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HOME-GROWN VEGGIES CAN FIGHT CLIMATE CHANGE—BUT BEWARE THE COMPOST PILE

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Vegetables grown in home gardens are associated with lower greenhouse gas emissions than vegetables bought at the store, according to a study by researchers at the University of California, Santa Barbara. Home gardening reduces emissions by about 2 kilograms for every kilogram of produce, they report in the journal *Landscape and Urban Planning*.

The study is the first to show that gardening could make a meaningful contribution to helping cities and states meet their emissions reductions targets.

Greenhouse gas savings from home gardening could stem from several factors, the researchers reasoned: producing vegetables at home rather than growing and transporting them in the conventional agriculture system; replacing lawn area with vegetable garden; using some household greywater to water the garden rather than sending it to a wastewater treatment plant; and composting food and yard waste instead of sending it to the landfill.

Using Santa Barbara County in southern California as a test case, the researchers figured that a garden of 18.7 square meters—about 3 percent of the average lawn size—could produce half the vegetables consumed by the average household.

(This assumes a middle-of-the-road yield of 5.72 kilograms of vegetables per square meter of garden per year. A higher but still realistic yield of 11.44 kilograms per square meter per year would mean the garden could produce *all* of a family's vegetables.)

Extrapolating statewide, they calculated that if half of families living in single-family homes had gardens producing half their vegetables, this could contribute over 7.8% of California's goal of reducing emissions to 1990 levels by 2020.

For an individual family, growing half of their vegetables would be equivalent to driving 11% less.

Plus, promoting gardening could be a good emissions reduction strategy because it requires little in the way of additional technology and infrastructure, the researchers argue.

On the other hand, their analysis suggests that in practice, emissions reductions could be much less impressive if gardeners use commercial fertilizers, achieve lower yields, or waste a substantial proportion of their harvest.

And composting of food and yard waste turns out to be an especially crucial factor determining whether

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gardening reduces emissions at all.

"There's the potential for home composting to be either positive or negative for the climate," says study leader David Cleveland, a research professor at UC Santa Barbara. "It takes a lot of attention to do it right."

If it's not done right, composting can generate a lot of methane and nitrous oxide, which are potent greenhouse gases. That can wipe out the climate gains from other aspects of veggie gardening.

"We found that if household organic waste was exported to landfills that captured methane and burned it to generate electricity, households sending their organic waste to a central facility would reduce greenhouse gas emissions more than composting at home," Cleveland said.

Emissions from industrial composting also vary a lot, but sending food and yard waste to an efficiently run, centralized composting facility can actually double the emissions reduction per kilogram of vegetables compared to the researchers' baseline assumptions.




"It's important not to get hung up on assumptions that small and local are always better," Cleveland said. "They may not be. You have to keep your eye on the real goal and not get tripped up by intermediate steps." So yes, kill your lawn—but be prepared to pay attention to the details. —Sarah DeWeerd | 13 September 2016

Source: Cleveland DA et al. "The potential for household vegetable gardens to reduce greenhouse gas emissions." *Landscape and Urban Planning*, 2016.

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