

Dairy manure goes urban

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Research plots were split and planted with St. Augustine grass and mixed ornamentals. Composted dairy manure solids were applied along with random tillage/aeration treatments. Credit: Photo by Shawna Loper

When natural ecosystems are replaced by roads, homes, and commercial structures, soil is negatively impacted. Studies have shown that, among other issues, distressed urban soils are often significantly compacted, may have alkaline pH, and may contain low amounts of essential organic matter and nutrients. This altered soil is typically not conducive to healthy plant root growth and establishment, leading to challenges for urban landscapes and home gardens.

"The management of urban soils often requires a different approach than is applied to natural or [agricultural soils](#), but some [management practices](#) that are commonly used in agricultural systems have the potential to improve the quality of urban soils", explained Amy L. Shober,

corresponding author of a new report from the University of Florida's Institute of Food and Agricultural Science. Shober, along with [graduate student](#) Shawna Loper and their colleagues, designed a study to determine if the addition of compost—with or without the application of shallow tillage or aeration—improves soil properties and plant growth in simulated new residential landscapes.

According to the report published in *HortScience*, the researchers established 24 mixed landscape plots designed to simulate new residential landscapes. Each plot was constructed using 10 cm of subsoil fill material over a compacted field soil and planted with St. Augustine grass (*Stenotaphrum secundatum*) and mixed ornamental plant species.

The scientists applied composted dairy manure solids as an organic soil amendment at a depth of 5 cm in combination with two mechanical soil treatments (tillage to 15 cm and plug aeration), then assessed soil physical and chemical properties, plant growth and quality, and plant tissue nutrient concentrations to determine the effects of the different treatments.

The data showed that applications of compost significantly reduced soil density and pH and increased soil [organic matter](#), electrical conductivity, and concentrations of phosphorus and potassium. Growth was enhanced in all of the ornamentals (except one) when the plants were cultivated in soil amended with composted dairy manure solids. In most instances, plant tissue nitrogen and phosphorus concentrations were higher for plants grown in soils receiving compost.

"We found that composted dairy manure solids can improve soil physical and chemical properties in residential landscapes when sandy fill soils are used. Application of composted dairy manure solids can also enhance the establishment and improve the growth of selected ornamental landscape plants", Shober said. "However, topdressing with

composted dairy manure solids enhanced plant growth and quality as much as incorporation of compost to a depth of 20 cm by tillage."

The results also showed that shallow tillage and aeration had little effect on soil properties or plant growth.

The study showed the benefits of compost additions only during the first year after planting; the authors noted that the increased growth and the subsequent health of plants resulting from applications of compost may also prevent future plant failure. They recommended that future studies be done to evaluate the long-term effects of [compost](#) addition after the plant establishment period.

More information: [hortsci.ashspublications.org/c ...
/abstract/45/10/1522](https://hortsci.ashspublications.org/c.../abstract/45/10/1522)

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