

SOYBEAN STATION

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Fine-Tune Soybean Seeding Rates During Chilly and Wet Spring

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April 2011 is a stark contrast to April 2010 where many wore short-sleeve shirts (even shorts) and basked on the tractor during the 75° days. At this time last year, ~50% of the corn and ~10% of the soybean was planted (a record pace for both crops). April 2011 has been much cooler and wetter, which we can take advantage for final tune-ups of our planting equipment. I want to remind us that soybean planting should be based on soil and environmental conditions. Planting dates are a good reference, but they should not override the field conditions. Planting soybean into a cold and wet soil can cause a several problems such as sidewall compaction in the seed furrow, emergence issues from cold temperatures to seedling diseases, and favorable conditions for SDS (*Fusarium virguliforme*) infection during early growth.

As you tune-up your planters, drills, and air-seeders, you should consider your soybean seeding rates for 2011. The seed is in the shed ready to be loaded and planted, but the seed lots this year will be different from last year. Many soybean lots planted in 2010 were large seeds (2200 seeds/lb and I even heard of one lot at 1900 seeds/lb). Soybean seeding rates need to be adjusted by seed size rather than weight. Planter settings used last year will probably drop more seeds per acre with this year's seed lots. Germination scores fluctuate as well.

My soybean seeding rates start around 130 to 150 thousand viable seeds per acre with adjustments for field conditions and planting equipment. The total seeding rate is calculated by dividing the viable seeding rate by the germination percent. For example, seeding at 140,000 viable seeds for a variety with 90% germination would require 155,000 total seeds (viable + nonviable) per acre. This same variety at 3100 seeds/lb would require 50 lb/acre; whereas, at 2500 seeds/lb would require 62 lb/acre. More difficult conditions for planting and seedling establishment will push the seeding rate higher. A general rule of thumb is to estimate that 85 to 95% of the viable seeds planted will emerge and establish a stand depending on accuracy of seed placement, residue issues, and other field conditions. This brings us to the overall goal for plant populations for soybean rather than just seeding rates.

Our small plot research has demonstrated that harvest stands near 100 to 120 thousand plants per acre optimize yield. In other words, soybean yields do not effectively increase with plant stands above 120,000 plants at harvest. This is lower than traditional thoughts of soybean plant stands and certainly lower than the target of many farmers. We initiated on-farm research trials in 2010 to address this topic at a larger scale, both in the field and across the state. The yield response to plant stand across the state was similar to our small plots. Harvest plant stands of

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90,000 plants/acre yielded 95% of the maximum and 120,000 plants/acre yielded 100% of the maximum (Figure 1). Three of the six on-farm sites in 2010 were not responsive to plant populations with a range of 45 to 175 thousand plants, which may be due to lower yield environment, soil productivity, soil moisture (too much or too little) or others. We are continuing the on-farm research efforts in 2011 to fine-tune the state (and possibly region/soil specific) plant population recommendations. Please visit www.agry.purdue.edu/ext/ofr/ or the local Extension office if you are interested in participating in this on-farm research. Here is hoping for some warmer and drier days!

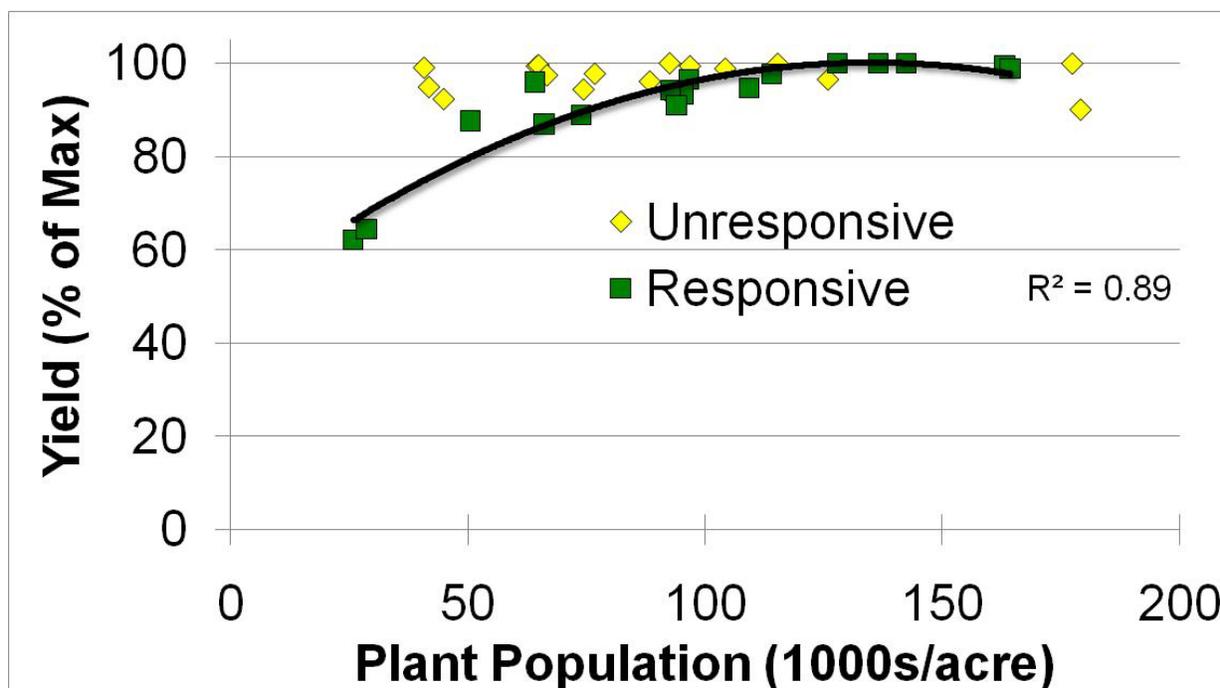


Figure 1. 2010 Soybean yield response to plant populations at harvest based on six on-farm research trials across in Indiana.