California Rice

January 6, 2023

Mary Jane Coombs, Branch Chief
Industrial Strategies Division
Product Assessment Branch
California Air Resources Board
1001 I Street, PO Box 2828
Sacramento, CA 95814

RE: CALIFORNIA RICE COMMISSION REQUEST TO DENY PETITION TO REGULATE SULFURYL FLUORIDE

Dear Ms. Coombs:

Thank for accepting comments in response to the petition letter from the Center for Biological Diversity and Californians for Pesticide Reform (Petitioners) submitted on October 27, 2022.

The California Rice Commission (CRC) is providing comments as a member of the coalition represented by Kahn Soares Conway. The CRC is a statutory organization[1] representing the state's rice industry, which comprises 2,500 rice producers (growers), 40 handlers (millers), and approximately 500,000 acres of farmland.

Sulfuryl fluoride is registered in California as a structural fumigant with an increase in usage following the phase down of methyl bromide. The California Department of Pesticide Regulation (DPR) evaluated the use of sulfuryl fluoride in a rice mill during the registration process. In 2006, DPR listed sulfuryl fluoride as a toxic air contaminant with stringent usage requirements. Evaluation of the fumigant is ongoing with consistent refinements to the use directions and management before, during and after the fumigation.[2]

Starting in 2011, the CRC began a process of submitting extensive comments to the U.S. Environmental Protection Agency (U.S. EPA) in response to the Agency denying a request for Stay from the petition filed by the Fluoride Action Network, Beyond Pesticides/National Coalition Against the Misuse of Pesticides, and the Environmental Working Group regarding

[1] California Department of Food and Agriculture. Food and Agricultural Code §71000-71138.

[2] California Code of Regulations (Title 3. Food and Agriculture). Division 6. Pesticides and Pest Control Operations. Chapter 4. Environmental Protection. Subchapter 2. Air. Article 1. Toxic Air Contaminants.

all tolerances established for sulfuryl fluoride and all tolerances for fluoride associated with the use of sulfuryl fluoride[3].

The CRC formed an industry task force comprised of mills, warehouses, and applicators to develop comments specific to the use of sulfuryl fluoride within the California rice industry. Several topics submitted in the comments to the U.S. EPA are relevant in response to the petition received by the California Air Resource Board (ARB).

Our comments are specific to the usage on California rice, rationale for fumigation, and heat as an alternative. Cleanliness is the primary focus when managing rice milling facilities in California. After cleanliness and sanitation, fumigants are used when necessary.

The Petitioners cite sulfuryl fluoride as the most used fumigant in California for structural termite control. True, sulfuryl fluoride is one of the few fumigants that remains registered and available for use in California for structural fumigation.

Overall usage for rice fumigation is relatively low with the major use in facilities where commodity is also stored.

Table 1. Amount of Sulfuryl Fluoride – Rice Usage 2017 to 2021

Year	Pounds Applied[1,2]	Area Treated[1,2]	Unit Treated[1,2]	Pounds Applied Statewide[3]
2021	668.66	335,000	C	3,065,098
2020	119.76	60,000	C	2,822,373
2019	313.37	183,000	C	3,019,149
2018	1,080.93	708,000	C	2,991,914
2017	13,665.61 682.63 11.25	5,857,223 23,400 17,053	C P S	3,654,817

[1]California Department of Pesticide Regulation (DPR) Pesticide Use Report (PUR) Draft Data (2019-2021)
[2]DPR PUR Published Data (2017-2018)
[3]Per letter filed by the Petitioners to the California Air Resources Board

Key to Treated Units (Type):
C = Cubic feet (of commodity treated)
P = Pounds (usually of post-harvest commodity treated)
S = Square feet (of commodity treated)

[3] [EPA–HQ–OPP–2005–0174; FRL–8867–9] Sulfuryl Fluoride; Addendum to Proposed Order Granting Objections to Tolerances and Denying Request for a Stay).

EPA Docket No. EPA-HQ-OPP-2005-0174-0111 Assessment of Impacts of Stay of Food Tolerances for Sulfuryl Fluoride on Select Post-Harvest Commodities.

EPA Docket No. EPA-HQ-OPP-2005-0174-0110 Assessment of Impacts on Flour Mill Operators of a Stay in Sulfuryl Fluoride Food Tolerances.

From the letter filed by the Petitioner's:

It is difficult to compare California's annual use of sulfuryl fluoride to other jurisdictions in the U.S. because California is the only state that publicly releases a record of its sulfuryl fluoride use.[43]

It is clear that California is one of the world's largest consumers of sulfuryl fluoride.[44] According to a report published in Environmental Science and Technology, between 50 to 60% of the entire global usage of sulfuryl fluoride takes place in California.[45]

43 Danielle Underferth, Researcher Explains the Main Source of a Rare but Destructive Greenhouse Gas, HUB John Hopkins University (Mar. 11, 2022), https://hub.jhu.edu/2022/03/11/sulfuryl-fluoride-greenhouse-emissions/[hereinafter Underferth].
44 Gallagher, supra note 9.
45 Id.

From the report cited per footnote 43:

Why is this problem concentrated in California?

