Impact of weather and well-timed cultural management techniques on organic weed control

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Weed management can be a tough challenge in organic cropping systems since growers don't have herbicides in their weed control arsenal. New research published in the journal *Weed Science*, though, shows that weather conditions and well-timed cultural management techniques can help fill the void by making crops more competitive.

A research team from the USDA's Agricultural Research Service (ARS) evaluated 18 years of weather data collected during a long-term, farming systems project at a site in Beltsville, Maryland. Their objective was to determine which meteorological and management factors most influence weed abundance and whether the impact was direct or indirect.

A structural equation analysis showed that precipitation during late vegetative or early reproductive crop growth had a strong positive effect on crop competitiveness, which in turn had an indirect, negative effect on weed cover. In addition, three commonly used cultural practices used in organic crops were found to have a positive impact on crop competitiveness and a negative impact on weeds—though to a lesser degree than precipitation:

- Careful rotary hoeing can improve crop competitiveness by reducing and delaying weed emergence relative to the crop.
- Delayed planting allows time for destruction of early emerging weeds and reduces emerged weed populations.
- Diverse crop rotations can dampen and diversify weed populations and improve soil fertility.

"Given the interrelationships of management techniques and weather conditions demonstrated by our analysis, it is clear organic growers need flexible approaches to weed management that respond to shifting conditions and changes in weed populations," says John Teasdale of the USDA ARS Sustainable Agricultural Systems Lab.

More information: John R. Teasdale et al, Meteorological and Management Factors Influencing Weed Abundance during 18 Years of Organic Crop Rotations, *Weed Science* (2018). DOI: 10.1017/wsc.2018.15

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