September 25, 2022

Ms. Anna Romanovsky
Pesticide Re-Evaluation Division (7508P)
Office of Pesticide Programs
Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460-0001

Submitted electronically via Federal eRulemaking Portal

RE: Petition To Revoke Tolerances and Cancel Registrations for Certain Organophosphate Uses (EPA-HQ-OPP-2022-0490)

Dear Ms. Romanovsky,

As stakeholder groups representing growers, retailers, manufacturers, crop consultants, and other stakeholders, we write to express our strong opposition to a petition before EPA seeking to revoke tolerances and cancel registrations for certain organophosphate uses (EPA-HQ-OPP-2022-0490). This petition is scientifically unjustifiable for numerous reasons, which we detail below. Moreover, to grant the petition would result in significant, irreparable harm to many agricultural stakeholders, international trade, food security, and public health and wellbeing. For these reasons, we strongly urge EPA to deny this harmful petition.

Harm Resulting from Granting the Petition

Were the agency to grant this petition, revoking tolerances and cancelling uses of most commercially-available organophosphates (OP) would inflict significant and irreparable harm to our nation's agricultural producers, public health, and our food and feed supplies. Many of the 15 pesticidal active ingredients named in this petition are vital to the pest management strategies for dozens of U.S.-grown crops. For several crops, due to the emergence of pest resistance pressures and the loss of other insect management tools, the OPs are the only effective tool remaining to control certain pests. To lose this class of insecticides would result in billions of dollars in losses to the U.S. and global food, feed, and fiber supplies, and would undermine vital public health efforts.

OPs are a class of broad-spectrum insecticides and one of only three remaining to U.S. producers. This class of pesticides acts by inhibiting the enzyme acetylcholinesterase (AChE). This mode of action (MOA) allows OPs to uniquely and effectively control a broad number of insect pests. For these reasons, OPs have for decades been and continue to remain a core component to the insect management strategies for many U.S. growers.

Should farmers lose access the 15 active ingredients named in this petition, U.S. agriculture would suffer significant, irreparable harm. While the analysis also included another class of pesticides, a 1999 study found that if U.S. agriculture were to lose access to carbamates and OPs, some crops would suffer yield losses as high as 38 percent, and the U.S. economy would collectively suffer more than $17.2 billion in

economic losses.[1] Adjusted for inflation, this is more than $30.6 billion in losses today.[2] A similar study from 2002 found that California producers and consumers would suffer $203 million in losses should OPs be banned.[3] Again, adjusting for inflation this represents $331.6 million in losses today.[4]

Another major concern for agriculture that would result from losing OPs beyond direct production impacts is the matter of resistance management. Numerous insect pests are notorious for selecting individuals from their populations resistant to certain insecticides or MOAs.[5,6] As those individuals survive pesticide applications and play a greater role in replacing a pest population, over time populations can develop that are resistant to certain active ingredients, making them far more difficult to control. To combat resistance management pressures, as part of integrated pest management strategies, growers rotate and mix pesticides with varying MOAs to provide multiple layers of protection. A resistant individual in a pest population may be capable of surviving one pesticidal MOA but is unlikely to survive multiple. However, if U.S. agriculture were to lose access to OPs, a vital rotational and mix tool would be removed from the grower's toolbox to manage resistance pressures. This would allow pest populations to evolve resistance more quickly to the fewer remaining insect management tools available to producers, resulting in even greater losses for agriculture in the future.

It is important to note that it is not only U.S. agriculture that would suffer should the OP petition be granted, but also public health efforts. Two of the OPs for which the petition is seeking cancellation of uses are naled and malathion. These two active ingredients serve as a backbone for mosquito control programs in the United States.[7] Like with other insect pests, mosquitoes are capable of developing resistance to other commonly used classes of pesticides, such as pyrethroids.[8] Losing access to these OP tools, as might occur should the agency grant this petition, would remove an essential tool for mosquito control programs. In turn, we would likely see the greater emergence of mosquito-borne illnesses domestically, such as Zika, West Nile, and Dengue Fever, which would pose a major threat to public health and result a significant increase in health care costs. Assuming mosquito control uses are not outright prohibited should the petition be granted, these uses could still be very difficult to maintain if they become the sole, diminished market opportunity for manufacturers who face the need to offset their costs of production and distribution.

