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# Cypermethrins

# Interim Registration Review Decision
# Case Number 2130

## March 2021

Approved by: _____

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Director
Pesticide Re-evaluation Division

Date: ___03/31/2021_____

Table of Contents

# I. INTRODUCTION

This document is the Environmental Protection Agency's (EPA or the Agency) Interim Registration Review Decision (ID) for cypermethrin, alpha-cypermethrin, and zeta-cypermethrin (referred to as the "cypermethrins") (cypermethrin PC Code 109702, alpha-cypermethrin PC Code 209600, zeta-cypermethrin PC Code 129064, case 2130). In a registration review decision under the Federal Insecticide, Fungicide, Rodenticide Act (FIFRA), the Agency determines whether a pesticide continues to meet FIFRA's registration standard.[1] Where appropriate, the Agency may issue an interim registration review decision before completing a registration review.[2] Among other things, the interim registration review decision may determine that new risk mitigation measures are necessary, lay out interim risk mitigation measures, identify data or information required to complete the review, and include schedules for submitting the required data, conducting the new risk assessment and completing the registration review.[3] For more information on the cypermethrins, see EPA's public docket (EPA-HQ-OPP-2012-0167) at www.regulations.gov.

FIFRA[4] mandates the continuous review of existing pesticides. All pesticides distributed or sold in the United States must be registered by EPA based on scientific data showing that they will not cause unreasonable adverse effects to human health or to the environment when used as directed on product labeling. In 2006, the Agency began implementing the registration review program. EPA will review each registered pesticide every 15 years. Through the registration review program, the Agency intends to verify that all registered pesticides continue to meet the registration standard as the ability to assess and reduce risk evolves and as policies and practices change. By periodically re-evaluating pesticides as science, public policy, and pesticide-use practices change, the Agency ensures that the public can continue to use products in the marketplace that do not present unreasonable adverse effects. For more information on the registration review program, see http://www.epa.gov/pesticide-reevaluation.

The Agency is issuing an ID for the cypermethrins so that it can (1) move forward with aspects of the registration review that are complete and (2) implement interim risk mitigation (see Appendices A and B). EPA is currently working with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (the Services) to improve the consultation process for national threatened and endangered (listed) species for pesticides under the Endangered Species Act (ESA).[5] The Agency has not yet fully evaluated the cypermethrins risks to federally listed species. However, EPA will complete its listed-species assessment and any necessary consultation with the Services before completing the cypermethrins registration review. Before completing registration review, EPA will also complete endocrine screening for the cypermethrins under the Federal Food, Drug, and Cosmetic Act (FFDCA).[6]

[1] Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) § 3(g), 7 U.S.C. § 136a(g); 40 C.F.R. § 155.57.
[2] 40 C.F.R. §§ 155.56, 155.58.
[3] 40 C.F.R. § 155.56.
[4] As amended by the Food Quality Protection Act (FQPA) of 1996, Pub. L. No. 104-170, 110 Stat. 1489.
[5] Endangered Species Act (ESA) § 7, 16 U.S.C. § 1536.
[6] Federal Food, Drug, and Cosmetic Act (FFDCA) § 408(p), 21 U.S.C. § 346a(p).

The cypermethrin case includes three active ingredients: racemic cypermethrin (hereafter referred to as cypermethrin), zeta-cypermethrin, and alpha-cypermethrin. Cypermethrin is a racemic mixture of eight stereoisomers, all of which are present in equal proportions. Zeta-cypermethrin and alpha-cypermethrin are enrichments of the more insecticidally-potent isomers (e.g., alpha-S and cis-2-R isomers). Collectively, cypermethrin, zeta-cypermethrin, and alpha-cypermethrin are referred to as "the cypermethrins" in this document.

The cypermethrins are pyrethroids that act through modulation of nerve axon sodium channels, causing neurotoxicity in insects and mammals. Products containing the cypermethrins are broad spectrum insecticides registered for agricultural use as a foliar application on food and feed crops. The cypermethrins can be applied to livestock and to horses. The cypermethrins are also registered for use on industrial, commercial, and residential sites. They are registered for outdoor use as a soil residual termiticide and to control insect pests such as ants in and on structures, impervious surfaces (in perimeter and crack-and-crevice treatments) and lawns. The cypermethrins can also be applied indoors to control ants, cockroaches, fleas, and other insects.

Cypermethrin was first registered in 1984 by FMC Corporation, which subsequently registered zeta-cypermethrin in 1992. The Reregistration Eligibility Decision for cypermethrin was completed in 2006. Zeta-cypermethrin and alpha-cypermethrin were not subject to reregistration since they were registered after 1984.

The cypermethrins are members of the pyrethroids class of insecticides, which share the same mode of action. These insecticides work by altering nerve function, causing paralysis in target insect pests (also called 'knockdown'), and eventually resulting in death. The Agency has determined that the pyrethroids and pyrethrins belong to a common mechanism group (http://www.regulations.gov; EPA-HQ-OPP-2008-0489-0006), and the Insecticide Resistance Action Committee (IRAC), composed of industry and university scientists, categorizes them together in Mode of Action Group 3A since they all have the same site of action in affected insects. A screening-level cumulative risk assessment to assess human health risks from this group of pesticides was completed in 2011. This analysis did not identify cumulative risks of concern for children and adults. For further information, please see Section III.A.2 of this document and the cumulative risk assessment for the pyrethroids and pyrethrins, published on November 9, 2011 (available at http://www.regulations.gov; EPA-HQ-OPP-2011-0746).

In addition to this cypermethrins ID, which describes the risk management approach for the cypermethrins determined to be necessary by the Agency, EPA previously published and opened 60-day public comment periods on the following documents which also discussed risk management and mitigation measures: *Cypermethrins Proposed Interim Registration Review Decision* (June 29, 2020), which summarizes the human health risk assessment and proposes mitigation for the cypermethrins; *Pyrethroids and Pyrethrins Ecological Risk Mitigation Proposal for 23 Chemicals* (September 30, 2019), which summarizes the ecological risk assessment approach and outlines EPA's proposed mitigation to address potential ecological risks for pyrethroids as a whole; and *USEPA Office of Pesticide Programs' Re-Evaluation of the FQPA Safety Factor for Pyrethroids: Updated Literature and CAPHRA Program Data Review* (July 1, 2019), which discusses the data and rationale underlying the Agency's decision to remove the 10X FQPA safety factor for the pyrethroids, including the cypermethrins. Those

documents, as well as additional supporting documents, are located in the cypermethrins docket and in the Special Docket for Pyrethroids, Pyrethrins, and Synergists located at http://www.regulations.gov (Dockets: EPA-HQ-OPP-2012-0167 and EPA-HQ-OPP-2008-0331, respectively).

Having considered stakeholder comments on the cypermethrins' Proposed Interim Decision (PID), the *Pyrethroids and Pyrethrins Ecological Risk Mitigation Proposal for 23 Chemicals* (September 30, 2019), and *USEPA Office of Pesticide Programs' Re-Evaluation of the FQPA Safety Factor for Pyrethroids: Updated Literature and CAPHRA Program Data Review* (July 1, 2019), EPA has consolidated the necessary human health and ecological risk management and mitigation measures in this interim decision document for the cypermethrins.

This document describes changes or updates since the cypermethrins PID and is organized in six sections: the *Introduction*, which includes this summary and a summary of public comments EPA received on the PID and the Agency's responses; *Use and Usage*, which describes how and why the cypermethrins are used and summarizes data on its use; *Scientific Assessments*, which summarizes EPA's risk and benefits assessments, updates or revisions to previous risk assessments, and provides broader context with a discussion of risk characterization; the *Interim Registration Review Decision*, which describes the mitigation measures necessary to address risks of concern and the regulatory rationale for EPA's ID; *Next Steps and Timeline*, which describes the next steps and timeline for completion of this registration review and, lastly; *References*, which lists the references used in this document.

### A. Updates since the Proposed Interim Decision was Issued

In September 2020, EPA published the PID for the cypermethrins. In this ID, there are several updates to what was proposed in the PID. The updates include changes to the ecological risk mitigation measures that were proposed in the *Pyrethroids and Pyrethrins Ecological Risk Mitigation Proposal for 23 Chemicals* (September 30, 2019). Label language has been revised for indoor, outdoor, and agricultural uses to improve clarity and consistency. The vegetative filter strip (VFS) requirement for the agricultural uses of pyrethroids has been revised to add flexibility for users. For Western irrigated agriculture, EPA is allowing use of a sediment control basin in lieu of constructing and maintaining a VFS. In addition, the Agency is adding an allowance for treatment areas of 10 acres or less to retain a 15-foot VFS. The Agency considers the use of sediment control basins for Western irrigated agriculture as effective as a VFS in retaining sediment and minimizing runoff, without the burden of constructing and maintaining a VFS. The allowance for treatment areas of 10-acres or less to retain a smaller VFS will alleviate some of the impact on small scale operations, which may be disproportionately impacted by the expanded VFS requirements. In addition, the Agency has determined that VFS is not required for rice fields. See the *Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals* (September 30, 2020), for a detailed discussion of the changes made to the proposed mitigation.

EPA announced the availability of 13 pyrethroid registration review IDs on October 29, 2020, which determined that risk mitigation was necessary in the form of revised label language. After the publication of the IDs, EPA received about 20 inquiries from various pyrethroid registrants

requesting clarification on which types of products/uses were affected under the new label requirements. Most registrants requested clarification on the type of formulations (liquid or granule) that would be affected by the revised label language. In response to questions raised, the Agency has clarified labeling for products with outdoor urban uses by specifying the type of products and uses that are affected by the necessary registration review label language, see *Memorandum: Updated Label Language for the 'Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals'* (February 17, 2021). Updated changes to the labeling consist of the following:

- The Agency is clarifying in the description to the "General Outdoor Application Statement," that the application restrictions include residential outdoor surface and space sprays and exclude outdoor fogging devices.
- For the "Buffer from Water Statement" and the "Water Protection Statements," the Agency is clarifying that the label language is necessary for both liquid and granule formulations.

The Agency also has corrected an error in this document. The correction provides a portion of the water soluble packaging label language that was inadvertently omitted in the PID label table in Appendix B. Appendix B in the PID only provided the engineering controls statement for Toxicity Category I and II products. There should have been a second statement for Toxicity Category III and IV products. Registrants must choose the appropriate statement to put on the label depending on the toxicity category of their end-use product.

Finally, the Agency has revised its intentions for making changes to tolerances in Section III based on the public comments received. The Agency will use its FFDCA rulemaking authority to make such changes in a separate action from this ID. For more details on how public comments influenced these updates, see Section I.C.

There have not been updates to the human health mitigation from what was proposed in the PID, nor any additional updates to the draft risk assessment (DRA). This ID thus finalizes the Agency's draft supporting documents: (1) *Cypermethrin, Zeta-cypermethrin, and Alpha-cypermethrin. Draft Human Health Risk Assessment for Registration Review* (December 21, 2017; also referred to as the 2017 HHRA in this document)*; (2) Cypermethrin, Zeta-cypermethrin, and Alpha-cypermethrin. Revised Draft Human Health Risk Assessment for Registration Review* (June 19, 2020; also referred to as the 2020 HHRA in this document)*;* (3) *Preliminary Comparative Environmental Fate and Ecological Risk Assessment for Registration Review of Eight Synthetic Pyrethroids and the Pyrethrins* (September 30, 2016; also referred to as the 2016 ERA in this document)*;* and (4) *Ecological Risk Management Rationale for Pyrethroids in Registration Review* (September 30, 2016)*,* which are available in the cypermethrins public docket.

### B. Summary of the Cypermethrins Registration Review

Pursuant to 40 CFR § 155.50, EPA formally initiated registration review for the cypermethrins with the opening of the registration review docket for the case in March 2012. The following summary highlights the docket opening and other significant milestones that have occurred thus far during the registration review of the cypermethrins.

- February 2012 – EPA issued *Generic Data Call-in Notice GDCI-109702-1107 (cypermethrin) and GDCI-129064-1097 (zeta-cypermethrin)* for guideline 875.1700 (product use information) on February 1, 2012. GDCI-109702-1107 and GDCI-129064-1097 are partially satisfied; EPA has received and accepted data from the companies who represent the Residential Exposure Joint Venture. EPA continues to evaluate data submitted from companies comprising the Generic Residential Exposure Task Force (GRETF), which is partially satisfied and will update the status of this DCI when the review is completed.

