American Farmland Trust
SAVING THE LAND THAT SUSTAINS US

April 30, 2021

Secretary Karen Ross
California Department of Food and Agriculture
Office of Environmental Farming and Innovation
1220 N Street
Sacramento, CA 95814

Submitted via email: cdfa.oefi@cdfa.ca.gov

RE: Comments on the Farmer and Rancher Led Climate Solutions Listening Sessions, Summary of Public Input, Preliminary Draft for Public Comment Feb. 2021

Dear Secretary Ross:

American Farmland Trust (AFT) is the only national conservation organization dedicated to protecting farmland, promoting sound farming practices, and keeping farmers on the land. AFT is deeply committed to maximizing the co-benefits of agriculture, including agriculture's ability to help fight climate change by reducing greenhouse gas emissions and removing carbon from the atmosphere. Accordingly, AFT is pleased to comment on the Farmer and Rancher-Led Climate Solutions Draft for Public Comment and offer its support in the development of strategies for the next State Scoping Plan and future work on Natural Working Lands climate smart strategies.

AFT would first like to offer general comments, and then specific comments to the following sections:

13. Preserve and Expand Agricultural Land
24. Take a Whole-Systems Approach
25. Create a Culture Shift that Supports Farmers

General Comments

AFT would like to offer the following comments regarding *continuation of existing programs, implementation of new programs and incentives, work across agencies and programming, and outreach to best reach farmers*.

Existing Programs

One of the most successful programs nationally has been the state's Climate Smart Agricultural programs. AFT recognizes that these programs are a critically important strategy for the state to fund in order to support the scaling up of these practices. Specifically, the Healthy Soils program, the State Water Efficiency & Enhancement Program, and the Alternative Manure Management Program. When stable funding is provided, this gives technical service providers a signal that reassure organizations to plan for and strengthen organizational capacity to effectively reach out to farmers and ranchers to accelerate the adoption management practices. California's farmers and ranchers need to be confident that these programs remain stable and a viable tool for conservation management on their farming and ranching operations.

Implementation of New Programs and Incentives

While AFT appreciates the desire to evolve and adopt new programs, it cautions adding new programs to the climate portfolio while existing programs remain vulnerable to variable funding. Securing robust funding to scale conservation solutions on these landscapes will be critical from state, federal, and private partners. Without strong state commitments, in-kind funding from these key partners is more difficult to secure.

Working Across Agencies and Programming

AFT is engaged in the planning process climate scoping plan and the natural and working lands climate smart efforts. We believe now more than ever, the state has an opportunity to create durable and collaborative engagement between state agencies, and to be a leader in climate smart agriculture and land solutions. We would urge the Department to continue to lean into agricultural solutions that are practical, economical, and encourage implementation through voluntary efforts to meet the ambitious climate goals in California.

Outreach to Farmers and Ranchers

Engagement with farmers and ranchers is critical in supporting the transition to sustainable land-based management practices. Nonprofits serve a critical role in this farmer and rancher outreach. We urge the department to explore options that include scaling up capacity for non-profit partners. Specifically, community organizations that primarily serve socially disadvantaged populations are often under-resourced and under-staffed. This means that they are less competitive for partnership grants, especially when pitted against national organizations or land-grant universities, and may be challenged to acquire the resources necessary to create a financial match for grants. By building up these community organizations, CDFA could help to create strong partnerships that would allow CDFA to access relationships with the populations most in need of support.

Recommendation: Offer capacity-building grants for small non-profit organizations that offer financial and technical services to socially disadvantaged communities. These multi-year grants would help organizations to develop internal infrastructure such as hiring finance staff, purchasing organizational and financial software, undergoing skills training, hiring consultants, and more. This internal development will be necessary to be competitive for grants, hire additional staff, develop programming, and eventually conduct outreach and education into the communities they serve. This would create a pipeline of organizations able to work with CDFA to advance climate-smart agriculture in diverse communities.

AFT also agrees with the comments reflected in the draft document that scaling up outreach efforts and tactics that embrace socially disadvantaged farmers and ranchers is key to overcoming barriers for these communities to engage in CDFA programming. Investing specifically in technical assistance partnership can accelerate and further CDFA's reach into these communities through existing and new partnerships.

Specific Comments

13. Preserve and Expand Agricultural Land

The comments in section 13, reflects the critical need for the state to implement programming that is reflective of the intersectionality between land, water, and climate. Land conservation and permanent protection remain necessary tools in combating climate change.

Land Protection as a Climate Strategy

California's agricultural land provides multiple environmental and public health benefits often overlooked. Along with a valuable local food source, this natural capital provides benefits such as recharging the state's groundwater, controlling floods, fires, and erosion, providing habitats for fish and wildlife, pollinating plants, controlling pests, sequestering carbon, removing pollutants from the air, creating space for outdoor recreation, attracting tourists, and providing beautiful scenery.

AFT's research entitled Greener Fields[1] highlights that urban expansion, especially low-density development, results in the irreplaceable loss of far more farmland than necessary. Average emissions from urban areas are 58–70 times higher (per acre) than those from crop production in California. Related to this, low-density development produces more greenhouse gases (GHG) per capita than efficient high-density development.

While land protection is a critical tool, acknowledging the critical role that local land use planning plays is essential to tackling issues like climate, land access, and food security in

[1] *California Greener Fields*, American Farmland Trust. 2018. https://farmlandinfo.org/publications/greener-fields-california-communities-combating-climate-change/

our communities. The Sustainable Agricultural Lands Conservation (SALC) program is truly innovative by integrating planning grants into the program to create meaningful engagement and actionable plans that center agricultural resources with local planning agencies at the helm to engage stakeholders.

Recommendation: To the extent possible, CDFA should engage with partner agencies to promote planning for climate resilience, which includes planning for and protecting agricultural resources so they can remain viable in an uncertain climate future.

Land Trust Capacity

Specifically, many recommendations from this section refer to programs that are delivered by the Department of Conservation (DOC), like the SALC Program and Williamson Act respectively. AFT would like to note, in July 2019, DOC provided a comprehensive evaluation and report entitled California Agricultural Conservation a Land Trust Listening Tour Report, which identified through interviews, many capacity needs for land trusts and land managers. Specifically, one theme from this report cites the lack of capacity some land managers have in working with landowners on the implementation of sustainable management practices, which is being voluntarily encouraged through the SALC and the California Farmland Conservancy Programs (CFCP). As the state works to permanently protect agricultural lands across the state, interagency cooperation will be paramount to ensure programming and funding are implemented in the most effective ways to encourage resilient farms and ranches in perpetuity.

Recommendation: To the extent possible, CDFA should engage with partner agencies (DOC)to ensure long-term and stable funding sources for land protection through the CFCP and SALC programs, and to ensure funding is made available for farmers and ranchers to implement conservation practices on these easements.

Farm Viability and Land Access

Another theme in recommendation 13 of this report is farm viability and land access. Creating space and opportunities for new and beginning farmers, and farmers of color to access land should be among the top priorities for CDFA and DOC. Doing so in the context of farmland loss occurring at a rate of 50,000 acres per year, with skyrocketing housing costs, all while California faces a pandemic and economic recovery, makes this a daunting, but critical time to act.

One-third of farmers are older than 65 and 40% of the land is expected to change hands in the next fifteen years. The future of California agriculture, and the communities and the livelihoods that depend on it, will require a new generation of growers. We believe investing in a state-funded farm linking program will create a chance to secure stable land for producing resilient food supplies. These farmers often have difficulty accessing government programs and lack culturally relevant technical assistance for cost-effective

regenerative agricultural practices, which would allow them to adapt to significant climatic changes, reduce their greenhouse gas emissions, and conserve precious resources. To succeed, this new generation of farmers will need greater access to quality agricultural land, culturally relevant technical assistance, and current or new government programs.

Recommendation: To the extent possible, CDFA should engage with partner agencies to invest in a state-funded farm linking program will create a chance to secure stable land for producing resilient food supplies.

Recommendation: consider reducing the cost share program requirements for Socially Disadvantaged Farmers and Ranchers.

Explore a Coordinated Statewide Agricultural Mitigation Program

Recommendation: The state should explore a coordinated statewide agricultural mitigation program for all state agencies that are required to obtain agricultural mitigation. By modeling this after the High-Speed Rail mitigation program and Agricultural Land Management Program (ALMP), which is managed by the Department of Conservation, agencies would retain the opportunity to utilize the Department's expertise and knowhow to implement effective and timely mitigation on agricultural lands. We further recommend that the state should consider tracking and report how much agricultural land it converts annually, while also attempting to minimize its impact on its most productive, versatile and resilient farmlands.

24. Take a Whole-Systems Approach

Farmers and ranchers manage nearly one billion acres (or approximately 60 percent) of the land in America—land that can act as a natural carbon "sink" by absorbing vast amounts of carbon dioxide from the atmosphere and storing it in plants and soil. Of California's approximately 100 million acres of land, 43 million acres are used for agriculture. Of this, 16 million acres are grazing land and 27 million acres are cropland. Only about 9 million acres of irrigated land (see illustration), or one-third of the state's cropland, are considered to be prime, unique or of statewide importance.[2]

Unfortunately, the nation's soil has degraded over time—losing more than half of its original organic matter content—resulting in erosion, soil nutrient losses, increased greenhouse gasses, and reduced productivity. We must reverse this trend.

CDFA is already a leader in this space, but we need to do more to scale this work up through technical assistance and stable programmatic funding for Climate Smart Agriculture programs. Regenerative agriculture—sometimes also known as restorative

[2] Ag Vision Documents: https://www.cdfa.ca.gov/agvision/docs/Agricultural_Loss_and_Conservation.pdf

agriculture or climate-smart agriculture or carbon farming, can help build soil health and, in doing so, capture atmospheric carbon and put it back into the earth. These practices include no-till farming, low till farming, cover crops, crop rotations, alley cropping, intensive rotational grazing, and silvo-pasture.

By focusing on the providing farmers with whole systems solutions, farmers can achieve multiple benefits. For example, healthy soils absorb more water during heavy rains, which reduces runoff, and offer better resilience during periods of drought because the land holds more water. Healthy soils also can help farmers increase yields, increase yield stability, and be more productive in the long term.

AFT believes adopting regenerative agricultural practices is among the least costly and most immediate actions that the state can invest in to help reduce greenhouse gas emissions on a meaningful scale. Their extensive adoption can serve as an important bridge until new climate-friendly energy and transportation technologies are developed.

25. Create a Culture Shift that Supports Farmers

CDFA has a unique position to assist farmers in making voluntary management decisions that are flexible and make economic sense. AFT encourages CDFA to continue to lean into its strong leadership that has brought innovative opportunities to farmers and ranchers, and to embrace the narrative in how conservation practices are not only good for the environment, our communities and consumers, but also for our farmer's bottom line. These practices must make financial sense so that farmers will continue to implement and embrace sustainable practices going forward. Engaging strong champions of change in diverse farming circles and communities will be time well spent in to ensure that farmers feel comfortable in making these critical investments, and can see the long view, benefits, and outcomes. Learning from farmers on the largest barriers they face, may be lead to opportunities for CDFA to work with other agencies to modify and or remove identified barriers. Additionally, exploring ways to increase marketability of climate friendly crops, with the goal of earning a premium for these practices may also serve as an opportunity to place California Farmers at an advantage in a global market.

In Conclusion

AFT would add that well-managed farmland supports wildlife and biodiversity, cleans our water, increases resilience to natural disasters like floods and fires, and helps combat climate change. It's now clear that we can't realize global climate goals only by reducing emissions, we also need to retain farmland and actively manage it to draw down carbon from the air. These actions are essential to the future of agriculture and our planet. Yet none are happening at the rate or scale needed given the enormity of the climate crisis.

Without farmers and ranchers and without farmland and ranchland, we can't win the global fight against climate change. Our food, our water, our environment, our survival—

it all depends on American, *and* Californian agricultural land. AFT has a proven track record of working with conservation partners, policymakers, and farmers and ranchers to advance a wide range of environmental goals—from improving air and water quality, to reducing soil erosion, building soil health, sequestering carbon, combating sprawl and keeping working lands working. In this spirit we offer our expertise as the state continues to plan for its climate scoping plan and natural and working lands strategies.

Should you have any questions regarding these comments, please reach out to Katie Patterson at (209) 663-7223, or kpatterson@farmland.org.

Sincerely,

Katie Patterson
California Policy Manager

Almond Alliance
OF CALIFORNIA

April 30, 2021

California Department of Food and Agriculture
Via *cdfa.oefi@cdfa.ca.gov.*

Re: Farmer & Rancher Led Climate Solutions Listening Sessions Report from 3/30/21

Dear CDFA Office of Environmental Farming & Innovation Staff:

The Almond Alliance of California along with the Almond Board of California appreciates the opportunity to provide comments on CDFA's notes from the listening sessions on how CDFA can contribute to increasing the adoption of climate smart ag practices. The Almond Alliance and the ABC work together to provide regulators with a better understanding of how specific issues impact the California Almond industry.

The Almond Alliance is an association representing the California Almond industry and is organized to promote the interests of its members. Our members represent over 80% of the California Almond industry based on volume.

Established in 1950, the Almond Board of California (ABC) is a grower-enacted Federal Marketing Order (FMO) under the supervision of the U.S. Department of Agriculture. The FMO administers a broad-based mandatory program which spans incoming and outgoing quality, compliance, food safety, industry education, market development, and research on the growing, nutrition, and food safety of almonds. The ABC is financed through an assessment collected on each pound of edible almonds delivered.

Background Almonds:
There are about 7,600 almond growers in California according to the 2017 USDA Agricultural Census, with a 2020 production of 3.0 billion pounds. Almonds are put into commercial channels by approximately 100 handlers. Virtually 100% of U.S. commercial almond production is in California; grown on over 1.5 million acres throughout the Central Valley. California produces over 80% of the global supply.

Through the ABC, almond growers have been investing in research to both better understand the greenhouse gasses associated with the growing of almonds (Life Cycle Assessment) as well ways to grow almonds to reduce emissions or sequester CO2. The Life Cycle Assessment (LCA) showed that nitrogen and water inputs were the largest sources of greenhouse gases (GHG) emissions associated with the 25 years of growing an almond orchard, while the trees, hulls, and shells - the co-products grown along with the kernel - provide sequestration, biomass energy, dairy feed alternatives which off-set at the time nearly 50% of the GHG emissions associated with 25 years of growing. Thus, the LCA helped us identify the opportunities

contained with the co-products as well opportunities to reduce other GHG emissions associated with almond growing.

For California almonds there are three areas where they can engage in adopting practices that reduce greenhouse gas emissions, keeping in mind that the growing of trees is sequestering carbon for the life of the trees:

1) Adopting growing practices around soil organic matter and nitrogen to sequester/reduce emissions.
2) Reducing their reliance on fossil fuel energy in the growing and processing of almonds, this includes for irrigation and in the production of fertilizers.
3) Contributing co-products, almond hulls, shells, annual prunings, and tree removals at end of orchard life to bioenergy or a bioeconomy.

