

Growing soybeans requires more management today than 20 years ago due to earlier planting and increased disease and insect pressure.

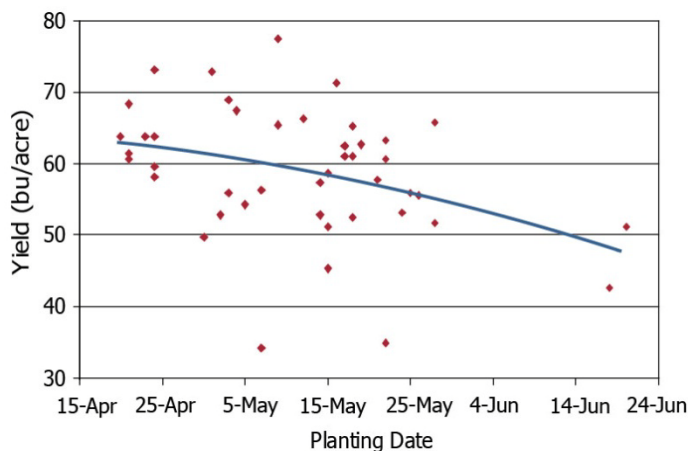
Key Steps to Maximize Yields:

Soybean Variety Selection

- Soil type, tillage system, drainage, geographic location, expected rainfall, potential diseases, and other local factors must all be accounted for in choosing an appropriate variety.
- Resistance to specific races of SCN, resistance or field tolerance to Phytophthora root rot, other diseases, or iron deficiency chlorosis may be essential to achieving high soybean yields in a particular field.

Planting Date

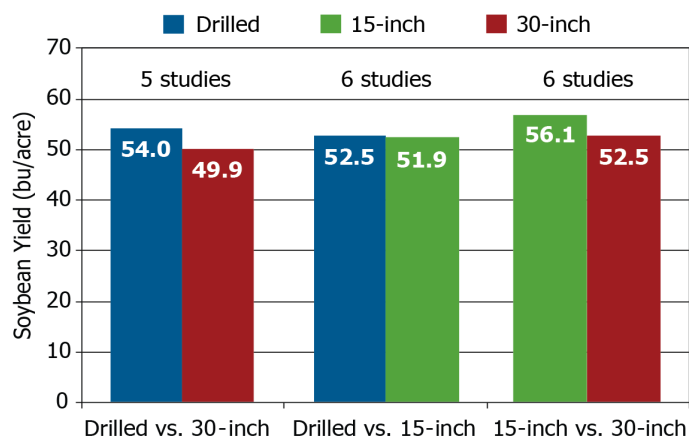
- Recent research has shown that soybeans can tolerate a reasonably wide window of planting dates and still produce top yields; however, outside the optimum window, yields are significantly lower and less stable
- DuPont Pioneer studies conducted over a 13-year period also showed that highest soybean yields were usually obtained with late-April to early or mid-May plantings.



Soybean yield response to planting date. Data from 23 site-years (IA, IL, IN, NE and MN), 2006-08. Pioneer Agronomy Sciences.

Row Width

- Recent research studies have shown a 3 to 4 bu/acre yield advantage with drilled narrow-row and 15-inch row soybeans over soybeans in 30-inch rows.

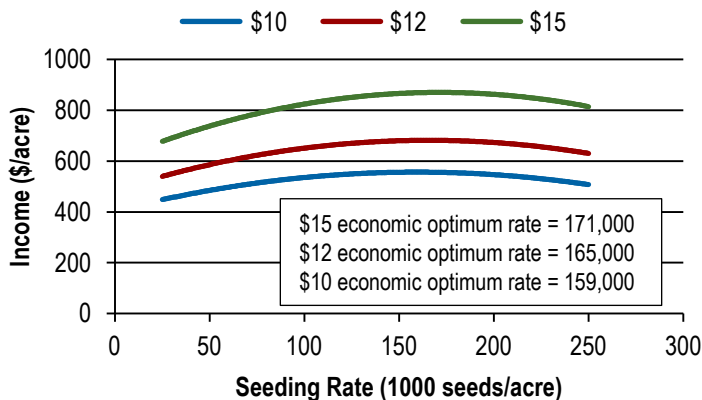


Average yield results from seven soybean row spacing studies published during the last ten years.

