

4-2-2007

## Soybean seeding rates: The balance between cost and yield

Jason De Bruin  
*Iowa State University*

Palle Pedersen  
*Iowa State University, palle@iastate.edu*

Follow this and additional works at: <http://lib.dr.iastate.edu/cropnews>

 Part of the [Agricultural Science Commons](#), [Agriculture Commons](#), and the [Agronomy and Crop Sciences Commons](#)

---

### Recommended Citation

De Bruin, Jason and Pedersen, Palle, "Soybean seeding rates: The balance between cost and yield" (2007). *Integrated Crop Management News*. 1116.  
<http://lib.dr.iastate.edu/cropnews/1116>

**The Iowa State University Digital Repository provides access to Integrated Crop Management News for historical purposes only. Users are hereby notified that the content may be inaccurate, out of date, incomplete and/or may not meet the needs and requirements of the user. Users should make their own assessment of the information and whether it is suitable for their intended purpose. For current information on integrated crop management from Iowa State University Extension and Outreach, please visit <https://crops.extension.iastate.edu/>.**

---

# Soybean seeding rates: The balance between cost and yield

## **Abstract**

Since 2003, the soybean extension program has conducted more than two dozen experiments across the state to evaluate seeding rate recommendations. Extension researchers have used seeding rates of 75,000, 125,000, 175,000, and 225,000 seeds per acre and determined how these seeding rates performed both at early and late planting dates and in 15" and 30" row spacing. This research was funded by the checkoff and the Iowa Soybean Association, and new seeding rate recommendations have been released based on the information gathered from these experiments.

## **Keywords**

Agronomy

## **Disciplines**

Agricultural Science | Agriculture | Agronomy and Crop Sciences

# INTEGRATED CROP MANAGEMENT

Get the latest research-based information on crops. [Sign up to be notified](#) when new content is available!

ICM > 2007 > IC-498 (4) -- April 2, 2007

## Current Newsletter

You are viewing **archives** for the newsletter from 1993-2007. For current news, see [Integrated Crop Management News](#).

## Archives 1993-2007



Announcements



Crop Production



Insects and Mites



Pesticide Education



Plant Diseases



Soils



Weed Management

[Image Gallery](#)

## Printable Version

Printable version of this page

## Related Articles

How many seeds does it really take to get 100,000 plants per acre at harvest?

**April 9, 2007**

Corn seeding rates and variable-rate seeding

**April 9, 2007**

How to plant all the

## Soybean seeding rates: The balance between cost and yield

*by Jason De Bruin and Palle Pedersen, Department of Agronomy*

Since 2003, the soybean extension program has conducted more than two dozen experiments across the state to evaluate seeding rate recommendations. Extension researchers have used seeding rates of 75,000, 125,000, 175,000, and 225,000 seeds per acre and determined how these seeding rates performed both at early and late planting dates and in 15" and 30" row spacing. This research was funded by the checkoff and the Iowa Soybean Association, and new seeding rate recommendations have been released based on the information gathered from these experiments.

### More seeds for narrow row spacing?

Prior to this study, it was common policy to use seeding rates of 160,000, 175,000, and 200,000 seeds per acre for 30", 15", and 7.5" row spacing, respectively. Based on research during the last four years, it was identified that the seeding rate can be reduced because a uniform stand of 100,000 plants per acre at harvest is enough to maximize yield and profitability regardless of row spacing (Figure 1). Previous recommendations were to increase seeding rate when using narrow row spacing. However, that is not the case any more, as long as a planter is used and weeds are managed early. Of course, if you use a drill, it will take a higher seeding rate because you do not have the same soil to seed contact with a drill that you have with a planter.

And do not forget about yield; narrow row spacing (15") increased yield an average of 4.5 bu/acre compared to 30" row spacing over the last three years of research in Iowa.

### Do seeding rates change for early or late planting dates?

Planting early will consistently increase yield (see the article "Early planting of soybean is very important" on pages 100-101). Yield continued to decrease as planting was delayed regardless of seeding rate. Planting higher populations at later dates did not improve yield and increased seeding rates were not required to maximize yield at early planting dates either. Compared to a final stand of 105,000 and 106,000 ppa, yield was increased significantly with a final stand of 146,000 ppa in Study 1 and a 174,000 ppa in Study 2 (Figure 2). However, when seed costs are included, the increased seeding costs offset the value of the increased yield.

acres

**February 12, 2007**

Increasing the frequency of corn in crop sequences: Grain yield and response to nitrogen -- a research update

**February 12, 2007**

The economics of corn on corn

**February 12, 2007**

300 bushels of corn . . . when and how?

**February 12, 2007**

More about early seed discounts

**November 13, 2006**

Early seed discounts don't always pay

**October 9, 2006**

What's the yield effect of uneven corn heights?

**June 12, 2006**

To be determined: Ear row numbers and kernels per row in corn

**May 30, 2006**

## Why does soybean not respond well to seeding rate?

The reason soybean does not respond well to seeding rate is because the soybean plant can compensate for space. You have probably all noticed the large bushy plants that occur in areas of poor plant stand and the skinny plants that occur in overseeded areas. This is the reason that soybean does not respond to increased seeding rates. The plant can add branches when there is space in the canopy. Stacking more plants into an area will reduce the yield per plant and not increase yield per acre. The goal is to use a seeding rate that balances individual plant productivity with canopy productivity.

