Narrow rows may lift bean yield

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Abstract
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By MARK LICHT and ANDY LENSSEN

Soybean row spacing: What is optimum for today’s production systems? Row spacing used by soybean farmers in Iowa has varied from 6 to 40 inches. What row spacing should you consider if you are contemplating buying a new planter for soybeans? Can narrower row spacing improve yield and profitability?

Many studies on soybean row spacing have been conducted by Iowa State University researchers. Weber and colleagues (1966) compared four row widths, 5 inch, 10 inch, 20 inch and 40 inch. They determined that maturity date, plant height and lodging were relatively unaffected across this range of widths.

Overall, seed yields were highest in the 5- and 10-inch row widths, and lowest in the 40-inch row width. Yield in the 20-inch width was intermediate, which was attributed to greater competition among soybean plants within wider rows.
In more recent studies, DeBruin and Pedersen compared two row widths, 15 inch and 30 inch, with four soybean seeding rates at three locations in Iowa from 2004 to 2006. Soybean seed weight and plant height were largely unaffected by row spacing, but yield was about 4 bushels per acre greater in the narrow rows due to production of more seed per unit area. Planting rate did not alter the effect of row spacing; narrower rows produced higher seed yields across a range of planting rates.

De Bruin and Pedersen also conducted economic analyses comparing grower returns for soybeans in 15- and 30-inch row widths for three farm sizes and three corn-soybean acreage allocations. Farms with 356 acres in row crops had increased returns from 15-inch row spacing when using a 50-50 corn-soybean production system. However, for farms with 1,420 or 3,200 acres in row crops, the use of 15-inch row widths produced greater returns for 70-30, 60-40 and 50-50 corn-soybean allocations.

In Indiana, Hanna et al. (2008) compared soybeans in three row widths — 7.5 inch, 15 inch and 30 inches. They found that narrow-row soybeans produced greater grain yields than soybeans planted in wide rows. Across six site years, yields for the 7.5-inch and 15-inch row widths averaged 52.7 and 51.8 bushels per acre, respectively — statistically more than the 47.7 bushels per acre produced in the 30-inch rows.

In New York, Cox and Cherney reported soybeans had limited compensation in pods and seeds per plant in wider rows. Bean yields averaged 50.2 bushels per acre in 7.5-inch row widths, while beans planted in 30-inch rows averaged 42.7 bushels per acre. Soybeans planted in the 15-inch row spacing averaged 46.4 bushels per acre.

Results favor narrow rows

Research results from different areas of the northern soybean belt over five decades provide similar responses: Narrow rows typically result in higher soybean yields, often in the range of 4 to 4.5 bushels per acre. Why haven’t all Iowa soybean farmers changed seeding practices to include narrow row spacing?
One reason is the cost of buying a row planter with at least double the number of planting units, which is not suitable for corn. Obtaining uniform planting depth and seed placement can be difficult when drilling soybeans into stubble from a high-yielding corn crop. Another reason is higher incidence of foliar diseases in narrow rows, particularly for white mold.

Although soybean breeders have made genetic improvements in mitigating the potentially devastating consequences of white mold, no variety is immune to the disease. Narrower rows are well-documented to have increased relative humidity compared to wider row spacing, which can result in increased disease pressure, including white mold.

In summary, narrow row spacing can increase soybean yield. Growers interested in high-yield soybean production should consider production systems with row spacing narrower than 30 inches.

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