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JOHAN SIX AND RENATA BRILLINGER: Work with state farmers, not against them

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When it comes to farming, other states are known for excelling in one specialty crop. Idaho grows potatoes, Wisconsin makes cheese, Florida grows oranges and so on. But California grows pretty much everything.

As America's top agricultural producer, we produce everything from avocados to apples, from pistachios to pomegranates, from wine grapes to milk cows. The San Joaquin Valley is an essential part of this productivity.

But because farming is subject to the whims of weather and water, it is rather vulnerable to climate change. However, farming is not only vulnerable to climate change, but it also contributes to it by being responsible for about 6% of California's greenhouse gas emissions.

That's why more than two dozen California agriculture and climate scientists and advisers submitted an open letter to Gov. Jerry Brown, the Legislature and the California Air Resources Board, urging them to support research, technical assistance and incentives that can help reduce agricultural greenhouse gas emissions and ensure a viable and resilient agricultural sector.

As California's landmark climate law, the Global Warming Solutions Act (AB 32), is being implemented, it's important to remember our farmers and the bounties they provide for us.

In the coming decades, climate models predict that California farmers and ranchers will face increasing competition for less water, more extreme and unpredictable weather events, new pests and diseases, temperature changes that may decrease fruit and nut production, and heat stress for farm workers and livestock.

All of these impacts have consequences for farm economies, for the state's financial health and for our future food security -- unless we act now.

California agriculture is a \$37 billion industry and the backbone of many of our rural communities, which are already struggling with a slow economic recovery. And California provides more than half of the nation's fruits, vegetables, nuts and dairy. So assuring that the state's agriculture sector continues to thrive is essential for national food security.

The good news is that research is identifying some of the best farming and ranching practices, both for reducing greenhouse gases and for increasing farm and ranch resilience in the face of a changing climate. California continues to be a leader in identifying the most effective ways for agriculture to reduce its greenhouse gas emissions and sequester carbon, thanks in no small part to state-government-funded research.

Some of the most promising practices include:

Increasing water and energy efficiency, and accelerating the production of renewable energy on farms and food processing facilities. This makes economic and environmental sense, and helps the state reach its clean energy goals.

Using nitrogen fertilizer more efficiently, minimizing its application and relying on recycling of nitrogen through applying compost and manure.

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Storing, or sequestering, carbon in soils, which prevents it from accumulating in the atmosphere as carbon dioxide. This also increases soil fertility. Promising techniques include the use of cover crops and manure, reducing tillage and managing the timing and density of livestock grazing.

Saving farmland, especially near urban areas. This avoids potentially significant greenhouse gas emissions associated with development, including increases in transportation-related emissions.

Farming and ranching that helps address climate change also offer a number of other benefits, such as improved air and water quality and better wildlife habitat. "Climate-friendly" farming practices will also help the agricultural industry adapt to the changing climate by reducing reliance on fossil fuel and water, cutting costs and increasing soil health and fertility.

Our state must continue to invest in research and technical assistance, and offer incentives for growers to transition to farming practices with the greatest environmental, health and economic benefits. California and the nation have entered an era of limits and the stakes are high, but with the right agricultural practices and climate policies, our farmers and farmland can continue to thrive.

California is a leader in agriculture and in environmental sustainability, and we must continue to make progress in both areas in order to support a viable, healthy food system. This will require the combined efforts of researchers, agricultural advisers, farmers and ranchers and their advocates and our elected representatives.

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