

## Malt barley yield and grain metabolite response to nitrogen and sulfur

### AT A GLANCE

Farmers learn about the potential risk to barley yield and malt quality if nitrogen and sulfur are insufficient for plant nutrition.

### The Situation

Nitrogen (N) and sulfur (S) are critical nutrients for producing high-quality malt barley but can be difficult to manage in semi-arid production systems where rainfall and, periodically, irrigation is variable. High spring precipitation or excessive irrigation events can favor N and S leaching reducing yield and grain quality. However, fertilizer sources and other additives such as urease inhibitors, nitrification inhibitors, and controlled-release products may improve N availability. Recent research by Jared Spackman found that irrigated spring barley is highly responsive to N fertilizer but does not respond to S fertilizer when irrigated with water derived from the Snake River because of its high sulfate-S content. However, producers outside of the Snake River plain regularly observe yield responses to S additions. The question is how much supplemental S should be supplied to meet barley S demand for crop development and productivity.

### Our Response

To give producers current and relevant N and S fertility recommendations, Spackman has collaborated with University of Idaho Extension educators and farmers to host barley fertility trials and field days in locations



Farmers examine barley nitrogen and sulfur fertility plot trials with Jared Spackman and Grant Loomis.

outside of the Snake River Plain where S response is likely.

### Program Outcomes

As of July 31, over 68 individuals have participated in field days throughout south-central and southeastern Idaho (Bellevue, Rupert, Aberdeen, Idaho Falls, Teton, and Soda Springs) to learn more about N and S management and to observe the differences in treatments. Those who have come to the field days are from a wide variety of audiences including young adults, senior citizens, males, females, and individuals with varying levels of agricultural experience. Survey data from those who have attended indicated the following results.

- Participants in attendance indicated in the post-survey that 100% either agreed or strongly agreed that attending the field day provided information that met audience needs.
- Several participants expressed that they would like to continue to see this type of research over several more years to ensure the results are timely and reproducible.
- One participant stated that he was getting tired of attending University of Idaho field days because the information no longer seemed to apply to him. He almost did not attend the field day in Soda Springs. However, he expressed great interest in the fertility study and repeatedly exclaimed “This is exactly the type of research and demonstration plots that we need here! After the field day, I am going to get my dad and bring him out here to see this!”

Grower engagement fosters meaningful relationships between University of Idaho Extension and helps to direct our research and outreach efforts. Through grower listening sessions and engaging with small grain producers, it was identified that fertility studies are

important topics to research and educate on. Growers who attended these field days felt that their concerns were important to the University of Idaho Extension.

### The Future

Spackman was approached by Sarah Whitcomb from the USDA ARS Cereal Crops Research Unit in Madison, Wisconsin. Whitcomb researched how nutrient management, especially S management, affects metabolite production in malt barley and how these metabolites may affect the final sensory experience felt by the consumer. Whitcomb will analyze the grain collected from these studies to see if S fertilizer source or application rate impact metabolite production. Further, this study and its associated field days will be repeated for two more years at locations outside the Snake River Plain.

### Cooperators and Co-Sponsors

The research projects and field days were financially or logistically supported by the Idaho Barley Commission, the American Malt Barley Association, and farmer collaborators in Soda Springs and Bellevue.

## FOR MORE INFORMATION

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