Double-Cropping Soybeans After Wheat

KEY POINTS

- The first step in a successful double-crop soybean production system begins by planting the double-crop as soon after wheat harvest as possible.
- Residue management during the wheat harvest is also very important.
- Selecting later-flowering soybean products helps to improve the chances that double-crop soybeans will produce adequate foliage and nodes which can fill more pods before frost.
- Controlling insects, diseases, and weeds can improve the chances that double-crop soybean will produce anticipated yields in a shortened growing season.

Introduction

Planting a soybean crop behind wheat presents the farmer with several production challenges. The growing season is shorter, wheat residue may require management, weather can be unpredictable, and rapidly growing weeds like Palmer amaranth can complicate production.

A key challenge in producing double-crop soybeans is producing enough leaf area fast enough to fill pods before a killing frost. The primary way to help manage this challenge is planting double-crop soybeans as soon after wheat harvest as possible. Every day lost by a delay in planting reduces the time the crop has for vegetative growth prior to reproductive growth. Soybeans are photoperiod sensitive and shift from vegetative to reproductive growth when daylength shortens. The timing depends on the maturity rating of the soybean, with later maturing varieties shifting to reproductive growth later in the growing season. A later maturing soybean is often planted in double-crop soybean systems to help extend the vegetative growth period helpful for producing a profitable double-crop bean crop. Increasing the seeding rate by 10 to 15% can also increase the number of nodes and pods per acre to help increase the yield potential of this late planted crop.[1]

An early wheat harvest can extend the window for planting double-crop soybeans. It may be beneficial to harvest wheat at a slightly higher moisture content and dry the grain rather than waiting for wheat to reach 13% moisture in the field. Harvesting wheat at 18 to 20% moisture does not appear to affect the milling or baking quality but will require drying costs or dockage will be assess when selling high-moisture grain.[2]

Figure 1. Narrow row, no till, double-crop soybean crop.

Bayer and Bayer Cross Design are registered trademarks of Bayer Group. ©2023 Bayer Group. All rights reserved.

Double-Cropping Soybeans After Wheat

No-till planting into wheat residue can help accelerate soybean planting and retain soil moisture; however, planting into wheat residue can be challenging. Cutting the wheat crop higher than usual or using a stripper header coupled with uniformly spreading residue behind the combine can help mitigate problems. Windrowing residue should only occur if it is baled and removed, which will delay soybean planting. The wheat residue can help reduce weed pressure at soybean emergence and help reduce soil temperature at mid-summer planting dates when soil temperatures can be high. Planters should be equipped with row cleaners and/or coulters that can cut through wheat residue and penetrate the soil to the desired seeding depth. Consistent seeding depth along with planting into a residue free zone is critical for good soil contact and uniform emergence. Dry conditions at planting may result in planting into dry soil or planting deeper to help get the seed into enough moisture for germination.

Weed Management

The same environmental conditions that are ideal for quick emergence and growth for double-crop soybeans are also ideal for weed growth. Some difficult-to-control weeds, like Palmer amaranth, can grow well even in hot, dry conditions. It is critical that double-crop soybean farmers begin with a weed-free seedbed. Pre-emergence herbicides should be used to prevent weeds from emerging with the planted soybeans. Narrower row spacing can help limit plant stress and increase yield potential by closing the canopy faster, reducing weed pressure and soil temperature.

Soybean Product Selection

One key to achieving the necessary plant growth is selecting a later-maturing soybean product. Later-maturing soybeans help the plant to produce more leaf area and nodes for pod formation. This is an advantage for a higher yield potential if the later maturity soybean can mature before a killing frost. In most cases, growers select a soybean product that is one or two maturity group gradations higher than what they would have planted as a full-season soybean. Some soybean products perform better than others in the same maturity group when planted in a double-crop system, so it is important to consult with your local seed advisor to find the best double crop soybean products for your area. Some states may also have data from official variety tests (OVT) for full-season and double crop soybeans, so check results for these types of tests for your area.

Figure 2. ALS injury to soybean leaf.

Use sulfonylurea ready (SR) or sulfonylurea tolerant soybean (STS®) soybean products if sulfonylurea herbicides were used for weed control in the wheat crop. This trait can help prevent injury in the double-crop soybean, as sulfonylurea herbicides would otherwise inhibit the ALS (acetolactate synthase) enzyme, which plays an important role in forming necessary proteins for the plant's growth and development. Since this class of herbicides is degraded by hydrolysis, or moisture in the soil, dry weather can cause more carryover problems. In environments with cooler weather and higher pH soils this natural break down or degradation of the herbicide can also be delayed, which could increase the potential for residual herbicide in the soil and the potential for herbicide injury in the double-crop soybean crop. [3]

Bayer and Bayer Cross Design are registered trademarks of Bayer Group. ©2023 Bayer Group. All rights reserved.