Almond Grower Research Efforts:
The Almond industry through the research program of the Almond Board of California has been investing in research on how to grow almonds in ways to improve the efficiency of growing while reducing impacts on the environment. In that context, the ABC has funded research related to climate smart farming in the last 10-15 years:

- two rounds of life cycle assessments for the 20-25 years of growing almonds that includes all the inputs to get to a brownskin almonds including growing the rootstock and scion in the nursery, to irrigation systems, to bees, etc.
- monitoring nitrous oxide emissions under different growing conditions as there was no data for irrigated, perennial cropping systems in a Mediterranean climate at the time 10+ years ago.
    - 10 years ago initiated and supplemented with NIFA-SCRI and FREP funds a revisit of the nitrogen management in almonds. The learnings of which are being actively extended to growers for the last 5 years.
- Over the last 10 years, ABC has been researching the impact of various ways to add soil organic matter back to the soil, to assess what makes a difference to the soil, but more importantly, what makes a difference to the growing of almonds and, thus, to the growers.
    - ABC was the first funder of the new practice of <u>whole orchard recycling</u>, where at the end of the orchard lifespan the trees are ground up and incorporated into the soil prior to replanting. It is showing a lot of promise for soil and positive contributions to growing.
    - Cover crops help for water infiltration or water holding capacity but are difficult to manage for water usage, frost protection, and/or clean orchard floor for harvesting reasons.
        - Tree rows with the irrigation system are managed differently from the middles.
        - Assessing roles of cover crops and external plantings (hedgerows) for pollinator habitat

    - Composts can help but struggle to find good incorporation mechanisms in what is a no-till system.
- Biomass utilization research to find higher value both in terms of economic and ecosystem uses of the hulls, shells, and woody biomass (prunings and tree removals).
- California Almond Sustainability Program is an almond centric grower self-assessment tool that provides information on what practices are or are not being used by almond growers has been in place for over 10 years.
    - It has been benchmarked with external programs such as FSA-SAI.

The Almond Alliance has been actively working with CDFA, CARB, and the SJV Air District on their incentive programs related to GHG emissions. The Alliance has also been working to expand next generation biomass utilization facilities within the Central Valley.

Comments:
CDFA has been on the forefront of developing policies and programs that encourage climate smart ag practices for over 7 years. And CDFA is aware of the diversity of agriculture within California, in types of crops, in cropping systems, in size of operations and diversities of ethnicities, ages of growers, climates, etc.

1) **Keep the diversity of cropping systems and climates in mind – not-one-size-fits-all**
    a. CDFA acknowledges this by splitting their listening sessions into 3 broad categories of crops/animal production system. However, often there is an assumption that policies or practices that work well for row crops or Midwestern crops, will automatically work in specialty crops grown in a Mediterranean climate.
        i. Food safety, for example, is a key issue for many specialty crops, including for almonds/tree nuts, that can limit the types of practices relevant to their systems.
        ii. Perennial cropping systems offer opportunities with their woody biomass but crop rotation is not their reality.
    b. Different climates and growing systems affect what kind of practices are relevant and doable.
        i. Many uniquely California crops thrive with the help of irrigation in the Mediterranean climate. However, water is the first resource to worry about. For example, implementing cover crops can be costly in terms of water usage depending on where located in the state.
    c. Continue to have programs that support the diversity of philosophies for how to grow and sizes of operations. Each have strengths and weaknesses in terms of their ability to contribute, trade-offs, or how they can implement climate smart ag practices, it is not just the smaller or larger growers, it is not just the organic or the conventional growers, etc.

2) **Develop robust and trusted mechanisms to assess the trade-offs of making changes in growing or processing systems**, aka “Take a whole systems approach”.

a. Any change in an agronomic system or practice involves some kind of trade-off whether changes in labor, technology investment, yields, quality, pests, beneficials, energy used/generated, land use, food waste, pollution, etc.
b. When look at systems or practices through one primary lens often miss the trade-offs.
   For example:
   i. in drier areas, will the increased water use by cover crops be offset by increased water holding capacity or other benefits over time?
   ii. Do cover crops in orchards increase disease incidence with higher humidity?
   iii. Do the uses of bioenergies affect criteria air pollutants?
   iv. Do less input intensive agronomic systems lead to increased land use?

Understanding the trade-offs and synergies will go a long way to increase adoption where warranted and ensure policies don't lead to poorer outcomes in other areas such as water or land use.

3) Tied into assessing the trade-offs, is **having data showing where implementing climate smart ag practices are in a grower's self-interest.** The most sustainable adoption of new practice(s) is when a grower sees that it improves their bottom line (value of their products), makes managing a problem easier than current methods, improves yield/quality, etc. Then adoption is rapid: for example: the move to microirrigation systems by almond (and other tree crop) growers as they improved yields, and water and nutrient use efficiencies; or more recently sub-surface irrigation in processing tomatoes. Another example are increased payments for improved quality.

4) As noted in the comment summary: **Science must play a central role in framing policies and practices intended to achieve climate resiliency and carbon neutrality on working lands.** CDFA has to date worked hard to ensure that science has been followed. If there is trustworthy data coming from trusted advisors/sources, then adoption is much easier to achieve.

Wood Products and Biomass

We strongly urge CDFA to work on programs/ incentives to use biomass in soil AND for bioenergy/bioeconomy. What we have learned with the loss of burning, then co-gens in the SJV is that relying on a single method to deal with woody biomass is fraught. For example, there may be good reasons for not doing whole orchard recycling at the end of an orchard's life, such as certain diseases, not replanting at all (SGMA impacts) so too costly, replanting to an annual crop where the chips would be a problem, etc. Also, from many of these bioenergy/ bioeconomy processes there is some biomass forms left over, such as biochar, that may still have utility in the soil.

- Continue the Healthy Soils Program.
  - Appreciate the addition of whole orchard recycling.
  - Expand once we better understand how co-products from bioenergy or bioproduction work in soils.

- Continue to work with the other state, regional, and federal agencies to develop practical and economically viable biomass utilization facilities.
    - Provides jobs to rural economies.
    - With the proximity to 5 major airports (Central Valley perspective) and to the Sierra Nevada forests can ag co-products contribute to bioaviation fuels?
    - Focus on more nimble systems that can move toward the dispersed/seasonal biomass sources.

Soil and Compost

We agree with the need to make composting on farm or regionally easier from a permitting and practical perspective. We add:

- Note that ensuring the food safety of any composts applied to almonds and many other crops needs to be a consideration.
- Research/demonstrations of composting plant biomass/coproducts with animal wastes to develop composts that utilize both waste streams better and may provide a product that works better for cultivated agriculture.

Organics and Pest Management

Both conventional and non-conventional pest management techniques have a place in climate smart ag practices. To date there is not enough data to know how implementation of a suite of climate smart practices will affect pests in the diverse agronomic systems of California. In some cases, the practices may reduce the conditions for pests; in other cases, the new practices may provide better habitat, such as increased humidity or cover, in ways that abets certain pest problems. Yield losses due to pests contribute to wasting the water, soil, fertilizer, land, and human resources used to grow. Furthermore, if moving to non-conventional pest management techniques requires increased tractor runs, relies on flaming/heat, etc. then the impact on emissions needs to be taken into consideration. Pesticides also play a key role in reducing post-harvest food losses = food waste. Thus, we urge CDFA to continue to have programs that support the diversity of philosophies for how to grow until we have better data on the impacts of these practices on pest pressures.

How to Incentivize

In general, CDFA has done an amazing job of developing incentive programs for a range of producers focused on climate smart practices. As noted, if there are ways to simplify applications/monitoring that would make a big difference. It is also appreciated that CDFA has not limited the programs to farms of certain sizes/incomes/philosophies, etc.

- We would love to see the COMET-Planner California version be built out further:
    - Expand the range and combination of practices.
    - Allow growers to see their baseline GHG emissions, not just the difference.
    - Allow growers to play to see how different practices make a difference.
    - Expand to include on farm energy metrics to remind of conservation or to urge move to renewable sources.
        - There is a lot of energy hidden in water and nitrogen fertilizers.

    - Expand to account for nitrogen fertilizers not produced with fossil fuels/reduced fossil fuels.
    - Expand to account for other ecosystem services/trade-offs.

  This could also be a tool to help with private ecosystem markets.
- Consider incentives that reach the PCAs, CCAs as they are the key source of information to growers.
- Consider incentives for electric farm vehicles as they become available/reliable.
    - E-ATVs haven been popular in the SJVAD incentive program.
    - Consider how to incentivize custom applications, harvester who service many smaller growers.

Research

CDFA needs to continue to articulate the research needs and support research where it can. The possibilities and needs are endless… so here some key next steps;

- Focus on demonstrations where practices are combined into a systems approach, no longer single practices.
- Ensure the funding is for more than 3 years as it takes that a long to start to see changes in the soil and ideally we would be following the changes for longer. Also, for perennial crops need time to see impacts on yield/quality.
    - Ensure the approaches are multi-disciplinary and focus on grower relevant metrics to assess trade-offs/co-benefits beyond the greenhouse gas associated metrics.
- Increase funding for UC extension,
- Reinvest in ensuring the genetic resources for California crops are modernized and maintain (e.g. clonal repositories).
- Plants the work as cover crops, pollinator, other habit providers in dryer growing regions.

Make Connections

At least in California there is little connection between UC extension staff and RCD and/or USDA- NRCS field staff. Each come from different cultures and have somewhat different priorities. However, all are interested in seeing growers adopt climate smart practices where they make sense. CDFA has funded the Climate positions located within ANR offices across the state. We suggest that CDFA help bring these agencies together to start breaking down barriers and cultures to allow the existing human resources to be more effectively used and just to get more philosophically coordinated. It does not help generate grower trust if one advisor says plant a cover crop and another advisor from a different institution say do not because it will use too much water/increase disease incidence…

Again, we appreciate CDFA taking the time to solicit feedback on how to improve their already excellent efforts to encourage the adoption of climate smart ag practices across the diversity of agriculture within California. Both the Alliance and the Almond Board look forward to continuing to work with CDFA has it works on these complex issues.

Sincerely,

Elaine Trevino
President, Almond Alliance of California

Cc: Gabriele Ludwig, Director Sustainability & Env. Affairs, Almond Board of California

CalCAN
CALIFORNIA CLIMATE & AGRICULTURE NETWORK

April 29, 2021

Dr. Amrith Gunasekara
Science Advisor to the Secretary and Liaison to the Science Advisory Panel
Office of Environmental Farming and Innovation (OEFI)
California Department of Food and Agriculture
1220 N Street
Sacramento, CA 95814

Re: Comments on the Farmer and Rancher Led Climate Change Solutions Listening Sessions Draft Report

Dear Dr. Gunasekara,

On behalf of the California Climate and Agriculture Network (CalCAN), I write to offer our comments on the draft CDFA report, *Farmer and Rancher Led Climate Change Solutions Listening Sessions.* We appreciate CDFA's leadership in convening the farmer and rancher listening sessions on climate change solutions and policy issues. Our comments are focused on next steps for this work.

Many of the comments outlined in the draft report echo similar input farmers and ranchers in our network have provided over the years as we advocate for resources for the agricultural community to address the climate crisis. Unsurprisingly, not all the farmers and ranchers who participated in the CDFA listening sessions are aligned and some of the recommendations contradict one another. It is also hard to discern from the draft report what the priority recommendations may be coming out of the listening sessions. This is understandable given the short timeline for the listening sessions and high number of participants.

To address this, we recommend that CDFA look to refine the recommendations from the listening sessions so they can meaningfully inform the Executive Order N-82-20 reports and the next Scoping Plan update.

Similar to what CDFA has done with the recent SWEEP Ad Hoc Advisory Group and the Climate Change Consortium of a few years ago, we recommend CDFA convene a smaller representative group of producers and other agricultural professionals, with support from professional facilitators, to review, refine, and prioritize the recommendations from the draft report. Such a representative group should be sure to include socially disadvantaged farmers and ranchers as well as producers from diverse scales and types of operations and those engaged in the Climate Smart Agriculture programs.

We are concerned that if the recommendations are not prioritized, it will be too difficult to incorporate the feedback. A prioritized list that avoids contradictory recommendations will better inform the administration's work on climate change and agriculture policy moving forward.

We believe this work can be done effectively, building off of CDFA's past successful convening efforts. !

Thank you for your consideration.

Sincerely, !

Jeanne Merrill !
Policy Director !

CCOF

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

April 30, 2021

Office of Environmental Farming and Innovation
California Department of Food and Agriculture
1220 N Street
Sacramento, CA 95814

RE: CCOF comment letter on CDFA's Farmer and Rancher-Led Climate Change Solutions draft recommendations

Submitted via email at cdfa.oefi@cdfa.ca.gov

Dear Office of Environmental Farming and Innovation:

California Certified Organic Farmers (CCOF) appreciates the opportunity to comment on the California Department of Food and Agriculture (CDFA) Farmer- and Rancher-Led Climate Change Solutions Listening Sessions draft recommendations (Draft Recommendations).

CCOF is a nonprofit organization that represents over 3,000 organic farms and businesses throughout California. We advance organic agriculture for a healthy world through certification, education, and advocacy. As the premier organic state, California accounts for 40 percent of all organic production in the country.[1]

Climate change impacts California's landscape, putting our water and food security at risk. At the forefront are California's natural and working lands, which experience the devastation of wildfires and extreme weather events, and yet offer the opportunity to mitigate climate change by storing greenhouse gases (GHG). With 5,340 million metric tons of carbon in soils and plant biomass, it is critical that the state protect these carbon pools by conserving, restoring, and managing its natural and working lands.[2] Stanford research from 2017 concluded that implementing climate mitigation activities on natural and working lands can contribute up to 17 percent of California's GHG reduction goal.[3]

However, the state needs to do more to protect and enhance the benefits of these landscapes. While the 2017 Scoping Plan proposes a natural and working lands GHG reduction goal of 15 to 20 million metric tons by 2030, the state does not have an overarching plan or designated agency to coordinate a cohesive strategy to meet this target.[4] The state's subsequent 2019 plan does not set specific emissions reduction or carbon sequestration goals, but does highlight the need for the state to more than double its pace and to increase fivefold the acres of cultivated lands and rangelands under state-funded soil conservation practices.[5]

CDFA's Draft Recommendations offer critical strategies to ensure California's cropland and rangeland become resilient carbon sinks. Adopting these farmer and rancher-led recommendations aligns with the Governor's directive to incorporate stakeholder input into the Scoping Plan process.[6] **CCOF recommends CDFA finalize the Draft**

[1] California Department of Food and Agriculture, California Agricultural Statistics Review 2019-2020, pg. 124.
[2] California Air Resources Board, An Inventory of Ecosystem Carbon in California's Natural and Working Lands, 2018, pg. 6.
[3] Cameron, D.R., Marvin, D.C., Remucal, J.M., and M.C. Passero. (2017). Ecosystem management and land conservation can substantially contribute to California's climate mitigation goals. *Proceedings of the National Academy of Sciences of the United States of America*, 114, 12833 – 12838. Retrieved from https://www.pnas.org/content/pnas/114/48/12833.full.pdf.
[4] California Air Resources Board, California's 2017 Climate Change Scoping Plan, pg. ES13.
[5] California Air Resources Board, et al., California 2030 Natural and Working Lands Climate Change Implementation Plan, 2019 Draft, pg. 3-4.
[6] Executive Order N-82-20 (8).

