



Soybean Objective Yield Survey Data, 1992-2006

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Soybean Objective Yield Data, 1992-2006

The National Agricultural Statistics Service (NASS) conducts a monthly Soybean Objective Yield Survey from August through November to forecast end-of-season yields for the eleven major soybean producing States (Arkansas, Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, Ohio, and South Dakota). Arkansas was added back to the objective yield program in 2004, after being discontinued in 2002. Kansas, North Dakota, and South Dakota were added to the program for the first time in 2004. The focus of this report is limited to the seven major States (Illinois, Indiana, Iowa, Minnesota, Missouri, Nebraska, and Ohio), since a continuous data series exists for these States for the 15-year reference period. These seven States accounted for 71 percent of all soybeans produced in 2006.

An objective yield sample consists of two independently located plots, each containing two parallel 3.5-foot sections of row located within randomly selected soybean fields. Counts, measurements, and observations of plant characteristics are made within these plots during the monthly survey periods. Just before farmer harvest, both units are hand harvested by an enumerator and weighed. A sample of pods is sent to a NASS laboratory where moisture content and pod weight are measured. A final gross yield is computed from the number of pods, average weight per pod, and row space width. The yield is measured as bushels of soybeans per acre at 12.5 percent moisture. Harvest loss is measured in separate units located near the monthly yield plots. State level indications are produced from the objective yield data. Regional level indications are derived by weighting the State data by harvested acres.

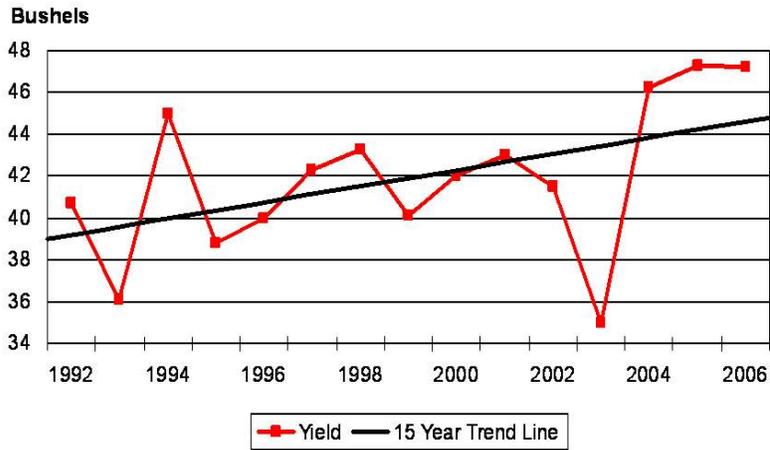
This report examines the changes in the objective yield indicated number of pods and row width measurements over the last 15 years. The report also looks at the changes in the derived weight per pod, which is calculated by dividing the final Agricultural Statistics Board (ASB) yield by the objective yield survey indicated pod count. The State level objective yield data in this report are published annually in the November *Crop Production* report.

Agricultural Statistics Board Final Estimates - 7 Major States Combined

Soybean production in the seven major soybean objective yield States in 2006 was 46 percent higher than 1992. This increase is due to both higher yields and increased harvested area. The average soybean yield in the seven major States climbed 16 percent between 1992 and 2006 (Chart 1). The 15-year trend yield, based on the final ASB yields over the last 15 years, rose from 39.2 bushels per acre in 1992 to 44.6 bushels per acre in 2006. This represents an increase of 14 percent, or an average increase of 0.36 bushel per year between 1992 and 2006.