- March 2012 – EPA posted the *Cypermethrin Summary Document* (March 19, 2012)*; Cypermethrin and Zeta-Cypermethrin: Human Health Risk Scoping Document in Support of Registration Review* (March 1, 2012)*;* and *Problem Formulation for the Environmental Fate and Ecological Risk, Endangered Species, and Drinking Water Assessments in Support of the Registration Review of Racemic Cypermethrin and Zeta-Cypermethrin* (March 1, 2012) to the public docket on March 28, 2012 for a 60-day public comment period.

- October 2012 – EPA posted the *Cypermethrin Final Work Plan* (FWP) (September 20, 2012) to the public docket on October 12, 2012. The Agency received seven comments on the PWP. The comments did not change the schedule but did change the risk assessment needs and anticipated data requirements in the FWP.

- February 2013 – EPA issued Generic Data Call-In-Notice GDCI-109702-1208 (cypermethrin) and GDCI-129064-1209 (zeta-cypermethrin) for data needed to conduct the registration review risk assessments. In May 2013, EPA issued GDCI-209600-1329 for data needed to conduct the registration review risk assessments for alpha-cypermethrin. Data were submitted or cited for all data requirements. However, several of the studies have been classified as "supplemental" and do not fulfill the data requirements; therefore, the GDCI has not been satisfied. The registrants must submit data for the non-guideline chronic sediment studies with *Hyalella Azteca* and *Chironomus Dilutus*. Refer to section III.B.1 for a list of outstanding studies.

- November 2016 - The Agency announced the availability of the *Preliminary Comparative Environmental Fate and Ecological Risk Assessment for the Registration Review of Eight Synthetic Pyrethroids and the Pyrethrins* (also referred to as September 30, 2016; referred to as the 2016 ERA) and the *Ecological Risk Management Rationale for Pyrethroids in Registration Review* (September 30, 2016; referred to as the Rationale Document) in the cypermethrins docket for a 60-day public comment period. The same FR Notice (81 FR 85952) also announced the availability of the risk assessments for several other pyrethroids, the 2016 ERA, and the Rationale Document in the individual pyrethroid dockets. The comment period was extended from January until July 2017.
    - During the public comment period, EPA received over 1,400 public comments across all the dockets of the pyrethroids.
    - These comments and the Agency's responses can be found in the *Joint Response from OPP's Environmental Fate and Effects Division and Pesticide Re-evaluation Division to Comments on the Preliminary Risk Assessments for the Pyrethroids*

*and Pyrethrins Insecticide*s (September 30, 2019) and the *Biological and Economic Analysis Division (BEAD) Summary of Public Comments Related to Benefits of Pyrethroids Submitted in Response to the Preliminary Comparative Environmental Fate and Ecological Risk Assessment for the Registration Review of Eight Synthetic Pyrethroids and the Pyrethrins* (September 18, 2019). These documents can be found at http://www.regulations.gov (EPA-HQ-OPP-2008-0331). The comments did not change the ecological risk assessment or registration review timeline for the cypermethrins.

- February 2018 - The Agency announced the availability of the *Cypermethrin, Zeta-cypermethrin, and Alpha-cypermethrin. Draft Human Health Risk Assessment for Registration Review* (December 21, 2017) in the cypermethrins docket for a 60-day public comment period.
    - During the public comment period, EPA received 4 public comments. These comments and the Agency's responses can be found in the *Cypermethrin(s). HED Response to Public Comments on the Cypermethrin, Zeta-cypermethrin, and Alpha-cypermethrin Draft Risk Assessment for Registration Review* (March 13, 2019).
    - The comments resulted in changes to the human health risk assessment for the cypermethrins, as noted in the *Cypermethrin, Zeta-Cypermethrin and Alpha-Cypermethrin. Revised Draft Human Health Risk Assessment for Registration Review* (June 19, 2020).

- August 2019 – The Agency published *USEPA Office of Pesticide Programs' Re-Evaluation of the FQPA Safety Factor for Pyrethroids: Updated Literature and CAPHRA Program Data Review* (July 1, 2019) on the webpage *https://www.epa.gov/sites/production/files/2019-08/documents/2019-pyrethroid-fqpa-caphra.pdf,* which discusses the data and rationale underlying the Agency's decision to remove the 10X FQPA safety factor for the pyrethroids, including the cypermethrins.

- November 2019 – The Agency opened a 60-day public comment period for *USEPA Office of Pesticide Programs' Re-Evaluation of the FQPA Safety Factor for Pyrethroids: Updated Literature and CAPHRA Program Data Review* (July 1, 2019). This document is located in the Special Docket for Pyrethroids, Pyrethrins, and Synergists at http://www.regulations.gov (Docket: EPA-HQ-OPP-2008-0331). The following supporting documents are also available in this docket:
    - *Pyrethroids: Documentation of Systematic Literature Review Conducted in Support of Registration Review* (April 11, 2019)
    - *cis-Permethrin: Statistical Analysis of PBPK Simulated Data for DDEF* (September 12, 2018)
    - *Pyrethroids: Tier II Epidemiology Report* (April 30, 2019)

- November 2019 – The Agency opened a 60-day public comment period for the *Pyrethroids and Pyrethrins Ecological Risk Mitigation Proposal for 23 Chemicals* (September 30, 2019). This document is located in the Special Docket for Pyrethroids, Pyrethrins, and Synergists located at http://www.regulations.gov (Docket: EPA-HQ-OPP-

2008-0331). The comment period was extended an additional 30 days, due to multiple requests for an extension. The following supporting documents are also available in this docket:

- *Joint Response from OPP's Environmental Fate and Effects Division and Pesticide Re-evaluation Division to Comments on the Preliminary Risk Assessments for Pyrethroids and Pyrethrins Insecticides* (September 30, 2019)
- *Updated Ecological Incidents Search for the Pyrethroids and Pyrethrins* (September 19, 2019)
- *Usage Characterization and Qualitative Overview of Agricultural Importance for Pyrethroids Insecticides for Selected Crops and Impacts of Potential Mitigation for Ecological Risks* (September 25, 2019)
- *Review of USDA's Assessment of the Benefits of Pyrethroids* (August 2, 2019)
- *Review of Estimated Benefits of Pyrethroids in U.S. Agriculture from "The Value of Pyrethroids in U.S. Agriculture and Urban Settings" Prepared by AgInfomatics, LLC for the Pyrethroid Working Group* (August 7, 2019)
- *Biological and Economic Analysis Division (BEAD) Summary of Public Comments Related to Benefits of Pyrethroids Submitted in Response to the Preliminary Comparative Environmental Fate and Ecological Risk Assessment for the Registration Review of Eight Synthetic Pyrethroids and the Pyrethrins* (September 18, 2019)
- *Review of "Economic Benefits of Pyrethroids Insecticides for Select California Crops," Report Prepared by ERA Economics for the Pyrethroids Working Group* (August 2, 2019)
- *Alternatives Assessment for Synthetic Pyrethroid/Pyrethrin Insecticides as Wide Area Mosquito Adulticides in Support of Registration Review* (November 26, 2018)
- *Readers Guide – Instructions for Commenting on the Registration Review Documents in the Pyrethroids Group* (September 30, 2019)

- September 2020 – The Agency opened a 60-day public comment period for the cypermethins PID in the cypermethrins registration review docket (EPA-HQ-OPP-2012-0167). Comments received on the PID are discussed in the following section. Along with the cypermethrins PID, the following documents were also posted in the cypermethrins registration review docket (EPA-HQ-OPP-2012-0167):
  - *Cypermethrin, Zeta-cypermethrin, and Alpha-cypermethrin. Revised Draft Human Health Risk Assessment for Registration Review* (June 19, 2020)
  - *Cypermethrin, Zeta-Cypermethrin and Alpha-Cypermethrin. Revised Occupational and Residential Exposure Assessment for Registration Review* (June 19, 2020)
  - *Cypermethrin(s). HED Response to Public Comments on the Cypermethrin, Zeta-cypermethrin, and Alpha-cypermethrin Draft Risk Assessment for Registration Review* (March 13, 2019)

- March 2021 – The Agency has completed the cypermethrins ID. Along with the cypermethrins ID, the following documents will also be available in the cypermethrins registration review docket (EPA-HQ-OPP-2012-0167):
    - *Pyrethroids: Health Effects Division Response to Public Comments Submitted to the Special Docket for Pyrethroids, Pyrethrins, and Synergists [EPA-HQ-OPP-2008-0331]* (September 23, 2020)
    - *Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals* (September 30, 2020)
    - *Considerations for Bridging Bee-Related Effects and Exposure Data for the Pyrethroids and Pyrethrins* (December 2020)
    - *Memorandum: Updated Label Language for the 'Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals'* (February 17, 2021)
    - *Cypermethrin, zeta-Cypermethrin, and alpha-Cypermethrin: HED's Response to USDA's Comments on the Cypermethrins Preliminary Interim Decision* (February 16, 2021)
    - *Cypermethrin: Response to Registrant Waiver Request for Chronic Sediment Toxicity Study Conducted with Chironomus dilutus* (February 17, 2021)

## C. Summary of Public Comments on the Proposed Interim Decision and Agency Responses

During the 60-day public comment period for the cypermethrins PID, which opened on September 2, 2020 and closed on November 2, 2020, the Agency received public comments from eight stakeholders. Syngenta Crop Protection, LLC (technical registrant) submitted comments requesting clarification for the pollinator risk mitigation label requirements in non-agricultural sites. The Alpha-cypermethrin, Zeta-cypermethrin, Cypermethrin Task Force (AZCTF) commented on the outstanding chronic sediment studies and the proposed pollinator data requirements. The American Soybean Association (ASA) provided use and benefit information for the use of the cypermethrins on soybean crops. The United States Department of Agriculture (USDA) supported the overall proposed label language and mitigation with additional concerns regarding droplet size language and international MRL harmonization that are addressed in detail below. The National Pest Management Association (NPMA), Bay Area Clean Water Agencies (BACWA), San Francisco Bay Regional Water Quality Control Board (SFBRWQCB), and California Stormwater Quality Association (CASQA) submitted comments relating to pyrethroids in general and the cypermethrins specifically.

During the public comment period for the *Pyrethroids and Pyrethrins Ecological Risk Mitigation Proposal for 23 Chemicals* (September 30, 2019) held from November 12, 2019 to February 12, 2020, the Agency received 65 substantive comments from various stakeholders on the pyrethroids as a group. Additional comments on the pyrethroids group were submitted by various stakeholders during the public comment periods for several individual pyrethroid proposed interim decisions held from May 5, 2020 to July 6, 2020. Public comments pertaining to overarching pyrethroid ecological concerns and the Agency's responses are addressed in the *Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on*

*the Ecological Risk Mitigation Proposal For 23 Chemicals* (September 30, 2020). Public comments pertaining to overarching pyrethroid human health and pet health concerns and the Agency's responses are addressed in detail in the document titled *Pyrethroids: Health Effects Division Response to Public Comments Submitted to the Special Docket for Pyrethroids, Pyrethrins, and Synergists* (September 23, 2020). Both of these documents are available in the Special Docket for Pyrethroids, Pyrethrins, and Synergists (EPA-HQ-OPP-2008-0331) and in the cypermethrins docket. The comments specific to the cypermethrins and the Agency's responses are summarized below.

**Comments Submitted by USDA (Docket ID: EPA-HQ-OPP-2012-0167-0157)**

**Comment 1:** The USDA encourages EPA to evaluate the potential for Codex MRL harmonization to the greatest extent possible or provide detailed, risk-based explanations for not harmonizing when U.S. tolerances are lower than the Codex MRLs. In addition, USDA encourages EPA to consider a more comprehensive approach to MRL harmonization by evaluating not only existing U.S. tolerances, but also cases where Codex has established an MRL and EPA has no corresponding tolerance.

**Comment 2:** USDA also requests that EPA consider the alternative language for droplet size restrictions for ground-boom and aerial applications.

**EPA Responses**:

**Response 1:** EPA thanks the USDA for its comments and has taken them into consideration in this ID and in the document *Cypermethrin, zeta-Cypermethrin, and alpha-Cypermethrin: HED's Response to USDA's Comments on the Cypermethrins Preliminary Interim Decision* (February 16, 2021). Regarding harmonization with Codex MRLs, EPA attempts to harmonize existing U.S. tolerances with Codex MRLs where feasible. During registration review, EPA evaluates established U.S. tolerances and considers whether harmonization of those tolerances with Codex MRLs is appropriate. In addition, when establishing a new tolerance in response to a petition or on the Agency's own initiative, EPA also considers whether it is appropriate to harmonize with Codex MRLs. Sometimes, harmonization is not appropriate due to a difference in tolerance expression (e.g., a difference in metabolites covered), a difference in commodity definition (e.g., livestock meat versus livestock fat), or a difference in use pattern (e.g., in season versus post-harvest). Where a U.S. tolerance does not exist, there is nothing to harmonize.