Recommendations to fund organic transition, support markets for organic food, and fund organic research and technical assistance. CCOF encourages CDFA to work with the California Air Resources Board and other state agencies to incorporate these recommendations into the Natural and Working Lands Climate Smart Strategy and the 2022 Scoping Plan and to set a 2045 climate goal for California's working lands.

Fund organic transition

CDFA should include funding organic transition as a final recommendation. The three-year transition period is one of the most significant barriers impeding farmers from becoming certified organic. During this time, producers take on the increased costs of organic management but are not yet eligible for the organic price premium.[7] Funding organic transition is frequently cited in the Draft Recommendations and aligns with the state's commitment to address climate change.

Executive Order N-82-20 directs CDFA to "accelerate natural removal of carbon and build climate resilience" in agricultural soils.[8] Healthy soils that are rich in soil organic matter are the crux of climate resilience because they capture and store carbon,[9] reduce reliance on fossil fuel-based pesticides and fertilizers, and improve drought and flood tolerance.[10] Research shows that farming organically significantly increases soil organic matter with one study finding that organic farms have 13 percent higher soil organic matter than conventional farms.[11] Supporting organic transition is a proven method for accelerating natural removal of carbon and building climate resilience.

CCOF supports the following Draft Recommendations:

- Fund certification and inspection fees for farmers and ranchers transitioning to organic practices
- Provide free technical assistance from experts in organic systems to farmers and ranchers who want to transition
- Fund input costs during the three-year transition period
- Support farmers in developing and implementing plans required to become certified organic, including the organic system plan

Support markets for organic food

CDFA should finalize the recommendation to expand procurement of organic food. California communities, especially communities of color, low-income, and rural communities, suffer from preventable diseases related to diet and food production. These communities often carry a heavier health burden by lack of access to nutritious food and greater exposure to synthetic pesticides. Providing access to organic food addresses both the nutritional and environmental health needs of a community and meets the state's mandate to advance multi-benefit approaches.[12]

Executive Order N-82-20 compels CDFA 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."[13] Organic food and farming underpins community health with studies showing organic foods to have higher levels of vitamins, minerals, and antioxidants[14] while organic farms lead to cleaner water[15] and lower risk of disease from pesticide

[7] Damewood, K. (2015) *Report on Economic Barriers to Organic Transition*. Santa Cruz, CA: California Certified Organic Farmers (CCOF).
[8] Executive Order N-82-20 (5).
[9] Ghabbour, E. A., Davies, G., Misiewicz, T., Alami, R. A., Askounis, E.M., Cuozzo, N.P., . . . Shade, J. (2017). Chapter one - national comparison of the total and sequestered organic matter contents of conventional and organic farm soil. *Advances in Agronomy*, 146, 1-35.
[10] Fenton, M., Albers, C., & Ketterings, Q. (2008). Soil organic matter. Cornell University Cooperative Extension, Agronomy Fact Sheet Series: Fact Sheet 41, 2p. Retrieved from http://franklin.cce.cornell.edu/resources/ soil-organic-matter-fact-sheet.
[11] Ghabbour, E. A., Davies, G., Misiewicz, T., Alami, R. A., Askounis, E. M., Cuozzo, N. P., … Shade, J. (2017). Chapter one - national comparison of the total and sequestered organic matter contents of conventional and organic farm soil. *Advances in Agronomy*, 146, 1–35.
[12] Executive Order N-82-20 (1)(e).
[13] Executive Order N-82-20 (6)(a).
[14] Brandt K., & Molgaard, J. P. (2001). Organic agriculture: Does it enhance or reduce the nutritional value of plant foods? *J. Sci Food Agr., 81,* 924–931.
[15] Harter, T., Lund, J. R., Darby, J., Fogg, G. E, Howitt, R., Jessoe, K. K., … Rosenstock, T. S. (2012). *Addressing nitrate in California's drinking water with a focus on Tulare Lake Basin and Salinas Valley groundwater.* Report for the State Water Resources Control Board Report to the Legislature. Center for Watershed Sciences, University of California, Davis.

exposure.[16] Expanding access to organic food is a multi-benefit strategy to build thriving communities and promote healthy land and water.

CCOF supports the following Draft Recommendations:

- Incentivize institutions to procure organic products
- Build markets for farm products with the highest carbon sequestration
- Support public procurement from small- and medium-sized California organic farmers, especially from socially disadvantaged farmers

Fund organic research and technical assistance

CDFA should incorporate funding for organic research and technical assistance in its final recommendations. Underinvestment in research and technical assistance constrains farmers' ability to adapt to increasingly variable and extreme weather conditions. The organic sector, in particular, has received limited government funding for research, and the scarcity of technical information is a barrier to organic adoption.[17] Funding these critical tools provides the opportunity to build on the resilience of organic farms and refine practices that help farmers produce higher yields in a changing environment.

Executive Order N-82-20 requires CDFA in collaboration with other state agencies to develop a Natural and Working Lands Climate Smart Strategy that advances the state's carbon neutrality goal and builds climate resilience.[18] Organic research and technical assistance builds climate resilience because of the water benefits of organic agriculture. A UC Davis study found that after 20 years organic soils absorbed and retained water more efficiently than conventional soils.[19] The water efficacy of organic systems is an important adaptation strategy because organic crops can produce higher yields under drought conditions by accessing water stored in soils.[20]

CCOF supports the following Draft Recommendations:

- Research and quantify the benefits of transitioning from conventional to organic farming practices
- Support experiments to identify strategies for maximizing microbial productivity and soil biodiversity, including long-term, large-scale trials on organic farms using multi-species cover crop blends plus compost
- Publish case studies on successful organic farmers that include economic breakdowns and explanations of farmer decision-making

The Draft Recommendations provide valuable input from farmers and ranchers that align with the state's mandate to conserve, restore, and manage its natural and working lands. We encourage CDFA to build on this input by integrating organic food and farming into the Natural and Working Lands Climate Smart Strategy and the 2022 Scoping Plan and to set a 2045 climate goal for California's working lands.

Sincerely,

Rebekah Weber
Policy Director

[16] Benador, L., Damewood, K., & Sooby, J. (2019). *Roadmap to an organic California: Benefits report*. Santa Cruz, CA: California Certified Organic Farmers (CCOF) Foundation.
[17] Marasteanu, I. J., & Jaenicke, E. C. (2015). The role of U.S. organic certifiers in organic hotspot formation. *Renewable Agriculture and Food Systems 453*, 485–521.
[18] Executive Order N-82-20 (6).
[19] Wolf, K., Herrera, I., Tomich, T. P., & Scow, K. (2017). Long-term agricultural experiments inform the development of climate-smart agricultural practices. *California Agriculture, 71*, 120–124.
[20] Pimentel, D., Hepperly, P., Hanson, J., Douds, D., & Seidel, R. (2005). Environmental, energetic and economic comparisons of organic and conventional farming systems. *Bioscience, 55*(7), 573–583.

April 30, 2021

The Honorable Karen Ross, Secretary
California Department of Food and Agriculture
1220 N Street
Sacramento, CA 95814

RE: Farmer- and Rancher-Led Climate Change Solutions Listening Sessions

Dear Secretary Ross:

Wine Institute is writing to provide input into the development of farmer- and rancher-led climate change solutions as part of California's effort to develop innovative strategies for California lands to address climate change and biodiversity challenges. Wine Institute is a public policy advocacy group representing approximately 1,000 California wineries and affiliated organizations responsible for 85 percent of the nation's wine production. The California wine community has a long history of adapting to change and demonstrating its commitment to sound environmental practices and social responsibility. This history and engagement in sustainability programs has made California wine a leader in addressing climate change.

California vineyards and wineries that produce a vast majority of the state's winegrapes and wine are participating in industry-led sustainability programs – e.g., Certified California Sustainable Winegrowing, LODI RULES, Napa Green, SIP Certified – which address climate smart agricultural practices in the vineyard and winery. Practices include energy and water use efficiency, air quality and climate protection, soil health and pest management, etc. Wine Institute and the California Sustainable Winegrowing Alliance, a non-profit organization established by Wine Institute and the California Association of Winegrape Growers in 2003, have also studied the carbon footprint of California wine, calibrated the DeNitrification and DeComposition model (DNDC model), and worked with international partners to establish an International Wine Greenhouse Gas Protocol.

California has shown itself to be a leader in implementing programs to help farmers meaningfully participate in efforts to improve soil health, reduce carbon emissions, and increase carbon sequestration. There are tremendous opportunities now to collaborate with the federal government to build on California's past efforts. Wine Institute recently submitted comments to the U.S. Department of Agriculture outlining Wine Institute's recommendations regarding climate-smart agriculture and the investments that would help build climate resiliency for wineries and winegrape growers and all of California. Please find the comments attached to this letter.

915 L Street, Suite 1190, Sacramento, CA 95814 Tel: 916-441-6974 Fax: 916-441-7890 www.wineinstitute.org

Wine Institute appreciates the opportunity to provide comments as you work to expand California's climate-smart agriculture programs and looks forward to the availability of additional resources to further implement climate-smart agricultural practices.

Sincerely,

Noelle G. Cremers
Director, Environmental and Regulatory Affairs

Enclosure: Tackling the Climate Crisis at Home and Abroad – Docket No. USDA-2021-0003

CC: Jenny Lester Moffitt, Undersecretary

April 29, 2021

Mr. William Hohenstein, Director
USDA Office of Energy and Environmental Policy
1400 Independence Avenue, SW
Room 4059-Mail Stop 3815
Washington, DC 20250-3817

Submitted via eRulemaking Portal

RE: Tackling the Climate Crisis at Home and Abroad – Docket No. USDA-2021-0003

Dear Mr. Hohenstein:

Wine Institute is writing to provide input on the U.S. Department of Agriculture's (USDA) climate-smart agriculture and forestry strategy. Wine Institute is a public policy advocacy group representing approximately 1,000 California wineries and affiliated organizations responsible for 85 percent of the nation's wine production. The California wine community has a long history of adapting to change and demonstrating its commitment to sound environmental practices and social responsibility. This history and engagement in sustainability programs has made California wine a leader in addressing climate change. Wine Institute appreciates the opportunity to provide input as USDA shapes its climate strategy.

USDA has a long history of assisting farmers working to voluntarily improve conservation practices. Utilizing existing programs to promote climate-smart agriculture will be the most efficient way of getting broad adoption of climate-smart management practices. Farmers are used to working with the Natural Resources Conservation Service (NRCS) and Resource Conservation Districts (RCD) to implement practices funded under the Environmental Quality Incentives Program (EQIP) and other Farm Bill programs such as the Conservation Stewardship Program (CSP) and Regional Conservation Partnership Program (RCPP).

In addition, California vineyards and wineries that produce a vast majority of the state's winegrapes and wine are participating in industry-led sustainability programs – e.g., Certified California Sustainable Winegrowing, LODI RULES, Napa Green, SIP Certified – which address climate smart agricultural practices in the vineyard and winery. Practices include energy and water use efficiency, air quality and climate protection, soil health and pest management, etc. Wine Institute and the California Sustainable Winegrowing Alliance, a non-profit organization established by Wine Institute and the California Association of Winegrape Growers in 2003, have also studied the carbon footprint of California wine, calibrated the DeNitrification and DeComposition model (DNDC model), and worked with international partners to establish an International Wine Greenhouse Gas Protocol.

Recommendations for a Climate-Smart Agriculture Strategy

Address the Complexity Barrier. It is important to recognize the barriers to participating in government funded programs. One of the most common barriers mentioned by farmers is the complexity of the application process and the paperwork and documentation required to participate. Wine Institute recommends that climate-smart agriculture programs have simple application procedures and allow farmers to utilize existing documentation rather than having to apply separately for every program.

Allow Flexibility for Regional Differences. It should also be recognized that there are significant differences in agricultural practices and landscapes across the country. Programs should be designed to allow for local input and flexibility to allow programs to be tailored to the local environment.

Develop Common Metrics for Climate-Smart Practices. It would be helpful to develop a system that allowed the quantification of climate-smart agriculture practices. There is a desire to quantify the carbon sequestration and carbon emission reductions generated by farms and food and beverage processors. However, there is not a unified approach to gather this data. Instead, the state looks only at benefits from state funded efforts. There would be significant benefit to having a unified data set to understand investments made by individuals, states, and the federal government to gain a true understanding of the benefits provided by climate-smart agriculture practices.

There are existing tools available to help generate this information such as COMET-Planner, Cool Farm Tool and the DNDC model. Wine Institute urges that one or two of the existing tools that have been calibrated and validated for specific agricultural crops to document climate benefits be used, rather than designing yet another model that would need to gain acceptance within the agricultural community.

Provide assistance to market climate-smart agriculture practices in international markets. Consumers throughout the world are expressing their desire to promote climate-smart practices through their purchases. Wine Institute would like to see marketing assistance provided through USDA's Market Access Program to promote products produced on farms using climate-smart agriculture practices. Trade partners are already committing to help their producers market sustainably produced products. For example, the European Union's Farm to Fork strategy will assist their agricultural producers and food processors with implementing "environmentally friendly" farming practices. USDA's assistance in this area would help level the playing field.

Partner with Existing State Climate-Smart Programs. There are opportunities for USDA to partner with existing state-run climate-smart agriculture programs to allow a farmer to apply for both state and federal assistance with once application. California's Department of Food and Agriculture (CDFA) has been partnering with farmers to implement climate-smart agriculture practices since 2014. Of interest to California winegrape growers are CDFA's Healthy Soils Program (HSP) and State Water Efficiency Enhancement Program (SWEEP) these programs provide financial and technical assistance to farmers to implement practices that increase the carbon storage capacity of soils, reduce greenhouse gases, and save water on California farms.

Collaborate with Respected Technical Service Providers. In addition to partnering with state-run climate smart agriculture programs, it is important to work closely with respected technical service providers. In California, the University of California Cooperative Extension (UCCE) and RCDs have both helped farmers understand and implement a wide range of conservation programs. The existing relationship these entities have with California farmers should continue to be utilized to help implement expanded climate-smart agriculture programs. These technical service providers will need funding to provide this

valuable service; and programs utilized to implement climate-smart agriculture practices should include funding for technical assistance.

USDA should also work closely with industry groups, private agricultural businesses, and NGOs to outreach to farmers, as well as working with UCCE and RCDs to implement climate-smart agriculture practices. Getting broad adoption of climate-smart agricultural practices is important and utilizing all available partners will help ensure the message reaches the largest group of farmers.

