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OPP Docket, Environmental Protection Agency
1200 Pennsylvania Ave, NW
Washington, DC 20460-0001
Attention: Docket ID No. EPA-HQ-OPP-2010-0480

Re: Docket ID: Federal Register Notice, EPA-HQ-OPP-2010-0480-0178, "Public Comment on the Registration Review Draft Risk Assessments for Pyrethroid Insecticides"

To whom it may concern,

I am writing to comment on the Agencies Registration Review: Pyrethroid Ecological Risk Assessment, and support the continued registration of pyrethroids for use in Integrated Pest Management (IPM) programs. I am a Professor of Entomology and Extension Specialist with the University of Arizona and have been conducting translational research and educational programs in leafy vegetables and melon crops in the southwestern U.S. for 27 years. I work closely with the Arizona and California vegetable industries and I am concerned that restrictions in pyrethroid use would seriously impact the industry's ability to economically produce quality crops. Pyrethroids play an important role in safely protecting crops and I would like to offer my perspective on why the present uses of the pyrethroids should be retained.

It has been my experience that pyrethroids provide contact activity against a wide range of insect species and life stages found in leafy vegetable and melon crops in the desert southwest. Pyrethroids are an ideal insecticide for broad-spectrum insect control in fresh-market fruits and vegetables because they pose less risk to human health and the environment than Organophosphate/Carbamate alternatives when used according to label directions. Nor are they persistent in the environment. Although, pyrethroids tend to be toxic to beneficial insects, including bees and predators, their adverse effects are greatly reduced when applied according to label instructions and only when needed based on University IPM guidelines. Because of these favorable attributes, pyrethroids are heavily used in leafy vegetables and melons in Arizona. Surveys of growers and PCAs show that pyrethroids have been the most commonly used insecticides in lettuce over the past 13 years.
https://cals.arizona.edu/crops/vegetables/advisories/docs/170531%20Insecticide%20Usage%20Summary%20in%20Lettuce% 202017.pdf

Arizona is the second leading producer of leafy vegetables and melons in the U.S., second only to California. Production of these crops is challenging because they are grown in pest-intensive cropping systems where numerous, highly mobile insect pests can quickly infest seedling crops and cause significant stand losses. Furthermore, these high-value vegetable and melon crops have strict quality standards that allow for little to no damage or contamination of harvested product. Because of the pest-intensity found in Arizona, and the high quality demands for cosmetically perfect produce, insecticides that provide quick, broad-spectrum efficacy are needed to prevent crop losses, particularly during stand establishment and pre-harvest growth periods. Unfortunately, many of the older broadly toxic OP/carbamate insecticides previously used by growers have been replaced with selective, reduced-risk products with a very narrow spectrum of activity that provide activity against a single pest species or life

stage. Presently, vegetable growers achieve broad spectrum insect control by tank mixing a pyrethroid in combination with a selective insecticide product. This management approach has allowed growers tosatisfy market, consumer and regulatory demands while safely protecting their crops. Below I provide a few specific examples why pyrethroids are one of the primary, insecticide alternatives used for controlling pests in leafy vegetables and melons.

Pests at stand establishment As crops emerge, they often encounter a number of insect pests that have the potential to cause serious economic losses to crop stands. These include flea beetles, crickets grasshoppers, darkling and rove beetles, and earwigs. These insects have chewing mouthparts and are capable of consuming large amounts of leaf tissue in a short period of time. Newly emerging crops are most susceptible; these pests can devour entire cotyledons or outright kill small seedlings. If left unprotected, larger seedling plants (1-2 leaf stage) can sustain significant feeding damage on the terminal growing points or newly emerged leaves. Not only can this feeding stunt plant growth, but can result in lack of stand uniformity and delayed harvest maturity. Pyrethroids are the safest and most effective insecticide alternative for control of these pests at stand establishment. Alternative insecticides include chlorpyrifos and methomyl, applied alone, or in combination with a neonicotinoid.
https://cals.arizona.edu/crops/vegetables/advisories/docs/081716%20Pests%20at%20stand%20establishment_2016.pdf

Seed corn maggot control in spring melons Seed corn maggots are a major problem in melon crops planted from Jan-Mar in Arizona and a can cause significant stand reductions when maggots feed on germinating seed, roots and stems of young seedlings and transplants. If larvae populations are high in the soil, replanting parts or all of an infested field is often necessary. Unfortunately, once maggots are found infesting the soil during crop establishment, control is not possible. To avoid such losses, insecticides are preventatively applied at-planting to minimize the impact from seed corn maggot. A pyrethroid (bifenthrin) applied as an in-furrow spray during planting has consistently shown to provide the most effective control. Alternatives such as in-furrow applications of clothianidin, spinosad and rynaxypyr do not consistently provide adequate control.
https://cals.arizona.edu/crops/vegetables/advisories/docs/170208%20Seed%20corn%20maggot%20in%20spring%20melons%202017.pdf

