



# Oil Crops Outlook: May 2024

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## Global Soybean Supply Increases in MY 2024/25

U.S. soybean supply for marketing year (MY) 2024/25 is forecast to rise 8 percent on higher carryover stocks and higher soybean production. Soybean production is forecast near a record high of 4.45 billion bushels on a 3.5-percent increase in planted area and higher yield. The U.S. soybean yield is forecast at 52.0 bushels per acre, based on a weather-adjusted trend while assuming normal weather during the growing season. With U.S. soybean demand growing by 6 percent, U.S. soybean ending stocks are forecast to reach 445 million bushels, up 105 million bushels from the MY 2023/24 estimate. The 2024/25 U.S. season-average farm price for soybeans is forecast at \$11.20 per bushel compared with \$12.55 per bushel in MY 2023/24. Soybean meal and soybean oil prices are forecast to decline to \$330.00 per short ton and \$0.42 per pound, respectively.

Global soybean production is forecast to reach a new record of 422.3 million metric tons, up 25.3 million metric tons from MY 2023/24 on increased planted area and average yield. A record-high soybean crop is forecast for Brazil, and Argentina's soybean crop is forecast slightly higher than MY 2023/24. Global soybean exports and crush volumes are projected to increase 7.7 million metric tons and 15.9 million metric tons, respectively, to reach 180.2 million metric tons and 345.9 million metric tons. Global soybean ending stocks for MY 2024/25 are projected at 128.5 million metric tons, up 16.7 million metric tons from MY 2023/24.

# Domestic Outlook

## U.S. Soybean Stocks To Rise in 2024/25

U.S. soybean production for MY 2024/25 is projected to exceed this year's output by 285 million bushels. The increase is due to larger soybean planted acreage and a weather-based trend yield of 52 bushels per acre. As outlined in the U.S. Department of Agriculture (USDA), National Agricultural Statistics Service's (NASS) *Prospective Plantings* report, U.S. farmers intend to plant 86.5 million acres, up 2.9 million acres from the previous year. With higher production and carryover stocks from MY 2023/24, U.S. supply is forecast to reach 4.8 billion bushels. Soybean demand is expected to strengthen in MY 2024/25. U.S. soybean exports are forecast at 1.83 billion bushels, 125 million bushels higher than MY 2023/24 on higher global soybean demand in MY 2024/25. U.S. soybean crush is forecast at a record-high 2.43 billion bushels, up 5 percent from MY 2023/24. Higher crush volumes are expected to meet the projected 3-percent increase in domestic soybean meal demand as well as growth in soybean meal exports. Furthermore, higher soybean crush volumes are largely supported by growing domestic soybean oil demand as a primary feedstock in the production of biofuels. U.S. soybean processors expanded crush capacity in the last year and new crush facilities are scheduled to start processing soybeans. With increased crush capacity in MY 2024/25 and expected higher soybean supply, U.S. soybean crush margins are to decline.

Soybean oil production for MY 2024/25 is forecast at 28.5 billion pounds, up 1.4 billion pounds from MY 2023/24. With higher domestic supply, soybean oil demand is forecast to increase by 1.3 billion pounds, driven by higher domestic consumption and an increase in soybean oil exports. Based on expectations for expansion in biofuel production capacity, soybean oil use for biofuel production in MY 2024/25 is projected to increase by 1.0 billion pounds to 14.0 billion pounds. Growth in soybean oil use in biofuels is limited by stronger use of feedstocks with lower carbon-intensity scores. Soybean oil use for food, feed, and other industrial products is expected to grow slightly to 14.3 billion pounds. U.S. soybean oil exports for MY 2024/25 are projected to increase 150 million pounds to 500 million pounds on higher global soybean oil demand. The soybean oil supply growth is expected to exceed the growth in soybean oil demand. Furthermore, U.S. soybean oil ending stocks are expected to recover and are projected to reach 1.8 billion pounds. The soybean oil price is forecast at \$0.42 per pound, down 13 percent from MY 2023/24.

Soybean meal production is forecast to reach a record high of 57.1 million short tons on a record soybean crush. The domestic soybean meal disappearance is forecast to increase by 1.3 million short tons to 40.3 million short tons. The growth in domestic meal demand is forecast in tandem with domestic pork and poultry production forecasts, and competitive soybean meal prices compared with other feed ingredients. Moreover, a larger supply of soybean meal, combined with lower prices and expanding port capacity, promises well for the future of the U.S. soybean meal export program. U.S. soybean meal exports for MY 2024/25 are forecast to increase 1.5 million short tons to a record-high 17.3 million short tons. The recovery in Argentina's crush and strong U.S. crush driven by new crush capacity and larger soybean supply suggests a highly competitive soybean meal export market with ample supplies and lower prices. Soybean meal prices are forecast at \$330.00 per short ton, down \$50.00 per short ton from MY 2023/24.

## Canola Oil Domestic Use Increases in MY 2024/25

U.S. farmers intend to plant slightly more canola acres in MY (June–May) 2024/25. Assuming a 97-percent harvested-to-planted ratio and a yield of 1,800 pounds per acre, canola production is forecast slightly down to 4.1 billion pounds. Despite the lower beginning stocks and production, canola supply is slightly higher on larger canola imports. Canola imports are forecast up from MY 2023/24 at 970 million pounds on a larger forecasted crop in Canada. Crush in MY 2024/25 is projected to increase marginally to 4.62 billion pounds. Canola ending stocks for MY 2024/25 are forecast up slightly from MY 2023/24, putting downward pressure on canola prices to \$21.00 per hundredweight.

Canola oil production is unchanged, while imports are forecast to a record-high 8.1 billion pounds driven by strong domestic demand for canola oil. Domestic demand for canola oil is expected to grow 7 percent, with a 2-percent growth in food use and a 15-percent growth in biofuel use. Biofuel use is forecast up 600 million pounds from MY 2023/24 to 4.6 billion pounds as canola oil continues to be a feedstock in renewable diesel production. Canola oil stocks are forecast at 184 million pounds, up 19 million pounds from MY 2023/24. Canola oil prices in MY 2024/25 are forecast down 7 cents to 49 cents per pound, in tandem with the soybean oil price forecast. Canola meal production is unchanged from MY 2023/24, while imports are forecast up slightly with higher available supplies in Canada.

## Other Oilseeds Outlook in MY 2024/25

As indicated by USDA, NASS *Prospective Plantings* report, farmers intend to plant 957,500 acres of sunflowerseed in MY 2024/25, the lowest since MY 1976/77. The decline from MY 2023/24 is largely driven by oil type sunflowerseed, whereas confection sunflowerseed type area remained steady. With fewer acres and a yield down slightly from MY 2023/24, sunflowerseed production is forecast to be 1.6 billion pounds. Oil type sunflowerseed production is projected to decline to 1.4 billion pounds, down 0.6 billion pounds from MY 2023/24. With lower oil type production, crush is forecast down to 914 million pounds. The total sunflowerseed stocks are lowered to 232 million pounds, down from MY 2023/24 and driven by decreased production. Sunflowerseed price is forecast higher to \$21.00 per hundredweight, up 45 cents from MY 2023/24 with tighter stocks.