Fund Green Technologies to Help Speed Adoption. Adopting climate smart practices can often require investment in new technologies. Unfortunately, these technology costs often prohibit the adoption of beneficial practices. For example, the use of air curtain burners would reduce emissions from burning vines pruned or removed from vineyards. However, their use is cost prohibitive without additional incentives. In Napa County conventional burning of removed vineyards costs about $550 per acre (including pulling, piling, burning, raking, and hauling) while using an air curtain burner costs about $1,200 per acre. Wine Institute urges tax benefits, subsidies, grants, and cost-share programs to assist in the adoption of climate-smart technologies. USDA has a track record of partnering with farmers in California to adopt cleaner diesel tractors to improve air quality through EQIP. Expanding this program to include additional technologies would benefit numerous vineyard owners interested in investing in environmentally friendly technologies and practices.

Fund Research to Address Co-Benefits and Information Gaps. While partnerships with states and technical service providers will help broaden the adoption of climate-smart agricultural practices, additional research will also help expand the interest in adopting practices. Research is documenting the agronomic benefits of healthy soils and other carbon sequestration and emission reduction practices, but more research is necessary. It would be helpful to have research that quantifies the multiple benefits of combining carbon sequestration practices.

Research is also needed to quantify the carbon sequestered by permanent crops and the lifespan of the sequestration benefits. There is also research needed to document potential benefits from new carbon sequestration practices such as the addition of biochar to soils. California has placed restrictions on burning grapevines after removal due to air quality concerns. Turning retired vines into biochar through a cleaner burning system is a practice of interest to vineyard managers to recycle vines into a product to improve the health of the soil. However, more research is needed into the efficacy of this practice.

Co-Benefits for Wildfire Prevention. If research can document the value of biochar for carbon sequestration it could also be created out of fuels removed from forests. This concept is of particular interest to vineyards and wineries at high risk of fire due to their proximity to very high and high fire hazard severity zones. Utilizing fuels removed to lower fire risk on neighboring agricultural lands to increase carbon sequestration is of particular interest to Wine Institute's members. This would not only increase carbon sequestration potential on agricultural lands, but also lower transportation-related emissions by utilizing the biomass removed from forested lands near its source and reduce carbon emissions from catastrophic wildfires.

There is a need to reduce the effects of climate change and build resiliency across landscapes, but there is a very real need in the near-term for immediate work to reduce wildfire risk for Californians. It is estimated that California wineries will see damages of $3.7 billion, over time, from just the wildfires of 2020. These losses are from lost buildings, equipment, wine, vineyards, as well as the significant loss in grapes that were left on the vine due to smoke exposure. According to the California Department of Food and Agriculture's Grape Crush Report, California saw its 2020 grape harvest decline by 13 percent from 2019.

There are myriad causes of the current wildfire situation facing California and significant work is necessary to bring the state back into a more natural fire regime. California is in need of resources to reduce fuel loads on the landscape and restore the health of its forests. These efforts will require the assistance of foresters and fuel-reduction crews, new markets for material removed from overgrown forests, and funds and technical assistance for restoration after fires occur. These are urgent needs, as the low rainfall this year has created extremely dry conditions and portends an early fire season.

Planning and education to engage communities in wildfire response and risk reduction. Specific assistance is needed in a number of areas to reduce the risks of catastrophic wildfire. The first step is assistance in planning and education. This effort is needed to help communities prepare for fires and educate community members on individual efforts that can be made by property owners to reduce fire risk. The next step is assistance in implementing necessary management practices to bring landscapes back to a fire resilient status.

***Landowner assistance for healthy forest management*.** Assistance for improved management is needed in two areas. The first being technical assistance to aid landowners in choosing the appropriate management practices. The need for registered professional foresters in California is acute as they are the only individuals certified to develop plans for forest management in California. To meet the needs of landowners wanting to improve the management of their forests to reduce fire risk, USDA could provide assistance by hiring additional foresters. It is not uncommon for wineries on California's north coast to also own forestland, and regardless of ownership, wineries on the north coast are interspersed with forests and directly impacted by their management.

In addition to the need for technical assistance, landowners need financial assistance to do the work necessary to remove dead and diseased trees and excess fuel from their properties. Tree removal and fuel reduction work is expensive, and landowners would benefit from additional funding in cost share programs to help incentivize work necessary to improve the health of forests on private lands and reduce fire risks.

Funding for fuel reduction work will help improve the health of California's forests and make them more fire resilient. It will also help ready the landscape for prescribed fire and a return to a more natural fire regime. Funding through cost-share programs will help implement fuel-reduction projects, but additional research into new markets for materials being removed will help create market-based incentives to continue management practices that promote healthy forest management. In addition to market-based incentives, as mentioned earlier, utilizing removed forest material to incorporate into the soil and increase the carbon storage capacity of the soil are possible outlets for these materials and research into the feasibility and benefits of this practice would be beneficial.

Wine Institute appreciates the opportunity to provide comments as you work to develop a climate-smart agriculture and forestry strategy. Much work has been done in California on this path and there are many partnership opportunities to help build upon current efforts. Wine Institute looks forward to the availability of additional resources to further implement climate-smart agricultural practices.

Sincerely,

Charles Jefferson
Vice President, Federal and International Public Policy

Submitted via electronic mail to cdfa.oefi@cdfa.ca.gov

April 30, 2021

California Department of Food and Agriculture
Office of Environmental Farming and Innovation
1220 N Street
Sacramento, California 95814

Re: Public Input on Draft Report, "Farmer- and Rancher-led Climate Change Solutions Listening Sessions"

To Department Staff:

Thank you for the opportunity to provide input on the California Department of Food and Agriculture's (CDFA) draft report, "Farmer- and Rancher-led Climate Change Solutions Listening Sessions."[1] The document is a useful record of discussions and recommendations offered by agricultural producers who attended any of six listening sessions on possible contributions the agricultural industry can make to climate change mitigation, adaptation and carbon management.

As might be expected from such free-flowing conversations, the report also conveys some unfounded claims, assumptions and opinions by participants, including on the purported ability of livestock grazing to sequester terrestrial carbon. The science on carbon sequestration in grazed lands is complex and incomplete, while the physiological and ecological effects of a grazing-based carbon sequestration initiative could nullify the marginal benefits that might result from such a strategy.

To be clear, our organizations do not oppose animal agriculture. Instead, we urge an honest conversation about the impacts of this industry on biodiversity and soil health and its contributions to climate change to identify sustainable levels of grazing that support California's climate and biodiversity goals.

[1] Publicly available at https://www.cdfa.ca.gov/oefi/climate/docs/CDFA_Farmer_Rancher_Led_Climate_Solutions_Meetings_Summary.pdf.

CDFA intends to use this report to improve agricultural programs, update incentives, inform the development of the next climate change Scoping Plan,[2] and to support the Natural Working Lands climate smart strategy.[3] Decision-makers should fully consider the limits and risks of policies that promote grazing as a carbon sequestration practice as part of these efforts. In service to CDFA and partners, our organizations respectfully offer comment and referenced information responding to the following statements contained in the draft report. Each of these statements are in error (either directly or by omission) or include erroneous or misleading points, as the following makes evident.

> "Pay farmers and ranchers for the carbon sequestration that is created via grazing and other ranch practices." (p. 6)
>
> "Promote and protect sheep and goat grazing to reduce fire risk and sequester carbon." (p. 6)
>
> "Consider exchanging 'mitigation payments' for livestock lost to mountain lion attacks (payed [sic] to ranchers by other state Fish and Game Departments) for carbon credits given to ranchers involved in grazing programs." (p. 6)
>
> "California cattle ranchers are increasingly burdened by over-reaching government regulations. Implement EO N-82-20 so that it increases economic productivity on public lands, mitigates wildfire hazard and, in turn, will serve to continue to help finance and maintain the burgeoning costs of our state's infrastructure, schools, and essential services." (p. 7)
>
> "Incorporate the benefits of sheep and goat grazing into HSP incentives:
> - Apply HSP credits to fuel load reduction to reduce potential carbon release from large fires.
> - Provide credits in HSP and other programs for carbon draw down and biodiversity promotion from grazing.
> - In the HSP, account for the fact that soils gain water retention from hooves walking across them." (p. 8)
>
> "Quantify the fire-risk reduction, carbon sequestration, and soil health benefits of sheep and goat grazing. Calculate the total number of acres grazed annually including federal, State, and private lands." (p. 10)
>
> "Fill research gaps regarding differences in enteric emissions when animals are grazing rangelands. Research underway in the Middle East could inform California." (p. 10)

[2] The California Air Resources Board's 2017 Climate Change Scoping Report is available at https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/scoping_plan_2017.pdf.
[3] California Air Resources Board, "Natural and Working Lands," https://ww2.arb.ca.gov/our-work/programs/natural-and-working-lands.

> "Cattle ranchers with public land permits to graze livestock are essential in restoring lands damaged by wildfires, but only if the administering government agencies with a proven poor track record for managing lands, support active and flexible multiple use of these public lands." (p. 14)
>
> "Pay farmers and ranchers for the carbon they sequester." (p. 16)

These listening sessions and draft report were generated in response to Governor Newsom's "biodiversity" Executive Order (EO 82-20-N); the order otherwise establishes a broad policy agenda for preserving California's unparalleled biodiversity, providing for climate change resiliency and achieving a statewide "30 x 30" conservation goal, as well as direction for implementing the order. In addition to the data and information provided below, the CDFA must consider the entirety of the Governor's order in pursuing a grazing-based carbon sequestration program, including its prescriptions for ensuring that proposed initiatives and incentives align with broader state policy goals.

Livestock Production is a Primary Source of Greenhouse Gas Emissions

The draft report includes scattered acknowledgement of the contributions of agriculture, including livestock grazing, to atmospheric emissions, though fails to recognize just how massive are the volume of gases generated from animal agriculture and the complete lifecycle of meat and dairy production.

Cattle in particular release significant amounts of methane and nitrous oxide, which are incredibly potent greenhouse gases. Methane has about twenty-three times the greenhouse effect of carbon dioxide; nitrous oxide has 296 times the effect (Gurian-Shurman 2011). In addition to the impact of greenhouse gases emitted directly by animals, animal agriculture in the United States contributes to climate change through methane released from fertilizer and manure decomposition; land use changes for grazing and to produce food for the animals; land degradation; and fossil fuels burned for fertilizer, animal food production, and transportation (Steinfeld 2006).

The Union of Concerned Scientists also found that pasture-raised cattle emit methane and nitrous oxide for a longer period of time and, therefore, emit more than other forms of livestock production (Gurian-Shurman 2011; *see also* Donahue 2015: 11115). The impact is greater when pastureland is degraded; cattle grazing on poor quality pasture produce four times more methane than those eating mostly grain (Franzluebbers 2010, citing others).

While California currently does not require the agricultural sector to report emissions under the Global Warming Solutions Act,[4] any grazing-based carbon management program or incentive should account for and deduct emissions against carbon sequestered on grazed lands. In many

[4] California Global Warming Solutions Act, Health and Safety Code §§ 38500-38599.

cases, emissions may exceed carbon measurably captured and verifiably sequestered in these systems.

Livestock Grazing Can Degrade Ecosystem Capacity to Sequester Carbon

Most livestock grazing occurs on publicly and privately owned rangelands and private irrigated pastureland in California, encompassing tens of millions of acres of Mediterranean grasslands, cold desert shrub steppe, warm deserts and oak savanna (Huntsinger and Bartolome 2014). Cattle are the predominant grazer in California (Huntsinger and Bartolome 2014).

In rangelands, most carbon is sequestered in plant roots (Viglizzo et al. 2019). Grasses are the main source of carbon input to soils in these environments (Diaz et al. 2009). Research on both carbon capture and carbon loss in rangelands generally focuses on the ability of vegetation to fix CO_2 through photosynthesis and the capacity of soils to retain organic carbon underground. As Booker et al. (2013: 242, citing others) noted, "in terms of long-term carbon storage, rangelands can be superior to forests because relatively more of the total site carbon is stored in the soil where it is usually better protected from atmospheric release than carbon stored in vegetation."

Livestock grazing can reduce rangeland capacity to sequester carbon through the removal of vegetation, trampling, compaction and erosion of soils, and reduction of belowground (e.g., roots) biomass (Beschta et al. 2013; Lal 2001). Deep-rooted native bunchgrasses respond to repeated grazing by redirecting energy from the plant's roots to producing more leaves to compensate for loss of aboveground biomass (see figure). Livestock grazing was found to markedly reduce root biomass of grazed plants, in both xeric and mesic environments (Kauffman et al. 2004). The die-off of belowground biomass limits the ability of vegetation to capture carbon and returns carbon to the atmosphere as root matter decays.

Grazing can also have deleterious effects on soils, through compaction and erosion that prevents plant generation and reduces soil capacity to store carbon. Kauffman et al. (2004) found that, by huge margins, soil bulk density was lower, infiltration rates were higher (for wet meadows, the infiltration rate was 233% greater) and belowground biomass were higher in ungrazed compared to grazed dry and wet meadows.

Livestock grazing especially poses a major threat to biological soil crusts in California's warm and cold deserts and semiarid landscapes. Soil crusts may constitute up to 70 percent of living cover in an arid ecosystem. In addition to slowing water erosion, stemming wind erosion and shielding ecosystems from invasive plant species, these biotic communities fix a significant amount of carbon and nitrogen, especially undisturbed, late-successional crusts (Belnap 2000; *see also* Li et al. 2017). Soil crusts also slow water erosion, stabilizing water and nutrient cycles that are essential to reducing the risk of desertification.

Biological soil crusts evolved with low levels of disturbance and are easily damaged or destroyed by livestock trampling (Belnap 2000). One cow hoof can exert the pressure of more than five times the pressure of heavy earth moving machinery on the soil surface (Beschta et al. 2013, citing others). The U.S. Department of the Interior recommended limiting grazing to winter use only and, in more sensitive sites, restrict grazing to avoid impacts on soil crusts (Belnap et al. 2001). Reducing livestock grazing impacts on soils and biological soil crusts would also help achieve the Governor's direction to "[e]nhance soil health and biodiversity through the Healthy Soils Initiative" (EO 82-20-N § (4(c)).

In compromising native vegetation, baring topsoil and trampling soil crusts, livestock grazing is also a primary vector for the spread of invasive plant species. Grazing is implicated in the rapid incursion of annual grasses, like red brome (*Bromus rubens*), buffelgrass (*Pennisetum ciliare, Cenchrus ciliary*) and cheatgrass (*Bromus tectorum*), in hot and cold deserts and other western ecosystems (Brooks and Berry 2006; Brooks and Pyke 2001; Brooks et al. 2004; Hall et al. 2005; Reisner et al. 2013; Knick et al. 2003; Pyke et al. 2015; *see* Chambers et al. 2016). These highly competitive, prolific and fast-curing exotics severely reduce biodiversity, eliminate entire suites of native species and exacerbate wildfire by fueling larger, hotter and more frequent blazes than occurred naturally.

