Science Societies

Reducing nitrate leaching from potato production

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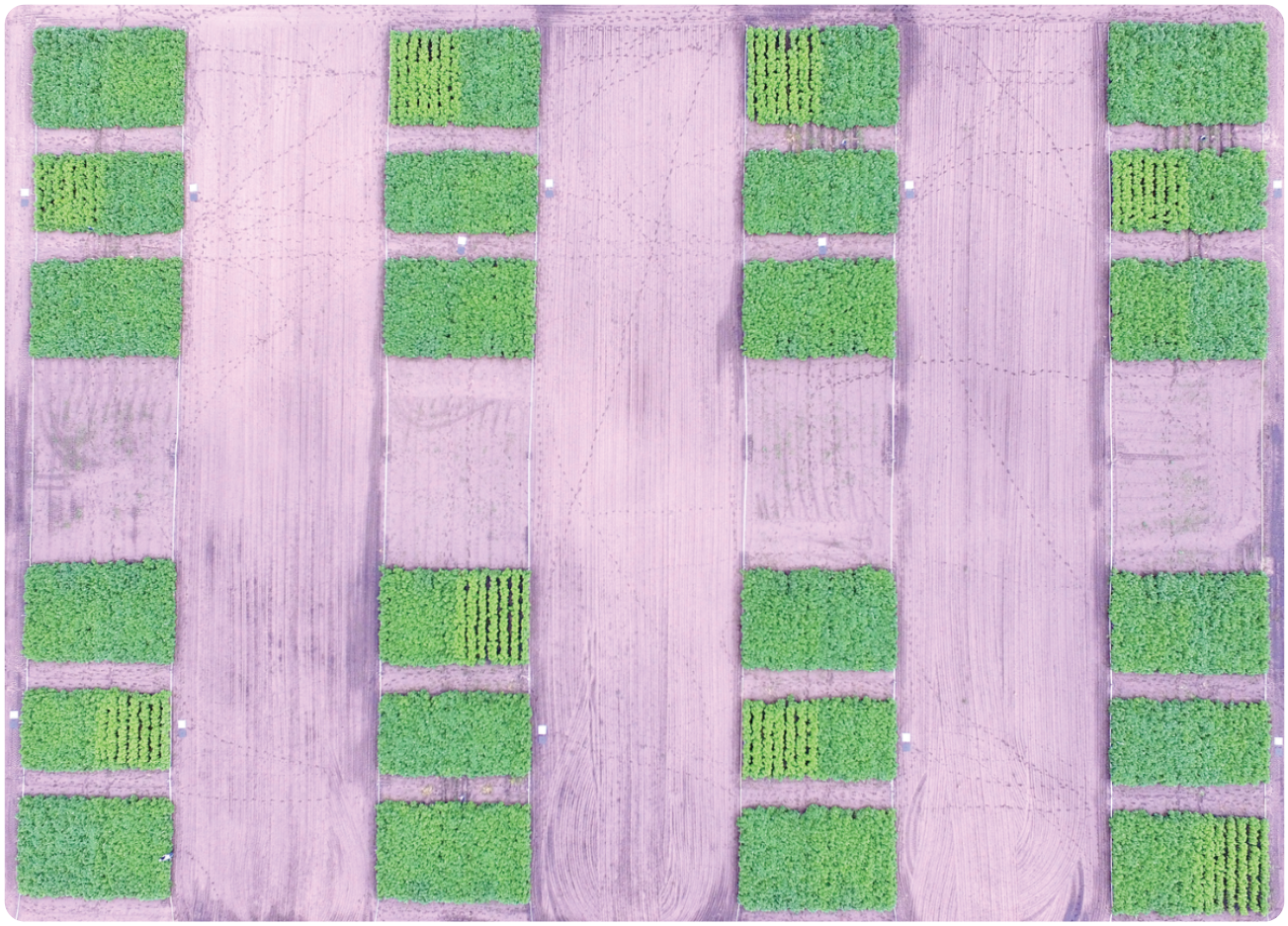

Aerial image of the study plots showing visible differences in crop N status resulting from imposed N treatments. Photo by Tyler Nigon.

In the April 2020 issue of CSA News magazine, p. 19, we ran an science summary titled, “Social Factors Constrain Efforts to Reduce Tile Nitrate Losses” (see https://doi.org/10.1002/csan.20103). The article title and text were incorrect. The correct summary is published on this page (https://doi.org/10.1002/csan.20160). We regret the error.

Nitrogen (N) loss from cropping systems has important environmental implications, including contamination of drinking water with nitrate. Nitrogen best management practices (BMPs) have reduced nitrate leaching in irrigated agriculture, but further reductions are necessary to better protect drinking water.

In a recent *Journal of Environmental Quality* article, researchers studied nitrate leaching in potatoes grown on sandy soil with variable-rate nitrogen (VRN) and reduced irrigation.

Reducing N rate by 8 and 16% in 2016 and 2017, respectively, for the VRN treatment had no effect on nitrate leaching relative to conventional N BMPs. Environmental factors such as precipitation and soil N mineralization were major drivers of nitrate leaching. Averaged across treatments, flow-weighted nitrate N concentration in 2017 was 12.8 mg N L^{-1} compared with 5.6 mg N L^{-1} in 2016. Because impacts of environmental factors on leaching cannot be mitigated by N BMPs alone, changes in

other management practices, including irrigation, are necessary to reduce N losses. In this study, reducing irrigation rate by 15% decreased nitrate leaching load by 17% through reduced percolation without affecting yield.

Supplementing N BMPs with better irrigation management and other additional practices is necessary to achieve water quality goals.

Dig Deeper

Bohman, B.J., Rosen, C.J., & Mulla, D.J. (2020). Impact of variable rate nitrogen and reduced irrigation management on nitrate leaching for potato. *Journal of Environmental Quality*, *49*, 281–291. **https://doi.org/10.1002/jeq2.20028**

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