Double-Cropping Soybeans After Wheat

Disease and Insect Management

Because double-crop soybeans are planted later in the season, plants may face more insect pressure at earlier growth stages than a full-season soybean crop. A three-year research study conducted by Mississippi State University concluded that applying an insecticide seed treatment resulted in about a 2.4 bushels/acre yield advantage, regardless of maturity group, location, or month planted, and the average response did not change much based on yield potential.[4] Selecting soybean products with good disease resistance, and including a seed treatment like those found in the Acceleron® Seed Applied Solutions portfolio, can help protect double-crop soybeans from both seedling diseases and insects. Farmers should always scout and apply additional fungicides and insecticides as needed to maintain soybean condition throughout the growing season.

Crop Insurance

Crop insurance availability for double-crop systems has historically been a problem. This concern has recently changed, as the White House announced in May of 2022 a plan to expand the number of counties eligible for double-crop crop insurance across the U.S. Now a farmer can potentially sign a written agreement (depending on the county where the double-crop will be planted) with the USDA Risk Management Agency (RMA) to provide coverage for the double-crop acres in production. These potential deviations might change how Actual Production History (APH) yields are calculated so understanding how these changes might affect USDA payments can influence a decision to start double-cropping.[5] Always consult your local USDA office and your local crop insurance provider to see how any system changes and production practices my affect your farm's eligibility for farm programs or crop insurance.

Management Strategies During Wheat Harvest

- Harvest wheat at a slightly higher moisture content and dry the grain to help speed up the harvest timeline.
- Harvest the wheat crop as soon as possible (13% moisture) if drying is not an option.
- Harvesting with a stripper head can help reduce the amount of residue that will need to be evenly spread in the field.

Management Strategies at Planting

- Plant as soon as possible after wheat harvest.
- Consider no-till planting to reduce the time needed for field preparation and help conserve moisture.
- Use narrow row spacing (7 to 15 inches wide rows).
- Increase the seeding rate by 10 to 15% above the typical full season soybean rate.
- Plant later-maturing soybean products.
- Plant deeper, if needed, to get into good soil moisture (1 to 1.5 inches deep).
- Plant in a weed-free seed bed.
- Use sulfonylurea ready (SR) or sulfonylurea-tolerant soybeans (STS) if a sulfonylurea herbicide was used for weed control in the wheat crop.
- Inoculate soybean seed with rhizobia bacteria in high-residue conditions after a wheat crop.

Bayer and Bayer Cross Design are registered trademarks of Bayer Group. ©2023 Bayer Group. All rights reserved.

Double-Cropping Soybeans After Wheat

Conclusion

After managing the production challenges of a double-crop soybean crop there is one challenge that can make or break a double-crop: soil moisture. The problem can become greater in sandy soil types with lower water holding capacity. Fields with irrigation can be managed, but timely irrigation applications are needed for good seed germination and throughout the shortened crop growing season. In rain-fed areas where the wheat crop has used up the soil profile moisture, the double-crop must rely on timely rains to maintain yield potential. Any stress during the shorten growing season in a double-crop system can have substantial negative impacts on production.

Sources:

[1] Brown, C. 2019. Improving yield in double-cropped soybeans. Soybean Research & Information Network. Resources Research Highlights. https://soybeanresearchinfo.com/research-highlight/improving-yield-in-double-cropped-soybeans/.

[2] Stewart, J. 2012. Early wheat could provide an opportunity for double cropping. Purdue University. University News Service. https://www.purdue.edu/newsroom/outreach/2012/120412OhmDouble.html

[3] Niver, R. 2020. What STS means and why you should care. Illinois Soybean Advisor. Illinois Soybean Association. https://www.ilsoyadvisor.com/what-sts-means-and-why-you-should-care/

[4] Catchot, A., Cook, D., and Gore, J. 2013. Do insecticide seed treatments provide any value on late planted soybeans? Mississippi State University Extension. https://www.mississippi-crops.com/2013/05/17/do-insecticide-seed-treatments-provide-any-value-on-late-planted-soybeans/

[5] 2022. Double cropping beneficial to farmers. The Soy Hopper. Checkoff News. https://www.unitedsoybean.org/hopper/double-cropping-beneficial-to-farmers/

Legal Statements

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Performance may vary , from location to location and from year to year, as local growing, soil and environmental conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on their growing environment.

The recommendations in this material are based upon trial observations and feedback received from a limited number of growers and growing environments. These recommendations should be considered as one reference point and should not be substituted for the professional opinion of agronomists, entomologists or other relevant experts evaluating specific conditions.

Acceleron®, Bayer and Bayer Cross are registered trademarks of Bayer Group. All other trademarks are the property of their respective owners. ©2023 Bayer Group. All rights reserved.1314_95008

Bayer and Bayer Cross Design are registered trademarks of Bayer Group. ©2023 Bayer Group. All rights reserved.