impact

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Sustainable alternatives to fumigation reduce potato early die risk

AT A GLANCE

University of Idaho trials and diagnostics show that combining soil testing, tolerant potato varieties and targeted fungicide programs can reduce potato early die pressure, lowering reliance on soil fumigation.

The Situation

Potato early die is a chronic production constraint in many Idaho fields. It can lower yield and tuber quality, cause premature vine senescence and complicate decisions around rotations and soil treatments.

Historically, some growers have relied on fumigation to manage soilborne contributors to early die. Fumigation can be costly, logistically challenging and increasingly difficult to fit within sustainability goals and evolving regulatory and market expectations. Growers need field-proven alternatives that reduce risk while maintaining productivity.

Our Response

With a Specialty Crops Block Grant from the Idaho State Department of Agriculture (ISDA), University of Idaho researchers evaluated integrated, non-fumigant strategies for potato early die management.

The project combined three core approaches. First, surveys and diagnostics determined which causal agents were present in commercial fields. Second, variety trials identified cultivars with increased tolerance to early die. Third, variety-by-fungicide trials tested new biopesticides and fungicides to identify programs that reduce symptoms and protect yield.



Associate Professor Phillip Wharton presenting data from this project at the 2025 Aberdeen Field Day.

A key deliverable was decision support based on soil testing. Soil testing for early die risk, including detection of *Verticillium dahliae* and associated risk analysis, is now available through the University of Idaho Parma diagnostic lab. Results can be paired with variety selection and targeted fungicide recommendations, giving growers a practical, more sustainable alternative to fumigation.

Program Outcomes

Project results provide growers with actionable, integrated options to manage potato early die without routine fumigation. Outcomes include the following:

- Surveyed 12 grower fields over two years, plus research plots at University of Idaho's Aberdeen

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Research and Extension Center and the Parma Research and Extension Center, to document early die causal agents.

- Confirmed that multiple pathogens commonly occur in Idaho fields with early die symptoms, including *Verticillium dahliae*, *Colletotrichum coccodes* and Botrytis cinerea.
- Identified potato varieties with increased tolerance to early die in trials at U of I Parma center.
- Completed two variety-by-fungicide trials at U of I Aberdeen center, identifying several fungicides that reduced early die symptoms and increased yield by up to 12%.
- Launched soil testing with risk indicators for early die at the U of I Parma diagnostic lab in 2025, enabling growers to assess field risk and choose variety and fungicide options accordingly, with greater than 200 fields tested to date.
- Expanded grower outreach, reaching 291 participants at the Idaho Potato Conference in January 2025, plus 150 attendees at the U of I Parma field day and 25 at the U of I Aberdeen field day in August 2025.
- Shared results with growers at the 2026 Idaho Potato Conference and at the 2026 U of I's Parma and Aberdeen field days.
- Documented early adoption intent; three cooperating growers reported plans to adopt project practices, including using effective fungicides for early die rather than fumigation.
- Developed a peer-reviewed, diagnostic guide published in Plant Health Progress (https://doi.org/10.1094/PHP-09-25-0231-DG).

The Future

Next steps include expanding diagnostic capacity, refining integrated recommendations across varieties and production environments, and continuing to reduce reliance on fumigation through practical, data-driven risk management.

Cooperators and Co-Sponsors

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FOR MORE INFORMATION

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