Chart 1

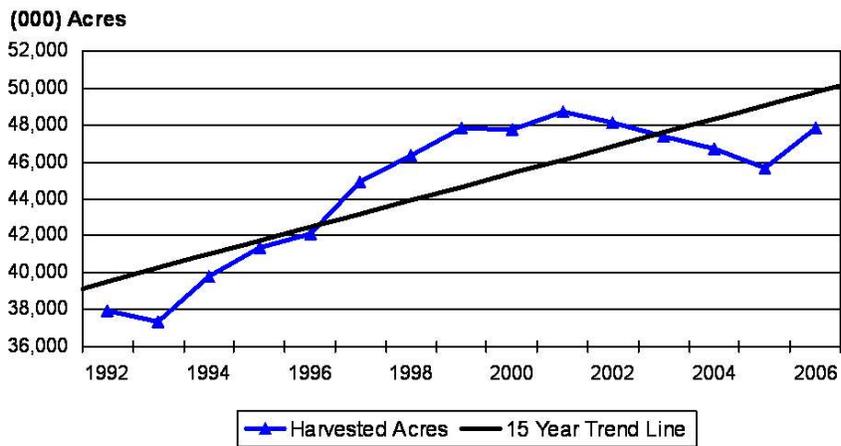
**Soybean Yield (ASB)
7 Major States Combined**



Harvested acres for the seven States totaled 47.8 million acres in 2006, up 26 percent from 1992 (Chart 2). The 15-year trend line also shows an increase of 26 percent between 1992 and 2006.

Chart 2

**Soybean Harvested Acres (ASB)
7 Major States Combined**

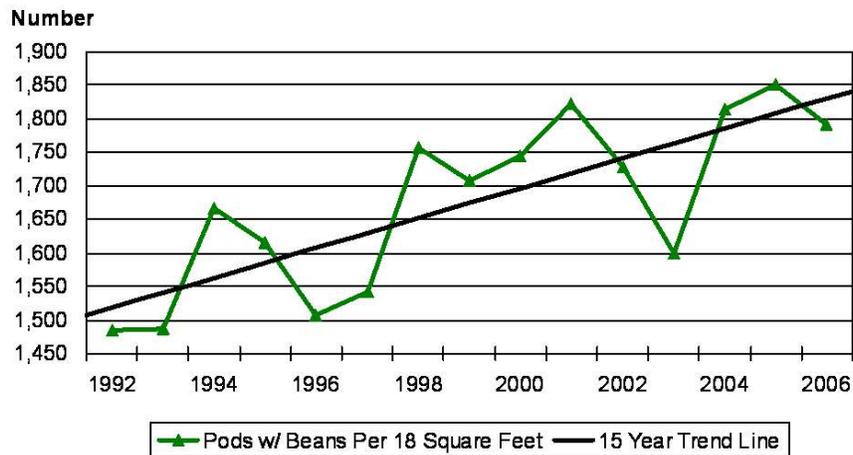


Pods With Beans Per 18 Square Feet (Pod Count)

The objective yield indicated pod counts have shown similar increases to yield over the last 15 years. The seven objective yield States averaged 1,791 pods per 18 square feet in 2006, up 21 percent from the 1,484 pods per 18 square feet in 1992 (Chart 3). The highest average pod count for the seven major States combined (since the data series began in 1987) occurred in 2005, at 1,851 pods with beans per 18 square feet. The 15-year trend line shows the pod count increased 21 percent, from 1,518 pods per 18 square feet in 1992 to 1,830 pods per 18 square feet in 2006.

Chart 3

Pods w/ Beans Per 18 Square Feet 7 Major States Combined



Charts 4 and 5 (on the next page) show the pod counts, by State, for the seven major States. The States are broken into two charts for clarity; one for the three States with the highest average pod count and one for the four States with the lowest average pod count. Illinois led all States in pod counts over the last 15 years, averaging 1,780 pods per 18 square feet between 1992 and 2006. Missouri was the second leading State, averaging 1,704 pods per 18 square feet over the same time period. Minnesota recorded the lowest average pod count from 1992 to 2006, with an average of 1,483 pods per 18 square feet.