U.S farmers intend to plant about the same amount of peanut acreage as last year at 1.65 million acres. Assuming 96 percent of sown acreage is harvested and yields improve to 4,000 pounds per acre, U.S. peanut production is forecast to rise to 6.3 billion pounds from 5.9 billion pounds in MY 2023/24. Peanut domestic food use in MY 2024/25 is projected to grow 1.3 percent from the previous year. With higher supply and moderate food growth, peanut crush is forecast up to 875 million pounds from 650 million pounds in MY 2023/24. Exports in MY 2024/25 are forecast at 1.3 billion pounds, down 0.2 billion pounds from the revised MY 2023/24 export estimate on higher South American supplies. MY 2023/24 peanut exports are up from last month to 1.5 billion pounds, driven by strong exports to Mexico, Canada, China, and the European Union (EU). Ending stocks of peanuts in MY 2024/25 are forecast up from last year at 2.3 billion pounds. With higher stocks, the peanut season-average farm price is forecast down from MY 2023/24 to 25.5 cents per pound in MY 2024/25.

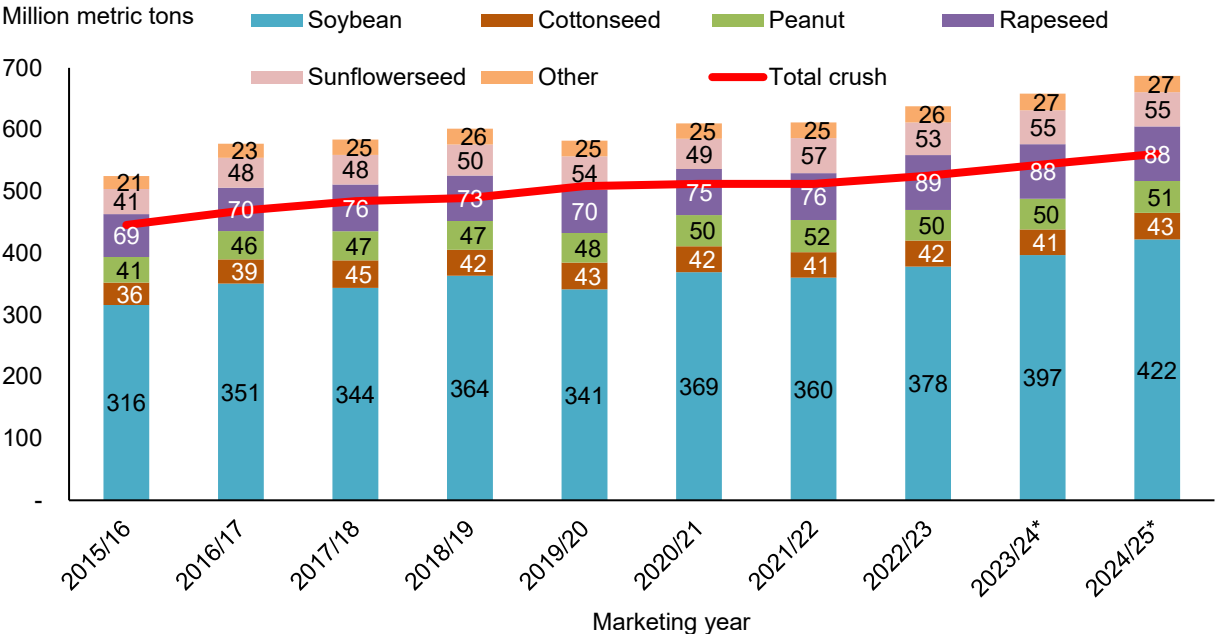
Cottonseed production is up from MY 2023/24 at 5.0 million short tons on higher intended cotton acres. Cottonseed crush in MY 2024/25 is forecast at 1.55 million short tons, up 150,000 short tons from MY 2023/24. Large domestic production pushes MY 2024/25 cottonseed exports to 450,000 short tons. Cottonseed prices in MY 2024/25 are projected to decline by \$4.00 to \$207.00 per short ton.

# International Outlook

## Global Oilseeds Production for MY 2024/25 Increases to a Record High

Global oilseeds production for MY 2024/25 is projected to increase by 28.9 million metric tons to 687.1 million metric tons on higher soybean, sunflowerseed, peanut, cottonseed, and palm kernel production, while rapeseed and copra production are projected to decline marginally (figure 1). Higher soybean production, which is expected to reach a record high of 422.3 million metric tons, accounts for most of the gain.

Figure 1  
**Global major oilseed production and crush**



Note: Asterisk (\*) denotes forecast. Other includes: Copra and palm kernel.  
 Source: USDA, Economic Research Service using data from USDA, Foreign Agricultural Service, *Production, Supply and Distribution* database, May 2024.

Global sunflowerseed production is projected to increase by 0.6 million metric tons to 55.4 million metric tons, whereas global rapeseed production is marginally down on a lower forecast for rapeseed production in the EU. Furthermore, global peanut and cottonseed production is expected to recover, projected at 51.3 million metric tons and 43.2 million metric tons, respectively.

Global oilseeds trade is forecast to increase by 8.6 million metric tons to 206.8 million metric tons on higher soybean, rapeseed, and peanut exports, which is partially offset by lower

sunflowerseed and copra exports. Global oilseed crush volume is forecast to increase by 17.3 million metric tons to 560.8 million metric tons, with soybean crush volume accounting for nearly 92 percent of that increase. Peanut, cottonseed, and palm kernel crush volumes account for the rest of that global increase. Global rapeseed, sunflowerseed, and copra crush volumes are forecast to decline slightly in MY 2024/25 due to a lower supply of seeds. Despite the 3-percent growth in global oilseeds domestic demand, global oilseeds ending stocks are forecast at 144.8 million metric tons, up 16.5 million metric tons. Soybean ending stocks are forecast at a record-high 128.5 million metric tons and account for 89 percent of global oilseed stocks. Global rapeseed and sunflowerseed ending stocks are forecast to decline to 7.8 million metric tons and 2.5 million metric tons, respectively. In addition, global peanuts and cottonseed stocks are forecast to recover marginally.

## Global Soybean Crush Increases on Higher Soybean Supply

Global soybean supply for MY 2024/25 is projected to increase on higher carryover soybean stocks from MY 2023/24 and a forecast for increased soybean production for Brazil, the United States, Argentina, Paraguay, South Africa, and India. The soybean planting economics are expected to favor planting more soybeans at the expense of grain acres. Consequently, global soybean area is expected to increase nearly 3 percent, reaching 143.4 million hectares. Global soybean trade is projected at 180.2 million metric tons, up 7.7 million metric tons from MY 2023/24 due to an increase in soybean consumption in China, Bangladesh, Iran, Southeast Asia, and a consumption recovery in Egypt and Pakistan. China's soybean imports are forecast at 109.0 million metric tons due to greater domestic soybean meal demand driven by growth in the livestock sector. Soybean imports for Bangladesh, Iran, Egypt, and Pakistan are forecast to increase due to higher domestic soybean crush and increased feed demand.

