CCOF

Advancing organic agriculture through certification, education, advocacy, and promotion.

April 4, 2022

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: CCOF Comment on Natural and Working Lands Model Scenarios for 2022 Scoping Plan Update

Dear Chair Randolph and Members of the Board:

California Certified Organic Farmers (CCOF) appreciates the opportunity to comment on the California Air Resources Board's (CARB) draft Initial Modeling Results for the Natural and Working Lands (NWL) section of the 2022 Scoping Plan Update and to provide our recommendations on a policy target to be included in the May draft Scoping Plan Update.

CCOF is a nonprofit organization that advances organic agriculture through certification, education, and advocacy. The 3,000 organic farms and businesses we represent in California are on the frontline of climate change. Drought and extreme heat disrupt crop and livestock production, wildfires destroy fields and barns, while smoke and ash contaminate crops and create unsafe working conditions. As farmers and ranchers bear the burden of growing and raising food under extreme conditions, CARB should incorporate farmer- and rancher-led solutions, including transitioning to organic agriculture, into the state's climate strategies.

We commend CARB for modeling increased organic agriculture as a climate management strategy, and we highlight that the scenario with the highest organic adoption corresponds with the greatest increase in carbon stocks.[1] However, we also have concerns that the climate benefits of organic farming are not fully captured because synthetic fertilizers are not included in the modeling, and the use of synthetic fertilizers is prohibited in organic agriculture. An evaluation of organic and conventional soils at UC Davis show that conventional soils release 56% more nitrous oxide, a potent GHG associated with synthetic fertilizer use,[2,3,4] than organic soils.[5]

In recognition that CARB's next step is to publish the draft 2022 Scoping Plan Update, **we urge CARB to establish a target of transitioning 30 percent of California's agricultural acreage to organic by 2030**. While currently 2.59 million acres, or roughly 10 percent, of agricultural land in California is under organic management,[6] organic agriculture is the only food production system capable of achieving carbon neutrality with studies showing organic farms to be net sinks of

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[1] California Air Resources Board, 2022 Scoping Plan Update Initial Modeling Results Natural and Working Lands, Retrieved from 2022 Scoping Plan Update Initial Modeling Results (March 15, 2022) (ca.gov).

[2] Vitousek PM, Porder S, Houlton BZ, Chadwick OA (2010). Terrestrial phosphorus limitation: mechanisms, implications, and nitrogen–phosphorus interactions. Ecol Appl 20:5–15.

[3] Galloway JN, Townsend AR, Erisman JW et al (2008) Transformation of the nitrogen cycle: recent trends, questions, and potential solutions. Science 320:889–892.

[4] IPCC (2006) Guidelines for National Greenhouse Gas Inventories. N2O emissions from managed soils, and CO2 emissions from lime and urea application, institute for global environmental strategies (IGES) for the IPCC
(2006) 4-88788-032-4.

[5] Burger, M., Jackson, L. E., Lundquist, E. J., Louie, D. T., Miller, R. L., Rolston, D. R., & Scow, K. M. (2005). Microbial responses and nitrous oxide emissions during wetting and drying of organically and conventionally managed soil under tomatoes. *Biology and Fertility of Soils, 42,* 109-118.

[6] California Department of Food and Agriculture, California Agricultural Statistics Review 2019-2020, Retrieved from California Agricultural Statistics Review 2019-2020.

greenhouse gases while non-organic farms are net emitters.[7,8] Transitioning acreage to organic management not only contributes to carbon neutrality, but also promotes a holistic approach to farming with multiple co-benefits.

Organic is grounded in science and contributes to carbon neutrality

CCOF commends CARB's principle to base policy targets on science and data.[9] Thirty years of peer-reviewed research demonstrates that organic farms sequester carbon and reduce greenhouse gas emissions. Setting a target of transitioning land to organic production is a climate solution grounded in science.

- A UC Davis Long-Term Research on Agricultural Systems (LTRAS) study found that after 10 years, organic systems resulted in 14 times the rate of carbon sequestration as the conventional system.[10] After 20 years, organically managed soils sequestered significantly more soil organic carbon than conventionally managed soils.[11]
- UC Davis's LTRAS comparison study shows that after 13 years under organic management, organic plots under conservation and standard tillage stored 131 percent and 135 percent more carbon dioxide equivalents, respectively, than the corresponding conventional plots, which were net emitters of greenhouse gases.[12]
- University of California's in-depth 2018 review of climate science recommends practices implemented by organic farmers, such as crop diversification and cover cropping, because these practices lead to healthy carbon-sequestering soils.[13]
- UC Davis researchers found that organic crop and livestock production practices build long-term soil fertility, creating healthy soils that can store increased levels of nutrients, including carbon.[14]
- All organic producers must graze ruminant animals on pasture for a minimum of 120 days per year[15] while non-organic ruminants may be raised in confined feeding operations. UC Davis scientists found that dairy cow and heifer manure on pasture emits minimal GHGs compared to lagoon storage, liquid slurry storage, and dry lot manure, which together account for 98 percent of dairy manure methane emissions in California.[16]
- Nationally, the largest study comparing organic and conventional soils in 48 states found that organic farms have 13 percent higher soil organic matter than conventional farms. Significantly higher soil organic matter allows organic soils to store more carbon than non-organic soils and provides numerous other climate benefits.[17]

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[7] De Gryze, S., Wolf, A., Kaffka, S. R., Mitchell, J., Rolston, D. E., Temple, . . . Six, J. (2010). Simulating greenhouse gas budgets of four California cropping systems under conventional and alternative management. *Ecological Applications,* 20(7), 1805-1819.

