Science Societies

Mapping post-harvest weeds with drones sheds light on management practices

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University of Delaware graduate student Jamie Taraila (left) and first author Jarrod Miller evaluate research plots to perform multispectral drone imagery. Photo by Michele Walfred.

Agriculture researchers typically use drones *during* the growing season to measure how management practices affect growth and yields. But drones can also be used to great effect *after* harvest as authors of a new *Agricultural & Environmental Letters* article demonstrated when they flew drones to map winter weed growth and shed light on its association to corn yields.

After completing 10 in-season research projects examining fertility, cover crops, and other questions, they flew drones during the two weeks before and the two weeks after harvest to calculate the presence of vegetation using the normalized difference vegetation index (NDVI). They then examined the correlations between those measurements and the in-season studies.

For all 10 studies, the team found positive correlations between yield and NDVI measured at corn maturity, but some relationships reversed following harvest. For studies with excess nitrogen fertility, post-harvest NDVI (measuring weed biomass) shared positive correlations to plot yields. But in other studies, including one on rye cover protecting corn from frost, post-harvest NDVI had a negative relationship with yield. These NDVI patterns can shed light on crop management issues, such as weed growth due to excess nitrogen or reduced late canopy.

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Miller, J.O., Shober, A.L., & VanGessel, M.J. (2022). Post-harvest drone flights to measure weed growth and yield associations. *Agricultural & Environmental Letters*, *7* , e20081. **https://doi.org/10.1002/ael2.20081**

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