Global soybean crush volume for MY 2024/25 is forecast to reach 345.9 million metric tons, a 15.9-million metric ton increase from MY 2023/24. Argentina's soybean crush continues to recover from the drought impacted MY 2022/23. Soybean crush volume is forecast to increase in several countries including China, the United States, Egypt, Iran, Pakistan, and Vietnam. The higher crush volumes are driven by demand growth for soybean meal and soybean oil. Global growth for soybean meal demand is driven by higher global livestock production and an expectation for lower soybean meal prices. Despite the growth in global soybean trade and domestic use, global soybean stocks for MY 2024/25 are projected at 128.5 million metric tons, 16.7 million metric tons higher than estimates for MY 2023/24.

Brazil's soybean production for MY 2024/25 is forecast to reach a record high of 169.0 million metric tons on higher area and soybean yield of 3.57 tons per hectare. If realized, this would be a 15-million metric tons increase from the revised production estimate for MY 2023/24. Soybean production for MY 2023/24 is reduced this month by 1.0 million metric tons to 154.0 million metric tons on flooding in Rio Grande do Sul. The major soybean-producing districts of Ijuí, Santa Maria, and Soledade received record-high rainfall (range of 8–12 inches) beginning in May, which is expected to result in harvest losses.

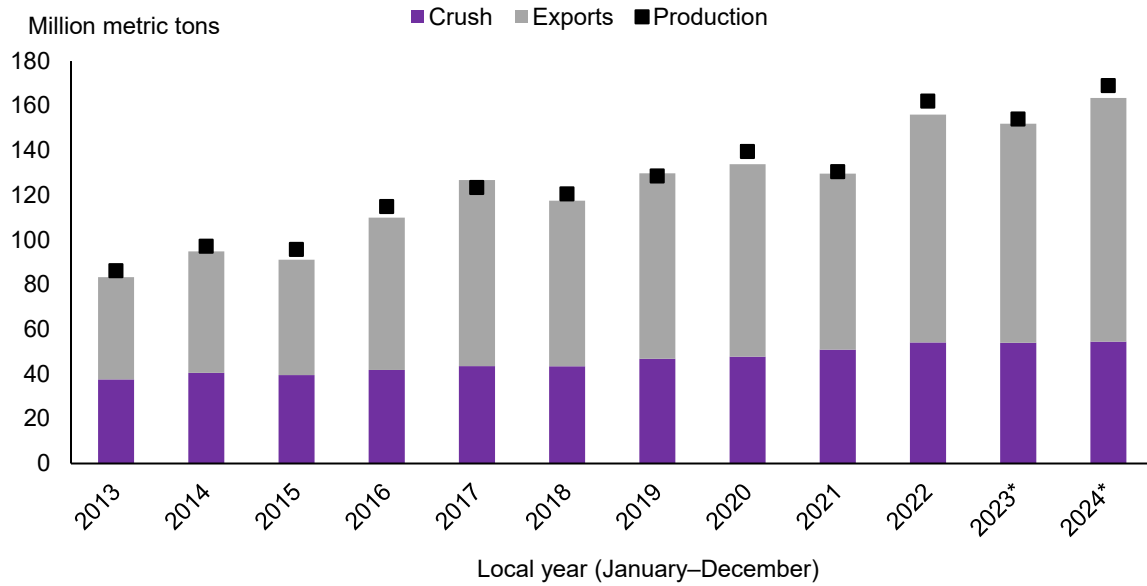
With a record-high soybean supply and weak currency, Brazil is projected to continue to dominate global soybean trade, accounting for 58 percent of the global soybean trade in MY 2024/25. Brazil's soybean exports are projected at 105.0 million metric tons, 3.0 million metric tons higher than the revised estimate for MY 2023/24. Soybean crush supported by soybean meal and oil demand is forecast at 54.0 million metric tons, unchanged from revised MY 2023/24 estimate. With a revised lower production estimate for MY 2023/24, Brazil's exports are forecast down while a strong crush pace results in a higher crush estimate and lower carryout.

In MY 2024/25, soybean domestic meal demand in Brazil is expected to grow 3 percent, while soybean meal exports are forecast to decline nearly 3 percent to 20.5 million metric tons due to stronger competition from Argentina and the United States. Furthermore, soybean oil domestic consumption is projected to increase 5 percent to 9.4 million metric tons. Strong demand for soybean oil is driven by domestic biodiesel policy. Recently, the Government of Brazil boosted the mandatory biodiesel mix to 14 percent from 12 percent.

Notably, this month, USDA made a series adjustment to the Brazil local year (LY) soybean balance sheet. The local year was changed from February–January to January–December and data series is adjusted back to 2000 (LY 1999/2000). This change is made to capture the early harvest activities. Soybean imports, exports, crush, and feed and waste are adjusted to reflect the January–December period, and ending stocks are estimated for the end of December (figure 2). The series can be found under “Oilseed, Soybean (Local)” in the Foreign Agricultural Service's *Production, Supply and Distribution (PSD)* database.

Figure 2

**Brazil's soybean production, crush, and exports**



Note: Asterisk (\*) denotes a forecast.

Source: USDA, Economic Research Service using USDA, Foreign Agricultural Service, *Production, Supply and Distribution* database, May 2024.

In Argentina, soybean planted area is expected to increase as a result of attractive soybean prices compared with grain prices. With an over 2-percent increase in the area and a yield of 3.0 tons per hectare, soybean production is forecast at 51.0 million metric tons. With higher supply, Argentina’s soybean export is forecast to increase by 0.9 million metric tons to 5.5 million metric tons. The crush is raised 4.5 million metric tons to 40.0 million metric tons on larger soybean supplies and growth in meal and oil demand. Furthermore, Argentina’s soybean meal exports for MY 2024/25 are expected to rebound 12 percent to 27.3 million metric tons, accounting for nearly 37 percent of world soybean meal trade compared with more than 34 percent in MY 2023/24.

In India, soybean production is forecast to increase 3 percent to 12.2 million metric tons on marginally lower area offset by higher yield. Crush is expected to rise to a record high of 11.0 million metric tons. With domestic soybean meal consumption growth over 6 percent, India’s soybean meal export forecast for MY 2024/25 is curtailed to 1.2 million metric tons, compared with 1.4 million metric tons in MY 2023/24.

In China, soybean production for MY 2024/25 is forecast marginally lower at 20.7 million metric tons. Soybean crush is expected to increase to 103.0 million metric tons, compared with the revised higher MY 2023/24 soybean crush of 99.0 million metric tons. With the higher crush



volume, MY 2024/25 soybean imports are forecast at 109.0 million metric tons, up 4.0 million metric tons from MY 2023/24.

