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## What is the best soybean seeding rate

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# What is the best soybean seeding rate

## **Abstract**

The seeding rate for soybeans varies considerably from producer to producer. The range is from 100,000 to 300,000 seeds per acre. A major seed company recently recommended planting 200,000 to 230,000 seeds per acre. Research at Iowa State University has shown that a lower seeding rate will give top yields.

## **Keywords**

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## **Disciplines**

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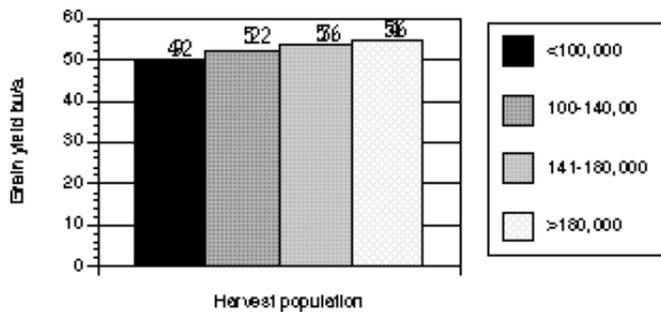
## What is the best soybean seeding rate

The seeding rate for soybeans varies considerably from producer to producer. The range is from 100,000 to 300,000 seeds per acre. A major seed company recently recommended planting 200,000 to 230,000 seeds per acre. Research at Iowa State University has shown that a lower seeding rate will give top yields.

At a time when all producers saved seed to plant the next season, the seed cost was figured at market price for a 60-pound bushel, plus the cost of storage. Now, when more than 80 percent of Iowa's producers buy their soybean seed each year, they are paying more for their seed. Seed costs range from about \$10 to more than \$20 for a 50-pound bag of seed in today's market. For example, if the seed size is 2,500 seeds per pound, there would be 25,000 less seeds in a 50-pound bag than in a 60-pound bushel of soybean seed. However, seed size will vary from season to season and from farm to farm depending on the environment in which the seed is grown.

Research conducted in Iowa at five research farms and in 23 on-farm trials between 1994 and 1996 indicates that a harvest plant population between 125,000 and 150,000 plants is usually sufficient to produce yields that are not significantly different than the highest yield. Tables 1 and 2 show the research farm results from northern Iowa and southern Iowa, respectively. The studies were conducted with no-till conditions and both 10-inch and 30-inch rows were evaluated. In both areas of the state a harvest plant population of 106,000 in 30-inch rows and 127,000 in 10-inch rows produced grain yields that were not significantly different from yields produced by higher harvest plant populations. Harvest populations less than 100,000 plants per acre produced significantly lower yields.

Harvest plant population is critical to grain yield, and seeding rate will be greater than harvest population due to seed germination rates and stand loss caused by weather, diseases, insects, or other factors. Planting high-quality seed in a disease-free environment, during a favorable weather season, will reduce the spread between the planting rate and harvest population. The loss between planting and harvest will usually be from 10-20 percent depending on planting conditions; equipment adjustment; seed quality; herbicide or cultivation damage; and disease, insect, and weed pressures.



Mean soybean yields from <100,000 to >180,000 plants/acre. Includes results from 23 trials in Iowa from 1994-1996.

The figure shows the mean soybean yields from different harvest plant populations when evaluated in 23 on-farm trials in Iowa between 1994 and 1996. In these trials the high yields were produced with harvest populations within the range from 129,000-189,000 plants per acre. Lower stands frequently resulted in significantly lower yields, but higher stands did not usually affect yields. The soybean plant has the ability to adjust and compensate for different plant populations by producing more branches and pods per plant if the stand is low and fewer branches and pods per plant if stands are high.

The producer may elect to reduce seed costs by reducing seeding rates, without significantly affecting the grain yield of soybeans. However, higher seeding rates may be justified if the field has a history of serious weed infestations. Higher plant populations will provide shade earlier in the season and reduce the germination and growth of some weeds. Higher plant populations will be needed if the date of planting is delayed until late June or July. Late-planted soybeans will not achieve as much vegetative growth as those planted earlier, because flowering occurs soon after emergence and the final plant height will be less. These shorter plants will have pods developing near the soil surface and probably will result in greater harvest losses. Higher plant populations will force the plant to etiolate and grow taller, resulting in the lowest pods being higher above the soil surface at harvest time.

Producers do not need to plant soybeans at extremely high populations to achieve high yields. The seeding rate of 127,000 to 152,000 plants per acre has produced yields not significantly different from the highest yields in these studies, assuming a loss of 20 percent between planting and harvest. A reduction in seeding rate of 50,000 seeds per acre could reduce seed costs by as much as \$8 per acre if the seed cost is \$20 per bag and the seed size is 2,500 seeds per pound. The savings per farm could be significant if a large number of acres is planted. For example, \$8 × 500 acres equals a savings of \$4,000.

**Table 1. Row spacing and harvest population effect on soybean yield in northern Iowa (3- year study).**

10-inch rows		30-inch rows	
Percent of maximum yield	Plants per acre	Percent of maximum yield	Plants per acre
89	88,000	88	72,000
96	127,000	96	106,000

96	142,000	98	128,000
100	167,000	100	156,000
100	196,000	100	182,000

**Table 2. Row spacing and harvest plant population effect on soybean yield in southern Iowa (3-year study).**

<b>10-inch rows</b>		<b>30-inch rows</b>	
<b>Percent of maximum yield</b>	<b>Plants per acre</b>	<b>Percent of maximum yield</b>	<b>Plants per acre</b>
96	88,000	96	70,000
98	127,000	98	106,000
98	158,000	99	131,000
100	191,000	100	167,000
100	224,000	97	187,000

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