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[1] Kuntson, Ronald D., and Edward G. Smith. Texas A&M University. Agricultural and Food Policy Center. April 1999. "Impacts of Eliminating Organophosphates and Carbamates from Crop Production." https://www.afpc.tamu.edu/research/publications/114/wp99-2.pdf

[2] Bureau of Labor Statistics. N.D. "CPI Inflation Calculator." Accessed September 22, 2022. https://www.bls.gov/data/inflation_calculator.htm

[3] Metcalfe, Mark, Bruce McWilliams, Brent Hueth, Robert Van Steenwyk, David Sunding, Aaron Swoboda, and David Zilberman. October 2002. University of California Cooperative Extension. "The Economic Importance of Organophosphates in California Agriculture" https://www.cdfa.ca.gov/oefi/opca/docs/OP-report-2002-10-24.pdf

[4] Bureau of Labor Statistics. Ibid.

[5] Beauzay, Patrick, and Janet J. Knodel. North Dakota State University. August 2021. "Pyrethroid Resistance in Diamondback Moth in Canola." https://www.ndsu.edu/agriculture/ag-hub/ag-topics/crop-production/diseases-pests-and-weeds/plant-insects/pyrethroid-resistance

[6] Koch, Robert. University of Minnesota-Extension. Reviewed 2022. "Insecticide options for resistant soybean aphid." Accessed September 22, 2022. https://extension.umn.edu/soybean-pest-management/insecticide-options-resistant-soybean-aphid

[7] Centers for Disease Control and Prevention. National Center for Emerging and Zoonotic Infectious Diseases. Reviewed November 24, 2020. "Adulticides." Accessed September 22, 2022. https://www.cdc.gov/mosquitoes/mosquito-control/community/adulticides.html

[8] Smith, Letícia B., Shinji Kasai, and Jeffrey G. Scott. October 2016. "Pyrethroid resistance in Aedes aegypti and Aedes albopictus: Important mosquito vectors of human diseases." *Pesticide Biochemistry and Physiology*. Vol. 133, P. 1-12. https://www.sciencedirect.com/science/article/abs/pii/S0048357516300220?via%3Dihub

Finally, we also are concerned granting this petition would result in disruptions to international trade and food security. Many of our trading partners will continue to use the OPs listed in this petition even if the U.S. ends their uses. To grant the tolerance revocation remedy sought by the petition would result in enormous import disruptions. Crops or foods imported with any detectable residues of the pesticides named in this petition could be found adulterated and subject to seizure or destruction, even if the foods are otherwise safe for consumption. Domestically produced crops with detectable residues could face a similar fate. Not only could this place the U.S. at odds with our trade obligations, but given the ongoing challenges facing domestic and global food insecurity stemming from the war in Ukraine and supply chain disruptions, it could greatly increase food costs, result in shortages, and amplify food insecurity risks.

In summary, we are concerned granting this petition and effectively ending domestic uses of these OPs could result in billions of dollars in losses to the U.S. economy. These significant, irreparable harms would take shape in many forms – immediate and long-term yield losses for domestic agricultural producers; increasing public health costs by undermining mosquito control programs; and the amplification of food insecurity and trade disruption risks. To avoid these potentially catastrophic scenarios, we strongly urge EPA to deny this petition.

Petition is Not Scientifically Justifiable

In addition to the practical harm that would result from granting the petition, we also believe it should be denied because it is not scientifically justifiable from multiple perspectives. First, the 15 pesticidal active ingredients named in the petition are entirely different chemicals. While they are all within the OP class and have a similar AChE inhibition MOA, that is where the similarities end. Each of these 15 active ingredients is uniquely effective on different crops and protect against different pests. As a result, they have different registered uses, must be applied at different rates, have different toxicological and exposure risk profiles, and so on. To seek to cancel uses and revoke tolerances for an entire class of pesticides as this petition does is an unprecedented, blunt-instrument approach that does not even feign an attempt to capture any individual nuances associated with this broad class of active ingredients.

