July 14, 2025

California Air Resources Board (CARB)
1001 I Street
Sacramento, California, 95814
Submitted Online

Re: Notice of Public Meeting to Hear Community Air Protection Program Annual Progress Report Update

Dear Chair Randolph:

Pesticide Action and Agroecology Network (PAN), on behalf of over 8,000 supporters in California and Californians for Pesticide Reform (CPR), appreciate the opportunity to comment in response to the California Air Resources Board (CARB) Annual Report Progress Update. Numerous farmers use VOC-emitting pesticides that contribute to the formation of ground-level ozone. Ozone is a potent greenhouse gas [1], a respiratory toxicant[2], and harmful to crop growth [3,4,5], necessitating prompt action to prevent further exacerbation of ozone-related harms.

The California 'State of the Air Report' conducted by the American Lung Association revealed People of Color were 2.3 times as likely as whites to live in counties with three failing grades representing unhealthy ozone and particulate matter pollution.[6] Pesticide emissions are also concentrated in areas with higher residents of color, with 60% of zip codes containing higher residents of color hosting more than 95% of agricultural pesticide use in the state, according to the CA Environmental Protection Agency.[7] Growers, farmworkers, and farm-adjacent communities are cumulatively exposed to more toxic air contaminants due to the nature of outdoor labor, increasing frequency and severity of wildfires, pesticide-related VOC emissions, pesticide exposures, and cumulative ozone emissions. It's imperative that we do not unnecessarily increase exposure to air toxicants and climate-harming substances in overburdened communities. It's also important to note that ozone is a human health *and* plant health-harming toxicant, with multiple studies demonstrating that ozone can inhibit the photosynthetic capabilities of plants leading to weakened immune and defense systems that increase plant susceptibility to pest-driven crop damage.[8] This is highly concerning, as ozone emissions could incentivize unduly application of harmful pesticides, creating a vicious cycle.

Ozone emissions in California adversely impact human, plant, and planetary health, warranting aggressive implementation of agroecological practices and associated reduction of synthetic inputs to protect human health and the environment. Although we recognize CARB's efforts to protect CA communities from VOC-emitting pesticides, the current report does not adequately address the monitoring, analysis, or research of ozone-forming pesticides.

To address these gaps, we urge CARB & CDPR staff to consider the following suggestions:

CARB

CARB should vet CDPR's VOC testing and emissions estimation methods for scientific accuracy. While we recognize the successful collaborative efforts between CDPR and CARB, we think it's equally important to peer-review VOC-related data, methods, and processes for scientific evaluation.

- ***CARB should investigate underlying assumptions of the HYDRUS model for 1,3-D applications.*** CDPR's recent HYDRUS model incorporates new soil-moisture requirements for 1,3-D applications.[9] It's unclear whether growers are applying these methods in real-world scenarios and how feasible soil moisture requirements are for varying soil types. There is a tradeoff between utilizing simpler, yet less accurate soil moisture analyses and more complex, accurate soil moisture measurements, so it's important to conduct groundtruthing to understand the methods that farmers are likely to use. CARB should analyze the underlying assumptions of the HYDRUS model and assess growers' behavior to ensure HYDRUS is not erroneously predicting lower 1,3-D emissions.

- ***CARB should re-evaluate the rationale for CDPR's conservative application method adjustment factors (AMAFs).*** PAN's evaluation of the AMAF factors reported in Table 5 of CDPR's 2024 Annual Report on Volatile Organic Compound Emissions from Pesticides: Emissions for 1990-2023, raises questions about CDPR's inputs for calculating AMAF factors, as several AMAF's are surprisingly low.[10] Predicted emissions associated with VOC-emitting pesticides is determined by the following mathematical equation: Emission = lbs of product used * EP (Emissions Potential) * AMAF (Active Ingredient + Application Method). If AMAF factors are determined by a combination of active ingredient and application methods, CDPR must be careful in calculating Emission Ratings for pesticides that are based on 'ideal' application methods that are not rooted in real-world grower behaviors. It's critical that we understand growers' behavior, as misconceptions could result in the underestimation of emission ratings. CARB should request CDPR deliver a presentation at the next CARB Steering Committee Meeting on the feasibility and factual adoption of TIF tarpaulin and other mitigation methods based on grower surveys and listening sessions.