While soybean meal consumption in China is forecast to grow 4 percent in MY 2024/25, the other importing countries are forecast to have strong growth in domestic soybean meal demand. In particular, the lower supply of rapeseed meal and sunflowerseed meal will likely benefit the EU's demand for soybean meal. In addition, lower soybean meal prices are expected to support soybean meal demand growth for countries in Asia including South Korea, Taiwan, Thailand, and Vietnam. Overall, global soybean meal domestic demand for MY 2024/25 is forecast to grow by more than 4 percent and reach 265.6 million metric tons. As a result of growing global soybean meal demand, global soybean meal trade for MY 2024/25 is expected to increase by nearly 5 percent to 74.5 million metric tons, with Argentina leading the increase followed by the United States. The EU, the biggest soybean meal importer accounting for 23 percent of global soybean meal trade, is forecast to import 16.2 million metric tons of soybean meal in MY 2024/25, nearly 3 percent higher than soybean meal imports in MY 2023/24. Furthermore, the EU is projected to increase soybean crush to 15.2 million metric tons from 14.9 million metric tons in MY 2023/24. In addition to the EU, Indonesia, Malaysia, the Philippines, Thailand, Japan, and Vietnam are forecast to increase soybean meal imports by 1.1 million metric tons (5 percent) on higher domestic meal demand supported by growth in the livestock sector and competitive prices for soybean meal as a feed ingredient. Other countries, such as Bangladesh, Iraq, Colombia, Ecuador, Mexico, Saudi Arabia, and Turkey, are also projected to import more soybean meal in MY 2024/25.

## Global Rapeseed Production Declines in 2024/25

Global rapeseed output for MY 2024/25 is forecast to decline marginally to 88.3 million metric tons on smaller production in the EU, United Kingdom, Pakistan, and Ukraine, which are partially offset by higher production in Canada, Australia, China, and Bangladesh. Rapeseed trade is expected to increase nearly 1.0 million metric tons to 17.6 million metric tons on higher exports from Australia and Canada. Global rapeseed crush volume is forecast at 83.8 million metric tons, marginally lower than the record-high crush in MY 2023/24. Global rapeseed stocks are forecast to decline by 0.3 million metric tons to 7.8 million metric tons for MY 2024/25.

In the EU, rapeseed production is forecast at 19.0 million metric tons, 1.0 million metric tons below last year. Rapeseed yields are forecast at 3.25 tons per hectare, close to the 3-year average. The harvested area is estimated at 5.9 million hectares, down 6 percent from MY

2023/24. The decline in the area is a result of a very wet autumn in Western and Northern Europe hindering farmers' ability to enter the fields. In addition, very dry weather in Romania resulted in the replanting of some fields and an overall reduction in the planted area.

The EU farmers experienced an uncommon growing season with a very warm winter that sped up the maturity of the rapeseed crop. However, in the week of April 21–27, the temperature dropped, and several rapeseed producing countries observed an early freeze.

With a 1.0 million metric ton decline in domestic production, the EU's rapeseed imports are forecast to increase by 1.1 million metric tons to 6.6 million metric tons to meet the domestic demand for rapeseed from crushers. Steady demand for rapeseed products supports the EU crush forecast projected at 24.5 million metric tons, 0.1 million metric tons higher than MY 2023/24.

In Ukraine and Russia, winter rapeseed experienced relatively stable weather during the growing season. Ukraine's rapeseed production for MY 2024/25 is projected down 0.7 million metric tons on lower harvested acreage, while Russia's production is forecast up 0.1 million metric tons on higher acreage. With a lower rapeseed crop, Ukraine's rapeseed exports and crush are projected to be lower than last year at 3.3 million metric tons and 400,000 metric tons, respectively. Russia's rapeseed crush is forecast to increase to a record 3.4 million metric tons on strong domestic demand, whereas rapeseed exports are forecast to decline to 750,000 metric tons.

In Canada, rapeseed area is forecast to decline 2 percent to 8.7 million hectares on less attractive prices. Low soil moisture levels persist in the scattered growing areas in Alberta and Saskatchewan and timely rainfall throughout the MY 2024/25 growing season will be needed to achieve the average yield. Assuming average yields of 2.25 ton per hectare, MY 2024/25 Canadian rapeseed production is forecast at 19.6 million metric tons, 0.8 million metric tons higher than in MY 2023/24. With carryover rapeseed stocks from MY 2023/24 and increased rapeseed production, Canada's rapeseed supply for MY 2024/25 is forecast up 1.2 million metric tons to 21.8 million metric tons. Rapeseed export and crush volumes are forecast to increase 350,000 metric tons and 800,000 metric tons, respectively, to reach 6.9 million metric tons and 11.8 million metric tons. The higher rapeseed crush is driven by strong rapeseed oil demand from the food and biofuels industry in the United States. According to the Oilseeds and Product Annual Global Agricultural Information Network (GAIN) report from the U.S. attaché in Canada, Canada's rapeseed crush capacity is expected to increase to 15.1 million metric tons by 2025.

Australia's harvested rapeseed area is forecast to increase nearly 9 percent in MY 2024/25 to 3.8 million hectares, which would still be the second largest area on record. This increase is due to favorable prices for rapeseed compared to alternative crops. In addition, the rotation practice is supportive of planting more rapeseed to reduce diseases. Assuming normal weather and a yield forecast of 1.7 metric tons per hectare, Australia's rapeseed production is forecast at 6.5 million metric tons, up 0.8 million metric tons from MY 2023/24. With expectations for higher rapeseed supply, Australia's exports are projected to increase by 0.8 million metric tons to 5.4 million metric tons, while crush is forecast unchanged at 1.1 million metric tons.

In China, the MY 2024/25 production of rapeseed is forecast to increase 1 percent to 15.6 million metric tons on slightly higher harvested area and an average yield projection. With higher domestic production, China's rapeseed imports are forecast at 3.2 million metric tons, down 0.2 million metric tons from last year. China's rapeseed crush volume is projected at 18.2 million metric tons, down 0.5 million metric tons from a record-high rapeseed crush in MY 2023/24.

In India, the 2024/25 rapeseed crop is forecast at 12.1 million metric tons, down 0.4 million tons from the record crop in MY 2023/24. This forecast is based on higher harvested area and average yield. The crush is forecast at 10.8 million metric tons, down 0.1 million metric tons from MY 2023/24.

## Global Sunflowerseed Production Increases on Higher Acreage

Global sunflowerseed production for MY 2024/25 is forecast to increase by 0.6 million metric tons from MY 2023/24 to 55.4 million metric tons on higher production in the EU, Ukraine, and Turkey, which is offset by lower production in Argentina, Russia, and the United States. The EU sunflowerseed production is forecast at 10.9 million metric tons, 0.9 million metric tons higher on a 3-percent increase in harvested acreage and average yield. In Ukraine, farmers are expected to increase seeded area by 3 percent to 6.2 million hectares. Assuming normal weather and average yield, Ukraine sunflowerseed production is forecast to increase to 14.7 million metric tons. Russia's sunflowerseed crop is forecast to decline to 17.0 million metric tons on a return to average yield.

