virginia and is an educational, marketing and social event that farmers look forward to every year.

Companies with agribusiness interest will be exhibiting their products, services and equipment. There will be a field tour of corn and soybean exhibit plots along with exhibit plots of corn weed control, soybean seeding rates and biosolids applications. Culpeper Soil and Water District along with VA DCR will sponsor a no till corn plot, to promote the new no till and cover crop BMP. Virginia Cooperative Extension will have a booth for livestock producers to sign up for the PREMISE REGISTRATION, the national livestock identification program. A bale wrapping demo is also planned.

A traditional Bar-B-Que lunch will be served with all the trimmings and beverages. Lunch tickets are $8.00 in advance with a limited number available on the day of the Ag Expo for $10.00. Look for registration information in the mail coming soon or contact your local Virginia Cooperative Extension Office.

The Virginia Ag Expo is a joint project of the Virginia Corn Growers Association, the Virginia Soybean Association and the Virginia Cooperative Extension Service. For more information, contact the field day manager, John Smith at 804-829-5671 or johnwsmth@aol.com.

Planting soybean varieties at Beauregard Farms.