

Viewpoint: ‘Unless we want to cut down our forests, we need to improve our crop yields’ — Practical biotech-based sustainable solutions are right in front of us

To feed a hotter and drier planet, Stanford scientists are building a smarter plant.

The team has genetically reprogrammed plants, nurtured in a laboratory chamber, to grow roots that are long or short, branched or slender — traits that change the ability to gather nutrients or water.

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“The goal of all of this work is to try to make plants that increase the sustainability of agriculture,” said plant systems biologist and professor [José Dinneny](#), whose work with bioengineering professor [Jennifer Brophy](#) was [published in the journal Science](#).

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The team envisions programming crops to develop root systems that are more angled, so they dive deeper to find water or nitrogen, or more shallow, to prevent drowning during floods from lack of oxygen. Plants could be designed for density, sending down one long tap root that doesn’t infringe on a neighbor.

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Domestication has created plants that are inefficient consumers of water and nutrients, said Dinneny. They’re designed for ideal environments.

If yields are improved, it will help preserve what remains of our wilderness, he added. “Unless we want to clear more forests to create more agricultural land,” he said, “we’re going to have to find ways of improving the way we grow plants for food.”

[**This is an excerpt. Read the original post here**](#)