

Select groundcover management systems found viable for organically managed apple orchard

April 15 2015

Determining and implementing orchard management practices that can improve soil organic matter is one of the primary goals of the USDA's National Organic Program. For producers in the southeastern United States, where interest in small-scale and organically managed orchards is growing, the challenge can be finding combinations of groundcover management systems and organic nutrient sources that can simultaneously improve soil quality. A new research study provides producers in the region with valuable information about effective organic orchard management practices in the Ozarks Highland and similar regions.

During the 7-year study, University of Arkansas researchers evaluated the impacts of groundcover management system and nutrient source on [soil quality](#)-related variables such as soil organic matter (SOM), soil bulk density, plant-available water, water-stable aggregation, saturated hydraulic conductivity, and water infiltration in an organically managed apple orchard. The scientists also compared soil quality in an organic apple orchard with those in an adjacent conventionally managed orchard. The orchards were located on highly weathered soil in the Ozark Highlands region of northwest Arkansas.

The scientists tested annual applications of municipal green compost, shredded office paper, wood chips, and mow-blow grass mulch groundcover management systems in combination with composted

poultry litter, commercial organic fertilizer, or a nonfertilized control as a nutrient source. "The combinations were implemented to evaluate their ability to alter near-surface soil quality in a newly established, organically managed apple orchard in the Ozark Highlands region of northwest Arkansas," said Curt Rom, corresponding author of the study published in *HortScience*.

"Our analyses showed that the soil organic matter concentration in the top 10 cm averaged 1.5% across all treatments at orchard establishment in 2006, but by 2012, SOM concentration had increased in all GMS and more than doubled to 5.6% under green compost," the authors said.

"Similarly, soil bulk density in the top 6 cm, which averaged $1.34 \text{ g}\cdot\text{cm}^{-3}$ among treatment combinations in 2006, decreased in all GMS by 2012."

With regard to fertilizers, green compost applied alone or in combination with commercial fertilizer had the largest estimated plant-available water among all treatment combinations.

Interestingly, analyses showed that many soil quality-related variables measured in the various organic groundcover management systems had "numerically greater values" compared with an adjacent conventionally managed [orchard](#) on the same soils.

"Implementation of these groundcover management systems appear to provide apple producers in the Ozark Highlands and similar regions a tangible means of meeting National Organic Program requirements for improving soil quality concurrent with production of certified organic crops," Rom noted, adding that the research findings also have implications for conventionally managed orchards, where maintaining or improving [soil](#) quality is a [management](#) goal.

More information: *HortScience*, hortsci.ashspublications.org/content/50/2/295.abstract

Provided by American Society for Horticultural Science

Citation: Select groundcover management systems found viable for organically managed apple orchard (2015, April 15) retrieved 9 April 2024 from

<https://phys.org/news/2015-04-groundcover-viable-apple-orchard.html>

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