Chart 4

Pods w/ Beans Per 18 Square Feet 3 States w/ Highest Average Pod Count

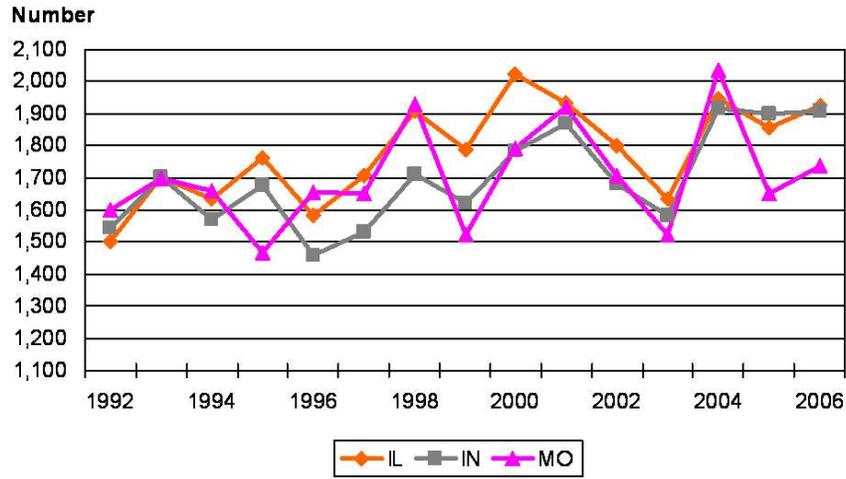
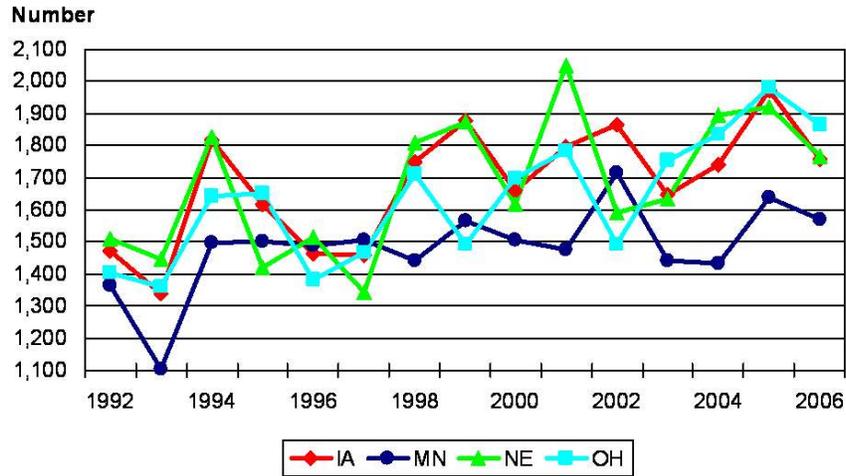


Chart 5

Pods w/ Beans Per 18 Square Feet 4 States w/ Lowest Average Pod Count



Derived Pod Weight -7 Major States Combined

The derived weight per pod, which is calculated by dividing the combined seven State average ASB yield by the average number of pods per 18 square feet for this region (converted to grams per pod), has actually shown a slight decrease over the past 15 years. The derived pod weight for the seven major States for 2006, at 0.296 grams per pod, was down 4 percent from 1992. So, while the pod count has gone up from 1992 to 2006, the derived pod weight has gone down (Chart 6).

The 15-year trend line for the derived pod weight between 1992 and 2006 indicates a 6 percent decrease, from 0.291 grams per pod in 1992 to 0.273 grams per pod in 2006 (Chart 7). The record low (since 1987) derived pod weight occurred in 2003, when drought conditions hampered the development of the soybean crop. If we exclude the derived pod weight of 2003, the trend equation actually shows a slight increase from 1992 to 2006 of less than one percent.