EPA has and continues to use 10% AChE inhibition in red blood cells as its point of departure (POD) for human health risk assessments for OPs. We believe EPA is justified in using this POD to protect human health, as we discuss further below. However, we are concerned the petition relies on poor, outdated, or inadequate data and assumptions to suggest the 10% AChE inhibition POD is not protective.

The petition repeatedly cites EPA's 2015 literature review and three human epidemiological cohorts conducted by University of California-Berkley, Mount Sinai School of Medicine, and the Columbia Center on Children's Environmental Health conducted throughout the early 2000s as justification for use cancellation and tolerance revocation remedies being sought. There exist numerous concerns with this very selective body of evidence. Previous analyses by EPA of this body of evidence were not reviewed through a framework published by the agency in 2016 establishing data evaluation and weight of evidence processes for incorporating human epidemiological data into pesticidal risk assessments.[9] In essence, at the time all evidence was treated equal, despite various strengths and weaknesses of individual studies. Using this previous approach, it was impossible for regulators to identify high- or low-quality sources of evidence.

[9] U.S. Environmental Protection Agency. Office of Pesticide Programs. December 28, 2016. *Office of Pesticide Programs' Framework for Incorporating Human Epidemiologic & Incident Data in Risk Assessments for Pesticides*. https://www3.epa.gov/pesticides/EPA-HQ-OPP-2008-0316-DRAFT-0075.pdf

However, by using the framework which has since been developed by the agency to better assess the strength of evidence, subsequent reviews of the evidence cited by the petition in both OP and pyrethroid registration review risk assessments have identified significant weaknesses. For example, some studies do not contain raw data needed for regulators or other peers reviewing the study to verify its results or conclusions. This was the case with the above referenced Columbia cohort, which EPA requested raw data from on multiple occasions but was repeatedly denied by the study's authors. Other studies cannot reliably establish OP exposure as a causal link for any observed health effects, to say nothing of attributing any alleged effects to individual pesticides for which the petition seeks its cancellation and revocation remedies. Meantime, since much of the evidence cited by petition was published, numerous other epidemiological studies and cohorts have been published finding no link between OPs and neurodevelopmental effects. The petition conveniently does not mention any of these subsequent studies or their conflicting results.

Another important factor to consider is that no other common MOA for OPs has ever been identified beyond AChE inhibition. There is also no plausible MOA identified in the epidemiological data for the alleged effects seen in the epidemiological data and EPA itself has acknowledged this fact. It is important to recall that the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the primary law under which pesticides are regulated, is a risk-benefit statute. Under FIFRA, EPA must protect against unreasonable *risks* to human health and the environment.[10] Without identifying that a novel MOA *hazard* even exists that is more sensitive than the 10% AChE inhibition POD used by EPA – to say nothing of identifying what *risks* that hypothetical MOA may present from any of the registered uses of individual OPs – it would be inappropriate for EPA to depart from this standard for assessing human health risks for OPs.

EPA's Office of Research and Development (ORD) and most recent Scientific Advisory Panel (SAP) to review this matter in 2020 agree with the above points. In an issue paper ORD presented to the SAP in September 2020[11] regarding the development of non-animal methods to testing for neurotoxicity potential, ORD states:

> *The Agency has used and continues to use inhibition of AChE as the POD for OP human health risk assessment. This science policy is based on decades of work which shows that AChE inhibition is the initial event in the pathway to acute cholinergic neurotoxicity…. At this time, a MOAs/AOPs [adverse outcome pathways] have not been established for neurodevelopmental outcomes. The growing body of literature does demonstrate, however, that OPs are biologically active on a number of processes that have the potential to affect the developing brain…. albeit at doses which cause AChE inhibition with limited exceptions.*[12]

