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Yield enhancement of droughted wheat by film antitranspirant application: rationale and evidence

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ABSTRACT

Extensive research in the 20th century explored the potential for mitigation of drought by applying polymers (film antitranspirants) to leaves to reduce water loss. It was concluded that film antitranspirants are of limited usefulness, since the polymers reduced photosynthesis (in addition to transpiration) and this was assumed to be detrimental to growth and yield. We propose, however, that irrespective of reduced assimilate availability from photosynthesis, the most drought sensitive stage of yield formation in wheat may respond positively to antitranspirant application. Six field experiments involved applying the film antitranspirant di-1-p-menthene at five development stages and 10 soil moisture deficits (SMD) in total over three years. Yield was reduced when the film antitranspirant was applied at development stages less-sensitive to drought, from inflorescence emergence to anthesis, consistent with the conclusions from previous research. In contrast, yield was increased when the film antitranspirant was applied at flag leaf stage, just before the stage most sensitive to drought (boot stage). These results show that film antitranspirant has the potential to mitigate drought effects on yield of wheat.

KEYWORDS

Di-1-p-Menthene; Triticum Aestivum; Water Deficit

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