

Do Narrower Row Spacing Improve Soybean Yield?

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In the past few years, the cost of feed has increased substantially. For example, currently, soybean prices are more than \$10 per bushel and it has been predicted to increase in 2010. According to the 2007 Census of Agriculture, in Massachusetts, only 5 farms with a total of 247 acres planted soybean. Recently more farmers have shown an interest in growing soybeans in Massachusetts to reduce their feed costs. Many farmers however, lack experience to grow soybean and require some basic information. Optimum seeding rate, planting row width, and cultivar selection are among fundamental decisions confronted by growers.

Traditionally soybeans are planted in 30 inch rows. Earlier studies on soybean physiology and cultivation management conducted at UMass Crop and Animal Research and Education Center in South Deerfield, Massachusetts indicated that higher grain yield can be obtained by using narrower rows.

In 2009 we compared yield performance of a roundup ready soybean cultivar (obtained from a grower) planted in traditional 30 inch row spacing and narrower spacing of 15 inches. A cone type distributor mounted on a double disc opening planter was used in a conventionally prepared seed bed. Plots were planted on May 20th at three population densities; 100,000, 150,000, and 200,000 seeds per acre. Experimental plots consisted of 3 rows with a length of 25 feet and replicated 8 times. Weeds were controlled using Roundup 3 weeks after planting.

Soybeans were harvested by hand when average moisture content of seeds was about 14%. Harvested plants were evaluated for grain yield and yield components including number of pod per plant, number of seeds per pod, and seed weight. Ten feet of the central row from each plot was harvested by hand for yield and yield components estimation. Grain yields were adjusted to standard 13.5% moisture.

Yield and yield components of soybeans planted on May 20th and harvested on October 30th. Grain yield is adjusted to 13.3 % moisture.

Row width (inch)(x1000)	Density	Grain yield (bu/ac)	Pod plant ⁻¹	Seed pod ⁻¹	Seed wt. (mg)
15	100	64.9	37.4	2.45	156
	150	73.8	32.2	2.44	164
	200	65.8	21.2	2.37	164
Mean		68.2	30.3	2.42	161
30	100	54.9	37.6	2.40	171
	150	55.6	28.0	2.31	174
	200	59.9	20.3	2.00	180
Mean		56.8	28.6	2.23	175

Although 2009 was exceptionally cool and wet compared to the norm for this location, grain yield was high compared to those reported in other states. Narrower planting rows yielded 68.2 bushel per acre averaged all seeding rates which was 17% higher than traditional 30 inch planting rows. This was mainly because more pods were produced when soybeans were planted in narrower rows. In narrower planting rows (squarer planting pattern) light spreads more uniformly and efficiently in crop canopy thus, plants experience less competition especially in their earlier stages of growth. Results from this study also indicated that seeding rates of 150,000 per acre produced highest yield and is recommended. The highest yield (73.8 bushel/acre) obtained from 150,000 seeds/acre planted in 15 inch rows.

We will continue this study in 2010, possibly with more soybean cultivars varying in relative maturity.