EPA does not generally initiate rulemakings to establish tolerances simply because a Codex tolerance exists; rather, EPA uses its limited resources for assessing the safety of tolerances for which there has been a specific request (e.g., through a petition) or there is a specific need (e.g., when in registration review the Agency determines that tolerances were inadvertently removed from EPA's regulations leaving domestic uses without tolerance coverage). Establishing tolerances simply to match Codex, as suggested by USDA, would not be tied to any specific request or need to cover residues in imported commodities. If there is a true need for such a tolerance, a person can submit a petition to the Agency asking for the establishment of such a tolerance.

**Response 2:** As discussed in the *Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals* (September 30, 2020), EPA agrees with the suggestion from USDA to modify the proposed droplet size language. The label language changes are reflected in Appendix B.

**Comments Submitted by AZCTF (Docket ID: EPA-HQ-OPP-2012-0167-0158)**

**Comment 1:** AZCTF commented on the outstanding chronic sediment studies in the registration review DCIs (GDCI-109702-1208, GDCI-129064-1209, and GDCI-209600-1329). For the non-guideline chronic sediment study with *Hyalella azteca*, AZCTF stated their intent to initiate a study to address this data gap. For the non-guideline chronic sediment study with *Chironomus dilutus*, AZCTF has requested a waiver claiming there is strong evidence that endpoints generated from this additional chronic midge study are unlikely to be more sensitive than those from *Hyalella azteca* studies.

**Comment 2:** AZCTF supports the proposed pollinator label language changes. AZCTF also commented on the proposed pollinator data requirements and requested that EPA consider approaches to utilize existing data and streamline data generation prior to issuing a DCI for pollinator data.

**EPA Responses:**

**Response 1:** EPA thanks AZCTF for its comments and looks forward to receiving the chronic sediment study with *Hyalella azteca*. The Agency disagrees that the available evidence indicates *Hyalella azteca* is consistently more sensitive compared to midge based on chronic sediment testing. EPA considers the submission of a chronic (life cycle) test with the midge (*Chironomus dilutus*) to be of value to future risk assessments for the cypermethrins and therefore, EPA is denying AZCTF's waiver request. Please see *Cypermethrin: Response to Registrant Waiver Request for Chronic Sediment Toxicity Study Conducted with Chironomus dilutus* (February 17, 2021) for more details.

**Response 2:** For the pollinator data requirements, EPA has been in discussion with the Pyrethroid Working Group on the possibility of bridging pollinator data across the pyrethroids to streamline data generation efforts. Registrants are strongly encouraged to submit proposals for bridging pyrethroid exposure and effects data to EPA for review and comment prior to their implementation. A bridging proposal should incorporate several underlying principles, including but not limited to:

a. generating sufficient empirical data to demonstrate the predictability of the bridging approach being proposed,

b. addressing the presumed greater uncertainty of bridged data relative to empirical data, and

c. addressing data gaps should the intended bridging approach be considered unreliable (e.g., using a conservative approach such as lower 95th confidence limit on observed toxicity).

Please see the *Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals* (September 30, 2020) and *Considerations for Bridging Bee-Related Effects and Exposure Data for the Pyrethroids and Pyrethrins* (December 2020) for additional considerations for pollinator data bridging.

EPA intends to issue Data Call-Ins (DCIs) for pollinator data for each pyrethroid with outdoor uses based on the data needs outlined in the pyrethroid DRAs and PIDs. As with all DCIs, registrants will be able to cite existing data and/or request data waivers (for example, as a result of a bridging approach) in response to the DCIs.

**Comments Submitted by NPMA (Docket ID: EPA-HQ-OPP-2012-0167-0159)**

**Comment**: The NPMA urged the Agency to consider comments previously submitted regarding the *Ecological Risk Mitigation Proposal for 23 Chemicals* and *Proposed Interim Decisions for Several Pesticides*. In those comments, NPMA outlined areas of concern including proposed label statements for spot treatments, rain-related application prohibitions, proposed rain-related unintended runoff, general outdoor application, and crack-and-crevice treatments. NPMA also urged EPA to maintain a consistent approach to regulating pyrethroid insecticides.

**EPA Response**: EPA thanks the NPMA for its comments. As discussed in the *Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals* (September 30, 2020), EPA has revised the label language pertaining to spot treatment, crack-and-crevice treatment, rain-related restrictions, and general outdoor statements to add clarity to the pyrethroid labels. The substance and intent of the statements, however, have not changed. The label language changes are reflected in Appendix B.

**Comments Submitted by Syngenta (Docket ID: EPA-HQ-OPP-2012-0167-0160)**

**Comment**: Syngenta Professional Solutions (Syngenta), a division of Syngenta Crop Protection, LLC supports the proposed label language updates to the glove statement, respirator statement, and products packaged in water soluble packets (WSP) as well as the resistance-management labeling requirements for its two active end-use product registrations containing cypermethrin.

Syngenta requests that the Agency clarify the pollinator risk mitigation label requirements for pest control in non-agricultural sites (*i.e.*, pest control in, on, or around residential, commercial, and institutional properties).

**EPA Response**: EPA thanks Syngenta for its feedback on the label language updates and the mitigation to address risks to pollinators. As discussed in the *Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals* (September 30, 2020), the pollinator labeling language is required for liquid formulation products for outdoor agricultural use. This labeling is intended to provide information to applicators to help reduce potential exposure to pollinators from applications related to crop production. These requirements do not apply to applications in, on, or around residential, commercial, and institutional properties at this time.

**Comments Submitted by Various Water Boards/Water Agencies**

**Comment 1:** The San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) (EPA-HQ-OPP-2012-0167-0161 and EPA-HQ-OPP-2012-0167-0165), the Bay Area Clean Water Agencies (BACWA) (EPA-HQ-OPP-2012-0167-0162), and the California Stormwater Quality Association (CASQA) (EPA-HQ-OPP-2012-0167-0164) commented on the proposed risk mitigation for the cypermethrins.

The water boards/agencies urged EPA to consider individualized mitigation measures for high risk pyrethroids such as the cypermethrins. The water boards/agencies noted that EPA's proposed mitigation was the same across all 23 pyrethroids and pyrethrins, but the level of risk differed substantially between individual pyrethroids, as reflected in the differences in the magnitude of risk quotients (RQs) for aquatic organisms. They suggest that EPA implement targeted mitigation for the most used and higher risk pyrethroids since not all pyrethroids and pyrethrins have equal costs and benefits.

**Comment 2:** CASQA (EPA-HQ-OPP-2012-0167-0164) recommended that the Agency (1) design a clear schematic graphic for products that may be dumped or washed into gutters and storm drains, and (2) edit descriptions of pervious and impervious surfaces as needed for clarity and consistency in Appendix B.

**EPA Responses:**

**Response 1**: The Agency appreciates the comments from SFBRWQCB, BACWA, and CASQA. EPA has considered these comments and has decided not to develop unique chemical-specific risk mitigation for the cypermethrins at this time beyond what is already required as part of this ID. EPA concludes that the cypermethrins provide high benefits for controlling pests in indoor residential areas, outdoor urban areas, and in agricultural crop production. The Agency is requiring risk mitigation primarily to address risk to non-target invertebrates and fish; however, risks may remain to non-target organisms even after mitigation. Any remaining risks are outweighed by the benefits of the cypermethrins use. In addition, EPA notes that all states, including California, are authorized to restrict pesticide use according to state requirements/standards. For a more detailed response to submitted water quality comments, please see the *Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals* (September 30, 2020).

**Response 2**: EPA thanks the CASQA for its comments. As discussed in the *Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals* (September 30, 2020), EPA revised the label language to include an image of a required pictogram and added clarity to various statements on the pyrethroid labels. The substance and intent of the statements, however, have not changed. The label language changes are reflected in Appendix B.

**Comments Submitted by ASA (Docket ID: EPA-HQ-OPP-2012-0167-0163)**

**Comment**: The ASA noted that the cypermethrins are an important component in Integrated Pest Management and Insecticide Resistance Management programs for soybean growers. The cypermethrins are used to knockdown and control aphids, stinkbugs, and other piercing, sucking, and chewing insect pests.

**EPA Response**: The Agency appreciates this information and considered it in the development of this ID.

**Comments Submitted by Pyrethrin Joint Venture and Various Registrants**

**Comment**: Pyrethrin Joint Venture (PJV) (posting in the pyrethroids special docket, EPA-HQ-OPP-2008-0331), Bayer CropScience LP (posting in the deltamethrin docket, EPA-HQ-OPP-2009-0637), and Valent (posting in the esfenvalerate docket, EPA-HQ-OPP-2009-0301) submitted comments requesting additional time for label submission (following the ID) and/or additional time to complete implementation of updated labels on containers. Bayer and Valent request an additional 60 days for a total of 120 days for registrants to submit revised labels following the issuance of the Interim Decisions. In addition, the PJV and Valent requested 18-24 months following EPA's approval of these amended labels for registrants to begin selling and distributing product containers reflecting these new amended labels. PJV believes the 18-month implementation timeline to be in accordance with 40 CFR 152.130(c).

**Agency Response:** EPA thanks the submitters for their comments and has determined that an extension to the 60-day timeframe is acceptable based on the number of pyrethroid labels that will be revised and submitted to the Agency. EPA agrees to extend the label submission deadline to 120 days following the issuance of the IDs. The Office of Pesticide Programs is currently looking into the timing concerns raised related to label implementation (*i.e.*, 40 CFR 152.130(c)) as an overall issue for the program and will consider the comments received before issuing a response.

## II. USE AND USAGE

As discussed above, the cypermethrins are pyrethroid insecticides that affect the peripheral and central nervous systems of insects. Pyrethroids work by keeping sodium channels in neuronal membranes open, which initially stimulates nerve cells to repeatedly discharge which results in paralysis (also called knockdown) and eventually death of target pests. The Insecticide Resistance Action Committee categorizes cypermethrins and other pyrethroids as Mode of Action (MOA) Group 3A (IRAC, 2020).

Cypermethrins are registered for use in a wide variety of settings including both crop and livestock production (e.g., premises and on animal), and indoor and outdoor uses in residential and commercial areas, including empty food storage warehouses.

Nationally, residential consumers purchased around 100,000 pounds (lbs) of pyrethroid insecticides, by active ingredient (a.i.), for indoor use, and around 2 million lbs a.i. of pyrethroids, including cypermethrins (which was not reported in a quantifiable measure beyond generalized pyrethroids), for residential outdoor uses in 2016 (NMRD, 2017a). These amounts include household insecticides for both indoor and outdoor use (e.g., ant, cockroach, termite, and fly control, and lawn and garden pest control insecticides), pet products, and insect repellents. Food handling establishments, including processing facilities, warehouses, restaurants, and other food preparation facilities, used around 200,000 lbs a.i. of pyrethroids, including 3,000 lbs of cypermethrin, in 2013 (Kline and Company, 2014). Professional pest management companies used over 3 million lbs a.i. of pyrethroids for control of various nuisance and public health pests both in and around residential and commercial buildings, including 300,000 lbs of cypermethrins (Kline and Company, 2013 and NMRD, 2017b). Pet products used by commercial groomers are not captured in these data. Industrial vegetation management, including roadways and rangeland, used around 2.5 million lbs of pyrethroids, including cypermethrins (NMRD, 2017c).

From 2014-2018, usage in agriculture averaged about 200,000 lbs a.i. of cypermethrins to treat over 6.2 million acres of cropland (Kynetec, 2019) annually. Soybeans, cotton, corn, oranges, and alfalfa account for about 70% of the usage in total pounds applied and 75% in total acres treated. Generally, the average annual percent of crops treated (PCT) for the top crops is 5% or less, except for oranges, which has an average of 45% crop treated. The sites with the highest PCT include grapefruit, squash, oranges, artichokes, and caneberries, which generally have a PCT between 40% and 55%. Cypermethrins usage data in livestock production are not available.

# III. SCIENTIFIC ASSESSMENTS

## A. Human Health Risks

A summary of the Agency's human health risk assessment is presented below. The Agency used the most current science policies and risk assessment methodologies to prepare a risk assessment in support of the registration review of the cypermethrins. For additional details on the human health assessment for the cypermethrins, see the *Cypermethrin, Zeta-cypermethrin, and Alpha-cypermethrin. Draft Human Health Risk Assessment for Registration Review* (December 21, 2017; also referred to as the 2017 HHRA)*; Cypermethrin, Zeta-cypermethrin, and Alpha-cypermethrin. Revised Draft Human Health Risk Assessment for Registration Review* (June 19, 2020; also referred to as the 2020 HHRA); and *Cypermethrin(s) HED Response to Public Comments on the Cypermethrin, Zeta-cypermethrin, and Alpha-cypermethrin Draft Risk Assessment for Registration Review* (March 13, 2019), which are available in the cypermethrins registration review docket (EPA-HQ-OPP-2012-0167).