- ***We thank CARB for showcasing the harms of ozone on plants.*** We are pleased to see that CARB has reported the harms of ozone on crops on the CARB website. It's important to inform growers and the general public about this lesser-known topic. When ozone enters the stomata of plants, it damages cells and interferes with photosynthesis, a

key source of plant energy for fundamental plant physiological processes. Photosynthetic disruption erodes naturally-occurring plant defenses making it more susceptible to disease, pests, and environmental stressors.[11] Most notably, ozone can significantly reduce crop yields by up to 15%, and many crops are ozone sensitive including soybean, cotton, peanut, clover, alfalfa, rice, wheat, tomato, bean, grape, watermelon, and potato.[12] CA witnessed a blow to crop yields in 1997, where yield losses of cantaloupe, grape, cotton, orange, and bean ranged from 12-31%.[13] These crops are grown primarily in the San Joaquin Valley and Southern California, which hosts several nonattainment ozone areas. Ozone can also alter the chemical composition of plants, potentially making them less nutritious to consume which is highly concerning for communities that are already overburdened by toxic polluting entities. Ozone also alters floral scents which weakens pollinator navigability, potentially leading to reduced crop yields.

CDPR

VOC testing is critical for mitigating ozone-forming pesticides. CDPR's assessments must demonstrate scientific rigor, uphold public transparency, and be based on data collected from real-world applications. However, we appreciate the pesticide monitoring progress reported in CARB's Annual Progress Report and much needed cross-agency collaboration. To strengthen your pesticide monitoring efforts, CDPR should consider the following recommendations based on CDPR's Annual Report on Volatile Organic Compound Emissions from Pesticides: Emissions for 1990-2023.[14]

- ***CDPR should enforce newly adopted soil moisture requirements for 1,3-D applications.*** CDPR requires fumigant application blocks to have at least 50 percent of field capacity at depth of three to nine inches below the soil surface when fumigation occurs, with the exception of drip chemigation field soil fumigations.[15] As stated above, soil moisture methods recommended by CDPR may be useful in reducing fugitive 1,3-D emissions; however, it's difficult to determine whether these methods are employed by growers in the field. Regarding the feel and appearance method, it's critical to acknowledge that soil is inherently heterogeneous warranting large sample sizes to extrapolate accurate soil moisture measurements. Although, CAC inspection data for Central Valley counties shows no fumigant pre-application inspection violations when evaluating soil moisture using qualitative methods, often CAC's don't conduct sizeable soil sampling for accurate analyses of soil moisture content. With respect to the soil sensor method, soil sensor measurements are highly context-dependent with varying results observed in nearby soils or slopes. Therefore, exact readings must be 'taken with a grain of salt', according to Morris *et al.* 2022.[16] CDPR should survey growers to determine if more complex soil moisture measuring methods are challenging to do, survey CAC's to inquire about feel and appearance method protocols during pre-application inspections, and present information on the effectiveness of analyzing soil moisture through observational means.

- ***CDPR should enforce VOC emission monitoring by ensuring farmers are using mitigation measures (e.g. TIF tarpaulins) and other methods underlying CDPR's HYDRUS model.*** CDPR prohibits the use of Nontarpaulin/shallow/broadcast fumigant methods within the San Joaquin Valley, Southeast Desert, or Ventura ozone nonattainment areas between May 1 and October 31st.[17] CDPR also prohibits methods (d)(2), (d)(4), and (d)(7) unless using an approved TIF tarpaulin per section 6448.1(a). CDPR should provide monetary resources to growers that are financially unable to cover the costs of implementing mitigation methods. The California Department of Food and Agriculture (2024) identified a sharp increase in the annual cost of implementing the TIF Tarpaulin regulation, ranging from $23-$25 million for trees/grapes while highlighting the supply of TIF Tarps is insufficient to meet the demands created by CDPR's directive.[18] CDPR should also evaluate the feasibility and adoption of 1,3-D mitigation methods by hosting grower listening sessions. If any compliance issues arise following growers' listening sessions, CDPR should conduct unannounced inspections and make publicly available fields that consistently violate application method requirements. CDPR should also add a section to the 'Monthly Summary Pesticide Use Report' that reports growers application methods used for fumigation.

- ***CDPR should make sure appendices and attachments referenced in reports are easily locatable and public facing.*** On Page 20 of CDPR's VOC Annual Report it states 'If emissions exceed the trigger level for the San Joaquin Valley NAA, certain uses of high-VOC products are prohibited until at least two consecutive years of total hypothetical emissions are less than the trigger level.[19] More information about the calculation of total hypothetical emissions can be found in Appendix 3.' Our staff were unable to locate Appendix 3 referenced in CDPR's VOC report. Transparency is the foundation for building public trust, rapport in the scientific community, and latitude to improve CDPR's monitoring efforts. When documents are not available or easily accessible, communities are denied the possibility of more health-protective research methods. CDPR should dedicate time to reviewing documents with missing attachments/appendices.