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[9] California Air Resources Board, 2022 Scoping Plan Update Technical Workshop on Natural and Working Lands, July 2021. Retrieved from [2022 Scoping Plan Update, Technical Workshop for Natural and Working Lands].

[10] Kong, A. Y., Six, J., Bryant, D. C., Denison, R. F., & Van Kessel, C. (2005). The relationship between carbon input, aggregation, and soil organic carbon stabilization in sustainable cropping systems. *Soil Sci Soc Am J.*, 69, 1078-1085.

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- The Rodale Farming Systems Trial, which is the longest running organic comparison study in the United States, documented that after 22 years, soil organic carbon increased by 15-28 percent in organically managed soils compared to 9 percent in the conventionally managed soils.[18]
- Globally, peer-reviewed evidence shows that organically managed soils hold more carbon and have higher rates of carbon sequestration than soil from non-organic systems.[19]

Organic is holistic with multiple co-benefits

CCOF commends CARB's focus on ecosystem benefits and impacts as a whole.[20] Organic agriculture is a holistic approach to farming that protects public health, promotes biodiversity, and feeds communities. By promoting multiple co-benefits, transitioning land to organic aligns with Executive Order N-82-20, which compels CARB and other state agencies to "[p]romote healthy lands that provide multiple benefits including improved air quality, reliable water supply, thriving communities, and economic stability."[21]

Public Health

- Organic farmers grow crops without synthetic pesticides.[22] By prohibiting synthetic pesticides, organic agriculture contributes to more equitable health outcomes. In California, Latino children are 91 percent more likely than White children to attend schools with the highest pesticide exposure.[23] This exposure is linked with impaired neurobehavioral development[24] as well as enhanced risk of diabetes[25] and asthma.[26]
- Meta-analyses consistently find that organic crops have higher levels of vitamins, minerals, and antioxidants [27,28,29,30,31,32] that are important for human health and significantly lower levels of pesticide residues than conventional foods.[33]

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- Use of antibiotics and hormones is prohibited in organic production.[34] Studies show that organic farms harbor fewer antibiotic resistant microbes than their conventional counterparts[35,36] and that organic meats are less likely to be contaminated with antibiotic resistant bacteria than conventional meat products.[37,38,39]
- Organic farmers must use practices that maintain or improve natural resources, including water quality.[40] A Washington state study on organic, conventional, and integrated apple production showed that nitrate leaching was four to six times higher in the conventional than the organic plots.[41] A Michigan study comparing conventional and organic row crop production showed that, after 12 years, organically managed plots had 50 percent less nitrate leaching and over twice the nitrogen use efficiency (yield per unit of nitrogen fertilizer) as the conventional plots.[42] Similarly, an extensive Midwest study using high-level water monitoring systems found 50 percent fewer nitrate losses under organic grain production.[43]
- A UC Davis study documenting unhealthy levels of nitrate in California's groundwater recommends that research focus on replacing synthetic fertilizers with organic fertilizers, along with agricultural management practices that reduce nitrogen inputs and improve crop nitrogen efficiency.[44]

Biodiversity

- Organic farming practices support diverse populations of beneficial birds and insects that prevent and control pest outbreaks, thereby reducing reliance on pesticides.[45,46,47,48] Extensive global analyses demonstrate that organic farms support higher populations of beneficial insects and bird species than conventional farms. Organic farms host on average 50 percent more organisms than conventional farms,[49] particularly natural pest enemies and pollinators.[50,51]

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- Organic farmers are required to implement practices that maintain or improve biodiversity.[52] A comprehensive meta-analysis of 30 years of research concludes that organic farming increases biodiversity by 30 percent compared to conventional farming.[53] Similarly, another comprehensive meta-analysis shows that organic farming significantly increases populations of beneficial insects, birds, and soil-dwelling organisms, as well as non-bird vertebrates (mammals, reptiles, etc.) and plants.[54]

Food Security

- International scientists recently determined that if food waste and demand for livestock products are reduced, then organic agriculture can feed 9 billion people by 2050.[55] In another global analysis comparing 293 organic and conventional crops, scientists found that current organic yields could supply at least the minimum calories per day, if not more, needed to sustain a growing worldwide population.[56]

Thank you for consideration of our comment. Establishing a target of transitioning 30 percent of California's agricultural acreage to organic by 2030 will support the state achieve its climate goals while promoting public health, biodiversity, and food security.

Sincerely,

Rebekah Weber
Policy Director

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