Global sunflowerseed exports for MY 2024/25 are forecast down 0.3 million metric tons from MY 2023/24 to 2.6 million metric tons as major producing countries consume (crush) sunflowerseed domestically. Global sunflowerseed crush is forecast to reach 51.5 million metric tons, 0.2 million metric tons lower than last year's record high of 51.7 million metric tons on lower supply.

The EU’s sunflowerseed crush is forecast up 0.6 million metric tons to 9.8 million metric tons. Russia’s crush is forecast to reach a record high of 16.7 million metric tons, while Ukraine’s crush declines to 14.3 million metric tons. As a result of anticipated sunflowerseed consumption exceeding production, global sunflowerseed stocks are forecast to decline by 0.3 million metric tons to 2.5 million metric tons.

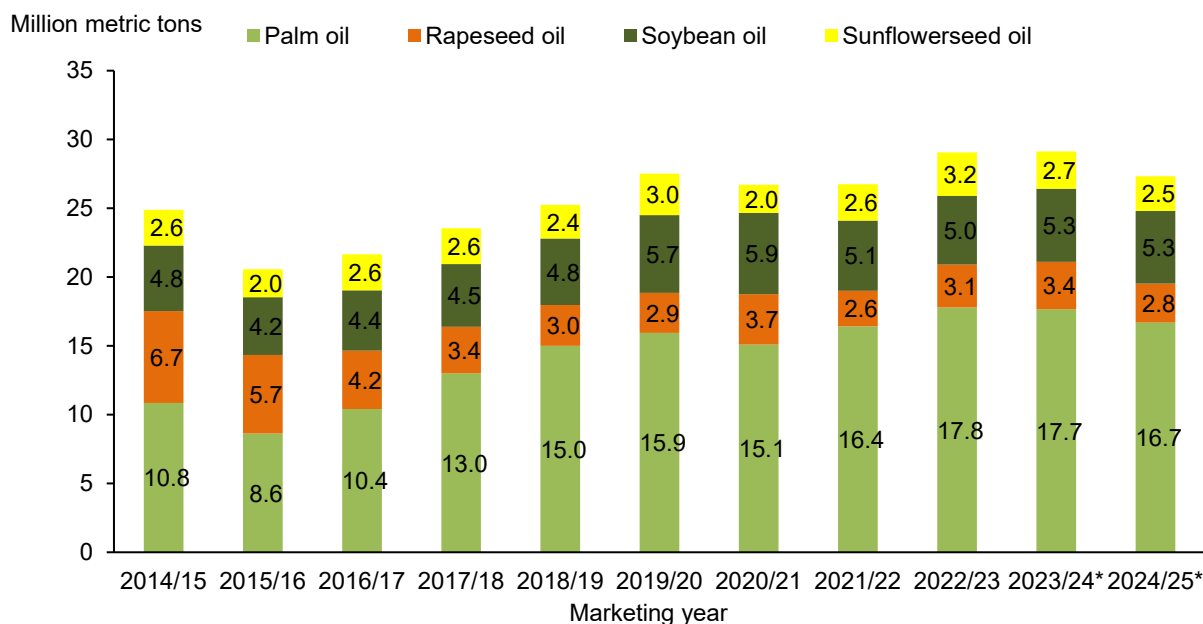
## Global Major Vegetable Oils Demand Outpaces Global Production

Global production of the four major vegetable oils (i.e., palm oil, soybean oil, rapeseed oil and sunflowerseed oil) is expected to reach 201.2 million metric tons in MY 2024/25, up 3.6 million metric tons (or 2 percent) from MY 2023/24.

Global major vegetable oils consumption is forecast to reach 198.3 million metric tons, up 5.2 million metric tons. Global food consumption accounts for 73 percent of the total. Global industrial use that includes the use of vegetable oils as feedstock for biofuels production continues to grow and is projected to reach 53.6 million metric tons, up 1.8 million metric tons from MY 2023/24. Stocks of major vegetable oils are expected to decline from 29.1 million metric tons in MY 2023/24 to 27.3 million metric tons in MY 2024/25.

Figure 3

### Global major vegetable oil stocks



Source: USDA, Economic Research Service using USDA, Foreign Agricultural Service, *Production, Supply and Distribution* database, May 2024.

Global palm oil production for MY 2024/25 is forecast to increase nearly 1 percent to 80.0 million metric tons. Malaysia's palm production is forecast at 19.0 million metric tons, unchanged from MY 2023/24. Indonesia's palm oil production is projected to increase 0.5 million metric tons to 47.5 million metric tons. Global palm oil exports are expected to grow marginally to 48.6 million metric tons. With growing domestic demand for palm oil from the biodiesel industry, Indonesia palm oil exports for MY 2024/25 are forecast to decline to 26.6 million metric tons. With steady growth in palm oil production and anticipated demand growth for palm oil, global palm oil stocks are projected to decline nearly 1.0 million metric tons to 16.7 million metric tons by the end of MY2024/25.

Global soybean oil production is projected to increase by 3.0 million metric tons to 65.4 million metric tons. Global domestic soybean oil consumption is forecast to grow by 5 percent to 64.5 million metric tons due to growth in food consumption and industrial use. Soybean oil exports are forecast to rise 0.7 million metric tons to 12.0 million metric tons on limited trade of other oils. India, Iran, and Pakistan are projected to import more soybean oil with limited supplies of sunflowerseed oil and palm oil. China's soybean oil imports forecast is unchanged at 0.4 million metric tons as China increases domestic crush and the supply of soybean oil. Global soybean oil ending stocks for MY 2024/25 are forecast at 5.3 million metric tons, a similar level as estimated ending stocks for MY 2023/24.

Global rapeseed oil production for MY 2024/25 is expected to reach 34.0 million metric tons, unchanged from MY 2023/24 on nearly unchanged global crush at 83.8 million metric tons. Higher supplies for Canada, Belarus, and Bangladesh are offset by lower supplies in China, India, Japan, and Ukraine. With expected global rapeseed oil consumption to grow 3-percent, global rapeseed oil stocks are projected to decline to 2.8 million metric tons, the lowest since MY 2021/22.