California's year-round warm climate is favorable for termite colony growth, both indoors and in nature, so it is very common for buildings there to have termite infestations that require fumigation.

Termites also can be found in the Southeast, especially in Florida, where the climate is also conducive to termite colony growth. Unfortunately, NOAA does not operate a greenhouse gas monitoring station downwind of Florida, and so it is difficult for us to infer much about sulfuryl fluoride emissions from there. NOAA does operate a tower in South Carolina, but concentrations of sulfuryl fluoride, which would indicate large emissions, are rarely detected at this lone Southeastern site. However, it is still possible that fumigations occurring in Florida could be swept up and carried over the Atlantic Ocean without being detected at the closest NOAA monitoring sites.

In addition, California is the only state that publicly releases a statewide record of sulfuryl fluoride use.

Note from the CRC: California began full use reporting of pesticides through the restricted materials program in 1990. As such, California is the only state consistently reporting pesticide usage on an annual basis.[4]

[4] A Guide to Pesticide Regulation in California – 2017 Update. California Department of Pesticide Regulation.

Rationale for fumigation

The following is a short summary of the necessity to fumigate with sulfuryl fluoride for rice storage pests consisting of various beetles, weevils, and moths.

Post-harvest use of fumigants is necessary for commodity fumigation and structural sanitation. California rice mills fumigate to meet sanitation requirements for the following reasons: 1) Customer requirements; 2) In-house compliance under the Food Safety Standard for specific auditors such as the American Institute of Baking; and 3) County, State and Federal Requirements under programs such as the Global Standard for Food Safety.

The customer ultimately controls the commodity fumigation. No customer will accept rice with insects because contracts state quality must meet the United States Department of Agriculture (USDA)[5] standards for grade in relation to acceptable levels of infestation. California produces mostly U.S. No. 1 Grade rice with standards for the number of live weevils, or other insects injurious to stored rice. For simplicity, one to two live insects can drop the rice grade from human consumption into the category of cattle feed. Structures and transportation devices are more commonly fumigated to protect the rice from pests.

Fumigation of paddy rice[6] (unprocessed rice straight from the field) is uncommon, but the crop must be fumigated if insects are found, and which were not detected during sampling, to maintain a clean and pest free product. This minimizes the risk of insect infestation in the facility and contamination of product shipped to customers and consumers.

The California Warehouse Association administers the Standard Operating Procedures of one live stored grain insect in a truckload of paddy rice results in the load considered infested. Most rice is transported from the field to a warehouse facility for drying (reducing the moisture content from 24 to 13 percent for storage), which is the reason for involvement by the California Warehouse Association – a separate entity from the CRC representation of the mills (handlers). The receiving systems for truckloads of rice require the paddy tanks to be removed from the mill/pack area for treatment with aluminum phosphide. The fumigant is more effective and cost efficient as a spot treatment. Aluminum phosphide is corrosive to equipment, and not useful in full facility fumigation.

California is not required to meet phytosanitary requirements from foreign markets to fumigate with sulfuryl fluoride. Rather, the rice mills prefer to use sulfuryl fluoride in buildings with sensitive equipment because the fumigant is more cost effective with no damage to the components and fewer days of down time. In addition, fumigation with

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[5] USDA Grain Inspection, Packers and Stockyards Administration, Federal Grain Inspection, United States Standards for Rice, §868.210 Grade. and §868.212 Special Grades and Requirements.

[6] USDA Grain Inspection, Packers and Stockyards Administration Federal Grain Inspection Service, United States Standards for Rice, §868.202 Definition of Other Terms. (2)(i) Paddy Kernels. Whole or Broken Unhulled Kernels of Rice.

sulfuryl fluoride allows marketers to meet the short response times in the open trade markets.

As stated, California rice mills are not required to mandatorily fumigate food products except as cited per regulation. In addition, sanitation standards must be met as described and cited in the regulatory subsection of when to fumigate.

Rice mills engage in requirements under the Global Standard for Food Safety (Standard), a worldwide network for businesses to assist in the production of safe food. The Standard has been developed to specify the safety, quality and operational criteria required within a food manufacturing organization. The certification provides assurance to customers and consumers the facility can successfully maintain the products they produce uphold to the specified shelf-life requirements. The format and content are designed to allow an assessment of a company's premises, operational systems, and procedures by a competent third-party (the certification body) against the requirements of the Standard. The scope of a Global Standard for Food Safety includes senior management commitment and provides for audits of storage facilities with certification by an independent third party.

Sanitation plus fumigation is critical in meeting the quality Standard. Facilities must maintain compliance by taking advantage of short timelines as production schedules permit.[7] Meeting sanitation standards is a daily activity to assure that facilities provide safe food for customers and consumers. All activities to maintain sanitation standards require diligence, time, workforce, and expense.

California rice mills maintain a disciplined sanitation program to minimize the use of fumigants.[8] Most California rice mills have a quarterly sanitation program that involves shutting down the facility for a thorough cleaning. The process involves cleaning all internal components such as machinery, air ducts and filters. The total time for an internal cleaning is approximately 24 to 48 hours to meet the sanitation requirements of the entity performing an audit for standards compliance. It is costly for a milling operation to shut down for any length of time, but the process is complete to assure product safety.