Chart 6

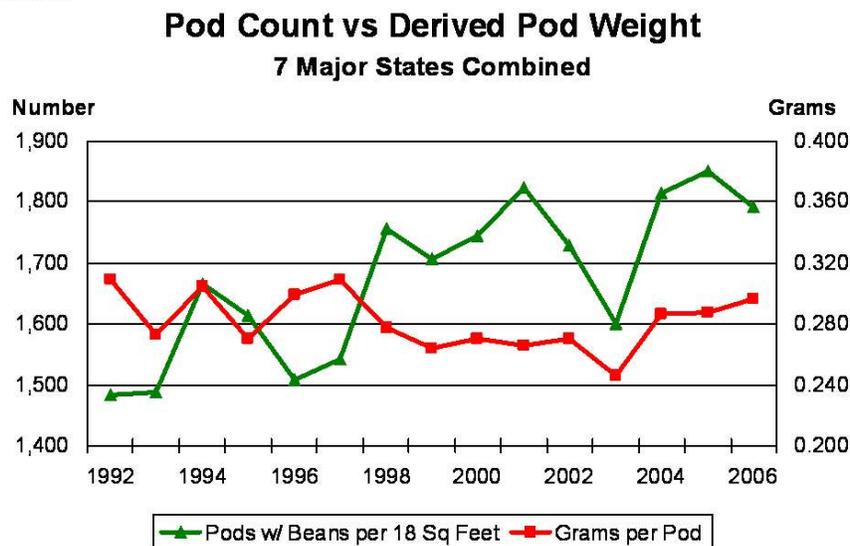
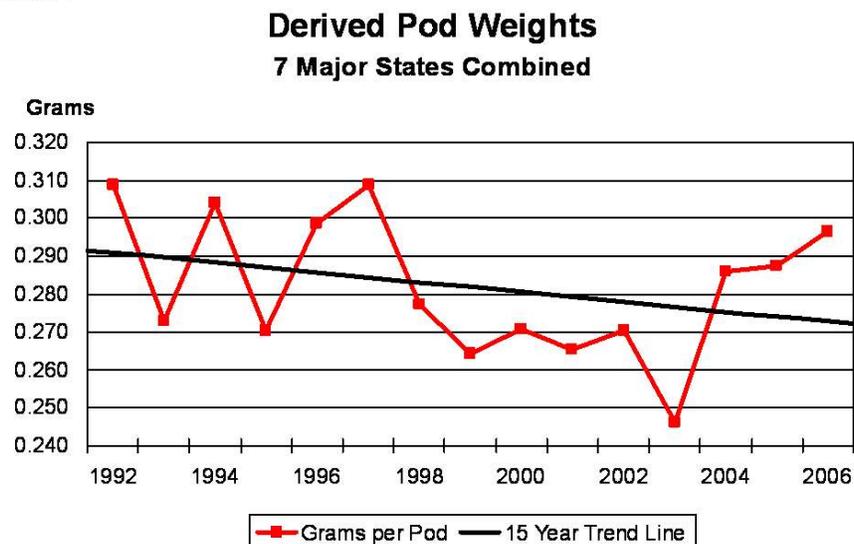


Chart 7



Row Width Measurements - 7 Major States Combined

The objective yield data indicate row space measurements have decreased over the last 15 years. This decrease in row width has contributed to the increase in pods per acre. The average row space measurement of all samples in the seven States in 2006 was 18.5 inches, 19 percent lower than the 22.7 inches in 1992. During this same time, pod count increased 21 percent (Chart 8). This decrease in row spacing is also evident in the objective yield row space distribution data which show that 65 percent of the samples had a row width of 18.5 inches or less in 2006 compared with only 41 percent in 1992 (Chart 9).