Landscapes invaded by annual grasses like cheatgrass sequester less carbon. These invasives absorb less carbon both aboveground and belowground than native species, and as they replace native communities, they eliminate woody shrubs and deep-rooted bunchgrasses that tend to store more carbon (Nagy et al. 2021; Bradley et al. 2006; Austreng et al. 2011). As Meyer (2011: 1), referring to western shrublands, summed: "[t]he elimination of perennial understory vegetation and cryptobiotic crusts is a nearly inevitable consequence of livestock grazing in deserts. This opens these systems to annual grass invasion, subsequent burning, and loss of a major carbon sink, a heavy price to pay for the minimal economic gains derived from direct use of these intrinsically unproductive lands for livestock production."

In addition to accounting for emissions from livestock production, decision-makers should consider the reduced capacity of an ecosystem to sequester carbon in any grazing-based carbon management program.

Livestock Grazing Remains Unproven as a Carbon Sequestration Management Practice

Writing as recently as 2020, Holechek et al. (2020: 1) reviewed the literature—and without weighing the carbon depletory impacts from grazing—still concluded that "rangeland management practices have low potential to sequester greenhouse gases." Even in reporting mixed findings on the ability of different rangeland ecotypes to absorb CO2, Svejcar et al. (2008) assessed *ungrazed* rather than grazed sites in their study, where carbon uptake might have been greater in the absence of herbivory by livestock. Booker et al. (2013: 240) argued that "given recent developments in the scientific understanding of rangeland ecological dynamics, grazing management strategies and associated management practices cannot lead to reliably increased capture of carbon on many arid rangelands [in the United States]" and that "[f]or this reason, policies for such rangelands that are based on additionality are unlikely to be effective, and may even lead to increased emissions."

Other research recommends removing livestock from arid and semiarid landscapes to increase carbon sequestration.

- "(G)razing exclusion is an effective ecosystem restoration approach to sequester and store carbon in the living biomass and soil profiles. It is important for climate change mitigation" (Reda 2018: 22870).

- "Simply removing livestock can increase soil carbon sequestration since grasslands with the greatest potential for increasing soil carbon storage are those that have been depleted in the past by poor management" (Beschta et al. 2013: 184, citing others).

- "While continuous overgrazing in the erosion-prone desert steppe is detrimental to soil and vegetation, this can be reversed and significant increases in soil fertility, cover, and biomass can be achieved by grazing exclusion" (Qin et al. 2015: 2587).

Livestock Grazing Damages Ecosystems

While the notion of a grazing-based carbon management strategy is questionable, the myriad negative effects of grazing and grazing infrastructure (e.g., fences, corals, troughs, etc.) on western ecosystems is well known. Commercial livestock production can fundamentally effect biodiversity on any given landscape, a fact state agencies should consider in executing the Governor's direction to "protect[] and restore[] biodiversity" in his executive order (EO N-82-20 § 2(b)). Grazing imperils species (Wilcove et al. 1998; Flather and Joyce 1994; Czech et al. 2000; BLM/Forest Service 1995); compacts and erodes soil (Fleishner 2010; Belsky and Blumenthal 1997); degrades riparian habitats, tramples wet meadows and defiles natural seeps and springs (Kauffman 2002; Belsky et al. 1999; Chaney et al. 1993; Kauffman and Krueger 1984); reduces water quality (fecal coliform, sedimentation) (Suk et al. 1986; Carter 2002) and water quantity (*see* Wuerthner 2002), and increases water temperature (Nusslé et al. 2015); impacts mycorrhizal communities (Bethlenfalvay and Dakessian 1984; *see also* van der Heyde et

al. 2019); shifts plant community composition (Fleischner 1994; Painter 1995; Donahue 1999); and introduces and propagates invasive species across an array of ecosystems (Kimball and Schiffman 2003; Reisner et al. 2013; Rosentreter 1994; Brooks and Berry 2006; Brooks and Pyke 2001; Brooks et al. 2004; *see also* Belsky and Gelbard 2000).

Commercial livestock grazing systematically eliminates native vegetation and often during critical times of the year when wildlife need those resources for shelter, nesting, rearing young, foraging and escaping predators (Donahue 1999; Fleischner 2010; Fleischner 1994). Grazing was identified as the fourth leading cause of species endangerment in California (Flather and Joyce 1994: 24, Table 9) and are a constant threat to native plants in the state (Painter 1995). Even where grazing might facilitate the occurrence of certain plant guilds (e.g., forbs in California coastal prairie), managers are cautioned to conduct grazing carefully to avoid impacts to sensitive species (Hayes and Holl 2003), which might not be possible in a grazing-based carbon management strategy.

Such management must include preserving plant species important to pollinators. The Governor has specifically directed CDFA and partners to "reinvigorate populations of pollinator insects across the State..." (EO N-82-20 § 4(a)). Scientific literature and evidence-based guidance recommends certain grazing intensities, rotations and seasons of use to preserve forbs and other flowering plants for pollinators (Sjö 2007; Lazaro et al. 2016; Thapa-Magar et al. 2020; Davidson et al. 2020; Blanchette 2019; Buxton et al., undated). Management must especially provide for conservation of butterflies and other pollinators that specialize on specific host plant species, not to maximize economic gain for the commercial rancher.

The pervasive use of public and private lands for livestock grazing also continues to hinder carnivore conservation and reintroduction in California. The widespread absence of apex predators has deprived California of the ecosystem services they evolved to provide, including regulation of native ungulates and other native grazers, which has been shown to provide a plethora of cascading benefits to ecosystems. Among these is the maintenance of diverse, vibrant riparian and upland habitats that are spared from heavy grazing by ungulates that are constantly on the move to avoid predators (Ripple and Beschta 2012). These healthy, diverse, resilient habitats capture and retain more carbon than overgrazed landscapes.

Grazing also wreaks havoc on natural fire regimes (*see* Beschta et al. 2014). As described previously, livestock are a primary vector in the spread of invasive plants on deserts, grasslands and shrublands that fuel massive fires in those ecosystems. In dry ponderosa pine forests, livestock grazing has dramatically reduced resilience to wildfire by eliminating the fine fuels that carry low intensity and rejuvenating ground fire, releasing dense thickets of competing ponderosa pine seedlings that drive high-intensity, devastating stand replacing crown fires that have become common in the West (Allen et al. 2002; Belsky and Blumenthal 1997; Cooper 1960; Covington and Moore 1994; Covington et al. 1997). Unnaturally large, catastrophic fires release more carbon than do smaller, more frequent fires, including prescribed fire (Watson et al. 2000; CARB 2020, draft report).

As the Governor stated in his order, invasive species are also a major threat to biodiversity in California (and were determined to be the second greatest threat to imperiled species nationwide, Wilcove et al. 1998). Grazing management should avoid contributing to the spread of invasive species in support of the Governor's goal to "[i]mplement strategic efforts to protect California's native plants and animals from invasive species and pests that threaten biodiversity and economic activities" (EO 82-20-N § 4(b)).

Summary

As we stated previously, while our organizations do not oppose animal agriculture, we urge an honest conversation about the impacts of this industry on biodiversity and the soil health and its contributions to climate change in identifying sustainable levels of grazing that support California's climate and biodiversity goals. In published commentary, Ripple et al. (2014) summarized the issues and identified opportunities available to decrease greenhouse gas emissions, including through reduced livestock production. These experts' review is worth considering verbatim in any policy that would depend on livestock grazing as a carbon sequestration practice.

- "At present non-CO2 greenhouse gases contribute about a third of total anthropogenic CO2 equivalent (CO2e) emissions and 35–45% of climate forcing (the change in radiant energy retained by Earth owing to emissions of long-lived greenhouse gases) resulting from those emissions" (p. 2).

- "Methane (CH4) is the most abundant non- CO2 greenhouse gas and because it has a much shorter atmospheric lifetime (~9 years) than CO2 it holds the potential for more rapid reductions in radiative forcing than would be possible by controlling emissions of CO2 alone" (p. 2).

- "[R]uminant production is the largest source of anthropogenic CH4 emissions and globally occupies more area than any other land use. Second, the relative neglect of this greenhouse gas source suggests that awareness of its importance is inappropriately low. Third, reductions in ruminant numbers and ruminant meat production would simultaneously benefit global food security, human health and environmental conservation. Finally, with political will, decreases in worldwide ruminant populations could potentially be accomplished quickly and relatively inexpensively" (p. 2).

- "Worldwide, the livestock sector is responsible for approximately 14.5% of all anthropogenic greenhouse gas emissions (7.1 of 49 Gt CO22e yr–1). Approximately 44% (3.1 Gt CO2e yr–1) of the livestock sector's emissions are in the form of CH4 from enteric fermentation, manure and rice feed, with the remaining portions almost equally shared between CO2 (27%, 2 Gt CO2e yr–1) from land-use change and fossil fuel use,

and nitrous oxide (N2O) (29%, 2 Gt CO2e yr–1) from fertilizer applied to feed-crop fields and manure" (p. 2).

- "Globally, ruminants contribute 11.6% and cattle 9.4% of all greenhouse gas emissions from anthropogenic sources" (p. 2).

- "Lower global ruminant numbers would have simultaneous benefits for other systems and processes. For example, in some grassland and savanna ecosystems, domestic ruminant grazing contributes to land degradation through desertification and reduced soil organic carbon. Ruminant agriculture can also have negative impacts on water quality and availability, hydrology and riparian ecosystems. Ruminant production can erode biodiversity through a wide range of processes such as forest loss and degradation, land use intensification, exotic plant invasions, soil erosion, persecution of large predators and competition with wildlife for resources" (p. 2).

- "The greenhouse gas footprint of consuming ruminant meat is, on average, 19–48 times higher than that of high-protein foods obtained from plants, when full life cycle analysis including both direct and indirect environmental effects from 'farm to fork' for enteric fermentation, manure, feed, fertilizer, processing, transportation and land-use change are considered" (p. 3).

- "(D)ecreasing ruminants should be considered alongside our grand challenge of significantly reducing the world's reliance on fossil fuel combustion. Only with the recognition of the urgency of this issue and the political will to commit resources to comprehensively mitigate both CO2 and non- CO2 greenhouse gas emissions will meaningful progress be made on climate change. For an effective and rapid response, we need to increase awareness among the public and policymakers that what we choose to eat has important consequences for climate change" (p. 4).

Thank you for considering our input on the Farmer- and Rancher-led Climate Change Solutions Listening Sessions draft report. We look forward to continued engagement with CDFA to develop and implement smart, scientifically viable policies to mitigate and adapt to climate change in California.

Sincerely,

Brandon Dawson
Acting Director
Sierra Club California

Neal Desai
Senior Director of Field Operations
National Parks Conservation Association

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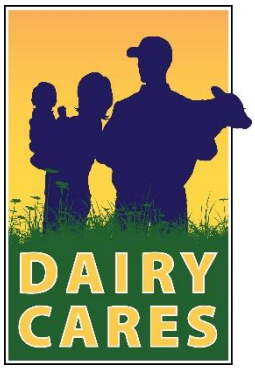

Submitted electronically to: cdfa.oefi@cdfa.ca.gov

April 30, 2021

Re: Farmer- And Rancher-Led Climate-Change Solutions

Dear CDFA/OEFI:

Dairy Cares greatly appreciates the opportunity to comment on the draft report of Farmer-and Rancher-Led Climate Solutions Listening Sessions. Dairy Cares is a coalition of California's dairy producer and processor associations, including the state's largest producer trade associations (***California Dairy Campaign, California Farm Bureau Federation*** and ***Milk Producers Council***) and the largest milk-processing companies and cooperatives (***California Dairies, Inc., Dairy Farmers of America-Western Area, Hilmar Cheese Company, Joseph Gallo Farms, Producers Bar 20 Dairy*** and ***Land O' Lakes, Inc.***). Formed in 2001, Dairy Cares promotes the long-term sustainability of California dairies by working to improve the industry's performance on environmental, animal care and other areas of sustainability.

Representatives of Dairy Cares participated in the Dairy and Livestock listening sessions on February 8 and 12, 2021. We offer the following comments:

First and foremost, Dairy Cares remains greatly concerned about the lack of continued funding in both the Dairy Digester Research and Development Program (DDRDP) and the Alternative Manure Management Program (AMMP). The failure to continue to fund these important dairy methane reduction programs the past two years at or near historical levels will likely lead to the inability of the livestock sector to achieve the methane reductions sought by the state (40% manure methane reduction by 2030). The dairy sector has made significant strides toward the goal when grant funding was provided by the state in previous budget cycles. The lack of funding in the 2020-21 budget year and lack of funding in the 2021-22 proposed budget will undoubtfully diminish the early momentum and limit the total reductions that can be achieved by 2030.

Dairy Cares supports continued incentivization of dairy digesters.
Dairy Cares supports several recommendations regarding continued implementation of dairy digesters. Dairy digesters continue to represent an important opportunity to improve overall dairy

farm management and overall sustainability. Dairy digesters are also critical to the state's efforts to reduce manure methane emissions from the livestock sector by 40% by 2030. Toward this end, the 40% manure methane reduction goal cannot and will not be met without continued development of dairy digesters on California dairies of all sizes. While tremendous progress has been made, another 60-100 dairy digester will need to be developed to meet the state's livestock methane reduction goal. The impact will be most significant on small dairies that are more costly to develop on an output basis. Smaller dairy digester projects, while less costly in total dollars, are more expensive on a per cow basis, and therefore, less economical, and less attractive to project developers and investors. These small dairies also pose more long-term risk to developers given the increasingly difficult regulatory burdens facing livestock operations in the state. Higher labor costs, water scarcity, and increasingly stringent environmental requirements impact all dairies, but have an increased impact on the economics of smaller dairies. As a result, continued lack of incentives will impact the dairy sector and the state's efforts to have additional dairy digester projects developed. Specific recommendations supported by Dairy Cares include:

- (p. 8) "Provide financial support for small-scale dairy farms implementing dairy digester programs."

- (p. 8) "Address inadequate funding of DDRDP that will result in net economic losses for the State because the Low Carbon Fuel Standard (LCFS) is already serving as a subsidy to dairies outside California.

Dairy Cares supports creation, export, and marketing of value-added manure products. Dairy Cares supports several recommendations in the report that are intended to build necessary infrastructure and incentives for creating a circular agricultural economy based on manure nutrients. Doing so would a) reduce water quality impacts and nitrous oxide emissions on dairy croplands by encouraging export of surplus crop nutrients contained in manure, b) reduce methane emissions generated by storing surplus manure in anaerobic lagoons on dairies, c) create new, safe, stabilized manure-based fertilizer products that improve soil health and can be used on crops where raw manure has not traditionally been used for food safety reasons, and d) reduce dependence on chemical and synthetic fertilizers, which often contain minerals mined in other countries and imported to the U.S., or depend on fossil fuel for their production. These recommendations specifically include:

- (p. 5) "Identify viable options for dairies to export excess manure nutrients off-site, including cropland around dairies, many of which are importing fertilizers and generating their own 'waste' that could be combined with manure."

- (p. 5) "Create incentive programs to export manure off small-scale dairy facilities and upcycle it. Turn manure from a waste into an asset."

- (p. 5) "Connect dairy farmers and crop farmers to export manure nutrients, process them, and export them for use on crops. This will reduce methane and nitrous oxide emissions, prevent water quality impacts from dairies, help build soils on crop farmland, and offset fossil fuel derived fertilizers."