Heat as an alternative

Provided by personnel managing food safety standards at a California rice mill:

Heat treatment is 30 percent more costly than chemical methods with limited use, which is the reason heat treatment was never universally utilized for controlling insects in mills.

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[7] Global Standards for Food Safety "BRC" British Retail Consortium accreditation body assessing certification www.brcglobalstandards.com

[8] Title 21, Code of Federal Regulation (CFR) Part 110 - Current good manufacturing practice in manufacturing, packing, or holding human food.

The use of heat for insect control was first utilized in the early 1900s, but the method was no longer preferred after the arrival of the gas fumigants. However, there was renewed interest in using heat to control insects in mills due to the of methyl bromide phase out, effective January 1, 2005.[9] Heat treatment typically involves raising the ambient mill temperature to 50 degrees Celsius, or above, for 24 to 36 hours to kill insects within the mill and milling equipment. The heat treatment is only effective when the ambient temperature reaches the specific temperature range and time interval for an effective kill. Lower ambient temperature could be used and generally takes a longer time for effectiveness.

Heat treatment will kill all four stages of insects that infest rice such as the Red and Confused Flour Beetle. However, heat treatment is limited to only the mill and empty bins and cannot be used on raw or finished product. Heating finished product in storage warehouses is strongly discouraged because food and stored products are good insulators and heat will not penetrate the products well. Similarly, heat treatment of a bin or silo full of rice is not recommended as the quality parameters of the stored product may become altered and degrade the quality below customer and consumer acceptance.

The current heat treatment process involves using 100 percent outside air to create a positive air pressure within an enclosed structure to achieve temperatures lethal to all stages of insects. The positive air pressure pushes hot air into cracks and crevices making it difficult for pests to hide. Sufficient air circulation is crucial to achieve the desired temperature uniformity in the mill.

Heat may damage packaging materials such as plastic. The heat treatment can an also cause minor damages to the mills with tar and composite wooden roof structures. The extreme heat will liquefy the tar causing it to drip from the roof onto the floor. The liquefied tar causes damage to the roof with exposed holes that need repair or leaks occur during the rainy season. Older mills constructed of wooden materials will result in wood warping and cracking due to excessive heat damaging the mill structure. Considerable structural repairs would be necessary for a second heat treatment.

Extra precautions must be taken to remove or insulate heat sensitive electronic equipment in the mill. The rice mills are completely mechanized and include equipment that optically sorts kernels by size and color. Due to the size, location or nature of the electronic equipment, removal or heat insulation is completely impractical.

The cost of heat treatment is generally about 30 percent higher than the chemical method, however, this price varies based on the mill location and specific application. The heat treatment process requires the operator to supply propane or natural gas to fire the heaters, thus contributing to the total cost. For example, the cost of heat treatment for a standard rice mill in California is $34,000, plus about $3,000 in natural gas, for a total cost of roughly

[9] https://www.epa.gov/ods-phaseout/methyl-bromide

$37,000 (2012). This price includes heat-treating the mill, bran warehouse and one head house and will vary depending on the area and application. A large portion of this cost is the freight for transporting the heat-treating equipment from Minnesota to California and back on a per mill basis. Currently, one rice mill in Northern California utilizes heat treatment for insect control.

In conclusion, the only successful heat treatment is found in a single California mill built to manage the process as facilities cannot be retrofitted to accept the higher temperatures. Heat treatment can be effective in controlling insects under certain conditions but should be used in conjunction with gas fumigants for optimal insect control. Heat treatment cannot be used on raw or finished products, so the method is limited to just the mill, empty bins, or silos. Therefore, heat treatment cannot absolutely replace sulfuryl fluoride in controlling insects due to the increased cost, the limited use, and potential damage to equipment and the structure.

California Global Warming Solutions Act (AB32)

Sulfuryl fluoride (SO_2F_2) is a fluorinated gas with a lifetime of 36 years. It is used as a pesticide for building fumigation and post-harvest storage of commodities but is not licensed for use in agricultural fields. Sulfuryl fluoride was believed to have a negligible global warming potentials (GWP) until 2009, when new research assigned a 100-year GWP of 4090 and a 20-year GWP of 6840. Because sulfuryl fluoride was not identified as a high-GWP gas at the time, it was not included as an AB 32 gas, and is not annually inventoried as a part of the ARB statewide GHG inventory. The annual usage of sulfuryl fluoride is inventoried by DPR as a highly regulated pesticide and ARB uses this data to track emissions.[10]

There has been a turnover of staff at both the ARB and DPR since the California registration of sulfuryl fluoride for use in rice facilities. Therefore, we welcome tours of rice facilities that process and store rice. In addition, we can coordinate meetings with the companies that provide fumigation to the rice structures.

Sincerely,

Roberta L. Firoved

Roberta L. Firoved
Industry Affairs Manager

cc: Julie Henderson, Director, California Department of Pesticide Regulation

[10] GHG Short-Lived Climate Pollutant Inventory Appendix C: California SLCP Emissions 2013.