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Publications	Growers can profit from parking carbon on farm
UC Delivers	When major events come to the fairgrounds, people who live nearby can make extra money by charging visitors to park cars on their front lawns. In much the same way, people who have a place to capture carbon on earth can profit by supplying carbon parking.
News	Carbon, element 6 on the periodic table, is a building block of all living things. Carbon is released into the atmosphere as carbon dioxide gas when animals breathe and when their wastes break down. Plants take up carbon when they grow and release it when they decay. But modern society has opened the spigot. Volumes of carbon flow into the atmosphere when fossil fuels are burned, when forests are harvested or when soils are intensively tilled.
County CE offices	Carbon and other gases collect in the upper atmosphere, forming a barrier that slows the release of the sun's heat back into space. For this reason, they are being called "greenhouse gases" and are being blamed for climactic changes worldwide.
Statewide programs	Even though carbon doesn't represent all the gasses that are causing the greenhouse effect in the Earth's upper atmosphere, because it is the most abundant, it has become the standard measurement unit for greenhouse gases, giving rise to a new world currency -- "carbon credits."
Campus resources	A Washington farmer reaps the benefits
Administration	Karl Kupers, a Washington farmer, is already selling carbon credits from his conservation-tillage wheat field. Kupers and a group of partners formed the Pacific Northwest Direct Seed Association and entered a 10-year contract with Louisiana-based Entergy Corporation, an energy company that boasts of its efforts at environmental conservation. Entergy gets credit for carbon-dioxide-emissions reductions achieved by the farmers to offset the carbon dioxide emissions from the company's power plants in the United States. The project reduces carbon dioxide emissions 30,000 tons over a 10-year period, according to the contract.
Development services	The deal didn't make the participating farmers rich – each received a single payment of \$250 – but the contract establishes the fact that their CT farms keep carbon. When the contract is up, those carbon credits may be sold to the highest bidder.
Employment opportunities	Terrestrial carbon parking is one way to earn carbon credits. Scientists are studying several options for parking carbon – forestland owners can pledge to not harvest for a long period of time, industry may be able to pump and trap carbon-rich emissions deep in the ocean and, farmers can store carbon in their soil, slowing gaseous emissions to the atmosphere. Experts agree that carbon parking is not the solution to global warming, but it is a way to buy some time while other strategies to reduce emissions of carbon into the atmosphere are being developed.
For ANR employees	Last month, the University of California introduced the latest developments on the topic at a meeting sponsored by the Kearney Foundation of Soil Science and the UC Conservation Tillage Workgroup on carbon sequestration -- the scientific term for holding carbon on the earth.
UC system	UC Cooperative Extension cropping systems specialist Jeff Mitchell, based at the Kearney Research and Extension Center near Parlier, spoke at the meeting about his research and work with farmers on conservation tillage (CT) practices, in which disturbance of farm soil with tractor implements is eliminated or limited. Tilling is thought to release stable carbon from the soil into the atmosphere. In addition to carbon parking potential, CT presents a spectrum of benefits to farmers – including savings in expenditures for weed control, labor and irrigation.
	"We're comparing conservation tillage with standard tillage and trying to quantify the potential for carbon to be stored using conservation tillage," Mitchell said. "We know that tillage causes carbon dioxide loss and the intensity of tillage is directly correlated with carbon dioxide emission."
	Carbon parking isn't pie in the sky
	Offering the CT farm as a parking lot for carbon is perhaps the most obscure of the potential advantages of CT farming, but the idea isn't entirely pie in the sky. UC Davis soil scientist Johan Six is developing computer models to calculate exactly how many carbon credits are parked on CT farms.
	"We're using an integrated approach," Six said. "We're using field experiments to calibrate the model, which is linked with an economic model."

Six's preliminary results suggest that by using a cover crop along with conservation tillage practices, a farm system can be converted from a net emitter to a net mitigator of carbon. But currently, it's expensive.

"In Five Points (where Mitchell conducts CT research), it costs about \$67 to mitigate a ton of carbon dioxide. In Europe, carbon credits are being traded for \$34 per ton," Six said. "Bundling greenhouse gas mitigation with other environmental benefits should increase its cost efficiency."

The attractiveness of the carbon parking strategy based on this approach may also increase if yields can be improved in conservation tillage systems, according to Mitchell.

Strategies for taking advantage of carbon parking

At the West Side meeting, speakers suggested several strategies for California farmers interested in eventually using their farms as profitable carbon parking lots:

- Investigate opportunities to register the farm's baseline of greenhouse gas emissions. Once the baseline is established and documented, the farmer will be able to take credit for any reduction in emissions from that point on. For more information, see the Climate Action Registry Web site at <http://www.climateregistry.org>.
- Join forces with other CT farmers. Large companies interested in purchasing carbon emission credits will not want to deal with individual agricultural entities, but may be interested in working with groups that can aggregate parking for thousands of tons of carbon.
- Get experience working with CT practices so when carbon parking becomes valuable, farmers are ready to take advantage of the opportunities. For more information, see the CT workgroup Web site at <http://groups.ucanr.org/ucct> or contact Jeff Mitchell at (559) 646-6565 or mitchell@uckac.edu.
- Learn new findings about soil carbon in California at the Kearney Foundation of Soil Science Web site (<http://kearney.ucdavis.edu>) or contact the foundation's director Kate Scow at (530) 752-4632 or kmscow@ucdavis.edu. The foundation's mission for 2001 to 2006 is "Soil Carbon and California Terrestrial Ecosystems."

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