

Idaho Innovators

Giving grain farmers better tools

By BRAD CARLSON
Capital Press

University of Idaho cereal researcher Juliet Marshall studies the environment as much as wheat and barley varieties.

“The varieties that were adapted 30 years ago aren’t necessarily adapted now,” the Idaho Falls-based plant pathologist said. “The environment is not static and the diseases that are circulating are not static. We have new strains of fungal pathogens that change and viral pathogen strains that change.”

Warmer weather, for example, benefits corn. As farmers grow more of that high-water crop, fungi that cause disease in wheat and barley will proliferate.

“Fusarium head blight is one of the bigger ones that is a problem as a result of higher corn production,” Marshall said. Barley yellow dwarf is another. The aphid-vectored virus can build up on corn and move to fall-planted wheat and barley.

She is among the researchers collaborating to develop better ways to control fusarium head blight, which produces a fungus-derived toxin that accumulates on grain. The project with the U.S. Wheat and Barley Scab Initiative has received federal funding.

Marshall said researchers are screening wheat and barley varieties for resistance, and are working to identify the best fungicides to apply as well as the best timing of application.

She said a recently tested fungicide can be applied over a longer period and still reduce the disease and toxin, “so it improves our ability to control the disease. A lot of previous fungicides had a very, very narrow window.”

While rain often gets strong consideration in Midwestern studies of fusarium head blight, Idaho work by Marshall and her colleagues focuses much



University of Idaho plant pathologist and cereals researcher Juliet Marshall is focused on wheat and barley yield, quality and disease resistance.

more on humidity and temperature — particularly evening temperatures that are favorable for the fungus to infect plants.

Unusually warm summer nights factored into the disease appearing in this year’s Idaho barley crop farther north and at higher elevations than usual, she said.

“The more warm nights that we have at flowering, the higher the chances of infection,” Marshall said.

She is also working with UI colleagues to identify the pathogen faster using molecular techniques. That could help reduce spread by optimizing fungicide application amounts and timing, she said.

As for barley yellow dwarf, “the difficulty in reducing virus transmission from aphids is complicated when our dryland

producers have to plant when moisture is available,” Marshall said. Rains came in early this August, as corn continued to grow, “and the aphids prefer the newly planted wheat and barley seedlings over aging corn — increasing the likelihood of transferring the virus.”

Many new cereal varieties are being introduced. Field trials seek to identify disease resistance and yield characteristics suited to a production location while “keeping the quality that the end users really want from those varieties,” she said. Baking, milling or brewing standards must be met, for example.

“It’s key for our producers to know that there are new varieties out there that will be more economically beneficial and sustainable to them,” Marshall said.

Variety trials also benefit seed companies by comparing a new release to an industry standard.

JULIET MARSHALL

Occupation: University of Idaho plant pathologist, professor, head of Plant Sciences Department. Based at UI Idaho Falls Research and Extension Center.

Education: B.S., M.S., University of Delaware, Newark; Ph.D., University of Illinois, Urbana-Champaign.

Age: 57

Home: Idaho Falls

Family: Husband Bill Clark, a commercial wheat and barley breeder. Two adult children.

Hobbies: Gardening, travel, camping.

Idaho’s wheat and barley commissions, farmers, crop consultants, breeders and other researchers all support her work.

“I have a lot of collaborators,” Marshall said. “The first people who benefit are the stakeholders — cereal producers in the area.”

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