The conclusions from ORD – which were reached after, are based on more data, and were developed using more refined processes than the evidence presented in the petition – are quite clear. No alternative MOA besides AChE inhibition that could pose a potential human health risk has ever been

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[10] U.S. Environmental Protection Agency. Updated September 12, 2022. "Summary of the Federal Insecticide, Fungicide, and Rodenticide Act." https://www.epa.gov/laws-regulations/summary-federal-insecticide-fungicide-and-rodenticide-act

[11] Gibson, Tamue. U.S. Environmental Protection Agency. N.D. "Transmittal of Meeting Minutes and Final Report of the Federal Insecticide, Fungicide, and Rodenticide Act, Scientific Advisory Panel (FIFRA SAP) Virtual Meeting held on September 15-18, 2020." Accessed on September 22, 2022. https://www.regulations.gov/document/EPA-HQ-OPP-2020-0263-0054

[12] U.S. Environmental Protection Agency. July 2020. *Agency Issue Paper: Use of New Approach Methodologies to Derive Extrapolation Factors and Evaluate Developmental Neurotoxicity for Human Health Risk Assessment*. P. 9. https://www.regulations.gov/document/EPA-HQ-OPP-2020-0263-0006

identified. Even if a hypothetical MOA does exist, regulating based on AChE inhibition is sufficiently sensitive and will protect human health including the neurodevelopmental effects alleged in epidemiological data presented by the petition.

The approach and evidence presented by the petition is significantly flawed and does not warrant the remedies sought. It is scientifically inappropriate to indiscriminately lump the 15 OPs together in a single petition and seek their collective use cancellation and tolerance revocation. All 15 active ingredients have different uses, risks, and benefits. EPA has an ongoing registration review process for each individual pesticide named in this petition, which is a far more appropriate venue for reviewing their unique characteristics. We support the ongoing work of EPA to conduct reviews of these chemicals through this normal order registration review process.

Moreover, the data presented by the petition does not reflect the most current science; it has not been viewed through frameworks established by the agency to determine strength of evidence; and it does not represent the most recent conclusions reached by EPA which have considered these additional scientific and framework factors. We urge EPA to deny the petition based on the fact that in numerous ways it is not scientifically justifiable.

Conclusion

The petition before the agency is dangerously problematic for many reasons. First, to grant the petition would inflict significant, irreparable harm to stakeholders, the broader economy, and public health and wellbeing. American agricultural producers would suffer immediate crop yield losses to devastating pests. In the longer-term, pest resistance pressures would more quickly erode the few remaining insect management tools available to growers, inflicting even greater losses. U.S. mosquito control programs would lose essential mosquito control tools that would put the American public at greater risk to insect-borne illness. There would also be enormous disruptions to international trade and public access to food, increasing domestic and global food insecurity risks.

While these significant material harms are grounds enough for EPA to deny this petition, we also urge EPA to consider the multiple ways in which this petition is scientifically unjustifiable. The petition casually and inexplicably lumps together 15 diverse pesticidal active ingredients and seeks their collective cancellation and revocation. This unprecedented approach entirely ignores the enormous nuances between their unique uses, risk profiles, and other characteristics that demands their continued consideration by the agency through the normal registration review process.

Finally, the petition alleges the AChE inhibition regulatory endpoint used by EPA to regulate the OPs is not safe. However, to reach this conclusion the petition cherry picks poor and outdated evidence, ignoring the robust body of evidence that has emerged and work the agency has conducted in recent years to ensure regulating based on AChE inhibition meets the safety and risk-based regulatory standards established by Congress. We strongly urge EPA to deny this harmful petition and thank the agency for the opportunity to comment.

Sincerely,

Agricultural Retailers Association
American Soybean Association
American Sugarbeet Growers Association

California Specialty Crops Council
Council of Producers and Distributors of Agrotechnology
Delta Council
Missouri Farm Bureau
National Agricultural Aviation Association
National Alliance of Independent Crop Consultants
National Association of Wheat Growers
National Cotton Council
National Onion Association
National Pest Management Association
U.S. Beet Sugar Association
Western Growers