COMPARISON OF ROW CONFIGURATIONS AND PLANTING POPULATIONS IN SOYBEANS

Both 30-inch single row and 38-inch twin row plantings (7.5-inches apart on top of the bed) have been shown to have several potential benefits including maximizing light interception, improving drainage versus flat planting systems, and allowing for increased plant root development which ultimately can increase nutrient and water interception. Because of these potential benefits, a multi-year effort is underway to evaluate row spacings that could improve soybean yield potential. The use of 38-inch twin row spacing could also allow better compatibility for soybeans in a cotton rotation while preserving yield potential. In 2012, an additional component was added to evaluate the affect of planting population on soybean yield potential with relation to row configuration.

Materials and Methods

From 2010 to 2012 a study was conducted at the Monsanto Learning Center at Scott, MS to evaluate narrow row spacing effects on soybean yield. In 2012, three soybean products with relative maturities (RM) 4.6, 4.8, and 5.3, were evaluated for yield in 38 -inch twin row and 30-inch single row systems. For both row configurations each product was planted at 90,000, 120,000 and 150,000 seeds/acre. Plots were planted on April 20, 2012 and harvested on September 19, 2012. Agronomic practices were in alignment with local standards and irrigation was applied as needed.

Results

In 2012, the 30-inch single rows yielded an average of 60 bu/acre, while 38-inch twin rows averaged 49 bu/acre when averaged across soybean products and planting populations (Figure 1). The 30-inch single rows out-yielded the 38-inch twin rows for the three planting populations and three different products by an average of 11 bu/acre (Figures 1 and 2). The lowest population (90,000 seeds/acre) yielded similar to the higher planting populations in both 30-inch single rows and 38-inch twin rows.

In similar research conducted in 2011, 30-inch single rows yielded an average of 5 bu/acre higher than 38-inch twin rows when averaged across four different soybean varieties (Figure 3). However, in 2010 the 38-inch twin rows out-yielded 30-inch single rows by 7 bu/acre. The differences in yields between the row spacing may be due in part to environmental conditions of the given trial year particularly seasonal rainfall and the associated issues with drainage.

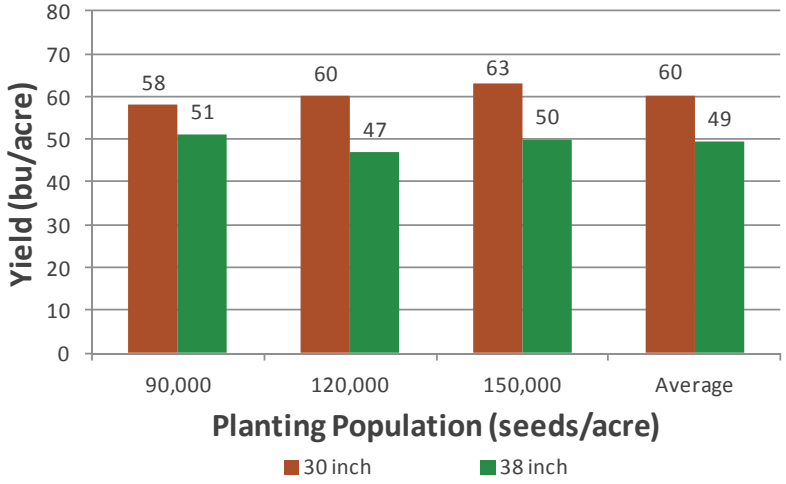

Figure 1. Average yield (bu/acre) of three different planting populations in 30-inch single rows and 38-inch twin rows when averaged across three soybean products in 2012.

