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Leaf water flow capacity varies among maize lines

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Dr. Nahid Jafarikouhini preparing leaves for observations of rate of stomata opening following leaf excision under water. Photo by Jennifer Howard, North Carolina State University.

Drought is a common problem in maize production and is expected to occur more frequently with climate change. Drought impact could be minimized by developing plants that conserve soil water during periods when there are high vapor pressure gradients between leaves and the atmosphere. Commonly, this would mean partial stomata closure during the midday to decrease transpiration rate. While varieties of maize have been identified that express this water conservation trait, the basis for this response to guide plant breeding efforts is unknown.

A new *Crop Science* article reports studies on the possibility of limited water flow capacity in leaves resulting in the water conservation response. Two sets of experiments were reported: (1) visual observations of stomata opening rate when leaves were supplied with water, and (2) transpiration rate of leaves after being supplied with silver ions, which could inhibit transpiration rate.

These two responses correlated among maize varieties. However, neither of these measures of leaf water flow capacity consistently correlated with the water conservation response. These results indicate that the basis of the water conservation trait likely resides in the roots and the water flow capacity of roots should be the focus for plant improvement for drought conditions.

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Jafarikouhini, N., Sinclair, T.R., & Resende, M.F. Jr. (2022). Comparison of water flow capacity in leaves among sweet corn genotypes as basis for plant transpiration

rate sensitivity to vapor pressure deficit. *Crop Science*.

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