SMaRT Soybean Management and Research Technology
SOYBEAN FACTS

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Early-Planted Soybeans - Benefits, Risks and Recommendations

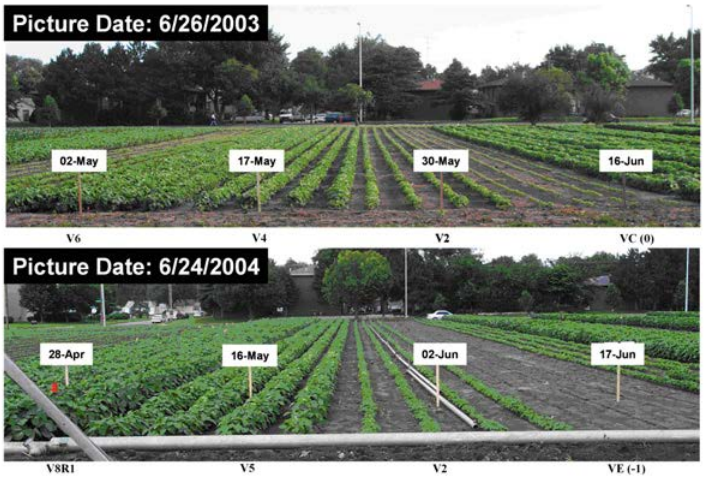
Mike Staton, MSU Extension CURE Soybean Educator
Kurt Thelen, MSU Extension Cropping Systems Specialist
Horst Bohner, Soybean Specialist, Ontario Ministry of Food and Rural Affairs

University researchers around the corn belt have shown that early planting is critical to producing high soybean yields. The ideal planting time for soybeans is basically the same as it is for corn -- the first week of May for the lower half of the Lower Peninsula. However, if soil conditions are favorable and producers manage the crop carefully, soybeans planted during the last week of April can perform as well as beans planted during the first week of May. The risks and the benefits of early planting will be summarized in this fact sheet. Specific management practices for early-planted soybeans are also provided.

Benefits

One of the biggest advantages of early planting is that it provides a longer planting window for attaining maximum yields. Soybeans planted during the last week of April have produced slightly higher yields than those planted on May 1. Data from Wisconsin research conducted in 2006 and 2007 showed that yield losses of 0.4 bushels per acre per day occur when planting is delayed after May 8th. When soybeans are planted early, they produce a larger crop canopy earlier in the growing season leading to better utilization of the available solar radiation and soil moisture. The earliest planted soybeans in Figure 1 have completely closed the rows enabling the crop to maximize photosynthesis by intercepting all the available sunlight. Subsequent planting dates produced smaller crop canopies increasing soil moisture losses due to evaporation. Early-planted soybeans also produce more nodes on the main stem increasing the potential for more pods per plant. University agronomists have also found that newer soybean varieties are more tolerant of adverse conditions and produce higher yields than older varieties when planted early.

Figure 1. Planting Date Effects on the Soybean Canopy



Source: Dr. James Specht, University of Nebraska

Risks

The primary risk of early-planting is that emerged bean plants will be damaged by freezing temperatures as the growing point is exposed and vulnerable when the cotyledons emerge. This risk is mitigated to some degree by the fact that germination and emergence are delayed under cooler soil temperatures. Soybean tissue is also more resistant to freezing temperatures than corn tissue. Typically, temperatures must reach 29 degrees F for damage to occur.

Another risk to consider when planting early is poor germination and emergence. When soils are cold, beans take longer to emerge increasing their exposure to soil-borne diseases such as pythium and insect feeding. If the beans were planted into extremely cold soils or get a cold rain right after planting there is also the risk of chilling injury. Researchers in Ontario demonstrated that soybean seed can be vulnerable to injury from cold soil temperatures during the first 6 to

24 hours after planting. In lab experiments, soybean stands were reduced when the soil temperature was maintained at 45 degrees F during the first 20 hours after planting. This was true even when the soil was warmed up to 75 degrees for the next 17 days. Field experience has shown that chilling injury can reduce germination especially when a cold rain immediately follows planting.

Early-planted soybeans that emerge uniformly and escape freeze injury also have a higher probability of experiencing damage from bean leaf beetles and sudden death syndrome than soybeans planted later in the season.

Recommendations

If you decide to plant soybeans in the last week of April, consider the following recommendations.

- Don't plant unless the soil is dry enough to support equipment and allow planting equipment to operate properly. Soil and sidewall compaction will haunt you the remainder of the growing season.
- Treat the seed with Apron® or Allegience® fungicides to protect the seedlings from the soil-borne pathogen pythium.
- Till the field or clear the residue away from the row to allow the soil to warm up faster and reduce the likelihood of freeze damage to emerged seedlings.
- Plant in fields at higher elevations having good air drainage to reduce the likelihood of frost/freeze injury to emerged plants.
- Plant only the highest quality seed as overly dry seed or seed having damaged seed coats will take in soil moisture more rapidly, increasing the likelihood for chilling injury to occur.
- If possible, plant when the soil temperatures are expected to be above 50 degrees F for the first 6 to 24 hours following planting. If you must plant into cold soils, consider waiting until early afternoon to begin planting to allow the soil to warm.
- Consider planting slightly shallower if soil moisture is available and planting equipment is providing uniform depth control and good seed-to-soil contact. Never plant less than 3/4" deep.
- Consider increasing seeding rates by 10% when planting into cool soils.
- Reduce the potential for SDS by planting into well-drained soils that are free from compaction and using SDS tolerant varieties.
- Consider planting seed treated with an insecticide registered for bean leaf beetle if damage is expected.

This fact sheet was originally produced by the Soybean 2010 project and will be updated as needed by its successor, the Soybean Management and Research Technology (SMaRT) program. The SMaRT program was developed to help Michigan growers increase soybean yields and farm profitability. Funding for SMaRT is provided by MSU Extension and the Michigan Soybean Promotion Committee. Additional information about increasing soybean yields and profitability can be found online at: http://www.michigansoybean.org.

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