impact

University of Idaho Extension programs that are making a difference in Idaho.

Calibrated soil pH buffer tests to simplify eastern Idaho liming recommendations

AT A GLANCE

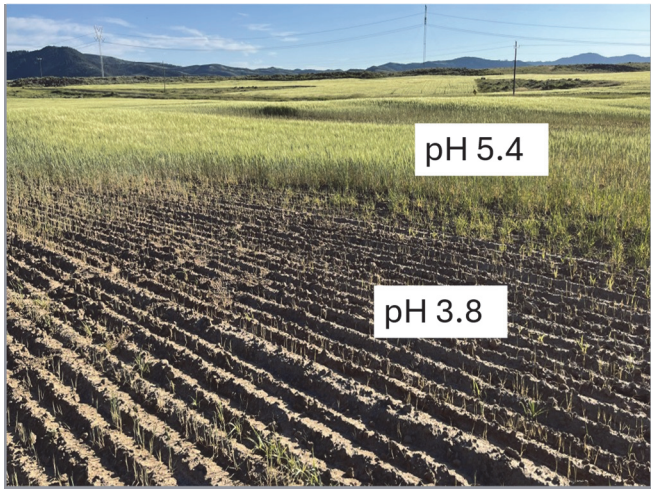
Calibrated soil buffer tests and PCC-specific lime recommendations help producers combat soil acidification, boost crop yields and maintain long-term farm productivity.

The Situation

Soil pH is a critical factor in agricultural productivity as it significantly impacts nutrient availability, weed and disease pressures, pesticide efficacy, and the yield and quality of crops. Soil acidification is becoming a serious issue in eastern and northern Idaho and other parts of the western United States. In Fremont, Caribou, Bonneville and Oneida counties, approximately 250 square miles (160,000 acres) of agricultural soils are acid-affected.

Farmers, particularly dryland barley and wheat producers in Fremont and Caribou counties, have reported gradual declines in soil pH, reduced crop productivity and increased weed pressure. To address these challenges, producers in eastern Idaho have experimented with precipitated calcium carbonate (PCC), also known as spent sugar beet lime. PCC is readily available, has a fine particle size (enhancing reactivity), contains 75-78% calcium carbonate equivalent, and includes organic matter and macro and micronutrients.

Producers have expressed a need for research-based guidance on PCC application rates, its reactivity in neutralizing soil pH and the longevity of its effects. They also need calibrated soil buffer tests specific to Eastern Idaho soils to give accurate lime rate recommendations and aid in developing variable lime rate applications.



A dryland field in Caribou County illustrating how severely acidic soils limit barley growth.

Our Response

University of Idaho Extension secured funding from the Idaho Wheat Commission, the Idaho Barley Commission and Western Sustainable Agriculture Research and Education. We partnered with nine producers in Ashton, Swan Valley and Soda Springs to establish on-farm strip trials to evaluate PCC applied at 0, 2, 4 and 6 tons per acre. We also collected acidic soils from 36 fields across eastern and northern Idaho and conducted lime requirement assessments to develop calibrated soil buffer test recommendations. Information from these studies was shared with producers and

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professionals at the 2026 Eastern Idaho Cereal Conference.

Program Outcomes

The Cereal School presentation made a significant impact on the participants by providing them with valuable insights and practical knowledge about liming acidic Eastern Idaho soils. The information about the on-farm field trial results, chemical and physical properties of PCC, and calibrated Sikora buffer test lime requirements provided participants with actionable information to improve cost-efficiency and effectiveness of lime recommendations.

One hundred percent of participants who filled out surveys (11 of 25 total attendees, 44% response rate) reported increased knowledge and confidence related to remediating acidic soils. The question-and-answer portion of the presentation facilitated the exchange of knowledge between Extension and participants, fostering a collaborative environment of shared learning.

- Within the next 12 months, 45% of the surveyed producers indicated that they would adopt one or more practices; 55% would increase their networking with other producers; and 36% would increase the diversification of their operations.
- Within the next 12 months, 64% of surveyed professionals indicated that they would make project resources available to producers and improve the advice/counsel they give to producers.
- Participants indicated that they would share information from this presentation with at least 48 other individuals within the next 12 months.

The Future

We anticipate publishing an Extension bulletin with the new Sikora buffer test lime requirements for Eastern Idaho soils within the next year. We will also continue to investigate yields and soil pH changes in our field studies over the coming years. The research team will continue to engage with stakeholders at annual field days and cereal schools to provide updates, gather feedback and adapt the studies to address emerging needs.

Cooperators and Co-Sponsors

- Idaho Wheat Commission
- Idaho Barley Commission
- Western Sustainable Agriculture Research and Education (Award number 2022-38640-37490 project OW-23-382)

FOR MORE INFORMATION

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