## Factors that influence stand

It is important that we are cautious when we reduce the seeding rate. Seed has been inexpensive in the past and overseeding has provided good insurance against poor seedbed conditions and low establishment rate. However, we can not afford the excessively high seeding rates anymore. The seeding rate that is required to reach 100,000 plants per acre at harvest can vary substantially depending on planting equipment, operator, planting speed, seed treatment, weed competition, seedling diseases, seeding depth, and seed quality, just to name a few. In our case, a seeding rate of 125,000 to 140,000 seeds per acre planted with a planter was often enough to give us a final stand of approximately 100,000 plants per acre at harvest using good quality seed and planting in a good seedbed. The only way to determine what seeding rate is required to achieve 100,000 plants at harvest on your farm is to take stand counts in the fall. This will help you zero in on the optimal spring seeding rate for your specific operation. For more information on stand establishment and plant mortality rate, see the article in the next newsletter, [How many seeds does it really take to get 100,000 plants per acre at harvest?](#)

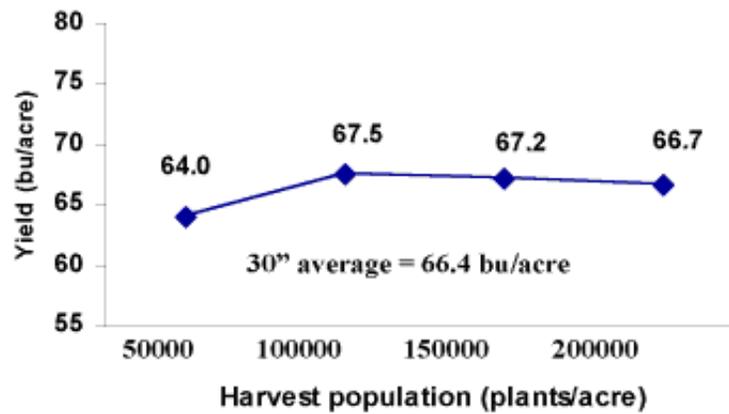
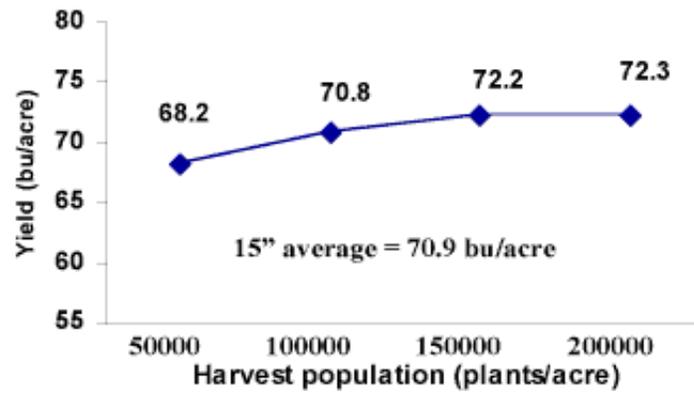


Figure 1. Yield response to four harvest plant populations in 15- and 30- row spacing. Data collected from eight environments from 2004 to 2006. LSD (5%) for comparison: row spacing (RS) = 1.3 bu/acre, seeding rate (SR) = 1.4 bu/acre, and RS x SR = NS. Yield values

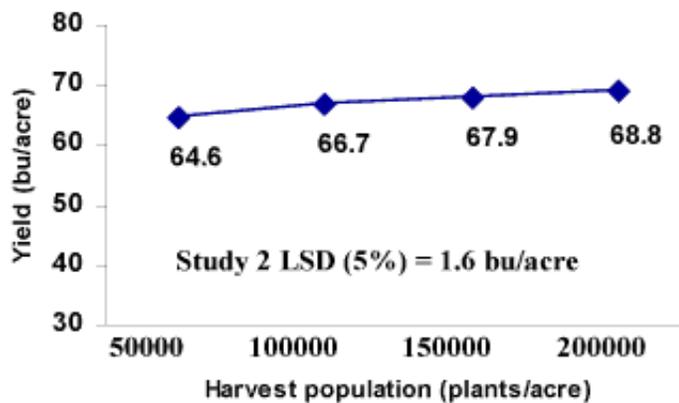
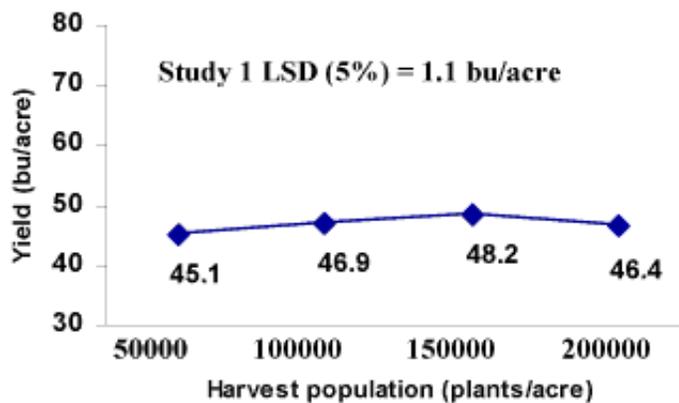


Figure 2. Yield response for four harvest plant populations averaged across four planting dates for two studies. Study 1 was conducted at Ames, Crawfordsville, and Nashua from 2003 to 2005. Study 2 was conducted at De Witt, Nevada, and Whiting from 2004 to 2006. Yield values are not significantly different from each other when the difference between values is less than the LSD.

Jason De Bruin is an assistant scientist with research responsibilities in soybean production. Palle Pedersen is an assistant professor of agronomy with research and extension responsibilities in soybean production.

This article originally appeared on pages 98-99 of the IC-498 (4) -- April 2, 2007 issue.

Updated 04/13/2007 - 4:44pm