(Hanna et al., 2008; De Bruin and Pedersen, 2008; Kratchovil et al., 2004; Cox and Cherney, 2011; Janovicek et al., 2006; Bertram and Pedersen, 2004; Pedersen and Lauer, 2003.)

Seeding Rate

- Seeding rate decisions should be based on soybean seed cost, grain market price and individual production practices and seedbed conditions.
- Higher seeding rates may need to be maintained to help prevent potential yield reductions or replanting when seedbed conditions, weather or pests are likely to reduce stands.



Optimum economic seeding rates at soybean market prices of \$10, \$12, and \$15/bu and a \$60/unit seed cost based on DuPont Pioneer research conducted across 9 locations in IA, IL, IN, MN, and NE. (Research trials were planted in 30-inch rows, economic optimum seeding rates would be expected to be greater in narrow rows.)

Soil Fertility

- An 80 bu/acre soybean crop would remove about 64 lbs P₂O₅ and 112 lbs K₂O from the soil in the grain. Soil testing can determine if field levels are adequate to supply these or other required amounts.
- Soybean plants have high nitrogen needs, which are usually supplied by nitrogen-fixing rhizobia bacteria associated with the roots.
- Adding nitrogen fertilizer is usually unnecessary under normal production practices. However, research in some irrigated, high-yield environments has demonstrated that applications of N during the pod or seed stages of soybean development can increase yield.
- Soybeans are more often deficient in manganese than in other micronutrients, and respond well to manganese fertilizers when deficient.
- Soybeans do not always respond to sulfur fertilizer, but yield responses can be substantial in cases where sulfur is deficient.

Soybean nutrient needs for an 80 bu/acre crop

	Uptake (lbs/acre)	Removal (lbs/acre)
N	416	320
P ₂ O ₅	76	64
K ₂ O:	256	112
Mg	32	—
S	26	—



Soybeans under conventional and intensive management systems at the R6 growth stage (Johnston, IA; 2009).

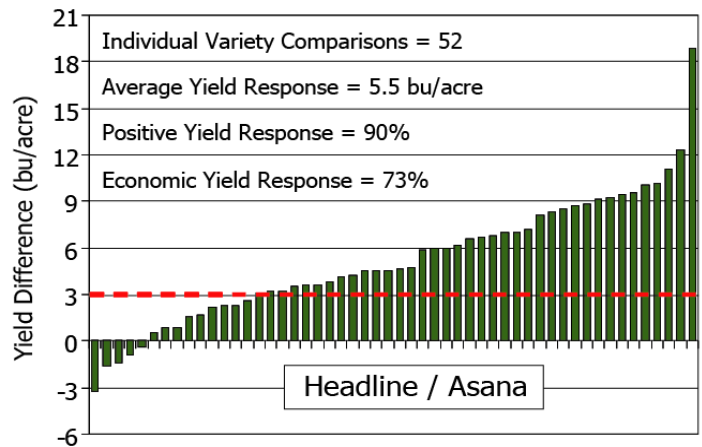
Product responses are variable and subject to a variety of environmental, disease and pest pressures. Individual results may vary.

SCN Management

- SCN has increasingly infested more fields throughout the US. Growers should test soils, select resistant varieties, rotate crops, rotate sources of resistance, and reduce other stresses on the crop to minimize damage from this pest.

Disease and Insect Control

- Disease control begins with scouting to understand disease risks and their potential severity in each field. Variety selection, crop rotation, seed treatments and foliar fungicides are the best tools available to counter most disease threats.
- Management of soybean aphid or bean leaf beetle may be necessary for top yields. Scout diligently and treat with an insecticide if needed.
- Due to earlier planting and higher levels of crop residues, fungicide-insecticide seed treatments are becoming more common and merit testing by growers. DuPont Pioneer research has shown increased yields and profits with these products.
- Strobilurin fungicides applied at the R3 growth stage have consistently increased soybean yields in Pioneer studies. Including an insecticide in the tank was usually cost-effective.



Yield response of soybean to Headline® and Asana® applied at the R3 growth stage in Pioneer research studies (2007-08).

Weed Control

- Effective weed management in soybean has often been relatively easy to achieve in recent years due to the availability of glyphosate-resistant varieties; however, glyphosate-resistant weeds are becoming increasingly common.
- Using a pre-emergence herbicide can improve weed control, and additional post-emergence herbicides may be necessary to prevent escapes of weeds not controlled by glyphosate.