Chart 8

Average Row Width vs Pod Count 7 Major States Combined

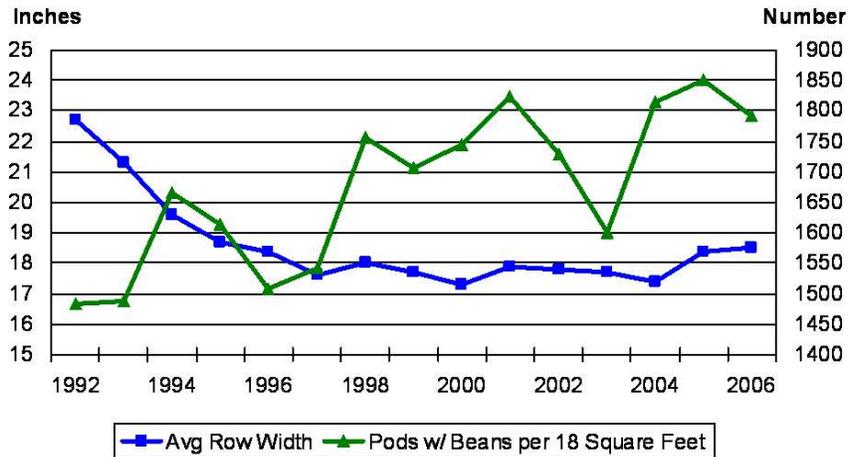
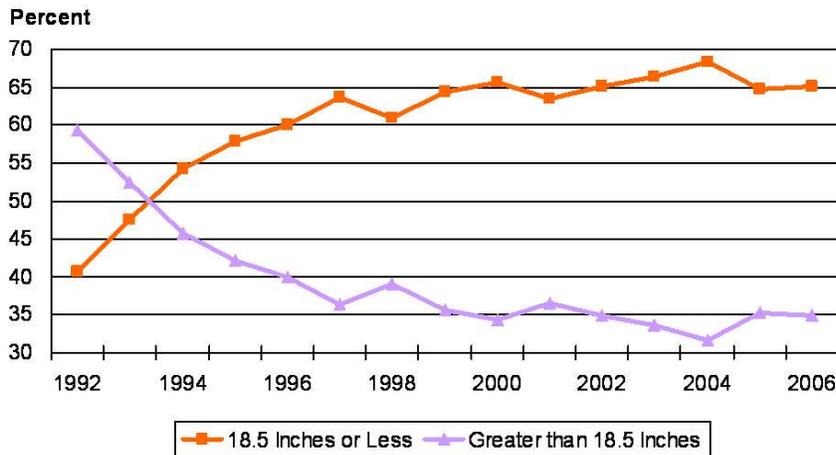


Chart 9

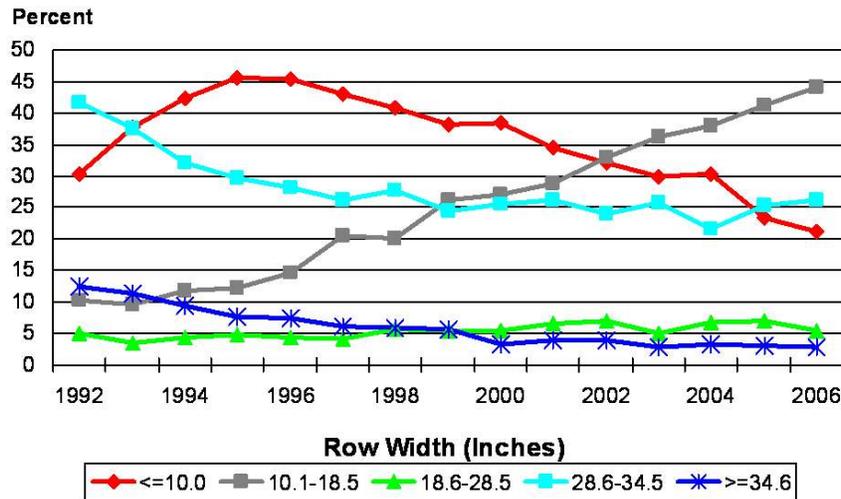
Percent Distributions by Row Width 7 Major States Combined



Taking a closer look at the row space distribution data shows that the increase in the percent of samples that have a row width of less than 18.5 inches is due to an increase in samples with a row spacing between 10.1 inches and 18.5 inches. In 2006, the row width for 44 percent of the samples in the seven major States fell within the 10.1 inch to 18.5 inch range, which is a significant increase from 1992 when only 10 percent of the samples fell within that range (Chart 10). Whereas, the percent of samples that were less than or equal to 10.0 inches decreased during the 15-year period after an initial increase from 1992 to 1995. In 2006, the row width for 21 percent of the samples was less than or equal to 10.0 inches, down from 30 percent in 1992 (and down from 46 percent in 1995). Decreases also occurred from 1992 to 2006 in the percent of samples that fell within the 28.6 inch to 34.5 inch category and the greater than 34.6 inch category. The percent of samples that fell between 28.6 and 34.5 inches generally decreased from 1992 to 1999, but since then has remained close to 25 percent after being nearly 42 percent in 1992. The category for row widths greater than 34.5 inches followed a similar pattern and has generally leveled off since 2000, to end up at 3 percent in 2006, down from 13 percent in 1992.

Chart 10

Percent Distributions by Row Width 7 Major States



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