

Practical screening method from USDA to speed up scab-resistant wheat breeding

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Individual kernels of wheat and barley can be quickly evaluated for resistance to a damaging scab disease by using near infrared light (NIR) technology, according to a U.S. Department of Agriculture (USDA) study conducted in support of a program to safeguard these valuable grain crops.

NIR light is partially absorbed by the kernels, creating a type of "fingerprint" scientists can use to detect fusarium head blight, also known as "scab," or its related mycotoxin, called deoxynivalenol, in single kernels of wheat or barley, according to engineer Floyd Dowell, with USDA's Agricultural Research Service (ARS). ARS is USDA's chief intramural scientific research agency, and Dowell works at the agency's Center for Grain and Animal Health Research in Manhattan, Kan.

Scab is a fungus that causes yield losses in wheat and barley. The ability to detect--in single kernels of wheat--the fungus or the [toxin](#) it produces will help breeders rapidly and objectively evaluate new [wheat](#) lines and select for resistance to the fungus or its toxin.

Dowell and colleagues measured NIR absorption values of pure deoxynivalenol and kernels with and without the toxin or [fungus](#). This information was used to improve near-infrared calibrations used to sort single [kernels](#) based on scab infection or deoxynivalenol levels.

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