Research finds how to increase wheat yield during drought in rainfed environments

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Farmers in climates where late-season drought occurs frequently may be able to increase wheat yield, according to research from The University of Western Australia.

Researchers investigated the use of film-forming antitranspirants, which are emulsions of wax or latex that reduce water loss through transpiration, by forming a thin film on foliage.

Araz Abdullah, a northern Iraqi student from UWA's School of Plant Biology and Institute of Agriculture, conducted the research as part of his Master of Science (Agriculture) studies at UWA.

He said in Mediterranean-type environments grain yield was limited by the amount of water available for transpiration especially during the grain filling period.

"The research showed that by applying the film-forming antitranspirants during booting, the most drought-sensitive stage in wheat development, the adverse effects of late-season drought on wheat growth and yield were alleviated," Mr Abdullah said.

Two experiments were conducted in a temperature-controlled glasshouse at UWA to compare well-watered and water deficit watering treatments, with antitranspirants sprayed before booting, before flowering was complete, or not at all.

Grain yield was improved in drought-stressed plants where the antitranspirants had been applied prior to the boot stage.

UWA Supervisor and Project leader Professor Kadambot Siddique said the application of film-forming antitranspirants could restrict photosynthesis and limit growth, but that the new research showed that reducing water loss during booting in wheat development outweighed any photosynthetic limitations.

"The current research showed the antitranspirant application at the booting stage increased grain yield in drought-stressed wheat plants by increasing grain set and this outweighed any photosynthetic limitations," Professor Siddique said.

"Antitranspirant application may have a significant positive impact on crop yields and priority should be given to testing the wider applicability of these results, especially under field conditions in rainfed environments."

The findings from this research were published in a paper entitled "Film antitranspirants increase yield in drought stressed wheat plants by maintaining high grain number" in *Agricultural Water Management*.

More information: "Film antitranspirants increase yield in drought stressed wheat plants by maintaining high grain number," *Agricultural Water Management*, Volume 159, September 2015, Pages 11-18, ISSN 0378-3774, dx.doi.org/10.1016/j.agwat.2015.05.018

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