### 1. Pyrethroids FQPA Safety Factor Determination

The Food Quality Protection Act (1996) requires EPA to apply a ten-fold margin of safety (10X FQPA Safety Factor (SF)) for infants, children, and women of child-bearing age to account for potential juvenile sensitivity to pesticides, unless there are reliable data to reduce this safety factor. The Agency considers the FQPA SF as having two components: 3X assigned to

pharmacokinetic (PK) differences and 3X to pharmacodynamic (PD) differences. In conjunction with registration review for the pyrethroid active ingredients, EPA previously used a 3X SF based on concerns for pharmacokinetic differences between adults and children. In 2019, EPA re-evaluated the need for an FQPA SF for human health risk assessments for pyrethroid pesticides. The previous conclusion that the PD contribution to the FQPA SF is 1X remains the same. Based on a review of the available guideline and literature studies as well as data from the Council for the Advancement of Pyrethroid Human Risk Assessment (CAPHRA) program, EPA concluded that the PK contribution to the FQPA SF is also 1X for adults, including women of child-bearing age, and children. Therefore, the Agency concluded the total FQPA SF for pyrethroids can be reduced to 1X for all populations. This conclusion was supported by two documents posted to the Agency's website and the Special Docket for Pyrethroids, Pyrethrins and Synergists (EPA-HQ-OPP-2008-0331): 1) *Re-Evaluation of the FQPA Safety Factor for Pyrethroids: Updated Literature and CAPHRA Program Data Review* (July 1, 2019); and 2) *Pyrethroids: Current Use and Potential Applications of a Generic Physiologically-Based Pharmacokinetic (PBPK) Model* (December 17, 2019).

## 2. Risk Summary and Characterization[7]

There are no dietary, residential, bystander, or aggregate risk estimates of concern for the registered uses of cypermethrin, zeta-cypermethrin, and alpha-cypermethrin. There is one occupational handler scenario identified with risks of concern for cypermethrin.

*Dietary (Food and Water)*

A refined acute probabilistic dietary exposure assessment was conducted for cypermethrin, zeta-cypermethrin, and alpha-cypermethrin (2017 HHRA). The U.S. population and all population subgroups have exposure and risk estimates below the level of concern of 100% of the acute population adjusted dose (aPAD). At the 99.9$^{th}$ percentile of exposure, the risk estimate for the general U.S. population is 29% of the aPAD. The population subgroup with the highest risk estimate is children ages 3-5, which uses 31% of the aPAD.

A chronic dietary endpoint is not required for the cypermethrins because repeated exposure does not result in a point of departure lower than that resulting from acute exposure. Therefore, the acute dietary risk assessment is protective of chronic dietary risk. However, the Agency conducted a refined chronic dietary exposure assessment to be used in the aggregate risk assessment. The chronic dietary exposure estimate for the general U.S. population is 0.00026 mg/kg/day. The most highly exposed population subgroup is children ages 1-2, which has a chronic dietary exposure estimate of 0.00071 mg/kg/day.

[7] To determine if a risk estimate is of concern or not, the Agency compares the risk estimate with a level of concern (LOC). The risk estimate is not of concern if it is <100% cPAD or aPAD for dietary exposure; the margin of exposure is > LOC; or the aggregate risk index (ARI) is > 1.

*Residential Handler Risks*

In the 2017 HHRA, the Agency identified a residential handler exposure scenario with risks of concern for alpha-cypermethrin (*i.e.*, inhalation and or dermal margins of exposure (MOEs) are < level of concern (LOC), the aggregate risk index (ARI) <1; the ARI approach was used when the LOC values for dermal exposure and inhalation exposure are different). This scenario was for microencapsulated alpha-cypermethrin concentrate use in livestock housing to treat darkling beetles in litter at a rate of 0.17 – 0.425 lb a.i./A. When applied at the maximum application rate of 0.425 lb a.i./A, the risk estimate was a dermal MOE of 62 and an ARI of 0.61 which is considered a risk of concern. See the 2017 HHRA for the full details.

Based on new information submitted in response to the 2017 HHRA and the lack of dermal toxicity for adult exposure to alpha-cypermethrin, the previous residential handler scenario of concern resulting from use of alpha-cypermethrin in livestock housing is no longer of concern. See the 2020 HHRA for the full details.

*Residential Post-Application Risks*

In the 2017 HHRA, the Agency identified several residential post-application exposure scenarios with risks of concern for cypermethrin, zeta-cypermethrin, and alpha-cypermethrin. The following residential post-application exposure scenarios for children 1 to <2 years old had risk estimates of concern (*i.e.*, inhalation and/or dermal MOEs are < LOC, ARI is < 1):

- cypermethrin dermal and combined dermal and incidental oral exposures from broadcast applications to lawns using a wettable powder formulation (LOC =300; MOE = 94)
- zeta-cypermethrin combined dermal and incidental oral exposures resulting from contact with pets treated with pet collars (*i.e.*, LOC =300; with MOEs ranging from 1.9 to 190)
- alpha-cypermethrin incidental oral (LOC =300; MOE = 270), and the combined dermal and incidental oral exposures resulting from indoor perimeter and spot treatments (MOEs ranging from 140 to 260)
- alpha-cypermethrin combined dermal and incidental oral exposures resulting from broadcast applications to lawns (LOC =300; MOE = 290)

Based on the new information submitted in response to the 2017 HHRA and the reduction of the FQPA SF to 1X for children <6 years old, the previous residential post-application scenarios resulting from use of cypermethrins in broadcast applications to lawns, pet collars, indoor perimeter and spot treatments are no longer of concern. See the 2020 HHRA for the full details.

*Bystander Risks*

The Agency did not conduct a spray drift assessment as there are registered turf uses of the cypermethrins. Turf uses resulted in worst-case exposure estimates for children (1 to <2 years) and adults from treated lawns and are considered protective of exposures from spray drift. There were no risk estimates of concern associated with the turf use.

*Aggregate*

Short-term aggregate risk assessments are needed for adults and children exposed in residential settings and through food and water; these assessments include exposure through the dermal and inhalation route for adults, and from dermal, inhalation and incidental oral exposure for children. Since the points of departure (PODs) and endpoints are based on cypermethrin data and there is concern for potential increased toxicity of alpha-cypermethrin, a 5X potency factor was applied to the PODs and the human equivalent concentrations/human equivalent doses (HECs/HEDs) used for the alpha-cypermethrin risk assessments. Therefore, separate aggregate exposure assessments were conducted for alpha-cypermethrin and cypermethrin/zeta-cypermethrin. No additional factors were added to cypermethrin/zeta-cypermethrin risk assessments since the PODs and endpoints selected were adequately protective.

In the 2020 HHRA, the Agency has revised the human health aggregate risk estimates to reflect the reduction of the FQPA SF, and to include the revised exposure estimates associated with pet collars and the use of water soluble packaging. There are no longer aggregate risk estimates of concern, with the lowest MOE of 130 for all of the cypermethrins corresponding to children's aggregate risk associated with post-application exposure to indoor surfaces following perimeter and crack-and-crevice applications. See the 2020 HHRA for the full details.

*Occupational*

In the 2017 HHRA, the Agency identified several occupational handler scenarios with risks of concern for cypermethrin, zeta-cypermethrin, and alpha-cypermethrin. The following occupational scenarios had risk estimates of concern (*i.e.*, inhalation and/or dermal MOEs are < LOC, ARI is < 1):

- Mixing/loading/applying liquid formulations of cypermethrin with a mechanically pressurized handgun to structural sites for control of termites (MOE = 28).
- Mixing/loading/applying liquid formulations of use of zeta-cypermethrin with handheld fogging equipment to structural and industrial sites (MOE = 9.9).
- Mixing/loading alpha-cypermethrin with truck mounted fogger for mosquito vector control resulted in an ARI of 0.61 with baseline attire (*i.e.*, no gloves or respirator).
- Applying alpha-cypermethrin using truck mounted fogger resulted in an ARI of 0.074 with baseline attire (*i.e.*, no gloves or respirator).
- Mixing/loading and applying alpha-cypermethrin with a manually pressurized handwand to turf, poultry/livestock housing, foundations and perimeters resulted in risk estimates of concern when using baseline attire and no respirator (ARIs = 0.2, 0.2, and 0.35, respectively).
- Mixing/loading/applying alpha-cypermethrin with a mechanically pressurized handgun to poultry/livestock housing, structures to control termites and typical field crops resulted in risk estimates of concern when using baseline attire and no gloves or respirator (ARIs = 0.36, 0.9, and 0.54, respectively).

In the 2020 HHRA, the Agency has revised the human health occupational handler risk estimates based on new information submitted in response to the 2017 HHRA and the lack of dermal toxicity for adults' exposure to alpha-cypermethrin. The previous occupational scenarios of

concern are no longer of concern with one exception – mixing/loading/applying liquid formulations of cypermethrin with a mechanically pressurized handgun to structural sites for control of termites (MOE = 28, LOC = 30).

The scenario was assessed using the rate of 0.08 lb a.i./gal (EPA Reg. No. 279-3082). Although the cypermethrin termiticide end-use product specifies use of "0.25% emulsion for subterranean termites" which corresponds to a maximum application rate of 0.02 1b a.i./gallon, the label also provides a table/chart of the amount of product for a given volume of finished emulsion concentrations for 0.25% (0.02 lb a.i./gal), 0.5% (0.04 lb a.i./gal), and 1.0% (0.08 lb a.i./gal). The label indicates that 0.5% and 1.0% rates are to be used in foam and underground service applications. The use of an application rate of 0.08 lb a.i./gal (1.0% emulsion concentration) for control of termites using a mechanically pressurized handgun results in an inhalation handler MOE of 28 (LOC = 30) with no personal protective equipment (PPE, *i.e.*, respirator; use of a respirator with a protection factor (PF) of 10 results in an MOE of 280).

EPA notes that this represents a worst-case scenario of foam and underground service applications with a mechanically pressurized handgun. The Agency also assumed in the risk calculations that 1,000 gallons were handled per day by occupational handlers. Given that these termite treatments are more like spot treatments than perimeter treatments and applicators would only be expected to treat several houses in a day, it is unlikely that 1,000 gallons would be handled in a day. In addition, products containing cypermethrin for termiticide uses require a respiratory protective device when working in non-ventilated spaces. Hence, the Agency is not requiring additional mitigation at this time.

*Cumulative*

The Agency has determined that the pyrethroids and pyrethrins share a common mechanism of toxicity group (http://www.regulations.gov; EPA-HQ-OPP-2008-0489-0006) with respect to human health. A 2011 cumulative risk assessment for the pyrethroids and pyrethrins did not identify cumulative risks of concern. After all chemical-specific interim decisions have been completed for all pyrethroids and pyrethrins, an update of the cumulative risk assessment may be performed in association with registration review.

For more information on the human health risks conclusions for the cypermethrins, refer to the *Cypermethrin, Zeta-cypermethrin, and Alpha-cypermethrin. Draft Human Health Risk Assessment for Registration Review* (December 21, 2017) and *Cypermethrin, Zeta-cypermethrin, and Alpha-cypermethrin. Revised Draft Human Health Risk Assessment for Registration Review* (June 19, 2020), which are available in the cypermethrins registration review docket (EPA-HQ-OPP-2012-0167).

## 3. Human Incidents and Epidemiology

The Agency prepared two separate reports of the incidents associated with cypermethrins. While cypermethrin and zeta-cypermethrin are separate active ingredients, each registered in separate end-use products, they were assessed together because of the close similarity of their uses,

toxicity, and chemical characteristics (USEPA 2017a). A separate incident report was prepared for alpha-cypermethrin (USEPA 2017b). The incident reports are summarized below.

