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Temporal water use varies with osmotic potential

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New research in Crop Science tracks the dynamics of water use of maize plants differing in solute accumulation over time. Source: Adobe Stock/lonelV.

In plants, solute accumulation of both sugars and ions has long been studied as a possible mechanism to increase crop drought tolerance. However, yields in response to solute accumulation have been highly variable.

In an article recently published in *Crop Science*, researchers examined the basis for these inconsistent results by tracking the dynamics of water use of maize plants differing in solute accumulation over time. In the initial phase of water use, just as the soil dried, a maize line accumulating solute transpired water more rapidly than the line not accumulating solute. Consequently, the soil dried faster in areas planted with the solute-accumulating line. The solute-accumulating line also reached a point where transpiration was less than that of the line not accumulating solute. In fact, extraction of soil water by the line not accumulating solute lasted several days longer than the line accumulating solute.

The team found that the impact of solute accumulation depended on the rate and duration of soil water extraction. Solute-accumulating plants have an advantage in a moderate water deficit, but the plants not accumulating solutes have the advantage when water deficits are more severe.

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Beseli, A.L., Shekoofa, A., Ali, M., & Sinclair, T.R. (2020). Temporal water use by two maize lines differing in leaf osmotic potential. *Crop Science*, 60.

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