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# New Multi-Purpose Cover Crop to Enhance Environmental Quality

*Professor Ray Weil and his team of graduate and undergraduate research assistants have been studying how an Asian vegetable used by no-till farmers in Brazil can help solve some of Maryland's most vexing environmental problems.*

## What Are Cover Crops?

Cover crops are plants grown to improve the quality and productivity of the soil, to fight global warming by increasing the amount of carbon sequestered from the atmosphere, and to protect water quality by preventing the loss of sediment and nitrogen from the land. The team is developing new cover crops, such as the forage (Daikon) radish, that can provide all these benefits to the environment and society while also directly benefiting the farmer.

The roots of this unique cover crop can substitute for fossil-fuel intensive deep tillage by the process of "biodrilling" which alleviates soil compaction. The forage radish can help save the Chesapeake Bay by capturing huge amounts of excess nitrogen from deep in the soil profile in the fall. It then releases this plant nutrient in early spring so less fertilizer needs to be applied.

## Multiple Benefits of Cover Crops

The forage radish dies when temperatures fall below 20°F, so unlike other cover crops, no chemicals or tillage is needed to kill it. The research has developed a system in which this cover crop can suppress weeds so thoroughly that it can eliminate the need for the herbicide spray normally used to kill weeds before spring planting. This system may be of particular interest to organic farmers because it allows no-till planting without herbicides, although cultivation or other weed control will be needed later in the season. If the forage radish biomass is removed before it freeze-kills in mid-winter, it may also help remediate soils saturated with phosphorus from years of over-manuring. For veggies, it may help prevent plant disease. In addition, research with Dr. Stephanie Lansing suggests that the radish biomass may even be suitable for on-farm digestion to produce methane gas for heating and electricity generation.

## Forage Radish Has Been Shown To:

- Alleviate soil compaction - save energy and cost of deep tillage
- Suppress weeds - save on herbicides / cultivation
- Enhance seedbed - save time and plant earlier in spring
- Build organic matter - improve soil quality
- Release N early and increase topsoil fertility - save on N and other fertilizers
- Reduce nitrate leaching - save the Bay from eutrophication
- Control erosion - save our soil
- Reduce runoff - conserve rainwater