Almond Alliance
OF CALIFORNIA

January 5, 2022

California Air Resources Board

RE: Input on the California Air Resources Board (CARB) Draft – Natural and Working Lands Climate Smart Strategy: Modeling and Scenarios

The Almond Alliance of California (AAC) and the Almond Board of California (ABC) appreciate the opportunity to provide comments on the Modelling and Scenarios of the Natural and Working Lands Climate Smart Strategy. The AAC and the ABC work together to provide regulators with a better understanding of how specific issues impact the California almond industry.

There are approximately 7,600 almond growers in California according to the 2017 USDA Agricultural Census. The 2020/21 crop was 3.1 billion pounds; 2021/22 production is forecasted to be 2.8 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 of almonds.

Almonds are in the same family as peaches and thrive in Mediterranean climates with cool, wet winters and hot, dry summers. California's Central Valley's climate and excellent soils are ideal for the growing of almonds. While the trees are drought tolerant, the yields are much higher with irrigation. Currently, orchards live an average 20-25 years before replanting is warranted. The nuts provide an energy dense food that is a good source of plant-based protein, healthy fats, and are high in a range of nutrients such as vitamin E, manganese, magnesium, calcium, iron, and potassium. The shelf-life of almonds is approximately two years when stored under cool, dry conditions – sufficient to meet the U.S. Department of Defense's requirement for MREs.

We believe there are great opportunities to reduce emissions and sequester carbon in Almond orchards and our nut and by-product processes. The primary purpose of the Natural and Working Lands Climate Smart Strategy is to reduce carbon emissions into the atmosphere and to use natural and working lands – almond orchards sequester carbon into sinks. When managing working lands for carbon, there can be other secondary benefits or trade-offs outlined by the administration in water use and biodiversity. We look forward to working closely with the administrative agencies and the legislature to identify, fund, and implement effective strategies.

Comments on the overall focus and principles of the scenarios

We appreciate that CARB focuses on setting a "target" and not a limit that acknowledges that natural and agricultural ecosystems are complex biological ecosystems and that the one constant is change. Thus, we encourage CARB to keep in mind that there are many factors beyond those being modeled that will affect the choices as to which crops to grow, how they are grown, etc.

We also appreciate that the value of woody perennial cropping systems, such as almonds, for greenhouse gas sequestration is *finally* being acknowledged by the State. Assessing the impacts of SGMA on land use changes is just as critical, as that will have tradeoffs.

Our overall concern with the agricultural scenarios is that no effort is being made to factor in leakage due to productivity changes. This results in a trade off that may undermine the goals of the Natural Working Lands Program. If there are productivity losses, then there is a high likelihood that those food calories and nutrients (it may not be the same crops) will be grown elsewhere in the US or world, and, in some cases, those foods will be imported into California. This undermines CARB's intent to reduce environmental challenges in one state, by increasing the burden elsewhere or even in

California by increasing imported foods to offset the reduction in locally grown options.

Another example could be in terms of organic farming methods. Certainly, for almonds, organic production tends to have lower yields – will that mean that additional land will need to go into production (in CA or elsewhere) potentially increasing conversion of natural to ag lands? The current models (Daycent, CARB Orchard Carbon Model, etc.) account for GHG changes but not productivity changes. What are the fundamental goals that the state is striving for? We agree with the focus on greenhouse gas reduction and understanding the changes to water use and on biodiversity associated with climate-smart practices, however, the value, affordability, and local accessibility of food - a fundamental human health and security need – is not included in the key factors to strive for. It needs to be included as a goal – providing a healthy, nutritious diet to Californians – precisely the kinds of foods California is good at growing.

As noted by some commenters, the best methodology to assess tradeoffs and consider leakage is the Life Cycle Assessment or Inventory methods. We highly encourage the State to consider expanding its modeling to encompass an LCA/I approach.

<u>Comments on the scenarios</u>

Our comments focus on ag scenarios 2-5, those between the idealized maximum carbon storage scenario and BAU.

