Californians For Pesticide Reform

August 23, 2018

Dave Edwards
Branch Chief, Greenhouse Gas and Toxic Emission Inventory Branch
California Air Resources Board
PO Box 2815
Sacramento, CA 95812

Re: Proposed Regulation for Criteria Pollutant and Toxic Air Contaminant Emissions Reporting

On behalf of the coalition Californians for Pesticide Reform – a statewide coalition of more than 190 member organizations dedicated to protecting public health and the environment from the dangers of pesticide use - we ask you to develop a plan for incorporating emissions from pesticides and fertilizers into the California Air Resources Board's respective emissions inventories.

We understand that CARB has numerous initiatives underway to compile information about emissions of hazardous and toxic air pollutants as well as greenhouse gases in ways that allow all emissions to be viewed together. This effort is important to both air pollution and climate policy and to the capacity to assess cumulative impacts.

Although pesticide and fertilizer emissions do not originate from the traditional "stationary" or "mobile" sources CARB prioritizes, they pose significant health risks and are emitted in significant quantities in and around agricultural communities, including disadvantaged communities. They are also relevant to climate policy.

Here are a few important facts relevant to why we believe CARB should incorporate emissions from pesticides and fertilizers into the Board's emissions inventory work:

• Several of the United States' worst air quality districts are in rural regions of California.[1]

• There are 46 pesticide Toxic Air Contaminants in California[2] (with the pesticide chlorpyrifos likely to be added as the 47th soon). Among these 46 TACs are gaseous fumigant pesticides, which are carcinogenic, extremely drift-prone and have been linked to developmental problems. More than 40 million pounds of fumigants are applied to California fields every year.[3] Applications from a number of these fumigants trigger the release of nitrous oxide (N_2O), a

[1] Almaraz, M., Bai, E., Wang C., Trousdell, J., Conley, S., Faloona, I., Houlton, B., "Agriculture is a major source of NO_x pollution in California," Science Advances, Vol. 4, No. 1, January 2018. http://advances.sciencemag.org/content/4/1/eaao3477.full
[2] Summary of Pesticide Use Report Data – 2016. California Department of Pesticide Regulation. Table 11. https://www.cdpr.ca.gov/docs/pur/pur16rep/tables/table11.pdf.
[3] Summary of Pesticide Use Report Data – 2016. California Department of Pesticide Regulation. Table 13. https://www.cdpr.ca.gov/docs/pur/pur16rep/tables/table13.pdf.

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greenhouse gas nearly 300 times more potent than carbon dioxide.[4] One study alone reported a 700% increase in N_2O emissions following a chloropicrin fumigation.[5]

• Fumigant TACS are also ozone-contributing Volatile Organic Compounds (VOCs). Along with emulsifiable concentrates, fumigants contribute significantly to the production of VOCs in the San Joaquin Valley.[6]

• Recent studies have documented fumigant TACs' contribution to secondary organic aerosols, a major component of PM2.5[7], the dominant cause of criteria air pollutant health impacts, including lung and heart problems, that disproportionately affect environmental justice communities. Recent lab tests from UC Riverside found that MITC, the main breakdown product of metam fumigants (12.5 million pounds of which are applied each year in California), increased secondary organic aerosol formation 12-fold.[8]

• In addition to pesticides, synthetic fertilizers cause a host of health problems in local rural communities and are a significant source of greenhouse gas emissions. According to a new study led by UC Davis, agricultural fields contribute between 25 and 41 percent of the nitrogen oxide (NOx) emissions in California, a criteria pollutant and key component of ozone.[9] The peer-reviewed study traces the emissions to fertilized soils in the Central Valley region. Excess nitrogen from synthetic fertilizers can pollute groundwater and air, impacts human health and the environment, and contributes to climate change. Eleven percent of nitrogen from crop land and livestock is lost as air pollution, contributing to the formation of ozone and ammonia, a component of particulate matter.[10] Well-established scientific evidence links ozone and particulate matter to poor respiratory and heart health. The over-use of fertilizer, in turn, can be linked, in part, to the fact that soils exposed to pesticides are damaged and show less ability to fix nitrogen in the soil for the benefit of plants, "necessitating" the addition of fertilizer.[11]

Because of the health impacts of exposure to pesticide and fertilizer emissions, their toxicity and contribution to greenhouse gases and criteria pollutants, we urge CARB to develop a plan to incorporate these emissions into CARB's emissions inventories.

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[4] Greenhouse Gas Emissions: Overview of Greenhouse Gases - Nitrous Oxide Emissions, *https://www.epa.gov/ghgemissions/overview-greenhouse-gases*.

[5] Spokas, K., Wang, D. "Stimulation of nitrous oxide production resulted from soil fumigation with chloropicrin." Atmospheric Environment 37 (2003) 3501-3507. *https://doi.org/10.1016/S1352-2310(03)00412-6*.

[6] Spurlock, F. "Estimating Volatile Organic Compound Emissions from Pesticides using PUR data." California Department of Pesticide Regulation. 2006.

[7] Secondary Organic Aerosol (SOAs) Research, U.S. EPA, *https://www.epa.gov/air-research/secondary-organic-aerosol-soas-research*.

[8] Yee, L.D., Warren, B.A., Cocker III, D.R. "Secondary Organic Aerosol (SOA) and Ozone Formation from Agricultural Pesticides." University of California Riverside Undergraduate Research Journal, Volume II (2008) 67-74. *http://ssp.ucr.edu/files/V2-2008.pdf*.

[9] Almaraz, M., Bai, E., Wang C., Trousdell, J., Conley, S., Faloona, I., Houlton, B., "Agriculture is a major source of NO_x pollution in California," Science Advances, Vol. 4, No. 1, January 2018. http://advances.sciencemag.org/content/4/1/eaao3477.full

[10] Kerlin, K. "California Nitrogen Assessment Shows the State of the Science on Nitrogen Use and Pollution: California Paves the Way for Reconciling Agriculture and the Environment," *Food and Agriculture News*, August 9, 2016. https://www.ucdavis.edu/news/first-state-level-nitrogen-assessment-shows-state-science-nitrogen-use-and-pollution.

[11] 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.

Thank you for the opportunity to weigh in on this issue.

Sincerely,

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