Cypermethrin and Zeta-cypermethrin:
Cypermethrin and zeta-cypermethrin incidents were previously reviewed on January 3, 2012 (USEPA 2012a). At that time, there were 605 incidents for cypermethrin and zeta-cypermethrin reported to the Main Incident Data System (IDS) and 4,342 incidents reported to the Aggregate IDS. A second review of incidents in IDS dated from January 1, 2011 to December 8, 2015, found 771 cases in the Main IDS and 5,200 incidents in the Aggregate IDS. In the Main IDS from 2012 to 2017, there were 3 single active ingredient incidents (moderate severity) and 1 multiple (minor severity reported to the database involving alpha-cypermethrin). A query of SENSOR-Pesticides from 1998-2012 identified 947 incidents involving cypermethrins. From January 1, 2010 to December 31, 2015, 94 incidents involving cypermethrin were reported to National Pesticide Information Center (NPIC), and 198 cases were reported to California's Pesticide Incident Surveillance Program (PISP) between 2010 and 2013 that involve the active ingredient, cypermethrin.

The Agency found that the acute health effects reported for cypermethrin are consistent among the databases queried and include respiratory, neurological, gastrointestinal, and dermal effects. These effects are generally mild/minor to moderate and resolve rapidly. The available incident data from IDS, NPIC, PISP, and Sentinel Event Notification System for Occupational Risk (SENSOR)-Pesticides similarly report that the majority of cypermethrin incident cases are residential. Further, these datasets suggest that most of the reported residential cypermethrin incidents involve the use of indoor foggers or indoor sprays. Based on the narratives associated with the incident reports, many of these incidents occur due to accidental exposure during application and post-application of the product.

Although there are a high number of cypermethrins incidents reported to IDS and SENSOR-Pesticides, there was a single death reported to IDS which was under investigation for malicious intent and has no further details. NPIC, SENSOR and PISP had no deaths reported associated with cypermethrin. The majority (87%) of these incidents were classified as low severity. Low severity means that a person alleged or exhibited some symptoms, but they were minimally traumatic, the symptoms resolved rapidly, and usually involved skin, eye or respiratory irritation. Further, these cypermethrins cases generally involved products containing multiple active ingredients. Incidents involving multiple pesticides are considered to provide less certain information about the potential effects of exposure from a particular pesticide. The Agency intends to conduct ongoing human incident monitoring for cypermethrin and zeta-cypermethrin and additional analyses if that monitoring indicates risks of concerns.

Alpha-cypermethrin:
From January 1, 2012 to November 13, 2017, there were four incidents involving alpha-cypermethrin reported to IDS. A query of SENSOR-Pesticides from 1998 to 2013 identified no cases involving alpha-cypermethrin.

Based on the low frequency and severity of alpha-cypermethrin incidents reported to both IDS and SENSOR-Pesticides, there does not appear to be a concern at this time. The Agency intends

to conduct ongoing human incident monitoring for alpha-cypermethrin and additional analyses if that monitoring indicates risks of concerns.

The cypermethrins are not included in the Agricultural Health Study (AHS). The AHS is a federally-funded study that evaluates associations between pesticide exposures and cancer and other health outcomes and represents a collaborative effort between the U.S. National Cancer Institute (NCI), National Institute of Environmental Health Sciences (NIEHS), CDC's National Institute of Occupational Safety and Health (NIOSH), and the U.S. EPA.

An epidemiological report was developed to assess the association between exposure to the pyrethroids in humans and adverse carcinogenic and non-carcinogenic outcomes, as well as select individual pyrethroids, including the cypermethrins. Overall, the epidemiological report found little substantive evidence to suggest a clear, associative, or causal relationship between exposure to pyrethroids and cancer and non-cancer health endpoints in the available studies, including the AHS publications reported. For further information, please see the *Pyrethroids: Tier II Epidemiological Report*[8] dated April 30, 2019.

## 4. Tolerances

Tolerances for the cypermethrins are listed in 40 CFR § 180.418. This CFR entry is divided into three sections. Section 180.418(a)(1) is for residues resulting from agricultural applications of cypermethrin, § 180.418(a)(2) is for residues resulting from agricultural applications and food handling establishments (FHE) uses of zeta-cypermethrin, and § 180.418(a)(3) is for residues resulting from agricultural applications and FHE uses of alpha-cypermethrin.

The residue of concern for tolerance enforcement is total cypermethrin. The tolerance expressions for zeta-cypermethrin and alpha-cypermethrin include both coverage and compliance statements. As a result, these statements are adequate and do not require revision. However, the tolerance expression for cypermethrin needs to be updated to address both coverage and compliance as per current practice concerning tolerance expressions.

The tolerance expression for cypermethrin in 40 CFR §180.418(a)(1) should be revised to state: "Tolerances are established for residues of cypermethrin, including its metabolites and degradates, in or on the commodities in the table below. Compliance with the tolerance levels specified below is to be determined by measuring only cypermethrin, (S)-cyano(3-phenoxyphenyl)methyl (±)-cis-trans-3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropane carboxylate, in or on the commodity."

The cypermethrins are registered on commodities that are part of crop groups or subgroups. The Agency has updated several of these groups and subgroups over the past few years. In some cases, the representative commodities have changed and in other cases, commodities were moved from one crop group or subgroup to another. The discussion that follows addresses the revisions to tolerances that the Agency intends to take under the FFDCA in order to be consistent with the updated crop groups.

[8] https://www.epa.gov/sites/production/files/2019-08/documents/tier-ii-epidemiology-report.pdf

In the case of alpha-cypermethrin, the Agency intends to update the tolerances for the existing leafy vegetable group, Crop group 4, and the head and stem *Brassica* subgroup, Subgroup 5A to the updated crop groups.

Cypermethrin is registered on the two *Brassica* leafy greens subgroups (subgroups 5A and 5B), and the tolerances have not been revised to reflect the updated subgroups.

Zeta-cypermethrin is registered for use on several crop groups and subgroups and the tolerances have not been revised to reflect the updated groups or subgroups: Berry group, 13; *Brassica*, head and stem, subgroup 5A; *Brassica*, leafy greens, subgroup 5B; Fruit, citrus, group 10, Fruit, pome, group 11; Fruit, stone, group 12; Nut, tree, group 14; and Vegetable, fruiting, group 8. Groups 8, 10, 11, 12, and 14 can be updated to their respective groups 8-10, 10-10, 11-10, 12-12, and 14-12 because the current and updated groups have the same representative commodities. The tolerances for the updated groups should be the same as those for the current groups.

Because of changes in the representative commodities for the leafy vegetable groups and subgroups and the establishment of the new group, Stalk, Stem, and Leaf Petiole Vegetable Group (22), the leafy vegetable group (Vegetable Leafy, Except *Brassica*, Group 4), the *Brassica*, Head and Stem, Subgroup 5A, and the *Brassica*, Leafy Greens Subgroup 5B, cannot be directly updated to the new and updated groups and subgroups. Instead, they should be replaced with the following groups and subgroups.

Cypermethrin: A tolerance of 15 ppm should be established for the *Brassica* leafy greens subgroup 4-16B. A tolerance of 2 ppm should be established for the *Brassica* head and stem subgroup, 5-16, and a tolerance of 2 ppm should be established for kohlrabi.

Zeta-Cypermethrin: A tolerance of 15 ppm should be established for the Leafy vegetable group, 4-16; a tolerance of 2 ppm should be established for *Brassica*, head and stem vegetable group, 5-16; and a tolerance of 10 ppm should be established for the Leaf petiole vegetable subgroup, 22B. Three commodities that were included in crop groups that had tolerances were moved to Crop Subgroup 22A, which does not have a tolerance. These commodities are kohlrabi, celtuce, and Florence fennel. Tolerances need to be established for the individual commodities. The recommended tolerance for kohlrabi is 2 ppm because it is currently in Crop Subgroup 5A, which has a tolerance of 2.0 ppm. The recommended tolerance for both celtuce and Florence fennel is 10 ppm because they are currently in Crop Group 4, which has a tolerance of 10 ppm.

Alpha-Cypermethrin: A tolerance of 15 ppm should be established for the Leafy greens subgroup, 4-16A; a tolerance of 2 ppm should be established for *Brassica*, head and stem vegetable group, 5-16; and a tolerance of 10 ppm should be established for the Leaf petiole vegetable subgroup, 22B. As with cypermethrin, three commodities that were included in crop groups that had tolerances were moved to Crop Subgroup 22A, which does not have a tolerance. These commodities are kohlrabi, celtuce, and Florence fennel. Tolerances need to be established for the individual commodities. EPA intends to establish a tolerance for kohlrabi at 2 ppm because it is currently in Crop Subgroup 5A, which has a tolerance of 2.0 ppm, and tolerances

for celtuce and Florence fennel at 10 ppm because they are currently in Crop Group 4, which has a tolerance of 10 ppm.

For both cypermethrin and zeta-cypermethrin, tolerances are established for bulb onion and green onion. The bulb onion tolerance is the same for both isomer mixtures: 0.1 ppm. The cypermethrin green onion tolerance is 6.0 ppm and the zeta-cypermethrin green onion tolerance is 3.00 ppm. Bulb onion and green onion now serve as the representative commodities for the crop subgroups: Bulb Onion Subgroup (3-07A) and Green Onion Subgroup (3-07B). As a result, the individual tolerances should be expanded to the respective subgroups. For the bulb onion subgroup, the tolerance should be 0.1 ppm for each isomer mixture. For the green onion subgroup, the tolerance should be 6 ppm for each isomer mixture. The 3.00 ppm tolerance for zeta-cypermethrin should be raised to 6 ppm to be consistent with cypermethrin green onion tolerance.

Zeta-cypermethrin has a tolerance of 0.8 pm for the Berry Group (13) and a tolerance of 2.0 ppm for grape. The Berry Crop Group (Group 13) cannot be updated to Group 13-07 without additional data because the updated crop group requires additional representative commodities for which residue data have not been submitted. The representative commodities for Group 13-07 are blackberry or raspberry, highbush blueberry, elderberry or mulberry, grape, fuzzy kiwifruit, and strawberry. Residue data were only submitted for blackberry, raspberry, highbush blueberry, and grape. As a result, unless additional data is submitted, the subgroups of Group 13-07 that have these commodities as their representative commodities are the only subgroups for which tolerances can be established. Blackberry and raspberry are the representative commodities for the Caneberry subgroup (13-07A), highbush blueberry is the representative commodity for the Bushberry subgroup (13-07B), and grape is the representative commodity for the Small fruit vine climbing subgroup except fuzzy kiwifruit (13-07F). The tolerance for both 13-07A and 13-07B should be 0.8 ppm. The tolerance for 13-07F should be 2 ppm.

When the tolerances for the updated crop groups and subgroups are established, the tolerances for the previous crop groups should be removed from the Agency's regulations because they will be superseded by the new tolerances.

Modifications to Individual Tolerances

The Agency also intends to revise several individual tolerances. For zeta-cypermethrin, there is a tolerance of 2.0 ppm for cabbage. EPA intends to use the data supporting this tolerance as a representative commodity for establishing the *Brassica* head and stem vegetable group (Group 5-16), which includes cabbage, and then remove the tolerance for cabbage as no longer necessary. EPA intends also to remove the individual tolerance for pecan, after establishing the tree nut crop group (14-12), which includes pecan.

The analytical enforcement method for the cypermethrins does not distinguish between the isomers. For this reason, the tolerances for the three cypermethrins should be consistent from one to the other. A tolerance of 30 ppm is established for zeta-cypermethrin in or on alfalfa hay, whereas a tolerance of 15 ppm is established for alpha-cypermethrin. Therefore, EPA intends to increase the 15 ppm tolerance to 30 ppm. Similarly, although a tolerance of 4.0 ppm is established for cypermethrin in or on head lettuce, this tolerance should be increased to 15 ppm,

since EPA intends to establish a tolerance of 15 ppm for zeta- and alpha-cypermethrin in or on the Leafy vegetable group (Group 4-16) to conform to OECD rounding classes.

In the 2017 HHRA, some of the tolerances in the tolerance tables contained trailing zeros. For example, the recommended tolerance for kohlrabi was 2.0. In 2019, the Agency adopted the OECD rounding classes, which do not include trailing zeros. As a result, some of the tolerances in Tables 1-3 below were revised to remove the trailing zeros. In addition, the Agency originally recommended in favor of a tolerance of 14 ppm for leafy vegetables. To conform to OECD rounding classes, this tolerance was increased to 15 ppm, as noted in the tables.

The Agency received public comments on the potential for Codex MRL harmonization during the public comment period for the cypermethrins PID. EPA has updated some of the proposed tolerances in Tables 1-3 below based on the public comments received. For additional details, see *Cypermethrin, zeta-Cypermethrin, and alpha-Cypermethrin: HED's Response to USDA's Comments on the Cypermethrins Preliminary Interim Decision* (February 16, 2021).

The tolerance recommendations discussed above are summarized in the tables below. The Agency will use its FFDCA rulemaking authority to make such changes.