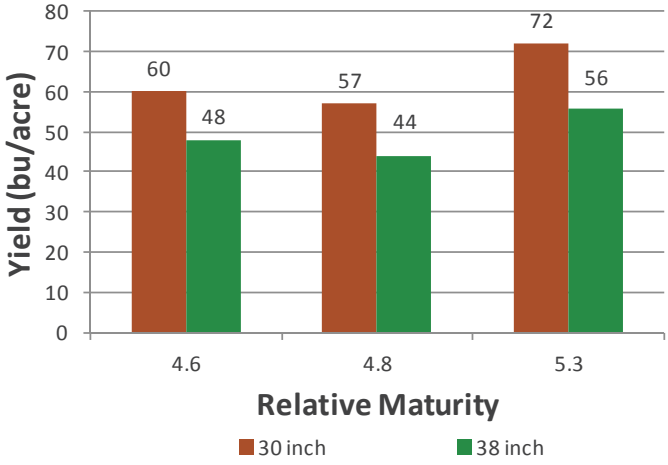

Figure 2. Average yield (bu/acre) of soybean products by relative maturity when planted in 30-inch single rows and 38-inch twin rows in 2012.

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Summary Comments

Twin row systems appear to be an option for soybean production in the Midsouth region and have the added benefit of being compatible with cotton production. In 2011 and 2012, lower rainfall amounts may have contributed to higher overall yields in the 30-inch rows as drainage was not a concern. In years where drainage may become a yield-reducing factor, 38-inch rows may improve drainage, negating the higher yield potential of 30-inch row spacings.

With the addition of the planting population component to the demonstration, one year of data suggests that with favorable in-season conditions, established populations which are lower than expected (on the lower end of the traditionally accepted levels) can have similar yield potential to higher planting/established populations; however, results will likely vary depending on the environmental conditions. In 2012, seedlings had favorable environmental conditions for establishment. In years with less favorable early-season conditions fewer seedlings may survive and reduced stands will negatively affect yield potential. When poor early-season environmental conditions occur, higher planting populations could serve to maintain or increase yield potential. It is not recommended to plant at low populations; however, if a soybean stand is reduced after planting, the crop may provide adequate yield potential given favorable environmental conditions for the remainder of the season.

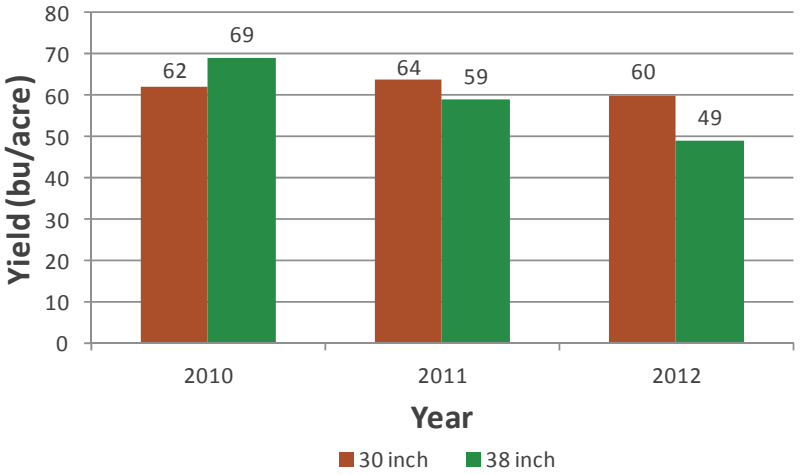

Figure 3. Average yield (bu/acre) of soybean products planted in 30-inch single rows and 38-inch twin rows for trials conducted in 2010-2012.

One other influence of population is specifically applicable to southern soybean production. In many cases where soybeans are planted on highly productive, irrigated soils (i.e. traditional cotton soils), planting populations may be reduced to help manage the potential for lodging. This is particularly true when locally adapted varieties are relatively tall.

Seeding rate decisions should always be made to at least guarantee a final stand that can optimize yield potential depending on localized emergence conditions, planting date, seed quality and treatments and the individual field conditions. Historically these planting rates have been in the range of 140,000 seeds planted, which has generally established 125,000 or so surviving plants. In general, higher planting rates are most applicable to less productive soil types, and lower populations may be used to help manage lodging potential in highly productive systems without sacrificing yield potential. Reduced populations should not be considered in less productive systems.

The information discussed in this report is from a single site, non-replicated, three-year demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.

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