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The 2024 soybean growing season is concluding with significant industrial quality issues in southeast Missouri. Problems began after the outer bands of Hurricane Helene brought heavy rainfall, overcast skies, temperatures in the upper 60°F, and prolonged moisture to the area. These conditions halted harvest operations, leaving mature soybeans exposed to excess moisture for up to 10 days.

For many farmers in the region, the wet weather compounded an already difficult growing season following an abnormally dry weather from August to late September. Across multiple counties, the late-season water deficit exceeded 6 inches, placing many of them in a moderate to severe drought, according to the US Drought Monitor System.

Even before Hurricane Helene struck, low test weights were anticipated due to the drought affecting soybean seed filling, as predicted by the University of Missouri's Soybean Growth and Yield tool. However, seed deterioration and other quality issues only became apparent after the storm.

Farmers initially observed seed sprouting in the pods as the first sign of damage. As air moisture receded and temperatures rose, small, deformed seeds with brown to greyish discoloration were left behind. While shattering is common, the damage extends beyond open pods. Farmers also report easily peeled seed hulls and cracks in pod walls. Additionally, plants retained green stems and leaves, despite the pods being fully mature. The issue appeared indiscriminate of maturity groups or seed brands.

Mature seeds exposed to standing water for an extended period absorbed moisture from the hurricane, swelling as they would during the early stages of germination. However, because the seeds were already undersized from drought conditions, this swelling caused hulls to rupture. Once damaged, the seeds became more vulnerable to rapid cycles of wetting and drying, leaving the cotyledons exposed to weather-related deterioration and opportunistic microorganisms. Other hypotheses are also being considered. Damaged seed samples have been sent to a phytopathology lab to investigate any unusual microorganisms contributing to the issue.

The United Soybean Board, with support from the Missouri Merchandise Council, has already approved a multi-state research project led by Dr. Laura Lindsay from Ohio State University to investigate management strategies for mitigating seed quality deterioration. The University of Missouri's Soybean Farming System is part of the project and will conduct field trials in the southeast region during the 2025 season.

In spite of the follow-up actions, the problem is pressing. Farmers are being heavily docked at the elevator, further aggravating the already low commodity prices. The impact of the 2024 season may still affect seed availability for the 2025 growing season.



Figure 1. Foto credits: Blake Barlow - MSMC