**Table 1. Tolerance Summary for Cypermethrin (40 CFR § 180.418(a)(1))**
**Tolerances to be Established or Revoked**

| Commodity | Current Tolerance (ppm) | Recommended Tolerance (ppm) | Comments; *Correct Commodity Definition* |
|---|---|---|---|
| *Brassica*, head and stem, group 5-16 | None | 2 | Updated crop group tolerance. |
| *Brassica*, leafy greens, subgroup 4-16B | None | 15 | Updated crop group tolerance, increased to conform to OECD rounding class. |
| Kohlrabi | None | 2 | Now in subgroup 22A (there is no subgroup tolerance). |
| *Brassica*, head and stem, subgroup 5A | 2.0 | None | Revoke as superseded by updated crop group. |
| *Brassica*, leafy greens, subgroup 5B | 14 | None | Revoke as superseded by updated crop group. |
| Lettuce, head | 4.0 | 15 | Raised to be consistent with zeta-cypermethrin crop group 4-16 tolerance and to conform to OECD rounding class. |
| Onion, bulb, subgroup 3-07A | None | 0.1 | Crop subgroup expansion. |
| Onion, bulb | 0.1 | None | Revoke as superseded by updated crop group. |
| Onion, green, subgroup 3-07B | None | 6 | Crop group expansion. |
| Onion, green | 6.0 | None | Revoke as superseded by updated crop group. |
| Poultry, fat | 0.05 | 0.1 | Harmonization with Codex and Canadian MRLs. |
| Poultry, meat | 0.05 | 0.1 | Harmonization with Codex and Canadian MRLs |

| Table 2. Tolerance Summary for Zeta-Cypermethrin (40 CFR § 180.418(a)(2)). Tolerances to be Established or Revoked | | | |
|---|---|---|---|
| **Commodity** | **Current Tolerance (ppm)** | **Recommended Tolerance (ppm)** | **Comments; *Correct Commodity Definition*** |
| Vegetable, leafy, group 4-16 | None | 15 | Updated crop group tolerance, increased to conform to OECD rounding class. |
| *Brassica*, head and stem, group 5-16 | None | 2 | Updated crop group tolerance. |
| Stalk, stem, and leaf petiole vegetable, subgroup 22B | None | 10 | Updated crop group tolerance. |
| *Brassica*, head and stem, subgroup 5A | 2.00 | None | Revoke as superseded by updated crop group. |
| Kohlrabi | None | 2 | Now in subgroup 22A (there is no 22A tolerance). |
| *Brassica*, leafy greens, subgroup 5B | 14.00 | None | Revoke as superseded by updated crop group. |
| Vegetable, leafy, except *Brassica*, group 4 | 10.00 | None | Revoke as superseded by updated crop group. |
| Celtuce | None | 10 | Now in subgroup 22A (there is no 22A tolerance). |
| Fennel, florence, fresh leaves and stalk | None | 10 | Now in subgroup 22A (there is no 22A tolerance). |
| Berry group 13 | 0.8 | None | Revoke as superseded by updated crop group. |
| Caneberry subgroup 13-07A | None | 0.8 | Crop group conversion. |
| Bushberry subgroup 13-07B | None | 0.8 | Crop group conversion. |
| Fruit, small, vine climbing, except fuzzy kiwifruit, subgroup 13-07F | None | 2 | Crop group expansion. |
| Grape | 2 | None | Revoke as superseded by updated crop group. |
| Fruit, pome, group 11-10 | None | 2 | Updated crop group tolerance. |
| Fruit, pome, group 11 | 2 | None | Revoke as superseded by updated crop group. |
| Fruit, stone, group 12-12 | None | 1 | Updated crop group tolerance. |
| Fruit, stone, group 12 | 1 | None | Revoke as superseded by updated crop group. |
| Nut, tree, group 14-12 | None | 0.05 | Updated crop group tolerance. |
| Nut, tree, group 14 | 0.05 | None | Revoke as superseded by updated crop group. |
| Vegetable, fruiting, group 8-10 | None | 0.2 | Updated crop group tolerance. |
| Vegetable, fruiting, group 8 | 0.2 | None | Revoke as superseded by updated crop group. |
| Onion, bulb | 0.10 | None | Revoke as superseded by updated crop group. |
| Onion, bulb, subgroup 3-07A | None | 0.1 | Crop subgroup expansion. |
| Onion, green | 3.00 | None | Revoke as superseded by updated crop group. |
| Onion, green, subgroup 3-07B | None | 6 | Crop group expansion, tolerance raised to be consistent with cypermethrin tolerance. |
| Cabbage | 2.0 | None | Revoke as superseded by updated crop group: Cabbage is a member of group 5-16, so the individual tolerance is not necessary. |
| Okra | 0.2 | None | Revoke as superseded by updated crop group: Okra is a member of group 8-10, so the individual tolerance is not necessary. |
| Pistachio | 0.05 | None | Revoke as superseded by updated crop group: Pistachio is a member of group 14-12, so the individual tolerance is not necessary. |

| Table 2. Tolerance Summary for Zeta-Cypermethrin (40 CFR § 180.418(a)(2)). Tolerances to be Established or Revoked | | | |
|---|---|---|---|
| **Commodity** | **Current Tolerance (ppm)** | **Recommended Tolerance (ppm)** | **Comments; *Correct Commodity Definition*** |
| Pecan | 0.05 | None | Revoke as superseded by updated crop group: Pecan is a member of group 14-12, so the individual tolerance is not necessary. |
| Turnip, greens | 14 | None | Revoke as superseded by updated crop group: Turnip greens are a member of group 4-16, so the individual tolerance is not necessary. |
| Poultry, fat | 0.05 | 0.1 | Harmonization with Codex and Canadian MRLs. |
| Poultry, meat | 0.05 | 0.1 | Harmonization with Codex and Canadian MRLs |
| Rice, grain | 1.5 | 2 | Harmonization with Codex MRL. |
| Vegetable, legume (6A Subgroup) | 0.5 | 0.7 | Harmonization with Codex MRL. |
| Fruit, stone, group 12 | 1 | - | Revoke as superseded by updated crop group |
| Fruit, stone, group 12-12 | - | 2 | Establish updated crop group and harmonize tolerance with Codex MRL |
| Fruit, citrus, group 10 | 0.35 | - | Revoke and replace with updated subgroups |
| Grapefruit subgroup 10-10C | - | 0.5 | Establish Grapefruit subgroup 10-10C and harmonize with the Codex MRL for the Pummelo and Grapefruits Subgroup |
| Lemon/Lime subgroup 10-10B | - | 0.3 | Establish Subgroup 10-10B and harmonize with Codex MRL for Citrus fruits (excluding shaddocks or pomelos) |
| Orange subgroup 10-10A | - | 0.3 | Establish Subgroup 10-10A and harmonize with Codex MRL for Citrus fruits (excluding shaddocks or pomelos) |

| Table 3. Tolerance Summary for Alpha-Cypermethrin (40 CFR § 180.418(a)(3)). Tolerances to be Established or Revoked | | | |
|---|---|---|---|
| **Commodity** | **Current Tolerance (ppm)** | **Recommended Tolerance (ppm)** | **Comments; *Correct Commodity Definition*** |
| Leafy greens, subgroup 4-16A | None | 15 | Updated crop group tolerance, increased to conform to OECD rounding class. |
| *Brassica*, head and stem, group 5-16 | None | 2 | Updated crop group tolerance. |
| Stalk, stem, and leaf petiole vegetable, subgroup 22B | None | 10 | Updated crop group tolerance. |
| *Brassica*, head and stem, subgroup 5A | 2.00 | None | Revoke as superseded by updated crop group. |
| Kohlrabi | None | 2 | Now in subgroup 22A (there is no 22A tolerance). |
| Vegetable, leafy, except *Brassica*, group 4 | 10.00 | None | Revoke as superseded by updated crop group. |
| Celtuce | None | 10 | Now in subgroup 22A (there is no 22A tolerance). |
| Fennel, florence, fresh leaves and stalk | None | 10 | Now in subgroup 22A (there is no 22A tolerance). |
| Alfalfa, hay | 15 | 30 | Raised to be consistent with zeta-cypermethrin tolerance. |
| Poultry, fat | 0.05 | 0.1 | Harmonization with Codex and Canadian MRLs. |
| Poultry, meat | 0.05 | 0.1 | Harmonization with Codex and Canadian MRLs. |

| Table 3. Tolerance Summary for Alpha-Cypermethrin (40 CFR § 180.418(a)(3)). Tolerances to be Established or Revoked | | | |
|---|---|---|---|
| **Commodity** | **Current Tolerance (ppm)** | **Recommended Tolerance (ppm)** | **Comments; *Correct Commodity Definition*** |
| Rice, grain | 1.5 | 2 | Harmonization with Codex MRL. |
| Vegetable, legume (6A Subgroup) | 0.5 | 0.7 | Harmonization with Codex MRL. |
| Fruit, citrus, group 10-10 | 0.35 | - | Revoke and replace with subgroups |
| Grapefruit subgroup 10-10C | - | 0.5 | Establish Grapefruit subgroup 10-10C and harmonize with the Codex MRL for the Pummelo and Grapefruits Subgroup |
| Lemon/Lime subgroup 10-10B | - | 0.3 | Establish Subgroup 10-10B and harmonize with Codex MRL for Citrus fruits (excluding shaddocks or pomelos) |
| Orange subgroup 10-10A | - | 0.3 | Establish Subgroup 10-10A and harmonize with Codex MRL for Citrus fruits (excluding shaddocks or pomelos) |

## 5. Human Health Data Needs

The Agency does not anticipate any further human health data needs for the cypermethrins registration review at this time.

GDCI-109702-1107 (cypermethrin) and GDCI-129064-1097 (zeta-cypermethrin) for guideline 875.1700 (product use information) is partially satisfied; EPA has received and accepted data from the companies who represent the Residential Exposure Joint Venture. EPA continues to evaluate data submitted from companies comprising the Generic Residential Exposure Task Force (GRETF) and is partially satisfied. EPA continues to evaluate data submitted from companies comprising the GRETF and will update the status of this DCI when the review is completed.

### B. Ecological Risks

The Agency used the most current science policies and risk assessment methodologies to prepare a risk assessment in support of the registration review of the pyrethroids and pyrethrins. EPA's *Preliminary Comparative Environmental Fate and Ecological Risk Assessment for Registration Review of Eight Synthetic Pyrethroids and the Pyrethrins* (September 30, 2016; referred to as the 2016 ERA in this document) is a quantitative ecological assessment of nine cases: bifenthrin, cyfluthrin (beta-cyfluthrin), cyhalothrins (lambda-cyhalothrin and gamma-cyhalothrin), cypermethrins (cypermethrin, alpha-cypermethrin, and zeta-cypermethrin), deltamethrin, esfenvalerate, fenpropathrin, permethrin, and pyrethrins.

The 2016 ERA was divided into five sections: risks from indoor "down the drain" uses;[9] risks from outdoor residential, commercial, turf, and nursery uses; risks from agricultural uses; risks from mosquito adulticide uses; and an assessment of risk to bees from agricultural uses of pyrethroids and pyrethrins. The Agency primarily focused on potential effects to aquatic organisms (for all uses) as well as terrestrial invertebrates (for agricultural uses). A quantitative assessment was conducted for these nine pesticides, for which the Agency had a relatively large amount of data.

A companion piece, titled the *Ecological Risk Management Rationale for Pyrethroids in Registration Review* (September 30, 2016; referred to as the Rationale Document), summarized potential risk concerns for the remaining pyrethroids and was published at the same time. The pesticides covered in the Rationale Document are: cyphenothrin, d-phenothrin, etofenprox, flumethrin, imiprothrin, momfluorothrin, prallethrin, tau-fluvalinate, esfenvalerate, and tetramethrin. The Rationale Document describes EPA's approach in using the quantitative assessment of the nine cases to serve as a basis for making risk management and regulatory decisions for all 23 affected pesticides currently undergoing registration review. Potential risks that were identified for the eight pyrethroids and pyrethrins assessed in the 2016 ERA were determined to be representative of the risks for the other pyrethroids also undergoing registration review.

For additional details on the ecological assessment for the pyrethroids, see the 2016 ERA and the Rationale Document, which are available in the public docket.

For registration review, the Agency issued a single ecological risk mitigation proposal to address the potential ecological risks of concern for the 23 pyrethroids and pyrethrins, based on their common insecticidal mode of action and similar potential ecological risks of concern (*i.e.*, risk to aquatic invertebrates). This ecological risk mitigation proposal (*Pyrethroids and Pyrethrins Ecological Risk Mitigation Proposal for 23 Chemicals* (September 30, 2019) found in EPA-HQ-OPP-2008-0331) ensured a consistent approach to mitigating potential ecological risk and provided equity to stakeholders when implementing regulatory changes for pesticides in this group.

