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Intermediate Row Width Can Increase Soybean Profits

Several years of research across the Midwest suggests that soybeans yield better when grown in 15 inch rows. For farmers, greater yields generally mean greater profit potential.

Research conducted in Iowa found a 3.7 bushel per acre yield advantage for soybean grown in intermediate (15 inch) rows compared to wide rows (30 inch), Figure 1 (4,10). The authors concluded that the yield advantage from intermediate row widths was stable across fields and environments suggesting the yield advantage could be achieved by most farmers (4).

The concept of planting soybean in narrow rows isn't new. Researchers discovered the yield benefit as early as 1939 (12).

The yield advantage of growing soybean in 15 inch rows has been documented in Iowa (4,11), Illinois (1), Wisconsin (2), Georgia (8), Minnesota (7), Indiana (5), and New York (3). This yield advantage is driven by greater light interception early in the growing season resulting in a larger, more photosynthetically productive crop canopy. This increases crop growth rate and ultimately yield, unless the crop experiences severe stress during the growing season. Several have suggested that the yield advantage of narrowing rows is also because of minimization of early-season competition from weeds.

Recently, De Bruin and Pedersen (4) suggested that the additional cost of a split-row planter was

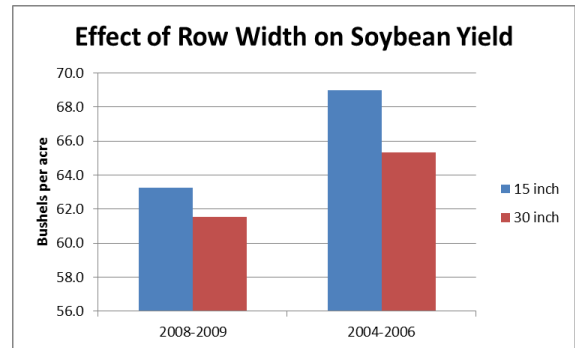


Figure 1. Effect of row width on soybean yield from two different experiments in Iowa. Source: De Bruin and Pedersen (4) and Swoboda et al. (11)

less than the economic gain for most farm sizes using a corn-soybean rotation in Iowa. They reported that farms of 700 acres or greater that dedicated more than 30 percent of those acres to soybean production would benefit economically from producing soybean in 15 inch rows, compared to 30 inch rows.

LIMITATIONS OF INTERMEDIATE ROW WIDTHS

The use of intermediate row widths in Iowa soybean production had been increasing, but trends have been relatively inconsistent over a recent eight year period (Figure 2). This reflects the influence that other factors such as farm size, machinery cost and biotic stress have on the decision to reduce row widths.

Factors that influence yield in narrow row soybean production include:

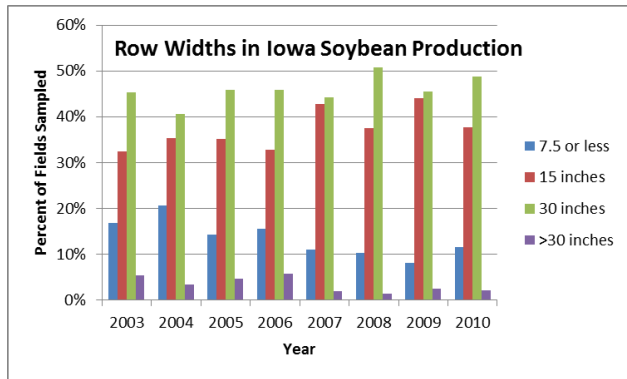


Figure 2. Use of narrow, intermediate, and wide (30 inch and wider) row widths in Iowa in 2010 (7).

Planting Date: De Bruin and Pedersen (4) showed that planting date affects the likelihood of achieving a yield increase in rows more narrow than 30 inches. The longer after April 25 in southern and central Iowa, and the longer after May 1 in northern Iowa soybean planting happens, the less likely a yield increase will occur by planting in intermediate or narrow rows.

Disease: The presence and frequency of biotic and abiotic stress should be taken into consideration before changing to narrow- or intermediate-row soybean production. Soybean diseases such as white mold, brown stem rot, and sudden death syndrome can quickly eliminate the yield advantage of narrow row soybean production. Grau and coworkers (6) reported that white mold is more prominent in narrow rows. Swoboda and coworkers in Iowa (10) showed that yield loss from sudden death syndrome in inoculated plots was 7 percent greater in 15 inch rows than in 30 inch rows.

Furthermore, Pedersen and Lauer (19) postulated the presence of high numbers of soybean cyst nematode mitigated any benefit from growing soybean in narrow rows if susceptible varieties were grown.

Environment: Research at several universities across the Midwest has shown that drought stress and stress during the early part of the growing season reduces the yield benefit of intermediate-row width soybean production. Although Iowa does not have a history of frequent severe droughts, crops grown in Iowa can experience brief periods of drought-related stress during their growth cycle in any given year. If this stress occurs during the plant's reproductive stages, yield loss is likely. Soil related issues, such as compaction, poor drainage, and improper soil fertility or pH, may limit yield gains from reducing row widths.

SUMMARY

Producing soybean in narrow rows can result in greater profit. Higher soybean yields and profits can be achieved in Iowa by changing from planting practices that include 30 inch rows to a row spacing of 15 inches.

Farmers should plant soybeans as soon as possible after April 25 in the southern two-thirds of Iowa and as soon as possible after May 1 in the northern one-third of Iowa, assuming soil conditions are suitable. Although there are abiotic and biotic stressors that can eliminate the yield benefits from narrow- and intermediate-row soybean production, many of those stressors can be managed.

Producing high yielding soybean begins with implementing management strategies targeted at predictable stressors and improving the soil environment. Create soil conditions that provide a high-yield environment.

The presence and severity of soybean diseases cannot be accurately predicted because they are highly dependent on environmental conditions. However, for fields with a history of consistent and severe disease, farmers should first select

varieties with greater genetic resistance to those problems.

Farmers should manage soybean for high profit. There is no 'miracle input' or 'yield gene' that will enable you to consistently produce a 70 bushels per acre soybean crop. High profit soybeans are the result of several management decisions and favorable environmental conditions during the growing season.

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