



Barley 'Mesa' - Russian Wheat Aphid Resistance

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Russian wheat aphid (RWA) infestation is a serious constraint to winter barley (*Hordeum vulgare*) production in the western U.S. An Iranian landrace with RWA resistance was crossed to the adapted U.S. cultivar 'Schuyler', and resistant plants were evaluated in field trials. 'Mesa' was the superior line in those trials and was released for production in 2017. Mesa, a 6-rowed winter habit feed barley, is classified as highly resistant to RWA and yields as well as its parent Schuyler, both in the presence and absence of RWA pressure.



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Winter barley close to harvest.

PROJECT GOALS

- ✓ Develop a 6-rowed winter barley with competitive yield and a high level of resistance to multiple RWA biotypes

Problems Addressed

Following its introduction in 1986, RWA spread rapidly in the western U.S., resulting in reduced grain yield and quality for barley and wheat. Winter barley had previously been grown as a feed crop and an important rotation crop with wheat, but its production declined drastically from susceptibility to RWA. The RWA problem became more complicated with the appearance of new biotypes of the insect. While USDA scientists had already developed resistant spring barleys, there was still need for commercially viable winter barley with high yield and the ability to withstand RWA infestations.

Solutions Developed

USDA researchers in Stillwater, Oklahoma crossed the resistant but unadapted barley germplasm line R017 to the high-yielding cultivar Schuyler, followed by three backcrosses. After each backcross, plants were screened for resistance and only resistant plants were used for the next backcross. 171 resistant lines were identified and evaluated in Colorado and Idaho for agronomic adaptation and yield performance. Mesa was chosen for release based on its grain yield equal to that of Schuyler as well as its high level of resistance to several U.S. and world RWA biotypes.



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