Corn earworm control in iceberg lettuce Corn earworm (CEW) larvae can be very damaging in iceberg lettuce crops once head formation begins. The larvae will bore into the head 1-2 days upon hatching, rendering the heads unmarketable. If fields are not watched closely, infestations may not be noticed until heads are harvested. Once inside the head, control of larvae with currently available insecticides is not possible. If eggs are found on plants and suspect CEW are active in the field when plants are beginning to head, growers are advised to treat at regular spray intervals (~ 7days). The UA nominal threshold for CEW in head lettuce from early heading to harvest is 1-2 larvae / 100 plants. Use of contact insecticides are effective and recommended for CEW control (i.e., pyrethoids and carbamates used alone, or in combination with spinetoram/spinosad).
https://cals.arizona.edu/crops/vegetables/advisories/docs/170221%20CEW%20%20Management%20on%20Desert%20Produce_2017.pdf

Bagrada bug control in cole crops
With the recent emergence of the invasive bagrada bug, *Bagrada hilaris*, in Arizona cole crops, growers have relied on contact insecticides (pyrethroids, methomyl and chlorpyrifos) early in the growing season to control migrating adult populations. Preventing the adults from feeding on plant terminals and small cotyledons is critical to establishing and maintaining a quality stand. If not controlled, bagrada bugs have the potential to reduce stands and yields by more than 50%. As a result, growers may need to make 4-6 insecticide applications per crop to effectively control this pest. Pyrethroids remain the primary product

used for controlling bagrada bug adults. The University of Arizona currently recommends that growers rotate pyrethroids with methomyl or a neonicotinoid to mitigate resistance. https://cals.arizona.edu/crops/vegetables/advisories/docs/091615_Bagrada_BugManagement_Tips_VegIPMUpdate_Fall%202015.pdf and https://cals.arizona.edu/crops/vegetables_/advisories/docs/052516%20_Bagrada%20Bug%20Survey%20Report_2015.pdf

Control of Insect Contaminates in Leafy Vegetables

Many of the insects that contaminate leafy vegetables at harvested are considered minor pests and are comprised of a number of plant bugs (false chinch bug, Lygus bug, stink bugs, three-corned alfalfa hopper). Survey results show that growers consistently apply 1-2 applications per season for their control in order to prevent lettuce and other leafy vegetables from being rejected due to excessive insect contamination. Prevention of insects on harvest product has become increasingly important with the popularity of fresh-cut and value-added bagged salad products. Pyrethroids are the primary insecticides used due to their safety, effectiveness, and short pre-harvest intervals. None of the alternatives (methomyl, dimethoate, chlorpyrifos, acephate) have comparable attributes. https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1137.pdf and https://cals.arizona.edu/crops/vegetables/advisories/more/insect183.html

Certified Organic Production of Leafy Vegetables The production of USDA certified organic lettuce and other leafy vegetables continues to increase throughout all growing areas of Arizona. These crops are exposed to the same pest-intensive, growing conditions and quality constraints as conventional crops. However, there are significantly fewer insecticide alternatives, particularly broad-spectrum alternatives, available to effectively control insects and protect crops. Field research has shown that pyrethrins are one of the few biopesticides that can provide reliable broad-spectrum contact activity against many of the pest mentioned above. Alternative biopesticides such as azadirachtin and fatty acid soaps are not as effective.

In conclusion, the availability of broad spectrum insecticides like the pyrethroids is one of the central reasons why Arizona vegetable growers can consistently provide markets with safe, affordable, and high quality produce. In my opinion, restricting the use of pyrethroids in leafy vegetable and melon crops would be detrimental not only to Arizona and California growers, but also to American consumers. In order to prevent economic losses to insect pests, growers would be forced to resort to the less effective and more toxic OP/carbamate insecticides that would likely be applied more frequently. Finally, I don't anticipate any future registrations of new chemistries that would effectively replace the pyrethroids role in the management of important pests found in leafy vegetable and melon crops grown in the southwestern U.S.

If you have any questions or would like to discuss this matter in more detail, please don't hesitate to contact me.

Sincerely,

John C. Palumbo, Ph.D.
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Department of Entomology