

The power of compost: Making waste a climate champion

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The Precision Compost Strategy could help reverse the degradation of soil, boosting crop production. Credit: University of Queensland

A new way of using compost could boost global crop production and deliver huge benefits to the planet, according to a study co-led by The University of Queensland.

Professor Susanne Schmidt from UQ's School of Agriculture and Food Sciences said adopting a Precision Compost Strategy (PCS) in large-scale agriculture could improve crop yield, [soil health](#) and divert biowaste from landfill where it generates harmful greenhouse gases.

"Instead of relying just on mineral fertilizers, PCS involves supplementing the right type of compost with nutrients to match the needs of soils and crops," Professor Schmidt said.

"Soils that have become compacted and acidic are then aerated and neutralized.

"The result is they can retain more water, facilitate root growth and nourish the organisms that keep soils and crops healthy."

Professor Schmidt said soil plays a crucial role in ensuring global food security. "But currently 30% of the world's agricultural [soil](#) is classified as degraded, with projections that this could rise to 90% by 2050," she said.

"Our research estimates PCS could boost the annual global production of major cereal crops by 96 million tons, or 4% of current production.

"This has flow-on effects for consumers by addressing food shortages and price hikes."

The study found applying PCS to large-scale agriculture could also help mitigate climate change.

"In Australia alone, more than 7 million tons of biowaste ends up in landfill every year where it generates huge amounts of avoidable greenhouse gases and other undesirable effects," Professor Schmidt said.

"If we repurpose it, we can restore crucial carbon in cropland topsoil.

"There are cost benefits too—diverting just 15,000 tons of biowaste could save a local council as much as \$2–3 million a year."



The Rossi Farm in Queensland are experimenting with compost use in sugarcane. Credit: University of Queensland



Could compost be the new black gold? Credit: University of Queensland



To improve soils in South Australia that are naturally low in organic matter, farmers have been using the Precision Compost Strategy. Credit: University of Queensland

Far North Queensland sugarcane farmer Tony Rossi said his family's company V. Rossi & Sons had been using precision compost for seven years with great success.

"We've been able to almost halve our fertilizer use which is so much better for the environment, and our crop yield is the same," Mr. Rossi said.

More than 2,000 examples of [compost](#) use in the [agricultural sector](#) across the globe were analyzed as part of the PCS study.

The research has been published in *Nature Food*.

More information: Weifeng Zhang, A precision compost strategy aligning composts and application methods with target crops and growth environments can increase global food production, *Nature Food* (2022).

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