- Scenario 2 & 3: It is not clear why there is a differentiation between drought resiliency practices and maximizing biodiversity practices. For the climate-smart ag practices that work for almonds, there is a mix of trade-offs and benefits to water use and biodiversity. For example, cover crops can increase water use depending on when in the ground while increasing biodiversity.

We recommend focusing on different levels of adoption between Scenarios 1 – 4 and assessing their relative impacts on greenhouse gases, water, biodiversity, and productivity.

  - A key element is also looking to rainfall differentials across the state. That will impact what climate-smart practices make sense – particularly relevant for cover crops/hedgerows, etc.

- As currently written for Scenario 3, it is not clear whether efforts by private markets who have made GHG reduction commitments and incentivized grower adoption of climate-smart practices are included. If not, these should be.

- Other than for Scenario 1 and BAU:
  - Need to assume the same level of ag land conversion to development across all the rest of the ag scenarios.
  - Need to assume SGMA impacts across Scenarios 2-5. Not clear why SGMA is not a part of Scenarios 4 and 5.

- For Scenario 5 (currently BAU for ag), we recommend modeling that a percentage of the ag co-products go to bioenergy and other bio-based products. A scenario to model is where not all of the co-products/woody biomass are returned to the soil, or composted, or are assumed a GHG benefit (e.g. if burned). Consider modeling if some 25-50% of ag co-products are used for bioenergy/bioproducts.
  - Ag is seeking to have various options for the use of their co-products, ideally with economic value.
  - Some of the modeling from forestry could be used for ag woody biomass to energy/biodiesel, etc.
  - It is not clear where biochar fits into any of these scenarios

- None of the scenarios consider changes in Nitrogen fertilizer sourcing. California data shows that certain forms of nitrogen are less likely to generate N_2O emissions (CAN17 vs UAN)There are fertilizers available that utilize significantly less energy or less fossil fuel energy in their production. In LCAs of various production ag systems, nitrogen is generally the largest contributor to the overall carbon footprint. Thus, changes in nitrogen forms and/or use of nitrogen produced to lower the associated GHG emission are a key mechanism for ag to reduce the greenhouse gas emission associated with food production and need to be included in the climate-smart ag practices.

- While organic agriculture is included in a number of the scenarios, we are not sure what data CARB has chosen to use. As noted above, organic ag often means lower yields and thus need to account for leakage and/or land-use changes. While organic ag is likely to include a wider diversity of soil organisms and higher organic matter contents focusing on organic matter in soils, it can also mean needing to apply an organically acceptable pesticide 4-5 times instead of 1 application of a more effective conventional pesticide. This also results in 3-5 more tractor runs to control insects or weeds. More transparency is needed regarding the data and assumptions CARB is uses in modeling increased organic production. And this comes back to the need for more of an LCA approach.

We note that in this modeling exercise, CARB seems to account for the lack of permanence in both the natural and ag land situations. In effect, that orchards don't last for 100 years, that ag soils are not undisturbed for 100 years, that forests are not undisturbed for 100 years. We would encourage CARB revisiting the permanence requirements as they currently stand for the Cap & Trade offset programs. We know

that any short-term sequestration, even for 20-40 years, that occurs *now* is more valuable than a GHG reduction that occurs 50 years from now.

We appreciate having the opportunity to comment on the draft scenarios and approach CARB is taking to assess the potential for natural and working lands to reduce greenhouse gas emissions.

Sincerely,

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President, Almond Alliance of California

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The Almond Alliance of California is a non-profit trade association dedicated to advocating on behalf of the California Almond industry and is organized to promote the interests of its members. AAC members include almond processors, hullers/shellers, growers and allied businesses. AAC is dedicated to educating state legislators, policy makers and regulatory officials about the California almond community. As a membership-based organization, we raise awareness, knowledge, address current issues and provide a better understanding about the scope, size, value and sustainability of the California almond community.

Established in 1950, the Almond Board of California 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 from growers on each pound of edible almonds they deliver to handlers.