



SOYBEAN FACTS

February 2010

Diagnosing Soybean Emergence Problems

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Early detection and diagnosis of soybean emergence problems is always important to achieving high yields. However, early season-scouting is even more important in years when seed quality is reduced. Determining the reasons for poor emergence enables you to minimize yield losses by taking prompt corrective actions such as rotary hoeing or replanting if necessary. Soybean emergence ranges from 6 days under ideal conditions to 18 days under more challenging soil conditions. Conditions that can lead to delayed or uneven emergence include:

- cold soil temperatures
- excess soil moisture
- inadequate soil moisture
- soil crusting
- improper seeding depth or uniformity
- poor seed-to-soil contact
- insect feeding
- disease infestations

If slow or uneven emergence occurs, dig up the seeds or seedlings and inspect them for signs of disease or insect damage to the root, hypocotyl or cotyledons.

The major insect pests affecting seedling emergence are seedcorn maggots, white grubs and wireworms. Seed corn maggot adults lay their eggs in fields where manure, cover crops or weeds have been incorporated into the soil within the past two weeks. If seedcorn maggots have reduced the stand to an unacceptable level, replanting should correct the problem as the decaying organic material that lured the adults to the field should no longer be attractive two weeks after incorporation. Seed treatments containing

imidacloprid or thiamethoxam will provide additional protection from seedcorn maggots. If wireworms or white grubs are responsible for unacceptable stands, the seed will need to be treated with thiamethoxam prior to replanting.

Phytophthora, *Pythium*, *Rhizoctonia* and *Fusarium* are the soil-borne diseases most likely to damage germinating soybean seed. *Fusarium* spp. are present over a wide range of temperatures and may not kill seed outright, but may cause stunting and root rots later on. *Pythium* is more likely to create problems under cool, wet soil conditions. *Pythium* is prevalent in southwest Michigan soils and damage is likely when soil temperatures are cool and a heavy rain occurs within 24 hours after planting. Affected plants will have swollen and bent hypocotyls. Replanting with seed treated with mefanoxam or metalaxyl or waiting until the soil temperatures exceed 60 degrees should result in satisfactory emergence. Warmer temperatures (75-89 °F) and drier conditions favor *Rhizoctonia*. *Phytophthora* is favored by poorly drained soils and warmer temperatures (68-77 °F). If seedlings emerged from the soil but died quickly, *Phytophthora* is a likely suspect. Replant with varieties having specific race resistance or seed treated with mefanoxam at 0.64 fl oz per cwt.

If no insect feeding or disease symptoms/lesions are present, determine if the surface of the soil has developed a crust. If a crust exists, consider using a rotary hoe to break up the crust. To prevent damage to emerging seedlings, avoid rotary hoeing when the plants are in the "crook" stage and for three days after this brittle stage



Program paid for by Michigan soybean producers through the soybean checkoff.
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References:

occurs. Large soybean seed is more likely to experience emergence problems in crusted soils than small soybean seed due to the larger cotyledons. Soybeans planted in 30" rows are more likely to emerge from crusted soils than beans planted in narrow rows as the closer seed spacing enables the emerging seedlings to crack the crust.

If crusting is not the problem, determine if the planting depth is correct (1 to 1.5 inches deep) and uniform and check to see that soil is firmed around the seeds. Some varieties may not emerge well when planted at depths of 2" or more. If serious planting problems are found and the stand is inadequate, the field will need to be replanted.

If no planting problems are detected, and the seeds/seedlings look healthy, inadequate soil moisture is the likely cause of the delayed emergence. Wait until a rain occurs and recheck the field.

When deciding if replanting is warranted, always compare the yield potential of the existing stand to that of the replanted stand and account for all replanting costs. Also consider the following information when making replant decisions:

- yield losses of 0.4 of a bushel per acre per day have been shown to occur when planting is delayed after May 8.
- uniform stands of 100,000 plants per acre in narrow rows and 80,000 plants per acre in 28 and 30 inch rows have the potential to produce good yields
- seed for high-yielding varieties may not be available for replanting

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>.

D. Brown-Rytlewski, C. DiFonzo, M. Jewett, W. Kirk and F. Warner. "Insect, Nematode and Disease Control in Michigan Field Crops", 2008.

N. Koval, P. Esker, C. Grau. "Soybean Disease Diagnosis at Emergence and Seedling Growth Stages". Wisconsin Crop Manager, May 8, 2008.

D. Reynolds and B. Potter. "Cold Wet Soils and Soybean Emergence", University of Minnesota, May 24, 2001.

J. Beuerlein. "The Soybean in Ohio". Extension bulletin # 741.