- (p. 6) "Develop a one-time concentrated investment to kick-start a nutrient cycling and soil health economy.
    - Bring diverse stakeholders together to research, explore, understand, and connect specific markets. This work could include an inventory of current wastes, where they are, and the impacts they are creating. It could also include an assessment of what specific current markets are using another product where manure, agricultural waste, or compost could be used as more beneficial alternative.

    - Together develop an implementation plan that specifies the roles of different industries and other stakeholders as well as a funding plan. Bring diverse stakeholders together to research, explore, understand, and connect."

Dairy Cares supports continued funding for the AMMP program.
Dairy Cares supports recommendations related to restoring funding to the successful Alternative Manure Management Practices Program (AMMP). AMMP has been a vital tool in the state's efforts to reduce methane emissions from dairies, particularly on smaller dairies where anaerobic digesters may not be technically or economically feasible. AMMP projects often offer multiple benefits, not only reducing methane, but facilitating export of surplus manure, which in turn leads to water quality and soil health benefits both on and off dairies. Specifically, we support the following comments on pages 8 and 9 of the draft report:

- "Provide funding for the AMMP, which has been highly effective but has not been apportioned funding in this year's proposed budget."
- "Continue funding and enhancing AMMP to incentivize practices that generate co-benefits (such as addressing acute groundwater nitrate challenges by being a first step in enabling dairies to export their excess manure off-site) and respond to CDFA's Farm Equity efforts (bringing incentive funding to more diverse dairies while also keeping a focus on cost-effectiveness)."

Other recommendations supported by Dairy Cares
In addition, Dairy Cares supports the following recommendations in the draft report:

- (p. 6) "Allow mammalian composting." Allowing composting of cattle carcasses when disposal to a rendering facility is not a feasible option would provide an environmentally and economically sustainable solution.
- (p. 6) "Incentivize use of manure drip systems to reduce nitrous oxide emissions."
- (p. 8) "Continue accepting the manure drip irrigation system as an eligible practice in SWEEP." Dairy Cares agrees that evidence suggests manure drip systems dramatically reduce emissions of nitrous oxide. These systems can also dramatically improve crop production, nutrient use efficiency, and water use efficiency, thus protecting water quality and maximizing efficient use of scarce water resources.

In conclusion, Dairy Cares does <u>not</u> support recommendations that would limit or de-prioritize funding for any of the programs discussed above. Continued incentives are critical to ensuring the ongoing success of the effective voluntary, incentive-based approaches being carried out through each of these programs. Thank you again for the opportunity to comment.

April 29, 2020

Karen Ross, Secretary
California Department of Food and Agriculture
1220 N Street, 4th Floor
Sacramento, CA 95814

Re: Farmer- and Rancher-Led Climate Change Solutions

Dear Secretary Ross:

Thank you for the opportunity to provide comment regarding the preliminary draft of public input provided at the Farmer- and Rancher-Led Climate Change Solutions listening sessions hosted by the California Department of Food and Agriculture (Department). The California Farm Bureau Federation (Farm Bureau) and the Agricultural Council of California (Ag Council) collectively submit this comment, in addition to previous correspondence, based on input provided by the wide array of our farming and ranching members in California and in response to comments noted in the preliminary draft report provided by participating.

We would like to express our appreciation and gratitude to the Department for hosting these listening sessions to actively and directly engage the farm community and identify opportunities for agriculture to play a leading role in the state's efforts to address climate change, while providing a sustainable and economically viable pathway forward. However, the meeting participants included a limited number of self-identified farmers and ranchers, as noted in the appendices. We strongly encourage the Department to take advantage of the Farm Bureau and the Ag Council's vast network of members to supplement this report. We would also advise the Department to seek opportunities to engage with more self-identified farmers and ranchers in agricultural-centric public engagement. We encourage this model for use in future activities, including but not limited to the Natural and Working Lands Climate Smart Strategy, the Scoping Plan and biodiversity action.

We would like to highlight and concur with the thematic recommendations and perspectives noted in the preliminary report found on Page 4. Given that California's farmers and ranchers are the most highly-regulated agricultural industry subsector in the Nation, it is unsurprising that actions related to natural resource management initiated by government, including goal setting, though well intentioned may be perceived as predating future regulatory action. Moreover, experiences by early management practice adopters have illustrated that often existing regulatory requirements can inhibit or directly conflict with beneficial actions to respond to and manage climate change pressures. To combat these practical and cultural barriers, we recommend the Department look to ease access to, flexibility within and efficient use of existing programs and tools to increase the scale of climate practices on working lands.

Providing financial and non-regulatory incentives and support are critical to broad climate action success. Despite this, we recognize that the finite nature of financial support makes incentivizing practices on every California farm or ranch unrealistic. Therefore, we encourage the Department and Administration to consider public-private partnership models, like carbon offsets, to produce sustainable private investments in on-farm conservation efforts. Such an offset program should be aligned with impending federal action so that state and national climate programs are compatible and not adverse to one-another. An example of a successful public-private partnership includes the Food Production Investment Program (FPIP). FPIP has already contributed to significant GHG reductions in the food-processing sector. We encourage the Department to reinstate FPIP funding. We also encourage the Department to embrace its role to protect and promote California agriculture and harness the purchasing power of the State to support the agricultural community through commodity procurement in state contracts. As California approaches potentially catastrophic droughts and water shortages, we strongly support continued funding for the State Water Efficiency and Enhancement Program (SWEEP) and possibly expanding SWEEP to include water efficiency programs for agricultural and food processors.

Furthermore, as the State plots its progress towards long-term climate goals, like greenhouse gas emission reductions and carbon neutrality, we recommend the Department catalogue all farm/ranch acreage that is currently under management practices, including those not participating in State funded programs. Properly articulating the totality of benefits of working lands, ensures climate benefits are properly operationalized and that co-benefits inherit to agriculture is acknowledged.

Finally, Farm Bureau and Ag Council would also like to use this opportunity to respond to some comments provided in the preliminary report. We recognize that the report is simply a reiteration of public comments collected from stakeholders, but we encourage the Department to consider them critically, considering the limited number of self-identified farmer and rancher participants. Several comments, including those related to rebuffing the benefits of dairy digesters[1], impacts of pesticide use[2], existing "incentives for agricultural burning,"[3] promotion of privately certification programs[4], and anticipated market responses to agricultural systems[5], should be evaluated based on scientific evidence and agricultural practitioners before used to guide state action.

Thank you for the opportunity to comment on this preliminary report. Please feel free to reach out to either to enable greater farmer-specific guidance on this challenging work. Farm Bureau, Ag Council, and its associated members look forward to playing an active role in implementation of Governor Newsom's Executive Order N-82-20 and associated climate and biodiversity action.

Sincerely,

Taylor Roschen, Policy Advocate
California Farm Bureau Federation

Emily Rooney, President
Agricultural Council of California

[1] Page 5: Bullet 9; Page 8: Bullet 11.
[2] Page 11: Bullet 11; Page 26: Bullet 4; Page 27: Bullets 1 and 3; and Page 34: Bullet 7.
[3] Page 25: Bullet 4.
[4] Page 16: Bullet 5, 13; Page 26: Bullets 2, 3, 5 and 10; and Page 34, Bullet 8 (Sub-bullet 2).
[5] Page 6, Bullet 2; Page 26, Bullet 2; Page 16: Bullet 10 (Sub-bullet 2); Page 34: Bullets 1 and 2.

Californians For Pesticide Reform

April 30, 2021

Secretary Karen Ross
California Department of Food and Agriculture
Office of Environmental Farming and Innovation
1220 N Street
Sacramento, CA 95814
cdfa.oefi@cdfa.ca.gov

Re: Farmer- and Rancher-Led Climate Solutions Listening Sessions Report

Below please find public comments and recommendations from the statewide coalition Californians for Pesticide Reform on CDFA's recently concluded Farmer- and Rancher-Led Climate Solutions Listening Sessions Report.

Following Executive Order N-82-20, CDFA is tasked with identifying effective working lands climate-change solutions that sequester carbon, reduce greenhouse gases and enhance biodiversity. We urge CDFA to fully incorporate and incentivize adoption of biological and organics systems and ecological pest management in recognition of their enhanced climate, biodiversity, water and air quality, and community health benefits.

For too long, organic farming has been ignored as a systems solution for climate mitigation, despite the fact organic farming systems reap greater climate benefits than adoption of individual climate-smart farming practices. **We recommend that CDFA recognize and prioritize funding to support farmers' transition to organic farming systems, especially organic farming systems that include other regenerative and agroecological elements**. Not only have a multitude of scientific studies now demonstrated the greater effectiveness of organic farming to sequester carbon, especially stable carbon, when compared to conventional farming, but organic farming brings a multitude of other benefits, including in air and water quality, biodiversity, community health, and jobs. Organic agriculture is structured for continuous improvement and is the only form of management that is certified and nationally regulated by precise standards to verify its claims. **Similarly, we urge CDFA to recognize the destructive and quantifiable role synthetic pesticides and fertilizers play in increasing greenhouse gas emissions and in depleting soil health and therefore the ability of the soil to absorb nutrients, including carbon and nitrogen**.

Fully Incorporate and Incentivize Biological and Organics Systems and Ecological Pest Management in Recognition of Their Enhanced Climate, Biodiversity, Water and Air Quality, and Community Health Benefits

Take a Whole-Systems Approach

Adoption of holistic farming systems and projects that combine multiple GHG-reducing practices on farms and ranches should be prioritized for state incentives. We know from the scientific literature that combining management practices that improve soil organic matter (SOM) does more to increase carbon sequestration and reduce GHG emissions than any single practice. We also know that when combined, many individual practices can have complementary agronomic and soil health results. For example, mulching and cover cropping can reduce weed pressure, thus reducing pesticide use and the need to till, while also building soil organic matter and improving water infiltration. We also know that inclusion of perennial species (e.g. perennial crops, forage, hedgerows) can lead to larger and more permanent improvements in SOM and C sequestration. Cropping systems that integrate multiple practices, including cover crops, diversified crop rotations, organic amendments, no-till, and limited use of synthetic fertilizers and herbicides show significant C sequestration potential, estimated at 600 – 1,000 lb SOC/ac-year in.[1] We encourage CDFA and its agency partners to prioritize projects, such as organic farming systems, that combine multiple practices and promote the use of integrated farming systems that work across multiple management areas including: water use/irrigation; off-farm inputs; energy use; crop choices and cropping patterns; and biodiversity.

Petroleum-derived Pesticides Degrade Soil Health, Biodiversity and Function, Including the Soil's Ability to Sequester Carbon

Ample research documents the effects of pesticides on soil health. Organochlorine pesticides inhibit nitrogen-fixing rhizobia bacteria, increase dependence on synthetic fertilizers and reduce overall plant yield.[2] Fungicides are associated with decreases in populations of nitrogen-fixing bacteria, increased populations of denitrifiers[3], and decreases in the number and type of soil fungi and formation of macroaggregates, which are essential to good soil structure.[4] The systemic herbicide glyphosate, which is widely used in California, reduces populations of soil microbial communities and disrupts nutrient cycling processes, reducing bioavailability of essential micronutrient and macronutrients, increasing reliance on mineral fertilizers, and reducing essential nutrient content in associated food crops.[5] Applications of the common soil fumigant metam sodium has shown persistent damage (lasting at least 4 months) in various microbial-mediated functions including nutrient cycling.[6] Neonicotinoid insecticides, which can persist in soils for years, can cause significant adverse effects on key soil organisms, including earthworms, soil microbes and decreased fungal abundance, and can lead to significant changes in levels of nitrate-N, ammonium, nitrite-N, and nitrate reductase enzyme activity, among other

[1] Lal, R. 2016. *Beyond COP21: Potential challenges of the "4 per thousand" initiative*. J. Soil & Water Conserv. 71(1): 20A-25A.
[2] Fox E, Gulledge J, Engelhaupt E, Burow ME, McLachlan JA. 2007. Pesticides reduce symbiotic efficiency of nitrogen-fixing rhizobia and host plants. PNAS vol. 104 no. 24 10283
[3] Martınez-Toledo MV, Salmeron V, Rodelas B, Pozo C, Gonzalez-Lopez J. 1998. Effects of the fungicide Captan on some functional groups of soil microflora. Applied Soil Ecology 7: 245–255; doi: https://doi.org/10.1016/S0929-1393(97)00026-7.
[4] Kalia A and Gosa SK. 2011. Effect of pesticide application on soil microorganisms. Archives of Agronomy and Soil Science, Volume 57, Issue 6
[5] Mertens M, Hoss S, Neumann G, Afzal J, Reichenbecher W. 2018. Glyphosate, a chelating agent—relevant for ecological risk assessment? Environ Sci Pollut Res Int. 25(6): 5298–5317. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5823954/
[6] Macalady JL, Fuller ME, Scow KM. 1998. Effects of Metam Sodium Fumigation on Soil Microbial Activity and Community Structure. J. Environ. Qual. 27:54-63.

impacts.[7] Pesticide applications result in a population shift from beneficial soil bacteria and fungi-feeding nematodes, essential for organic matter decomposition, nitrogen cycling, and biological control, to greater proportion of plant-parasitic nematodes.[8] Several pesticides decrease reproductive success, juvenile survival, and overall development in earthworms, which are vital for good soil structure and fertility.[9]

Recent Studies Document Organic Farming's Unsurpassed Carbon Sequestration Potential

- 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 15-18% in organically managed soils compared to 9% in the conventionally managed** soils.[10]

- As detailed in this excerpt (page 20) from a 2019 report "Agriculture and Climate Change: Policy Imperatives and Opportunities to Help Producers Meet the Challenge" by the National Sustainable Agriculture Coalition (NSAC), a number of recent meta-studies have documented how organic farming, which prohibits nearly all use of synthetic pesticides and fertilizers, demonstrated higher carbon sequestration levels over conventional farming practices [footnotes and bolds added]:

*"**Six long-term farming systems trials across the U.S. have shown greater SOC sequestration in established organic cropping systems than in conventional cropping systems** (Delate et al., 2015a)[11]. In the Beltsville, MD trial, the organic rotation accrued 2.5 tons/ac more SOC over a 13-year period than continuous no-till with conventional inputs (Comis, 2007[12], Cavigelli et al.[13], 2013; Delate et al., 2015a[14]). The conventional systems were characterized by low diversity rotations with limited or no use of cover crops; thus, implementation of NOP*

[7] Madeleine C, Kreutzweiser D, Mitchell EAD, Morrissey CA, Noome DA, Van der Sluijs JP. 2015. Risks of large-scale use of systemic insecticides to ecosystem functioning and services. Environ Sci Pollut Res 22:119–134.
[8] Yardirn EN, Edwards CA. 1998. The effects of chemical pest, disease and weed management practices on the trophic structure of nematode populations in tomato agroecosystems. Applied Soil Ecology 7: 137–147; doi: https://doi.org/10.1016/S0929-1393(97)00036-X.
[9] a. Casabé N, Piola L, Fuchs J, Oneto ML, Pamparato L, Basack S. 2007. Ecotoxicological assessment of the effects of glyphosate and chlorpyrifos in an Argentine soya field. Journal of Soils and Sediments 7:232–239; doi: https://doi.org/10.1065/jss2007.04.224.
b. Yasmin S, D'Souza D. 2010. Effects of Pesticides on the Growth and Reproduction of Earthworm: A Review. Applied and Environmental Soil Science 2010:1–9; doi: https://doi.org/10.1155/2010/678360.
[10] Pimentel, D., Hepperly, P., Hanson, J., Douds, D., & Siedel, R. (2005). Environmental, energetic and economic comparisons of organic and conventional farming systems. Biosicence, 55(7), 573-583.
[11] Delate, K., C. Cambardella, and C. Chase. 2015a. Effects of cover crops, soil amendments, and reduced tillage on carbon sequestration and soil health in a long term vegetable system. Final report for ORG project 2010-03956. CRIS Abstracts*
[12] Comis, D. 2007. No shortcuts in Checking Soil Health. Agricultural Research Service. July 2007: 4-5. Available at: http://www.ars.usda.gov/is/AR/archive/jul07/soil0707.pdf
[13] Cavigelli, M.A., J.R. Teasdale, and J.T. Spargo. 2013. Increasing Crop Rotation Diversity Improves Agronomic, Economic, and Environmental Performance of Organic Grain Cropping Systems at the USDA ARS Beltsville Farming Systems Project. Crop Management 12(1) Symposium Proceedings: USDA Organic Farming Systems Research Conference: https://dl.sciencesocieties.org/publications/cm/tocs/12/1.
[14] See Delate, K., et al, *supra*.

requirements for crop rotation and cropping system diversity contribute to the observed increases in SOC.

