

# Looking to the Earth Itself as a Climate Solution

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**The agriculture industry is beginning to consider soil's ability to capture and store carbon, a potential climate-saver long overlooked.**

*By Georgina Gustin, InsideClimate News*



*Farmers, by using techniques that help preserve soil carbon, could make a contribution to reducing overall greenhouse gas emissions. Credit: Getty Images*

As President Obama scrambles to seal his climate legacy before he leaves office, his administration is taking a serious look downward—at soil.

The administration is intent on developing its plan to meet the emissions reductions goals it agreed to in last year's Paris climate accord, and that plan will likely outline how farmland, with its huge potential to sequester carbon, will play a key role.

"Attention to soil health is gaining momentum out of frustration with our inability to regulate greenhouse gas emissions at an economy-wide scale," said [Thomas Driscoll](#), director of conservation policy and education for the National Farmers Union, the country's second-largest

farm industry group. "People are starting to pay attention to farming and land-use because they're having so much trouble everywhere else."

The world's cropland has the potential to store 20 billion tons of carbon on about 4 billion acres over a 25-year period. That is enough to offset as much as 15 percent of carbon emissions from fossil fuel burning each year. France recently launched an international initiative to boost the organic carbon in soil by 4 parts per thousand, which it says is enough to offset annual increases in overall carbon emissions.

"I wish the U.S. were taking the lead. We're the world's breadbasket," said [Rattan Lal](#), a soil science professor at Ohio State University and the incoming president of the International Union of Soil Sciences. "But the French are, and as long as the U.S. follows along, then at least we're heading in the right direction."

Soil scientists like Lal and conservation groups have long recognized farmland's ability to capture and store carbon, but the U.S. agricultural industry has been slow to embrace it. The American Farm Bureau, the biggest farm industry group in the country, [has questioned](#) the reality of manmade [climate change](#), which makes it highly unlikely to push its members to take steps, particularly costly ones, to address carbon.

When soil is tilled or forests are cleared, natural carbon in the soil is released into the atmosphere, where it mixes with oxygen to form heat-trapping carbon dioxide. Since agriculture began about 10,000 years ago, soils have lost as much as 70 percent of their natural carbon. The simple solution is to stop clearing forests for cropland and reforest the ones that have been cleared, but increasingly, the focus has shifted to cropland's potential to capture and store carbon. With a growing global population and the need to feed an estimated 9.7 billion people by 2050, every acre of arable land will become essential.

By using techniques like "no-till," in which farmers plant crops without disturbing the soil, they can minimize the release of carbon. Farmers can also plant cover crops after the growing season that improve soil health by adding carbon, make the soil less prone to erosion and draw in and store carbon from the atmosphere.

More U.S. farmers may be asked to do their part and use these techniques soon.

The White House's Council on Environmental Quality recently held a series of meetings, including one with agriculture and forestry stakeholders, to investigate industry trends and these and other possible mitigation strategies. The White House Office of Science and Technology Policy in August announced [a new interagency working group](#) on soil health. And last year, Agriculture Secretary Tom Vilsack launched "Building Blocks for Climate Smart Agriculture," [a framework for helping](#) farmers deal with —and mitigate — climate change, including using carbon sequestration.

Through the Building Blocks initiative, the Agriculture Department aims to increase carbon stored in forest and soils by 120 million metric tons of carbon dioxide equivalent per year by 2025, a goal the agency has said will help the U.S. meet its mid-century targets.

Agriculture worldwide accounts for a quarter of all greenhouse gas emissions, but unlike industries such as transportation and energy, it has largely escaped discussion as a climate target.

"I think we're the only sector of the economy that has the potential to reduce existing emissions," said Driscoll. "What's exciting is that agriculture has the ability to reduce emissions — by buying an energy efficient grain drier or bolting solar panels on your barn for hot water or by applying fertilizer in ways that avoid nitrous oxide from going into the atmosphere. But we also have the ability to take carbon out of the atmosphere."

For the first time in more than 20 years of UN climate change talks, soil was on the agenda of at the Paris climate summit last year. The French government launched its initiative, dubbed "4 per Thousand," which encourages governments and NGOs to implement carbon sequestering and capturing practices.

The initiative, however, is based on voluntary commitments, an arrangement that critics say makes it merely symbolic. But it does signal that the government acknowledges the critical role that agricultural lands, and the farmers who make their living off them, play in stemming climate change.

"There's recognition that soils are a very large part of the carbon cycle, and when you look at options and potential around taking carbon out of the atmosphere and putting it somewhere else, soils are one of your greatest unexplored opportunities," said Harold M. van Es, a professor of soil science at Cornell University.

Over the past decade or so, more American farmers have started to employ the practices that store carbon or minimize its release.

"Soil health and soil carbon, which have been front and center for sustainable agriculture, including organic, for decades and decades, has suddenly become this big conversation in conventional agriculture, particularly around no-till and cover cropping," said Ferd Hoefner, policy director for the National Sustainable Agriculture Coalition. "It's one of the most hopeful things in agriculture.... It would be terrible if the U.S. submission for the mid-century [targets] in any way downplayed ag."

The numbers, however, are still relatively tiny. Only [2 percent](#) of the farmland in the Mississippi River basin, for example, is planted with cover crops and about [35 percent](#) of the cropland used to grow the eight major crops use no-till.

But environmental groups and academics are optimistic that more producers will start using these methods, not least because they improve soil health — and productivity.

Some Big Ag interests have started taking steps, largely because their industries depend on soil health. Monsanto, the world's largest seed company, announced last year that it would make its operations carbon-neutral by 2021 and the National Corn Growers Association linked up with conservation groups in 2014 to launch the Soil Health Partnership.

"I think they may be more swayed if they can be convinced of the benefits. It's their land," van Es said. "I think there are also indirect ways to encourage farmers. One is to provide carbon credits, or to reflect the increase in carbon in the soil in terms of land value."

Lal thinks the only way to get farmers to implement carbon sequestering practices is to pay them directly, a very hard sell to governments.

"I don't think farmers are going to do anything unless they're paid," he said. "So my suggestion was that every farmer that does conservation agriculture, should be given 16 dollars per acre.

"There's 4 billion acres of cropland worldwide, so 16 times 4. It's a crude estimate. But that's the price of a few fighter jets, so do it."

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