- ***CDPR should adopt OEHHA's health-protective threshold of 0.04 parts per billion (ppb) for 1,3-D occupational and residential bystander exposure levels.*** The occupational and residential bystander requirements adopted by CDPR allow farm-adjacent communities to be exposed to 14 times more 1,3-D or 0.56 ppb than occupational bystanders at 0.04 ppb. The Office of Environmental Health Hazard Assessment (OEHHA) set a lifetime cancer risk exposure threshold of 0.04 ppb/day for all people to protect to the 10-5 level for lifetime exposure. CDPR did not exhibit scientific rigor when suggesting that residents, encompassing children, elderly

individuals, and farmworkers are allowed to be exposed to significantly higher levels of 1,3-D than occupational bystanders. Further, this determination was not based on real-world scenarios for occupational bystanders, as 1,3-D emissions are highest in the early morning and nighttime hours, buffer zone signage is not required, and most farmworkers live and work near or on farms.[20] It's also inconceivable that CDPR has rescinded the use caps for 1,3-D, a probable carcinogen, endocrine disruptor, and respiratory toxicant. Regulation without positive change on the ground is lip service. CDPR should value and champion the most health-protective threshold for 1,3-D, employ the Sustainable Pest Roadmap (SPM), and pledge to protect people not industry's near-boundless access to 1,3-D usage.

CARB & CDPR

We strongly support the increased collaboration between CARB and CDPR. Interagency collaboration is key to building and maintaining a cohesive, less siloed regulatory system that is committed to protecting people and the environment from harmful exposures. To strengthen the burgeoning relationship between CARB and CDPR, we urge both agencies to consider the following recommendations:

- ***CARB and CDPR should release a cross-agency report on VOC emission data.*** We recognize that pesticide emission monitoring primarily falls under the jurisdiction of CDPR. However, CARB is responsible for protecting air quality and regulating Toxic Air Contaminants throughout the state of California. We encourage the continued collaboration between CDPR and CARB, as evidenced by 'CDPR's presentation on pesticide usage reporting (PUR) data to residents to help prioritize which pesticides to monitor, with CARB scheduled to conduct pesticide air monitoring in 2026.' We also support the cross-agency collaboration on communicating pesticide air monitoring data to community residents in La Viña, Arvin/Lamont, and Eastern Coachella Valley. Interagency collaboration fortifies our regulatory system, allowing for CA to better protect people and the planet. CARB and CDPR should release a cross-agency report on VOC emission data to maximize interagency expertise as it relates to air quality, create an intrinsic peer-review process, and foster an environment for cooperative ideation.

- ***CARB should stay abreast of CDPR's SPM Advisory Committee initiatives to catalyze the state's transition to more sustainable, climate-friendly agricultural practices***. In the spirit of cross-agency collaboration and support for Sustainable Pest Management (SPM), a representative from CARB should attend CDPR's SPM Advisory Committee meetings to remain knowledgeable about alternative agroecological practices that are rooted in reducing and/or eliminating harmful pesticides which will inevitably lead to a decrease in

ozone-forming emissions. Also, CDPR must ensure experiential, grower-based, and scientific agroecological expertise is represented in the SPM Advisory Committee. CARB should synthesize this information and share findings with participants of CARB's Funding Agricultural Replacement Measures for Emission Reductions (FARMER) program to encourage the adoption of Sustainable Pest Management (SPM) practices that will reduce reliance on harmful, GHG-generating pesticides in addition to phasing out high-emission agricultural equipment. CARB should also direct participants of the FARMER program to initiatives led by CDPR's SPM Advisory Committee to help farmers transition to more sustainable, climate-friendly practices.

Although we see progress in CARB's and CDPR's pesticide monitoring efforts, there are many areas that are in dire need of improvement. According to a July 10 Federal Register Notice (Vol. 90, No. 130, p. 30607) the US EPA is proposing to determine that the San Joaquin Valley, California area failed to attain the 1997 8-hour ozone national ambient air quality standard by its June 15, 2024 'Extreme' area attainment date.[21] This proposed determination is based on quality-assured and certified ambient air quality monitoring data from 2021 through 2023. This notice is highly concerning, as it's likely the US EPA did not consider the influence of pesticides in making its determination. Thus, the extent of non-attainment could be even greater than predicted.

We look forward to continuing to engage with CARB and CDPR's regulatory process to promote the transition away from highly hazardous pesticides to Sustainable Pest Management practices that rebuild soil ecosystems, protect community health, restore biodiversity, enhance crop yields, and decrease VOC emissions.

Thank you,

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[10] California Department of Pesticide Regulation (CDPR) Annual Report on Volatile Organic Compound Emissions from Pesticides: Emissions for 1990-2023.

[11] "Ozone weakens plant defenses making them more susceptible to pest-driven crop damage [3,4,5]."

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