In a meta-analysis of 20 organic/conventional comparison trials from around the world, organic systems accrued an average of 400 lb C/ac-year more than conventional systems*, of which about 60 percent was sequestered in situ and 40 percent was imported in the form of compost, manure, and other organic amendments (Gattinger et al., 2012[15]).* ***Another meta-analysis of 59 studies found total SOC averaging 19 percent higher in organic than conventional systems*** *(Lori et al., 2017[16]).* ***In the U.S., a nationwide sampling of 659 organic fields and 728 conventional fields across the U.S. showed 13 percent higher total Soil Organic Matter (SOM) and 53 percent higher stable SOM in the organic soils*** *(Ghabbour et al., 2017[17]).*

Most recently a meta-analysis examined 528 studies which each compared at least one organic farm to at least one conventional farm (Sanders and Hess, 2019[18]). On average, organically managed soils had a 10 percent higher organic C content and a higher annual C sequestration rate of 256 kg C/ha. Nitrous oxide emissions averaged 24 percent lower for organic farming, which results in a cumulative climate protection performance of 1,082 kg CO equivalents per hectare per year. Aggregate stability in soil was on average 15 percent higher (median) in organic farming *. . .”*

- NSAC page 18 [footnotes and bolds added]:

- *“Over the past several decades NRCS and other soil conservation professionals have promoted continuous no-till for building SOC and soil health, and have considered the soil disturbance from one tillage operation more destructive to SOC and soil life than the herbicides and other agro-chemicals on which continuous no-till systems depend for successful crop production. . . . However, much of this SOC accrues in aggregates near the soil surface, where it is vulnerable to rapid oxidation after even a single tillage pass; most no-till farmers till once every several years to deal with perennial weeds and/or soil compaction (Grandy et al., 2006[19]; Kane, 2015[20]).* ***Crucially, most stabilized soil organic***

[15] Gattinger, A., A. Muller, M. Haeni, C. Skinner., A. Fliessbach, N. Buchmann, P. Madder, M. Stolze, P. Smith, N.E. Scialabba, and U. Niggli. 2012. Enhanced topsoil carbon stocks under organic farming, *PNAS*, 109 (44) 18826-18231.

[16] Lori, M., S. Symnaczik, P. MaEder, G. De Deyn, A. Gattinger. 2017. Organic farming enhances soil microbial abundance and activity – A meta-analysis and meta-regression. PLOS ONE https://doi.org/10.1371/journal.pone.0180442 July 12, 2017, 25 pp.

[17] Ghabbour, E. A. *et al.* Chapter One - National Comparison of the Total and Sequestered Organic Matter Contents of Conventional and Organic Farm Soils. in *Advances in Agronomy* (ed. Sparks, D. L.) vol. 146 1–35 (Academic Press, 2017).

[18] Sanders J and J. Hess (Eds), 2019. Leistungen des ökologischen Landbaus für Umwelt und Gesellschaft. Braunschweig: Johann Heinrich von Thünen-Instit, 364 p, Thünen Report 65. Accessed May 2, 2019 at: https://www.thuenen.de/media/publikationen/thuenen-report/Thuenen_Report_65.pdf

[19] Grandy, A.S., G.P. Robertson, and K.D. Thelen. 2006. Do Productivity and Environmental Tradeoffs Justify Periodically Cultivating No-till Cropping Systems? *Agronomy Journal*, 98(6): 1377-1383.

[20] Kane, D. 2015. Carbon sequestration potential on agricultural lands: a review of current science and available practices. Breakthrough Strategies and Solutions and National Sustainable Agriculture Coalition. 35 pp. available at https://sustainableagriculture.net/wp-content/uploads/2015/12/Soil_C_review_Kane_Dec_4-final-v4.pdf.

matter appears to derive from microbial process of root exudates and other organic residues and are not of direct plan origin (Paustian et al., 2016[21]; Kallenbach et al., 2016[22]; Schmidt et al., 2011[23]). Thus, the detrimental effect of chemicals used in no-till systems to soil microbes undermines formation of stable soil organic matter *(Druille et al, 2013[24]; Nicolas et al., 2016[25]).*

- Dr. Horwath's research at UC Davis concludes that the metric of organic is a better predictor of carbon sequestration compared to no till and cover crops.

We urge CDFA to recommend and adopt policies in accordance with the organic farming studies above, not only for the beneficial climate impacts of organic farming but for the critical co-benefits associated with organic farming's near elimination of synthetic inputs, including for biodiversity, air and water quality and community health. Supporting this transition is also important for the future of Californian farming. Currently, demand for organic supersedes supply in California. And with other large agricultural economies investing heavily in organic farming, it's critical that California do the same and help California farmers remain competitive.[26]

Incentivize Farmers' Reduction of Synthetic Pesticide & Fertilizer Use Since Synthetic Pesticides and Fertilizers Contribute to Greenhouse Gas Emissions and Impede Soil Carbon Sequestration

Although generally excluded from state emission estimates, pesticides and fertilizers contribute directly to greenhouse gas emissions. Pesticide production is an energy-intensive process, with fumigant production alone (roughly 17% of California's agricultural pesticide use) utilizing approximately 500,000 gigajoules of energy per year, likely an underestimate.[27] Application of three common fumigants (approximately 20 million pounds of which are applied in California each year) are associated with 7-100 fold increased rates of N_20 emissions, a greenhouse gas 300

[21] Paustian, K., Lehmann, J., Ogle, S., Reay, D., Robertson, G.P., & Smith, P. (2016). Climate-smart soils. *Nature*, 532 (7597), 49-57. DOI: 10.1038/nature17174.
[22] Kallenbach, Cynthia M., Frey, Serita D., & Grandy, A. Stuart. 2016: Direct evidence for microbial-derived soil organic matter formation and its ecophysiological controls. Nature Communications, 7, Article number: 3630. https://www.osti.gov/pages/servlets/purl/1363941.
[23] Schmidt et al., 2011. Persistence of soil organic matter as an ecosystem process. *Nature*, 478: 49-56.
[24] Druille M, Cabello MN, Omacini M, Golluscio RA. 2013. Glyphosate reduces spore viability and root colonization of arbuscular mycorrhizal fungi. *Applied Soil Ecology*, 64: 99-103; https://doi.org/10.1016/j.apsoil.2021.10.007.
[25] Nicolas V. Oestreicher N, Vélot C. 2016. Multiple effects of a commercial Roundup formulation on the soil filamentous fungus Aspergillus nidulans at low doses: evidence of an unexpected impact on energetic metabolism. *Environmental Science and Pollution Research* 23, 14393-14404; doi: https://doi.org/10.1007/s11356-016-6596-2.
[26] In recognition of the strong demand from public authorities, the general public, and agricultural professionals, in February of this year, 24 European research institutes issued a joint declaration of intent "Towards a Chemical Pesticide-free Agriculture" to set a common research strategy for the entire European Union. This was followed in March by the European Commission presenting an Action Plan for the development of organic production with a goal of reaching 25% of all agricultural land in the European Union being under organic farming by 2030.
[27] The range of energy required for production of some common organic chemicals ranges from 10-70 gigajoules per tonne. While we do not know the precise amount of energy consumed per tonne in the production of fumigants, approximately 13,600 tonnes of fumigants are used every year in California. A central estimate of energy use per tonne of 35 gigajoules per tonne would indicate that fumigant production alone utilizes approximately 500,000 gigajoules of energy in California. [CITATION?]

times more potent than carbon dioxide.[28] Fumigation with chloropicrin is associated with 7-100-fold increases in nitrous oxide.[29] Fumigation with the MITC fumigants alone (metam sodium and dazomet), and in combination with chloropicrin, also increases N_2O emissions.[30] Application of all three fumigants increased N_2O emission rates significantly when compared to non-fumigated controls, and the effects were still evident after 48 days, in contrast with fertilizer-induced N_2O emissions, which generally return to background within two weeks after application.[31] Fumigation with two other fumigants, dimethyl disulfide and allyl isothiocyanate, also increased N_2O emissions 6.5–7.3 and 11.2–20.7 times, respectively.[32] In addition, some herbicides appear to accelerate soil N_2O emissions.[33] We urge CDFA to ensure that this research is taken into account and incorporated into the state's greenhouse gas emission metrics, to ensure that farmers are rewarded for reduction of these greenhouse gas-emitting chemicals.

In addition, pesticide and fertilizer applications also inhibit the soil's ability to sequester carbon. Organic farming free of synthetic pesticides and fertilizers has been shown to result in higher stable[34] soil organic carbon than conventional farming, even continuous no till conventional farming, as well as reduced nitrous oxide emissions.[35] Fertilizer applications inhibit soil

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[28] Spokas K, Wang D. 2003. Stimulation of nitrous oxide production resulted from soil fumigation with chloropicrin. *Atmospheric Environment* 37 (2003) 3501–3507. Spokas K, Wang D, Venterea R, Sadowsky M. 2006. Mechanisms of N2O production following chloropicrin fumigation. *Applied Soil Ecology* 31: 101–109. Spokas K, D Wang, Venterea. R. 2004. Greenhouse gas production and emission from a forest nursery soil following fumigation with chloropicrin and methyl isothiocyanate. *Soil Biology & Biochemistry* 37: 475–485

[29] Spokas K., Wang D. 2003. Stimulation of nitrous oxide production resulted from soil fumigation with chloropicrin. *Atmospheric Environment* 37 (2003) 3501–3507. Spokas K, D Wang, Venterea. R. 2004. Greenhouse gas production and emission from a forest nursery soil following fumigation with chloropicrin and methyl isothiocyanate. *Soil Biology & Biochemistry* 37 (2005) 475– 485. https://doi.org/10.1016/S1352-2310(03)00412-6. Fang W., Yan D., Wang X., Huang B., Song Z., Liu J., Liu X., Wang Q., Li Y., Ouyang C., and Cao A. Evidences of N20 Emissions in Chloropicrin-Fumigated Soil. *Journal of Agricultural and Food Chemistry*, 2018, 66, 11580-11591.

[30] Spokas K, D Wang, Venterea. R. 2004. Greenhouse gas production and emission from a forest nursery soil following fumigation with chloropicrin and methyl isothiocyanate. Soil Biology & Biochemistry 37 (2005) 475–485. https://doi.org/10.1016/S1352-2310(03)00412-6

[31] Id.

[32] Biochemical pathways used by microorganisms to produce nitrous oxide emissions from soils fumigated with dimethyl disulfide or allyl isothiocyanate. *Soil Biol. Biochem.* **2019**, *132*, 1–13. https://doi.org/10.1016/j.soilbio.2019.01.019

[33] Li L., Wang M., Hatano R., Hashidoko Y. Effects of methyl viologen dichloride and other chemicals on nitrous oxide (N_2O) emission and repression by pseudomonad denitrifiers isolated from corn farmland soil in Hokkaido, Japan. Journal of Pesticide Science, 2014 Volume 39 Issue 3 Pages 115-120, https://doi.org/10.1584/jpestics.D14-003.

[34] Most stabilized soil organic matter appears to derive from microbial processing of root exudates and other organic residues. Thus, the detrimental effect of agricultural chemicals on soil microbes undermines formation of stable soil organic matter. Paustian, K., Lehmann, J., Ogle, S., Reay, D., Robertson, G. P., & Smith, P. (2016). Climate-smart soils. Nature, 532(7597), 49-57. DOI:10.1038/nature17174. Kallenbach, Cynthia M., Frey, Serita D., & Grandy, A. Stuart. 2016. Direct evidence for microbial-derived soil organic matter formation and its ecophysiological controls. Nature Communications 7, Article number: 3630 https://www.osti.gov/pages/servlets/purl/1363941. A nationwide survey in the U.S. of 659 organic fields and 728 conventional fields showed 13% higher total SOM and 53% higher stable SOM in the organic soils. Ghabbour E, G. Davies G, Misiewicz T, Alami R, Askounis E, Cuozzo N, Filice A, Haskell J, Moy A, Roach A, and Shade J. 2017. National Comparison of the Total and Sequestered Organic Matter Contents of Conventional and Organic Farm Soils. Advances in Agronomy 146: 1-35.