Global sunflowerseed oil production for MY 2024/25 is forecast at 21.7 million metric tons, down 0.1 million metric tons on lower sunflowerseed crush in Ukraine and Argentina partially offsets the higher crush and sunflowerseed oil production in the EU and Russia. Global sunflowerseed oil exports are expected to decline 1.0 million metric tons to 13.4 million metric tons on lower shipments from Argentina, Turkey, Ukraine, and Russia. Imports of sunflowerseed oil for the EU and India are forecast to decline to 2.1 million metric tons and 2.2 million metric tons, respectively. Global sunflowerseed oil consumption for MY 2024/25 is forecast to decline nearly 2 percent (0.4 million metric tons) from a record-high consumption in MY 2023/24 of 20.7 million metric tons. The decline is projected in major consuming countries: India, China, Iran, and the EU. With global demand growth outpacing global supply, global sunflower oil stocks for MY

2024/25 are forecast to decline slightly to 2.5 million metric tons from 2.7 million metric tons in MY 2023/24.

# Special Article: U.S. Soybean Seeding Rates Affected by Technological Advancements

Bryn Swearingen and Kate Vaiknoras

## Introduction

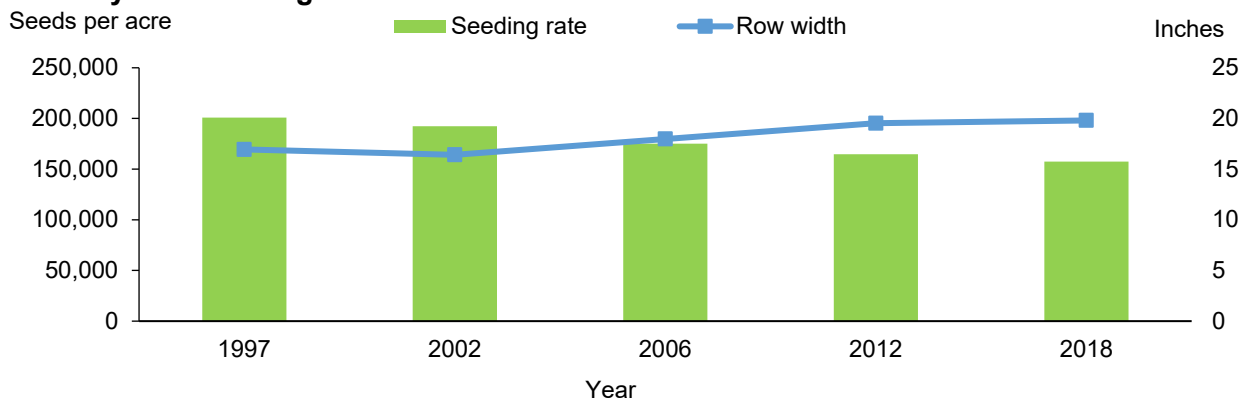
Between 1997 and 2018, soybean seeding rates declined on U.S. farms. This decline has been accompanied by increased crop row widths along with other changes in farming practices, technologies, and seed costs. For example, soybean farmers' use of genetically engineered seed and conventional planters have grown, which have likely contributed to the declined soybean seeding rates. In addition to these changing technologies, seed and other input costs have increased. This special article analyzes farm-level data on soybean seeding rates and provides an updated methodology for calculating use of soybean for seed in the U.S. soybean balance sheet released in the *World Agricultural Supply and Demand Estimates (WASDE)* report on May 10, 2024.

## Seeding Rate and Row Width Shifts Over Time

Utilizing nationally representative data from the Agricultural Resource Management Survey (ARMS), which is jointly administered by USDA, National Agricultural Statistics Survey (NASS) and USDA, Economic Research Service (ERS), this study indicates shifts in seeding rates and row widths over time. ARMS surveys farmers of specific commodities on a rotating basis (e.g., soybean farmers were surveyed in 1997, 2002, 2006, 2012, and 2018). Average U.S. soybean seeding rates have decreased from over 200,000 seeds per acre in 1997 to about 157,000 seeds per acre in 2018 (figure SA-1). This was accompanied by an increase in row width, from about 17 inches in 1997 to almost 20 inches in 2018.

Figure SA-1

**U.S. soybean seeding rate and row width**

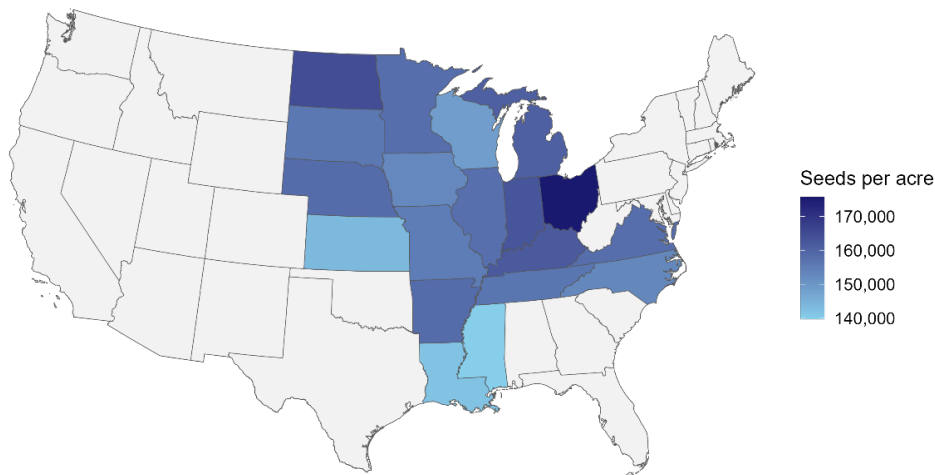


Source: USDA, Economic Research Service (ERS) estimates based on the 1997, 2002, 2006, 2012, and 2018 Agricultural Resource Management Survey (ARMS), jointly administered by USDA, ERS and USDA, National Agricultural Statistics Service.

From 1997 to 2018, seeding rates fell in every major soybean-producing State. The leading soybean-producing States of Iowa and Illinois fell by 18 and 35 percent, respectively. Whereas some smaller producing States, such as Mississippi and Tennessee, saw less than a 10-percent decline in soybean seeding rates. In 2018, Ohio had the highest seeding rate of about 175,700 seeds per acre, followed by North Dakota and Indiana (figure SA-2). The lowest seeding rates in 2018 were in Mississippi, Louisiana, and Kansas, at less than 145,000 seeds per acre. These States have historically been lower than the U.S. average. Iowa and Illinois had rates that were close to the U.S. average (153,000 and 158,000 seeds per acre, respectively). Regional differences in technology use and planting methods (explained below) may contribute to differences in seeding rates.

Figure SA-2

**Soybean seeding rates by State, 2018**



Note: Grey areas include States for which no data are available. Hawaii and Alaska are excluded as data are not available. Source: USDA, Economic Research Service (ERS) estimates based on the 2018 Agricultural Resource Management Survey (ARMS), jointly administered by USDA, ERS and USDA, National Agricultural Statistics Service.



