

Cool, Wet Soils Will Hurt Soybean Seed Germination

Short soybean seed supply increases need for good planting practices to avoid replanting

COLUMBIA, MO.

Cool, wet soils can cause extra hazards to soybean seed being planted this spring. Caution should be taken at planting time to assure good stands, said a University of Missouri Extension agronomist.

“Bad things can happen to good seed,” said Bill Wiebold, MU soybean specialist. “Worse things happen to poor-quality seed.”

Extra precautions may be needed this year to avoid a need for replanting, Wiebold said. “With a short seed supply and high demand for seed for increased soybean acreage, there may be a short supply of elite seed available for replant.”

There may be a temptation to plant too early, Wiebold said. “Problems increase if seed is planted in soils below 50°F in temperature and soils that are waterlogged.”

Poor conditions can slow plant growth. Seed in the ground begins to expend stored reserves to cause cell expansion and division. Under ideal conditions, the plants emerge quickly, reducing risks to the seed.

Water is necessary for germination, Wiebold said. However, too much water, which enters through cracks in the seed coating, can lead to over-absorption. This becomes a bigger problem if conditions are not right for rapid germination.

As seeds soak up water, they expand. “Water absorbed too quickly can cause cell walls to rupture,” Wiebold said. “That can cause cell death. An intact seed coat slows water absorption.”

Gentle handling of seed helps reduce cracks, chips and other damage that can hurt germination. “Seeds not handled carefully during harvest, storage and transport are likely to contain cracks that are invisible to the human eye,” Wiebold said. “Those cracks cause problems during germination.”

Every commercial seed supply contains a tag giving details on seed quality. However, germination percentages obtained in the lab may be higher than those achieved under field conditions. While seed companies sell high-quality seed, there may be pressure to lower standards

to meet the demand, Wiebold said.

High water content in the soil can be associated with colder temperatures but also lower oxygen levels in the soil. “Water in soil pores excludes oxygen needed for seedling growth,” Wiebold said. “Initial water absorption by seeds is not dependent on oxygen. Even dead seeds can absorb water.

“Once water content exceeds 50 percent, continued absorption depends on energy released by the seed respiration rate,” he said. When growth starts, oxygen demand increases rapidly. That oxygen must come from air in soil pores.

Delaying planting until conditions are suitable for quick germination and growth will improve the success rate and help avoid expense of replant.

There are added hazards awaiting slow-to-germinate seed.

When seeds germinate, the cells release sugars into the surrounding soil. Pathogens in the soil can use energy from the sugars to multiply and invade the seed. That leakage of sugars is more likely with low-quality or cracked seed, Wiebold said.

“I don’t usually recommend treating seeds with fungicides,” Wiebold said. “This may be a year to use seed treatments, both fungicides and insecticides, to assure a better stand.”

Selecting high-quality seed, delaying planting until soils are ready, treating the seed, and careful handling of seeds during planting help ensure a good stand.

Every detail in the operation affects a successful planting. Now, more than ever, careful attention can pay off.

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