[35] Sanders, J, Hess J (Eds), 2019. Leistungen des ökologischen Landbaus für Umwelt und Gesellschaft . Braunschweig: Johann Heinrich von Thünen-Institut, p. 364, Thünen Report 65. https://www.thuenen.de/media/publikationen/thuenen-report/Thuenen_Report_65.pdf This meta-analysis of 528 studies found that organically-managed soils had, on average, a 10% higher organic carbon content, a higher annual

sequestration as a result of the higher Nitrogen Phosphorous Potassium (NPK) rates, which sharply reduce soil organic matter.[36]

Barriers in Shifting From Conventional to Organic/Sustainable Production That Supports Climate Goals

- The three-year organic transition period poses numerous challenges, including need for capital investment, high operating costs, risk management, and regulatory compliance costs at the same time the product is not yet eligible for an organic price premium
- Inadequate information to sufficiently develop business plans or economic models for organic transition
- Public investment in organic agriculture research, technical support, and education is not sufficient to meet the needs of existing, expanding, and future organic producers
- A reliable market for organic produce is lacking, especially for smaller and mid-scale growers who cannot supply organic at scale and need support from aggregation entities

Incentives and Programs to Support Organic Farming and Reduced Synthetic Pesticide & Fertilizer Use

- Identify a sustainable funding source to support agroecological and regenerative organic farming that is neither inconsistent (such as the Greenhouse Gas Reduction Fund) nor temporary (such as a general obligation bond). Public funds have long supported development of chemical solutions to farming challenges before we collectively realized some of the inadvertent harms that arise from such chemical use. All public funding, research and implementation support should be shifted away from chemical reliance to support agroecological and regenerative organic farming.
- Add pesticide impacts on greenhouse gas emissions and the ability of the soil to sequester carbon to critical measurement tools for carbon and align incentives to favor reduction of pesticides in light of climate (and other) harms.
- Subsidize transition to organic farming by covering expenses related to the development of organic plans, ensuring no farmer has to pay for organic certification or inspections, and providing free transition assessment/services, etc., to get a bigger return on investment for carbon sequestration compared to incentivizing siloed practices like the Healthy Soils Program is doing using COMET-Planner.
- Establish scheduled public procurement goals requiring government institutions, such as public schools, hospitals, prisons, etc., to gradually increase the percentage of their purchases from organic farmers, especially small-and medium-sized and socially disadvantaged farmers, with a goal of 100% organic by 2050.
- Provide funding, technical assistance and other support to help California farmers transition off of agricultural pesticides to more ecological farming that focuses on prevention of pest and disease problems through plant and soil health and resilience.
- Expand and support the BIFS program and support additional peer-to-peer learning with farmers around pesticide reductions.

carbon sequestration rate of 256 kg C /ha, with 24% lower nitrous oxide emissions, resulting in a cumulative climate protection performance of 1,082 kg carbon equivalents per hectare per year.

[36] 1967-present Morrow Plots study (Univ. of IL)

- Add to the Healthy Soils Program criteria an organic transition package as well as a biodynamic IPM practice code. The IPM code should be consistent with UC IPM and ATTRA (not the current NRCS IPM practice code) as a strategy of managing crops and soils to prevent pests and disease and dramatically reduce use of hazardous pesticides.[37]
- Support regional Integrated Pest Management efforts.
- Promote cooperative regional insectaries to avoid the use of toxic pesticides.
- Encourage the UC Division of Agriculture and Natural Resources, the Cooperative Extension, and the UC Statewide Integrated Pest Management project to follow the Roadmap for IPM in California, including updating recommendations to emphasize pest prevention and biological and cultural controls.
- Allocate resources for studying the long-term impacts of pesticides on human health in California agriculture.
- Implement the third conservation leg of SALC.
- "Yes, yes we know it works practically, but does it work in theory?" In addition to relying on peer-reviewed literature for policy development, greater attention needs to be paid to grey literature and the on-the-ground expertise and knowledge of farmers.

The use of synthetic pesticides and fertilizers decreases soil health and fertility and reduces biodiversity, which are critical for successful farming (soil microbiota and pollination). Organic farming almost entirely prohibits the use of these synthetic chemicals, and a multitude of meta-studies have now documented how organic farming sequesters more carbon, and in a more stable form, than does conventional farming. To speed the process of adoption, it's critical the state adopt carbon metrics that recognize the multitude of benefits provided by organic farming and provide incentives for farmers to transition to organic farming, continuously improve in incorporating additional regenerative practices, and support the maintenance of organic farms and peer-to-peer teaching of organic.

Emphasize Support for Small- and Medium-Scale Farmers, Especially Socially-Disadvantaged Farmers

- International climate science continues to reveal that biodiverse and smaller scale agriculture is the key to a more resilient and climate friendly food system. Smaller-scale production is more likely to address local food needs for fresh vegetables than industrial agriculture focused on exporting outside the state (which brings additional greenhouse gas emissions). California should reflect these findings throughout its state programs to support farmers, and should empower small scale and agroecological growers to preserve culturally appropriate farming practices that cool the planet.
- Devote sufficient resources to outreach, language, and cultural competency to reach small-scale and medium-scale farmers, especially socially disadvantaged farmers. Invest in additional on-the-ground technical assistance, outreach, and peer-to-peer training and support networks, and devote sufficient resources so that all farmers, regardless of size, income, language, racial and cultural background are able to access new and existing programs intended to benefit them. The lack of resources is a major barrier to farmers participating in current government incentive programs.

[37] UC IPM; ATTRA, USDA/NIFA

- All outreach, stakeholder meetings, technical assistance, should be provided in multiple languages. This was a flaw in CDFA's listening session, with only English provided.
- Schedule all listening sessions intended to gather input from farmers and ranchers at times they are most likely to be available. Again CDFA's listening sessions were not timed for greatest farmer/rancher participation. In addition, offer other ways for farmers and ranchers to provide feedback – phone and email surveys, smaller outreach meetings, etc.
- Consider developing a common application form that can be used by farmers to apply for multiple incentives through various programs. The form should be easy to fill out and should reference all potential incentive programs for which applicants might be eligible.
- Incentive funding should be provided upfront.
- Hire bilingual and culturally competent staff with expertise in culturally relevant crops.
- The state needs to support the growth of Resource Conservation Districts, which are largely lacking or under-resourced in areas of the state such as the San Joaquin Valley, which is falling behind in climate farming practices such as organic farming. Without this type of county-level infrastructure and investment in environmental stewardship, USDA and UC Coop Extension agents are burdened with the task of facilitating the outreach and engagement with growers on state programs in addition to federal programs, and adoption remains slow.

March 30th, 2021

Secretary Karen Ross
Office of Environmental Farming and Innovation
California Department of Food and Agriculture
1220 N Street, Sacramento, CA 95814
Via email: cdfa.oefi@cdfa.ca.gov

Re: Farmer- and Rancher-led Climate Change Solutions Listening Sessions

Dear Secretary Ross & OEFI staff:

Thank you for the opportunity to provide comments on the draft summary of stakeholder input on farmer- and rancher-led climate change solutions, which is in response to Executive Order N-822-20. Leadership Counsel for Justice & Accountability is a community-based organization working alongside rural, unincorporated and low-income communities in the San Joaquin and Eastern Coachella valleys. In our agriculture, climate and water work, we collaborate with many residents who are farmworkers; who live near large-scale conventional farms and dairies; who often suffer from the public health consequences of pesticide use, agricultural burning, water pollution and unavailability; and who are small/micro-scale growers or aspiring growers.

We offer, below, our recommendations based on topic themes and comments that were captured from the listening sessions, along with some additional points.

Dairy manure management & biomass:

- ! Discontinue the Dairy Digester Research & Development Program (DDRDP) and do not continue to promote the false solution of dairy digesters. Dairy biomethane has no place in the zero emission energy & transportation future the State has envisioned. The manure-lagoon system which is a condition for dairy digesters relies on unsustainable concentrations of cows, and their manure, on relatively small areas of land, especially in the San Joaquin Valley. This model of animal agriculture creates local water, air quality, odor and other impacts, disproportionately affecting lower-income Latinx communities. We encourage CDFA to work with environmental justice, rural residents, other state agencies, sustainable agriculture researchers, and agricultural stakeholders on strategies to reduce methane emissions *in the first place*.

- ! Similarly, efforts to research uses for the effluent from dairy digesters are misplaced. Valuable research dollars should not be dumped into dairy digester technologies and byproducts when data, research, and effort is needed to focus on pasture based dairy, safe, equitable and sustainable composting, and diversified, agroecological, multibenefit farming.

- ! Ensure protection of water quality, air quality, and local community health when considering various markets for manure and the “nutrient cycling and soil health economy;” long-distance export, for example, could increase truck traffic in nearby communities.

- ! Include holistic data and research that presents life cycle analyses of farm and dairy operations to support farmers to transition towards multibenefit climate solutions that consider not just carbon, but water and air pollution, pesticides & fertilizer impacts, and the emissions taking place across different farm activities, both on and off the farm.

- ! Do not incentivize agricultural burning or incinerating organic material that could be reincorporated into the soil. We agree with the comment that alternatives such as whole orchard recycling, mulching, or composting could be possible with appropriate support and equitable implementation. Biomass incineration, particularly in already overburdened air basins, is harmful to air quality and public health.

BIPOC (Black, Indigenous & Person of Color) farmers & Racial Justice

- ! Continue implementing the Farmer Equity Act by expanding targeted support and resources for BIPOC farmers, gatherers and growers who have historically been denied rights, resources, and recognition. We support comments raised in the listening sessions about increasing public procurement from socially disadvantaged farmers, outreach, language and cultural competency, technical assistance and access to programs.

- ! Deepen CDFA’s analysis and capacity in advancing racial & climate justice. Intentionally serving farmers of color is not a “special interest” issue, as one workgroup comment suggests-- it is about addressing racial justice in agriculture by starting to remediate past and ongoing harm caused by a clear and unarguable history of land theft, genocide of Native peoples, discrimination and stolen labor from people of color and immigrants, which all built the agricultural industry that we have today. Addressing racism in agriculture is not a threat to white farmers, but is beneficial to white farmers too. CDFA has a role to play in shifting the narrative.

- ! Consider new programs for innovative farmer, farmworker, BIPOC community, and environmental justice partnerships to implement projects or community-based research to advance equitable, multi-benefit climate solutions on farms (GHG reduction, carbon sequestration *and* water/air pollution reduction, water conservation, synthetic input reductions, equitable food access, workforce development, land-based training, community benefits etc.).

Equitable Land Conservation & Tenure $

- ! Collaborate with other state agencies to improve BIPOC access to land by providing financial support and technical assistance through new and existing programs.

- ! Work with the Department of Conservation and Strategic Growth Council to define agricultural land conservation more broadly to include not just land that hasn't been converted to urban use, but that actively conserves water quantity, water & air quality, reduces synthetic pesticide and fertilizer use, and protects public health.

- ! Work with partner agencies and stakeholders to create pathways to stable, equitable land tenure that allows under resourced farmers to implement agroecological practices that may take years to see results. Facilitate long-term stability for farmers who want to practice and promote just, agroecological systems into the future.

- ! Incentivize land-based training programs that specifically advance agroecological farming and support BIPOC growers, gatherers and communities, and farmworkers who may want or need to transition in their jobs due to issues like labor automation.

- ! Through new or expanded programs, promote cooperative land ownership and management models that allow farmers or aspiring farmers to pool resources to shift to agroecological practices and reach climate justice goals.

Water and Pesticides

- ! Identify crops, such as drought resistant varieties, whose water demand is aligned with water availability in their growing region, and coordinate crop planting with expected future climate change scenarios and droughts to minimize water use.

- ! Acknowledge and create strategies to address the climate and water quality impacts of pesticides in new and existing CDFA programs. We agree with the comments to quantify GHG reduction that comes from eliminating conventional pesticides and to support strategies and funding that directly reduces the use of synthetic pesticides. We add that CDFA should incorporate these strategies across agency climate plans and in the Climate Smart Lands Strategy.

- ! Work with farmers and agencies to create protective buffer zones between synthetic pesticide-treated fields and sensitive sites like schools and homes.

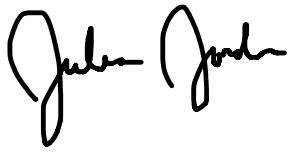
Outreach, Engagement & Relationship-building

- ! Expand CDFA’s outreach and engagement to better bridge the divide and increase trust between environmental justice, farmworker, tribal, farmer, TA provider, and state stakeholders. It is unclear who CDFA considers an agricultural stakeholder in the listening sessions summary report. For example, were farmworkers or

farmworker-serving grassroots organizations involved? Workers have a wealth of knowledge to contribute to the climate solutions, are just as connected to agriculture as farm owners and managers and must be considered invaluable partners. The same is true for indigenous communities and growers of color. As the State develops climate plans, we urge the agencies involved to consider these communities as key agricultural stakeholders.

Thank you for considering these comments as you move forward in the process of implementing E.O. N-28-20 and the necessary efforts to address climate and equity in agriculture in California. We look forward to continuing this conversation with you.

Sincerely,



Julia Jordan, Policy Coordinator
Leadership Counsel for Justice & Accountability

Hi Team at CDFA,

Thank you for the opportunity to comment on the *Farmer-and Rancher-Led Climate Solutions Listening Sessions* report.

As a resident of Los Angeles and consumer of foods produced by hardworking farmers and ranchers, I am pleased to see many suggestions by the ag community to move towards natural, regenerative organic practices that focus on soil health and biodiversity. I'm hopeful to see these suggestions carried forward and to see the Healthy Soils Program (HSP) expanded.

I go out of my way to buy Non-GMO, Organic/Regenerative Organic Certified foods because food grown this way benefits the health of the planet and the health of communities. Chemicals do not belong in our food - they not only pollute our shared air and waterways, they are dangerous for farmworkers, reduce fertility of the land, and kill the very microbes that make nutrients available for plants and for us as consumers. I am pleased to see the overwhelming support in favor of moving away from pesticides/agrochemicals and towards regenerative land management practices.

Sincerely,
Jennifer Ho
Resident of Los Angeles

I participated in some of these grower-led comment sessions and would like to expand upon a suggestion shown in the subject report as ... -
"Improve the HSP modeling tool to include farmers who want to do whole orchard recycling, compost and cover crop on the same field." -
My experience as a HSP Demo-funded soil carbon scientist is that this suggestion applies to all the HSP modeling tools that growers are required to use to apply and comply with the HSP grants program. Specifically, COMET is a badly flawed tool and needs to be replaced with a California-specific carbon farm planning tool -- one size does not fit all. -
Moreover, the HSP required methods for compost applications do not comply with the COMET (nor with any other published/scientific) protocols for rates and years of application. Here is how the HSP-required composting method for rangelands breaks down, versus the scientific way to do it to achieve proven soil sequestration benefits... -
CDFA Compost Application Rate: 10 tons / acre -
Scientifically supported rate: 40 tons / acre (Ryals et al., 2016, Ecosphere) -

CDFA Compost Application Replication: Once per year for consecutive 3 years -
Scientifically supported rate: Once every 10 years (Ryals and Silver, 2013, Ecol. Appl.) -

So I ask you, when will the lead scientists at CDFA actually take the time to understand the published literature results and recommend these scientifically supported composting methods for their HSP grants instead?
Christopher Potter, Ph.D. -
CASA Systems 2100, LLC -

California is the leader in “Farmer-and Rancher-Led Climate Solutions” and as such various funding is being provided for livestock production activities and reducing their impact on the environment. This view overlooks the factual reality that this initial production activity is created and sustained by the “food chain”. If the finished processed livestock product isn’t being bought for “consumption” there would be a decreasing need for livestock production and no need to fund actions and activities that lower its carbon footprint.
The ultimate result of producing livestock is the slaughter of that livestock, it just doesn’t “graze away”. Slaughter facilities consume large amounts of resources, water, power (electricity, natural gas, diesel fuel) and require proper waste disposal of water, and solid waste material, mainly animal remains coupled with natural mortalities of livestock Rendering is a critical industry to livestock production. Funding should be made available for carbon reduction for this. Rendering activity that supports this basic Ranch livestock production.
David Schurr