For the cypermethrins, risks of concern were identified for aquatic invertebrates and fish from indoor, outdoor, and agricultural uses.

Terrestrial Invertebrates (honeybees)

Risks to bees were assessed for the agricultural uses of certain pesticides in the Agency's 2016 ERA: bifenthrin, cyfluthrins, cyhalothrins, cypermethrins, deltamethrin, esfenvalerate, fenpropathrin, permethrin, and pyrethrins. The Agency's pollinator risk assessment was limited by the scarcity of bee data available across the pyrethroids/pyrethrins. Only honeybee (*Apis mellifera*) adult acute contact and acute oral toxicity studies are available for a select number of pyrethroids/pyrethrins. Based on the available data, risk quotients indicate a potential for adverse

[9] "Down the drain" uses refer to indoor uses of pesticides that may be discharged as residues in domestic wastewater from indoor drains and then enter into publicly-owned treatment works, potentially resulting in releases to water bodies.

effects on bees from acute exposure from particular uses of pyrethroids/pyrethrins. Reported bee mortality incidents from spray drift support these risks of concern.

The Agency did not have sufficient information to assess chronic risk to bees or effects on honeybee colonies. EPA concludes that additional pollinator data are necessary to fully evaluate risks to bees from use of the pyrethroids/pyrethrins. The Agency has determined the full suite of pollinator studies for the pyrethroids/pyrethrins that may impact pollinators is necessary, where such data are not currently available. EPA will issue a Data Call-In (DCI) for the pollinator studies listed in Table 4.

**Table 4: Pollinator Data Requirements**

| Guideline Number | Study |
|---|---|
| Tier 1 | |
| 850.3020 | Acute contact toxicity study with adult honeybees |
| 850.3030 [1] | Honeybee toxicity of residues on foliage |
| Non-Guideline (OECD 213) | Honeybee adult acute oral toxicity |
| Non-Guideline (OECD 237) | Honeybee larvae acute oral toxicity |
| Non-Guideline | Honeybee adult chronic oral toxicity |
| Non-Guideline | Honeybee larvae chronic oral toxicity |
| Tier 2[†] | |
| Non-Guideline | Field trial of residues in pollen and nectar |
| Non-Guideline (OECD 75) | Semi-field testing for pollinators |
| Tier 3[†] | |
| 850.3040 | Full-Field testing for pollinators |

[1] OCSPP Guideline 850.3030 is triggered for cypermethrin based on the honey bee acute contact $LD_{50}$ of 0.023 ug a.i./bee as reported in the 2012 cypermethrin registration review problem formulation (3/1/2012, DP Barcode 395264.
[†] The need for higher tier tests for pollinators will be determined based upon the results of lower tiered tests and/or other lines of evidence and the need for a refined pollinator risk assessment.

EPA will consider proposals from registrants to bridge pollinator datasets across pyrethroids, see *Considerations for Bridging Bee-Related Effects and Exposure Data for the Pyrethroids and Pyrethrins* (December 2020). This document provides guidance on the principles to consider when designing a bridging proposal and is available in the cypermethrins registration review docket (EPA-HQ-OPP-2012-0167) and in the Special Docket for Pyrethroids, Pyrethrins, and Synergists located at http://www.regulations.gov (EPA-HQ-OPP-2008-0331).

Once adequate pollinator data are received and reviewed, the Agency will reassess risk to pollinators and consider any additional mitigation changes for the cypermethrins.

### 1. Ecological and Environmental Fate Data Needs

As noted previously, additional pollinator data are necessary to fully evaluate risks to bees from use of the cypermethrins. EPA will issue a DCI for the necessary pollinator studies.

Sufficient data were available for conducting the 2016 ERA and making a regulatory decision as discussed in the Rationale Document. However, several data requirements are still outstanding and will be used to inform future risk assessments.

The following studies are outstanding for the cypermethrins from the registration review GDCI-109702-1208 (cypermethrin), GDCI-129064-1209 (zeta-cypermethrin), and GDCI-209600-1329 (alpha-cypermethrin):

- Chronic Sediment - *Hyalella Azteca* (non-guideline)
- Chronic Sediment - *Chironomus Dilutus* (non-guideline)

Data submitted for the following studies were classified as "supplemental"; however, EPA does not need additional data at this time to issue the ID. The Agency may require additional data for these data requirements to inform future risk assessments.

- Aerobic Aquatic Metabolism (guideline 835.4300)
- Anaerobic Aquatic Metabolism (guideline 835.4400)
- Terrestrial field dissipation study (guideline 835.6100)
- Avian Acute Oral Toxicity Test (guideline 850.2100)
- Aquatic Plant Toxicity Test - Tiers 1 & 2 (guideline 850.4400)
- POTW Treatability Study (nonguideline)

Although not included in the DCIs, an acute sediment study (guideline 850.1735, *Chironomus Dilutus*) is also a data gap that may need to be addressed in the future. These data will be used to inform future risk assessments.

### C. Benefits

Pyrethroids, including the cypermethrins, are widely used in agriculture to control a wide variety of pests that cause problems in crop production, and in urban pest control programs for several public-health and nuisance pests. The rapid control of pests or the knockdown effect provided by pyrethroids is often a desirable feature for applicators because it prevents affected insect pests from feeding even before death occurs. In terms of the total acres treated and particularly in the variety of crops that depend on them, pyrethroids have largely surpassed the organophosphate and carbamate classes as the preferred options by growers for cost-effective and broad-spectrum insect control.

Cypermethrins, including alpha-cypermethrin and zeta-cypermethrin, are recommended by university extension specialists for the control of pests in many agricultural crops, livestock production, turfgrass and ornamentals, and structures (Townsend, 2012; North Dakota State University Extension, 2019; University of Arkansas Extension, 2020). Agricultural applicators may find cypermethrin and zeta-cypermethrin to be useful tools as they provide broad-spectrum pest control (*i.e.*, they affect pests in diverse taxa, including fly, beetle, caterpillar, plant bug, and mite pests) that are often economically important problems in many crops (Bari and Natwick, 2015; Grafton-Cardwell et al., 2019; North Dakota State University Extension, 2019; University of Arkansas Extension, 2020). Both cypermethrin and zeta-cypermethrin are recommended for use in cotton production and are among the market-leading insecticides used by growers

targeting lygus bugs (also referred to as tarnished plant bug), stink bugs, and bollworms (USEPA, 2019; University of Arkansas Extension, 2020).

Of the cypermethrins, zeta-cypermethrin is more commonly recommended by university extension specialists for use in many crops, including soybeans, corn, citrus (e.g., orange and grapefruit), alfalfa, wheat, rice, cucurbits (e.g., squash, cucumber), fruiting vegetables (e.g., tomatoes, peppers), artichoke, *Brassica* (e.g., cabbage, mustard), lettuce and leafy greens, sunflowers, caneberries (e.g., blackberry, raspberry), and blueberries (Bari and Natwick, 2015; Grafton-Cardwell et al., 2019; North Dakota State University Extension, 2019; University of Arkansas Extension, 2020). Within these crops, zeta-cypermethrin is used to target a variety of economically important and/or disease vectoring pests and pest complexes such as aphids; Asian citrus psyllid; stink bugs; lygus and plant bugs; leafhoppers; caterpillars, moths and borers; weevils; blueberry maggot and spotted wing drosophila; grasshoppers and katydids; and mites (USEPA, 2019). Generally, alternatives to the cypermethrins that have similar broad-spectrum pest activity include other pyrethroid insecticides, carbamates, neonicotinoids, and organophosphates. See *Usage Characterization and Qualitative Overview of Agricultural Importance for Pyrethroid Insecticides for Selected Crops and Impacts of Potential Mitigation for Ecological Risks* (USEPA, 2019) for more detail.

Various products containing cypermethrins are recommended for use in and around non-food livestock quarters (e.g., barns, stables, pens, kennels) in addition to direct applications to horses, cattle and dairy cattle, sheep and goats (e.g., sprays, ear tags, pour-ons, roll-ons, dusts) for the control of several nuisance and/or mechanical vectors (e.g., face flies, horn flies, stable flies, lice, and other biting flies) and disease-vectoring pests (e.g., mosquitoes, fleas, ticks) (Townsend, 2012; University of Arkansas Extension, 2020). Alternatives to the cypermethrins depend on the target pest and application method which may be applied to animals or structures in addition to products formulated as baits or feed-through additives. These products include other pyrethroids and pyrethrins, carbamates (e.g., methomyl), growth regulators or disruptors (e.g., diflubenzuron, methoprene), neonicotinoids (e.g., dinotefuran, imidacloprid), organophosphates (e.g., coumaphos, DDVP, tetrachlorvinphos, trichlorfon), and spinosad. Additionally, fly traps and sanitation or exclusion practices may reduce or control pest populations.

To protect commodities against insects such as beetles and moth larvae that can infest food commodities stored long-term, cypermethrins are registered for use in empty food warehouse buildings. They are among several insecticides registered for such uses. Other examples include fumigants such as sulfuryl fluoride and phosphine, other pyrethroids such as cyfluthrin, insect growth regulators (methoprene), and organophosphates (malathion).

Cypermethrins are also used in indoor/outdoor residential settings and in pet products such as dog collars to control fleas and ticks. In residential settings, cypermethrins may be used to target various arthropods, including nuisance pests such as houseflies, crickets, and centipedes, pests that damage turf and gardens (e.g., aphids, beetles, caterpillars, etc.), and public health pests, such as fire ants, mosquitoes, cockroaches, and bedbugs. As such, the cypermethrins provide benefits in being among several options to suppress pests of public health concern.

While cypermethrins generally offer effective pest control for all these uses, various alternatives with efficacy also exist in the marketplace. Many are other pyrethroids. Depending on the use setting, other chemistries are also available. For example, some organophosphates (e.g., malathion), carbamates (e.g., carbaryl), and neonicotinoids (e.g., imidacloprid) are available for outdoor residential uses. For indoor residential uses, other pyrethroids, as well as hydramethylnon, indoxacarb, and boric acid can control many of the pests targeted by cypermethrins.

For pests that affect pets such as dogs, pet collars are available that contain tetrachlorovinphos (an organophosphate), propoxur (a carbamate), insect growth regulators (such as methoprene), imidacloprid, or amitraz. These pet collars sometimes also contain pyrethroids as co-formulated active ingredients. Non-pyrethroid active ingredients in "spot-on" treatments include fipronil, indoxacarb, or imidacloprid. These active ingredients are often co-formulated with insect growth regulators, *e.g.*, pyriproxyfen or s-methoprene, which provide specific efficacy against flea eggs and larvae. In addition, the U.S. Food and Drug Administration also registers pet medications that control fleas and ticks. These include the non-pyrethroid active ingredients such as fluralaner, afoxolaner, cythiolate, lufenuron, selamectin, nitenpyran, milbemycin oxime, s-methoprene, and spinosad. Some of these products require veterinary licensing for use and some products may not be stand-alone treatments, *i.e.*, these require the use of additional treatments or pest exclusion tactics to be fully effective.

For more information on the usage of the cypermethrins, refer to the *Usage Characterization and Alternatives Summary for Synthetic Pyrethroids Used in Residential Lawns and Outdoor Vegetative Spot Treatments* (April 13, 2016) and *Usage Characterization and Qualitative Overview of Agricultural Importance for Pyrethroid Insecticides for Selected Crops and Impacts of Potential Mitigation for Ecological Risks* (September 25, 2019) (available in the public docket EPA-HQ-OPP-2008-0331). For additional information on the benefits of pyrethroids in general, refer to the *Pyrethroids and Pyrethrins Ecological Risk Mitigation Proposal for 23 Chemicals* (September 30, 2019) and the *Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals* (September 30, 2020), also available in the public docket (EPA-HQ-OPP-2008-0331).

# IV. INTERIM REGISTRATION REVIEW DECISION

## A. Risk Mitigation and Regulatory Rationale

As discussed in Section III.A.2 of this document, the Agency has determined that there is a potential occupational handler risk of concern associated with the registered uses of cypermethrin for one scenario (mixing/loading/applying liquid formulations of cypermethrin with a mechanically pressurized handgun to structural sites for control of termites). EPA considered the risks, the benefits, and the use pattern of cypermethrin in evaluating potential risk mitigation. As a result, EPA is not proposing mitigation for this occupational scenario. EPA does not consider this scenario with an MOE close to the LOC (*i.e.*, MOE = 28, LOC = 30) a risk of concern after taking the conservative nature of the assessment into account (see Section III.A.2, *Occupational* for a more detailed discussion).