## Method of Planting Soybean Seeds

Soybean seeding rates are associated with the method of planting soybean seeds, which has changed somewhat over time. There are three ways that farmers can plant soybean seed: (1) broadcasting, (2) drilling, and (3) planting in conventional rows. In all survey years, drilling and planting in conventional rows were much more common than broadcasting. Since 1997, the share of soybean acres planted using conventional rows has increased while the share planted using broadcasting or drilling has fallen. In 1997, 51 percent of U.S. soybean acres were planted using the drill or broadcasting methods, and 49 percent were planted in conventional rows (figure SA-3a). By 2018, only 26 percent of acres were drilled or broadcast, and 74 percent were planted in rows. These methods require different types of machinery. Drills tend to be less precise than conventional planters, plant seeds closer together, and plant in narrower rows. Broadcasting seeds is less precise than drilling.

Seeding rates have been consistently higher for soybeans planted with drills or broadcasting than soybeans planted in conventional rows, although the difference between them has declined over time (figure SA-3b). In 1997, the U.S. average seeding rate for drilling or broadcasting techniques was more than 52,000 seeds per acre higher than for seeds planted in rows. From 1997 to 2018, the seeding rate for drilled rows or broadcast seed fell more than 25 percent, compared with a 12-percent decline for seeds planted in rows. In 2018, the seeding rate for the drilling or broadcasting method was only about 14,000 seeds per acre greater than seeds planted in rows.

Figure SA-3a  
**Soybean planting method**

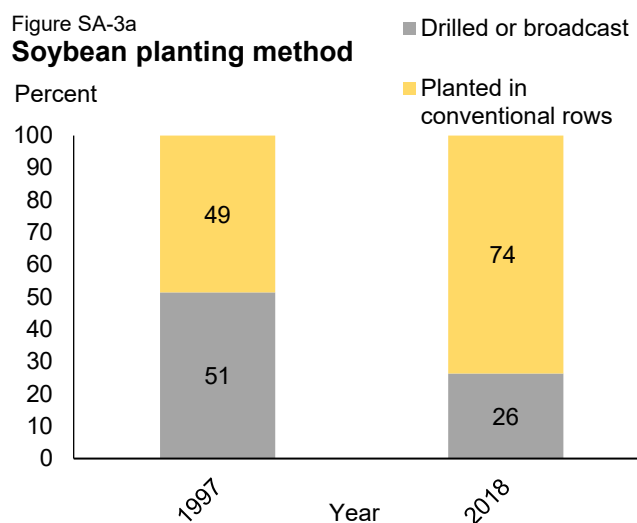
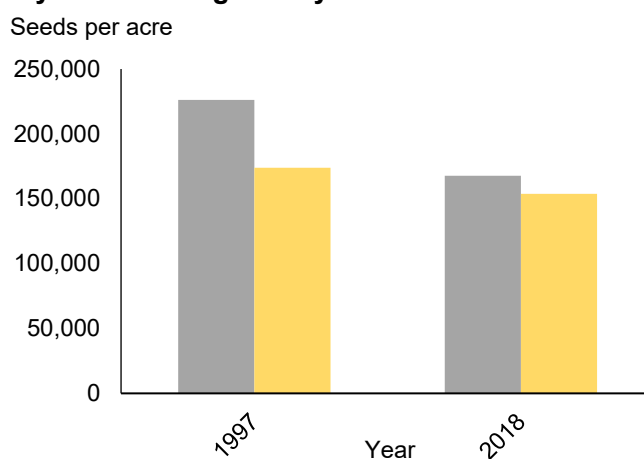


Figure SA-3b  
**Soybean seeding rate by method**



Note: Drilling and broadcasting methods were combined due to disclosure concerns.

Source: USDA, Economic Research Service (ERS) estimates based on the 1997 and 2018 Agricultural Resource Management Survey (ARMS), jointly administered by USDA, ERS and USDA, National Agricultural Statistics Service.

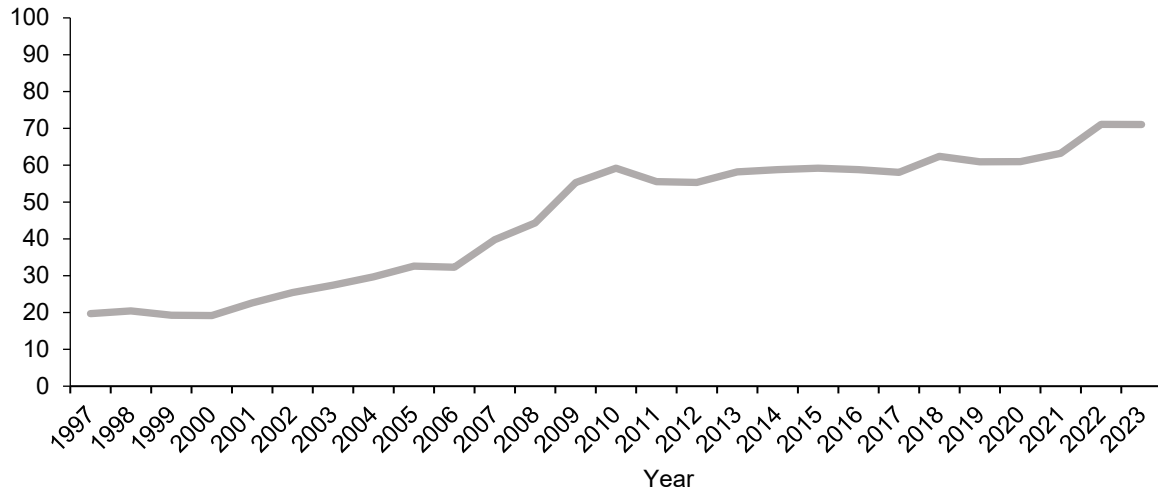
## Other Technological Advancements and Market Factors

In addition to changes in planting methods, seeding technologies, seed quality, and costs have also changed over time, which may have contributed to the seeding rate decline. In the mid-1990s, seed companies began selling genetically engineered soybean seeds to U.S. farmers. In 1997, regional adoption rates for these genetically engineered soybean seeds ranged from 8 to 21 percent (Foreman & Livezey, 2002). In 2002, adoption still varied by region but had jumped from 60 to 96 percent. By 2006 and in remaining survey years, U.S. farmers had planted genetically engineered soybean seeds on at least 93 percent of acres in all regions (Vaiknoras & Hubbs, 2023). In all survey years, the seeding rate for nongenetically engineered seeds was higher than for genetically engineered seeds, although this difference has declined over time. For example, in 1997, the seeding rate for nongenetically engineered seeds exceeded genetically engineered seeds by about 15,000 seeds per acre, compared with 2018 when the difference was less than 4,000 seeds per acre. In more recent years, farmers can purchase soybean seeds with stacked resistance to multiple herbicides. Seeds have also been treated directly with pesticides as a pest management strategy. In addition, precision agriculture (which, through the automation of some farming tasks, can allow farmers to vary the rate of several inputs including seeds) has become increasingly popular (Vaiknoras & Hubbs, 2023). These technological advancements have increased the quality and reliability of the seeds.

