

The price is wrong: Researchers explore farmers' interests in carbon markets

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The United States, along with 123 other countries, have pledged to reach "net-zero" carbon emissions by 2050 or 2060. A number of strategies are being deployed to reach this ambitious goal, but the one most pertinent

to South Dakota residents is the utilization of one of the state's most abundant natural resources: soil.

Soil has long been viewed as one of the most promising frontiers for [carbon](#) removal, and research conducted by South Dakota State University has only underlined this thinking. In particular, "climate-smart" farming techniques—like no or reduced tillage, [cover crops](#) and nutrient management—not only improve [crop yields](#), but can sequester carbon in the soil as well.

As we inch closer to 2050, "carbon programs" have begun to sprout up that will actually pay farmers to adopt the aforementioned climate-smart practices. However, recent studies have found that only a small percentage of eligible farmers choose to enroll in these programs. Why?

One of the biggest barriers to enrollment, previous research has found, is the [economic costs](#) that are associated with adopting these practices. A new study from SDSU's Ness School of Management and Economics—led by associate professors Tong Wang and Hailong Jin—examines this barrier by exploring what price point farmers would be willing to accept to enroll in these carbon programs.

This [study](#), titled "Carbon supply elasticity and determinants of farmer carbon farming decisions," was published in the journal *Applied Economic Perspectives and Policy*.

Price point for carbon markets

In 2021, Wang and Jin—two members of the research team—received approximately 1,100 survey responses from farmers in Minnesota, Nebraska, North Dakota and South Dakota. Around that time, there were at least 12 carbon programs available to farmers in the region, offering rates based on the quantity of carbon dioxide sequestered on a

per-metric-ton basis (unit). The rates ranged between \$15 and \$30 per unit sequestered.

The research team surveyed the farmers to see if they would be willing to adopt a climate-smart practice (a requirement to sequester carbon) at a range of carbon prices, from \$10 to \$70 per unit. As the price increased, so did their willingness to adopt the practices.

At the current available prices (\$10 and \$20 per unit), only a fraction of the respondents (3% and 4%) were willing to change their [farming practices](#). At the highest currently available price point (\$30), only 11% of farmers were willing to adopt.

"Most farmers did not have incentives to enroll in carbon programs at currently offered price levels," Wang said. "At higher rates (\$40, \$50 and \$70), the percentage of farmers willing to change practices increased. About half of the respondents were still not willing to enroll at the highest price listed, or if the current carbon prices double or triple."

The researchers theorize that a lack of information about the cost and benefit of different climate-smart practices, as well as the measured and verified amount of carbon sequestration, play a role in the unwillingness of some farmers to change practices, regardless of how high the offering price is.

As Wang notes, this insight matches up with past research, in particular, a 2017 study from Australia which found that nearly half of all farmers had no interest in a carbon [program](#) as they felt it "deprived them of the right to operate the land in the way they would like."

To improve perceptions around these practices, the researchers suggest creating more education programs available to farmers.

"These could help them gain a better understanding of the co-benefits of carbon program enrollment, including the benefits of climate smart practices on soil, yields or profit," Wang said.

The researchers also note that costs surrounding carbon markets need to decrease. New equipment, learning, measurement and verification all present barriers to adopting these practices, some of which are costly, either in terms of time or money. While monetary support would help in overcoming some barriers, so would technical support, Wang said.

Takeaways and caveats

The biggest takeaway from this study is the price point of current carbon markets: too low for farmers to be incentivized to change their practices. The researchers suggest, based on their findings, that a price increase could go a long way toward increasing the number of farmers utilizing carbon programs in the region.

"Our results indicate that increasing carbon prices from \$20 to \$50 (per unit) will enhance the carbon program participation rates from 4% to nearly 40%," Wang said.

Like all studies, there are a few caveats to keep in mind. First, the survey was conducted in 2021, when carbon markets and programs were still a relatively new concept. Now, nearly three years later, their perception among farmers could have changed.

"Our findings also highlight the importance for policymakers to consider the economic mitigation potential of carbon, rather than focusing on the more optimistic technical mitigation potential," Wang added.

More information: Tong Wang et al, Carbon supply elasticity and determinants of farmer carbon farming decisions, *Applied Economic*

Perspectives and Policy (2024). [DOI: 10.1002/aepp.13442](https://doi.org/10.1002/aepp.13442)

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