Early planting is critical in maximizing yield potential, as long as planting recommendations are followed. Planting a soybean crop early can help develop a larger canopy, which can lead to an increase in photosynthesis, extension of the reproductive growth stage, and an increase in the growth rate during pod setting, all of which can help maximize yield potential. While there are risks associated with early planting, technologies and tools are available to help mitigate potential risks.

**Benefits**

The following reasons have been identified for the potential yield increase associated with an early planted soybean crop:

- Soybean plants produce larger canopies earlier in the season, which can intercept more sunlight, leading to a higher seasonable canopy photosynthesis rate and conservation of soil moisture, which is critical during reproductive periods.
- An increase in the number of nodes on the main stem, due to a longer growing season, potentially can lead to more pods per plant. This has been supported by data collected from the Michigan Soybean Yield Contest where the high-yield producers averaged 10 more pods per plant than the low-yield groups.\(^1\)
- Lengthening the reproductive period due to earlier flowering, and increasing the crop growth rate during pod set, which may lead to a greater seed filling rate.

**Soil Conditions**

**Temperatures.** Planting soybean early can help to maximize yield potential despite cold soil temperatures and slow seedling growth. Although the ideal soil temperature for rapid soybean germination and emergence is between 77 and 86 °F, soybean seeds can germinate when the soil temperature is about 50 °F. However, soybean emergence may take as long as two to three weeks under cold soil conditions.

**Moisture content.** When planting early, it is important to wait until good soil and seedbed conditions exist. Planting when soil is too wet can result in compaction, poor seed placement, and poor stand establishment. Excessive tillage or a heavy rain soon after planting can result in soil crusting, which can lead to a poor stand. Soybean planted in wet soils will likely negate any yield advantage from planting early.

**Risks and Management**

Risks to early planting can be mitigated with improved technologies. Cold soil temperatures can slow root development and make soybean stands more susceptible to soil-borne pathogens. Planting treated seed can help to achieve appropriate stands and maximize early season soybean growth. Fungicide seed treatments can provide protection from early season diseases such as Phytophthora, Pythium, Rhizoctonia, and Fusarium. Insecticide seed treatments can help provide protection against early season insect pests, such as the overwintering bean leaf beetle (BLB) (Figure 1).

The following cultural practices should be considered at planting to help establish an optimum stand capable of achieving maximum yield potential:

- **Tillage.** Some tillage may be necessary to reduce residue, but soils should be dry enough to support equipment and reduce compaction.
- **Nutrients.** Adequate fertility is important to maintain soybean growth throughout the growing season.
- **Soil Drainage.** Adequate soil drainage helps soybean plants develop a good root system.
- **Equipment.** Planting equipment should be calibrated for the planting depth and seeding rate required to achieve an adequate stand. Always refer to the manufacturer’s manual before performing any maintenance.
- **Seed.** Planting quality seed is recommended because seeds with damaged seed coats absorb soil moisture more rapidly, which increases the possibility of imbibitional chilling injury.
- **Disease and Insect Pressure.** Sudden death syndrome (SDS) is a disease associated with cool, saturated soils that are common during the early growing season (Figure 2). These conditions favor pathogen development and can predispose soybean plants to infection. Selecting soybean products with SDS tolerance may reduce the risk of SDS development later in the season. Additionally, planting soybean products that are resistant to soybean cyst nematodes (SCN) (Figure 3) can help, as the presence of SCN has been associated with increased SDS incidence. Monitoring fields...
Early Planting in Soybean

frequently during the season is important to address problems and prevent soybean yield loss due to pests. A larger canopy earlier in the season can provide a favorable environment for diseases such as white mold and frogeye leaf spot (Figure 4). In addition, with early planting, it may be important to monitor and prevent damage from BLB.

- **Chilling Injury and/or Frost.** A late-spring frost could damage emerged soybean plants since the growing point is exposed and vulnerable to freezing temperatures. If conditions are good at planting, the chances for imbibitional chilling injury and frost damage can be minimized. Soybean tissue is more resistant to freezing temperatures than corn tissue. Temperatures need to reach 28 °F for soybean tissue damage to occur. Sometimes only the upper portion of the emerged plant is damaged and not the growing point, and growth will resume from the surviving buds.

- **Weed Management.** Starting with a clean field is essential. Weed control programs using a residual herbicide along with post-emergence herbicides should be planned for season-long weed management.

![Figure 2. SDS symptoms with interveinal yellowing and necrotic spots.](image)

![Figure 3. SCN females on soybean roots (left) and SCN symptoms on soybean plants (right).](image)

![Figure 4. Frogeye leaf spot (left) and white mold (right) symptoms on soybean plants.](image)

Summary

Planting into a suitable seedbed condition requires management considerations and patience, especially if the goal is to plant early. Early planting has advantages and disadvantages. The advantages include earlier flowering, more vegetative nodes, increase in reproductive nodes, and potential for an early harvest. The disadvantages include soil crusting, damping off, late spring frost, insect pressure such as BLB, and potential diseases such as SDS.

Sources


Web sources verified 04/11/16. 140405061002

For additional agronomic information, please contact your local seed representative. Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible. ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Asgrow and the A Design®, Asgrow® and DEKALB® are registered trademarks of Monsanto Technology LLC. All other trademarks are the property of their respective owners. ©2016 Monsanto Company. 140405061002 021515SMK