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Automated detection of canola flowering transitions

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Remote-sensing scientist John Sulik uses a high-spectral-resolution sensor to record hundreds of wavelengths of light to understand which combinations are most effective for estimating the number of flowers per square meter and final seed yield. Photo courtesy of

the USDA-ARS Columbia Plateau Conservation Research Station in Adams, OR.

Canola produces beautiful yellow flowers that indicate changes in development stages that farmers use as cues for management practices such as fungicide application and harvest timing. However, current methods for estimating flowering transitions require specialized sensors that are typically expensive and difficult to operate.

In an article recently published in *Agrosystems, Geosciences & Environment*, researchers evaluated ground-based and satellite sensors for remotely estimating the spatial density of flowers as well as flowering transitions, reporting results from multi-site on-farm observations and research station experiments, across a range of management practices, soil types, and climate.

Remarkably, the researchers found that red, green, and blue wavebands of light are more sensitive to flowering transitions than approaches incorporating infrared wavebands, which land managers commonly use for crop health assessment. This provides new opportunities for producers and researchers to monitor canola flowering with remote-sensing metrics that are attainable with the same color channels in a typical smartphone, which also provides more options for satellite sensing.

Scientists and land managers now have more sensor options and lower costs associated with evaluating spatial differences in canola development or for inventorying when flowering starts, peaks, or stops; this offers the potential to improve disease risk assessments, spray decisions, and harvest timing.

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Sulik, J.J., & Long, D.S. (2020). Automated detection of phenological transitions for yellow flowering plants such as Brassica oilseeds. *Agrosystems, Geosciences & Environment, 3*, e20125. **https://doi.org/10.1002/agg2.20125**

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