Possibly and partly due to these technological advancements and higher quality seeds, soybean seeds have become more costly in recent years. In 1997, U.S. farmers spent an average of \$19.72 per acre on soybean seeds. That expense rose by more than 260 percent by 2023, when U.S. farmers were spending \$71.03 per acre on soybean seeds (figure SA-4). Much of the cost increases occurred during 1997–2010, when seed costs increased by 200 percent to \$59.20 per acre. Meanwhile, total production costs also increased from \$245.83 per acre in 1997 to \$632.22 per acre in 2023 (a 157-percent increase). Seed costs have thus increased as a share of total costs, from 8 percent in 1997 to 11 percent in 2023. The share of soybean seed costs was highest in 2010, at 16 percent.

Figure SA-4  
**Soybean seed cost**

Dollars per acre



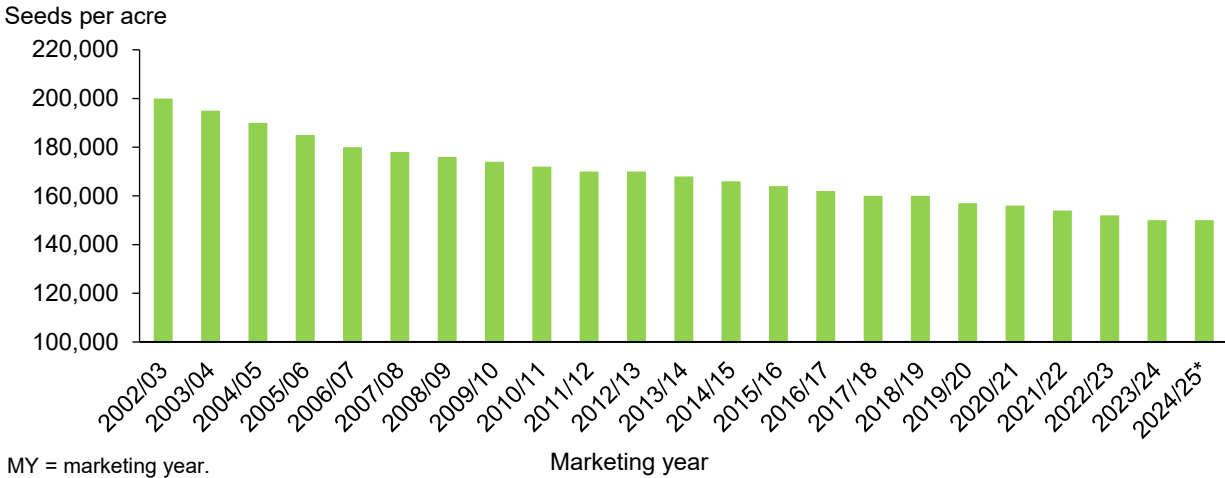
Source: USDA, Economic Research Service Commodity Costs and Returns data.

## Soybean Seed Use Methodology

Since marketing year (MY) 2009/10, seed use was calculated with a seeding rate of 195,000 seeds per acre. On May 10, 2024, the *World Agricultural Supply and Demand Estimates (WASDE)* report released historical updates to the U.S. soybean balance sheet. Soybean seed use was revised back to MY 2001/02 using an updated seeding rate guided by ARMS survey data. Moving forward USDA will use Agricultural Resource Management Survey (ARMS) data to guide and provide insights for future seeding rate trends to be used in the seed use calculation.

For 2002, 2006, 2012, and 2018 ARMS, the seeding rate results were rounded up and then trended down between surveys. After 2018, the seeding rate is now forecast based on a trend decline for the 2005–17 period. Figure SA-5 shows the finalized seeding rates from MY 2002/03 through MY 2024/25. Once the next survey results are available, the years following the previous survey will be revised accordingly.

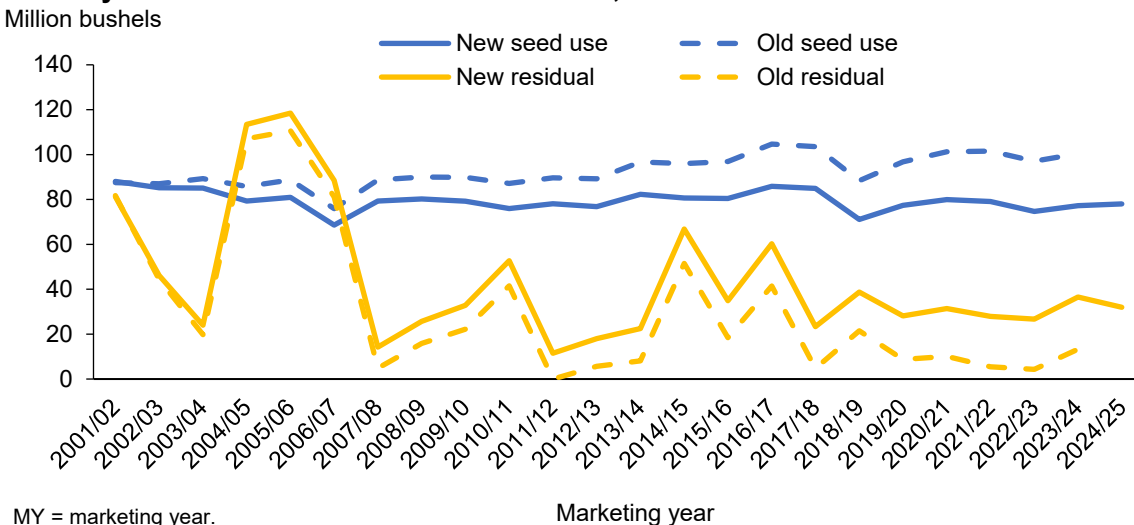
Figure SA-5  
**U.S. soybean seeding rate, MY 2002/03–2024/25**



MY = marketing year.  
 Note: Asterisk (\*) denotes a forecast.  
 Source: USDA, Economic Research Service using data from USDA, World Agricultural Outlook Board, May 2024 *World Agricultural Supply and Demand Estimates*.

In the *WASDE* report, soybean seed use is calculated by taking the next year’s planted acreage and multiplying it by the seeding rate in bushels per acre. To convert to bushels per acre, the seeding rate is converted assuming a 50-pound bag of seed is 140,000 seeds and 1 bushel of soybeans is 60 pounds. With this historical revision, soybean seed use declined from 88 million bushels in MY 2001/02 to a forecast of 78 million bushels in MY 2024/25 (figure SA-6). For a detailed account of these calculations, see figure SA-5 in the Oil Tables Excel file included with this report. The lower seed use resulted in an increased residual category, which includes factors such as the use of soybeans for food and feed, and statistical errors.

Figure SA-6  
**U.S. soybean seed and residual use revisions, MY 2001/02–2024/25**



MY = marketing year.  
 Note: Asterisk (\*) denotes a forecast.  
 Source: USDA, Economic Research Service using data from USDA, World Agricultural Outlook Board, May 2024 *World Agricultural Supply and Demand Estimates*.

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