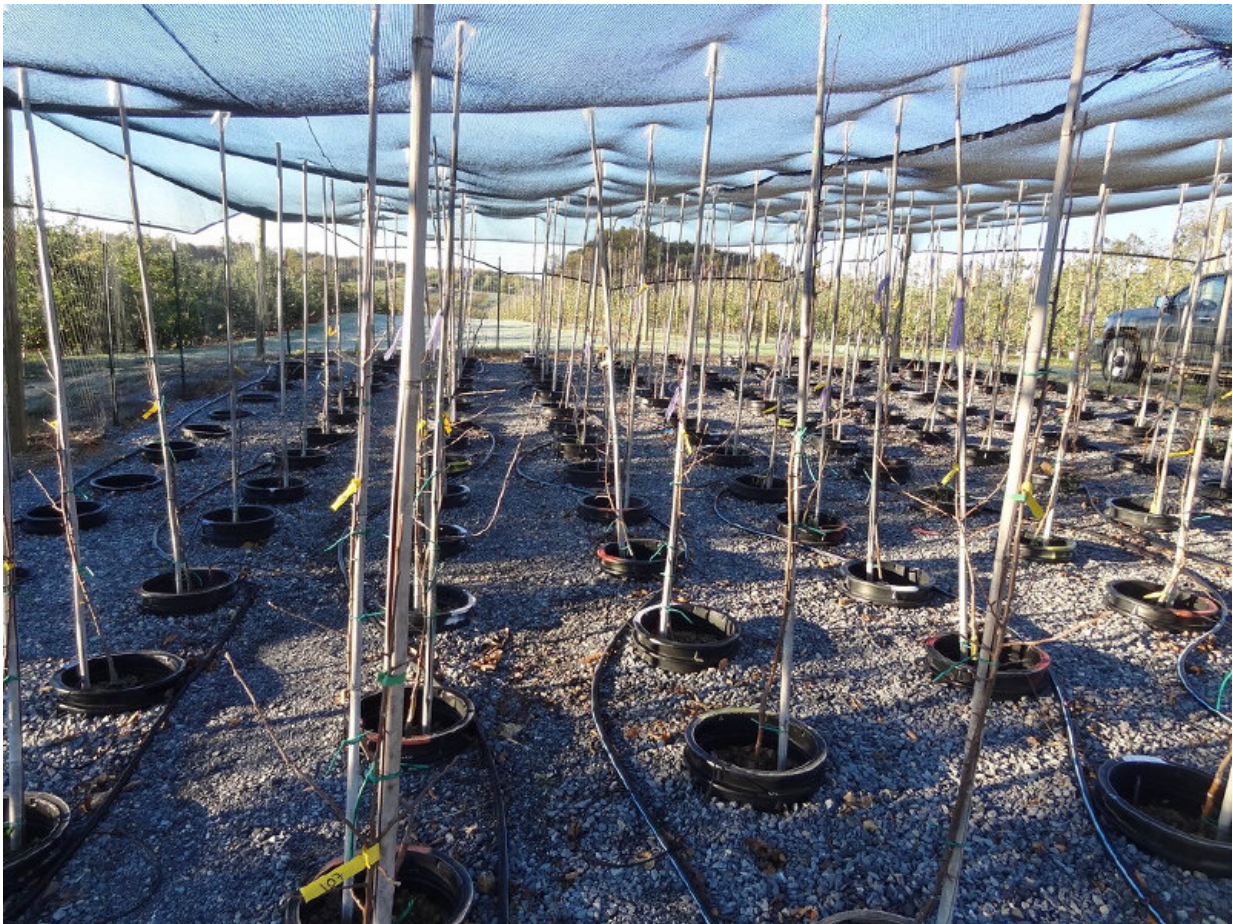


Compost improves apple orchard sustainability

June 21 2021, by Rachel Schutte



The research team used pots to ensure uniformity in the soil prior to planting the trees and adding the fertilizer treatments. Credit: Greg Peck

As the saying goes, an apple a day keeps the doctor away. But what's the key to growing a quality apple?

Apple trees need access to important nutrients, which come from the soil. However, soil is quite different from orchard to orchard.

Gregory Peck studies how sustainable orchard practices can improve the availability of nutrients. The research was recently shared in *Soil Science Society of America Journal*, a publication of the Soil Science Society of America.

Farmers are becoming more aware of the environmental impacts of different orchard management practices.

"Apple growers are interested in developing more sustainable nutrient management plans," explains Peck. "They are asking for more information to improve the soil health on their farms."

A healthy soil depends on many factors. One of those factors is the microbial community living in the soil. The community is made up of bacteria, nematodes, and fungi. Some of these microbes convert nutrients in the soil into forms that [apple trees](#) can use.

In the soil, microbes and [plant roots](#) interact in beneficial partnerships. Plants, like apple trees, release fluids from their roots into the soil. These fluids serve as a [food source](#) for the microbial community. In return, the microbes can help the apple trees.

"Bacteria serve many functions in an apple orchard soil," says Peck. "They recycle nutrients, promote plant growth, and even alter plant metabolisms."



Researchers air-dried harvested apple roots. The roots were further dried in an oven to measure biomass. Credit: Greg Peck

In this study, the team applied composts—such as chicken litter and yard waste—to apple orchards.

Researchers found that adding compost increased the number of soil bacteria associated with recycling nutrients. The compost provides additional food for the bacteria to help them thrive.

This larger microbial community means more nutrients are available to the apple trees.

By applying compost, farmers could reduce the amount of fertilizer needed to provide nutrients for apple trees. This could help their pocketbooks and the environment.

Some fertilizers come from non-renewable sources. Adding in compost to a farm's nutrient management plan reduces the dependence on those sources. It also provides a sustainable use for materials otherwise considered to be waste.

On a practical level, this research shows that farmers can successfully integrate compost with quicker release fertilizer sources.

"Although sustainable apple production is not defined by a single practice, we think this research contributes to the long-term goal of increasing farm sustainability," says Peck.

In the future, the team hopes to replicate this study in different regions with different [soil](#) characteristics. They would also like to take a deeper look into the roles of fungi in the microbial community of orchard soils.

"We can produce great apples, and [apple](#) orchard farmers can supply a huge population with delicious, nutritious food," Peck adds.

More information: Hazem Sharaf et al, Compost applications increase bacterial community diversity in the apple rhizosphere, *Soil Science Society of America Journal* (2021). [DOI: 10.1002/saj2.20251](https://doi.org/10.1002/saj2.20251)

Provided by American Society of Agronomy

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