The cypermethrins pose potential risks of concern for aquatic organisms, as do many of the other pyrethroids. The Agency identified potential risks for various aquatic taxa, with the major potential risks of concern focusing on aquatic invertebrates from indoor, outdoor, and agricultural uses, and terrestrial invertebrates from agricultural uses of the cypermethrins. Mitigation to address risks to aquatic and terrestrial invertebrates will benefit the other taxa to the extent that there is any risk.

The residential indoor products containing pyrethroids are expected to result in risks of concern from the use of pet shampoos, pyrethroid-impregnated or treated textiles being laundered, and indoor household treatments (e.g., carpet, furniture, bedding) to control bed bugs, fleas, and other pests with public health significance. Under these use patterns, the wastewater that goes down-the-drain contains pyrethroid residues and is treated in wastewater treatment plants (WWTPs) or publicly owned treatment works (POTWs) and then discharged to waterbodies. A portion of the pyrethroid residues remains in the water discharged to the outdoor waterbodies and results in potential risks to aquatic invertebrates and fish. Mitigation to address risks from the indoor use of products containing these chemicals focuses on reducing the amount of residues being poured down the drain. The potential ecological risks, which are expected to be reduced with the mitigation, are outweighed by the high benefits associated with the use of pyrethroids for the control of pests with public health significance.

Outdoor urban uses of pyrethroids and pyrethrins are expected to result in potential risks of concern for aquatic invertebrates and fish as a result of urban runoff, spray drift or improper disposal of pyrethroid products. The potential for this risk to occur in the environment is supported by pyrethroid monitoring data from urban settings at levels that would be expected to result in potential risk to aquatic invertebrates. There has been a substantial concern from municipalities and states, particularly California, that urban pyrethroid usage adversely impacts water quality and, in the case of California, contributes to Total Maximum Daily Load (TMDL) exceedances. As a result, EPA has determined that measures to reduce the urban footprint of the pyrethroid group are necessary while still allowing flexibility for the user community and retaining the benefits of efficacious pest control.

Agricultural uses of the pyrethroids are expected to result in potential risks of concern to aquatic invertebrates and fish, primarily from runoff and spray drift. However, the benefits of pyrethroids in agricultural crop production outweigh the risks, and the necessary mitigation is expected to allow continued use of pyrethroids in agricultural settings while putting reasonable measures in place to reduce risk to non-target organisms from runoff and spray drift. The vegetative filter strip (VFS) requirement has been expanded in some cases but the Agency has added flexibility for Western irrigated agriculture and areas where soil conservation practices are being used. The Agency has also identified potential risks of concern to terrestrial invertebrates from the foliar applications of pyrethroids in agricultural areas. The Agency has determined that mitigation to address potential terrestrial invertebrate risks is necessary and has revised the terrestrial invertebrate Environmental Hazard Statement, adding information on stewardship and best management practices, promoting State Managed Pollinator Protection Plans (MP3s), and adding information on Pollinator Incident Reporting.

For a detailed discussion of the mitigation to address risks to aquatic and terrestrial invertebrates, refer to the *Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals* (September 30, 2020) and *Memorandum: Updated Label Language for the 'Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals'* (February 17, 2021). In keeping with the Agency's current approach for insecticides and to address generic labeling requirements, EPA has determined that the addition of insect resistance management language to the cypermethrins labels and updates to glove, respirator language, and products packaged in water soluble packets (WSP) are necessary, where applicable.

### 1. Mitigation Measures to Promote Proper Usage and Reduce Indoor and Storm Drain Disposal of Pyrethroids

To address concerns for residues in wastewater discharges, the Agency has determined that advisory label language and graphics on indoor pyrethroid products that have uses that could end up down-the-drain, are necessary to help mitigate this potential risk.

To reduce the potential for aquatic risks from improper use and disposal of pyrethroids down indoor drains and storm drains, EPA has determined that measures to inform consumers about the appropriate use sites for the pyrethroid products they purchase are necessary, as well as the importance of proper disposal of leftover pesticides and their containers. These product stewardship measures include clear, simple language about whether the product is meant to be used indoors or outdoors, as well as consistent label language and graphic imagery to encourage proper disposal.

The products that are subject to these necessary amendments are those with any indoor or outdoor use in a residential or commercial setting. Note that all products registered for indoor residential and commercial uses are included, not just the those with indoor down-the-drain uses, because the potential for improper use or disposal is present for any household pyrethroid product. The specific measures are necessary to reduce the potential for runoff and drain disposal, and subsequent potential aquatic risk, and are outlined below.

**a. Indoor and Outdoor Use Site Clarification**

- Label language must explicitly state whether the product is allowed to be applied indoors only, outdoors only, or both indoors and outdoors. For example, label text for a product that is only used indoors could state, "For indoor use only."
- For applications to pets, the label must have the following statement to ensure products are applied indoors.
    - "Application of product on pets must only be done indoors."

**b. Disposal/Stewardship Statement and Pictogram**

- Labels must include the following statement on the product label unless labeled for use directly inside pipes/sinks.

  - "Do not pour or dispose down the drain or sewer. Call your local solid waste agency for local disposal options."
- Include a pictogram of a diagonal strikethrough over a drain on all end-use consumer product containers. Place pictogram in a prominent location. The pictogram must be legible (*i.e.* no smaller than 1.5 square centimeters or 0.25 square inch unless this size is greater than 10% of the size of the label). Below is an example graphic of an indoor drain image:

**c. Advisory Statements**

- Labels must include the following statements on all end-use consumer product containers in a prominent location. The only exception is for pet products, as residues from these products may be expected to be released down indoor or outdoor drains as a result of standard pet care:
  - "Do not allow to enter indoor or outdoor drains." and also include the Spanish translation, "No permita la entrada a desagües internos o externos." For products with down-the-drain uses, use the following variation - "Do not allow to enter indoor or outdoor drains unless labeled for drain treatments." and the Spanish translation, "No permita la entrada a desagües internos o externos a menos que el etiquetado indique que está permitido el uso del producto para tratamiento de desagües."
  - "Follow proper disposal procedures on this label." And also include the Spanish translation, "Siga las indicaciones del etiquetado para el desecho apropiado del producto."

The Agency does not expect that this mitigation would have an adverse impact to pesticide users. Directions are intended to promote proper disposal after use of the product.

### 2. Mitigation Measures for Outdoor Urban Uses

EPA has determined that mitigation measures for outdoor urban uses in residential and commercial settings (*i.e.*, structural, turf, ornamental, nursery) are appropriate. To mitigate potential risks to aquatic organisms, it is the goal of the Agency to reduce runoff into water bodies from treated urban environments. By reducing the total amount of chemicals applied to an area, there is less potential for runoff into water bodies.

In order to reduce the potential load of pyrethroids in surface water attributed to urban uses, the Agency has determined that a reduction in distance from building foundations that can be treated with pyrethroids from 10 feet to 7 feet is necessary. The Agency considered reducing the distance to 3 feet from the building foundation but found the 3-foot distance to be too restrictive to allow for effective use of pyrethroids throughout various building environments. Commenters

have suggested limiting to this distance could impact the efficacy of treatments in certain areas. However, the Agency finds that in order to protect aquatic environments from risks posed by pyrethroids, a reduction in the application footprint of these pesticides is necessary. The Agency has decided that decreasing the allowable treated distance from 10 feet to 7 feet is appropriate. The decrease in the area that can be treated at the same application rate amounts to a load reduction for each pyrethroid treatment, which represents a clear reduction in the amount of pyrethroid material that can be transported from a treated area. The Agency acknowledges that the biggest driver of pyrethroid transport is runoff from impervious surfaces rather than permeable surfaces. However, bare soil in cultivated areas near a home can still be transported to permeable surfaces and eventually enter surface waters during large storm events, which have been more prevalent in recent years. The purpose of this mitigation is load reduction, which is consistent with the kind of remedy built into TMDLs that California commenters say have become necessary because pyrethroid residues have caused them to declare some urban streams to be impaired.

The mitigation measures to reduce the perimeter treatment area and increase label clarity and consistency are intended to reduce the overall amount of pyrethroids in the urban environment that enters waterbodies and outdoor drainage systems. Specific measures are intended to ensure areas sprayed are permeable and less runoff-prone, reduce offsite-drift to waterbodies, increase distances between the area treated and waterbodies, as well as to reduce the potential for over-spraying. Although potential risks to aquatic organisms are expected to remain after the implementation of the measures, these required label changes are directionally correct with respect to reducing the amount of environmental exposure to pyrethroids in urban areas.

### A. Statements for Outdoor Label Consistency and Clean-up

The Agency has determined that several label changes for consistency with other products and current policy (e.g., EPA's January 10, 2013 letter *Revisions to Environmental Hazard and General Labeling for Pyrethroid Non-Agricultural Outdoor Products*) are necessary. Labels must explicitly say whether particular products are to be applied indoors only, outdoors only, or both indoors and outdoors (as described in the previous section).

### B. Revised General Outdoor Application Statement

The Agency is revising the general outdoor statement for all outdoor spray applications, which includes a maximum horizontal perimeter treatment of 7 feet from the base of a structure and a reduction from 3 feet to 2 feet for vertical applications to man-made structures. Current pyrethroid product labels specify the vertical and horizontal distance that may be treated with a pyrethroid; the vertical distance is measured from the ground upward and the horizontal distance is measured outward, away from the side of a man-made structure. Due to varying use sites and target pests, it is difficult to determine a single effective vertical and horizontal specification across all products. Insects need to come into contact or ingest a lethal dose of insecticide to be effectively controlled. However, reduction of the area that can be treated at the same application rate represents a load reduction for each pyrethroid treatment, which represents a clear reduction in the amount of pyrethroid material that can be transported from a treated area to nearby waterbodies. The Agency has determined that the vertical application distance may extend up to

2 feet above ground level, rather than "3 feet above grade" as previously stated on labels. The horizontal application distance is restricted to 7 feet or less from the base of a man-made structure to pervious surfaces (e.g., grass, mulched groundcover, planted areas).

It is necessary that the following language replace the current general outdoor application statement:

> "All outdoor spray applications must be limited to spot or crack-and-crevice treatments only, except for the following permitted uses:
>
> 1. Application to pervious surfaces such as soil, lawn, turf, and other vegetation;
>
> 2. Perimeter band treatments of 7 feet wide or less from the base of a man-made structure to pervious surfaces (*e.g.*, soil, mulch, or lawn);
>
> 3. Applications to underside of eaves, soffits, doors, or windows permanently protected from rainfall by a covering, overhang, awning, or other structure;
>
> 4. Applications around potential exterior pest entry points into man-made structures such as doorways and windows, when limited to a band not to exceed one inch;
>
> 5. Applications to vertical surfaces (such as the side of a man-made structure) directly above impervious surfaces (e.g., driveways, sidewalks, etc.), up to 2 feet above ground level;
>
> 6. Applications to vertical surfaces directly above pervious surfaces, such as soil, lawn, turf, mulch or other vegetation) only if the pervious surface does not drain into ditches, storm drains, gutters, or surface waters."

The Agency also has determined that several specific mitigation measures to reduce the amount of runoff entering waterbodies and drainage systems are necessary. These include:

**C. Spot Treatment Guidance Statement**

- "Spot treatments must not exceed two square feet in size (for example, 2 ft. by 1 ft. or 4 ft. by 0.5 ft.)."

**D. Buffer from Water Statement**

- "For soil or foliar applications, do not apply by ground within 25 feet of lakes, reservoirs, rivers, permanent streams, marshes or natural ponds, estuaries and commercial fish farm ponds."

**E. Water Protection Statements**

- "Do not apply the product into fish pools, ponds, streams, or lakes. Do not apply directly to sewers or storm drains, or to any area like a drain or gutter where drainage to sewers, storm drains, water bodies, or aquatic habitat can occur."

- "Do not allow the product to enter any drain during or after application."

- "Do not apply directly to impervious horizontal surfaces such as sidewalks, driveways, and patios except as a spot or crack-and-crevice treatment."

- "Do not apply or irrigate to the point of runoff."

**F. Rain-Related Statements**

- "Do not make applications during rain. Avoid making applications when rainfall is expected before the product has sufficient time to dry (minimum 4 hours)."

- "Rainfall within 24 hours after application may cause unintended runoff of pesticide application."

The Agency has determined that mitigation measures for specific industry sectors to reduce off-site drift to waterbodies, increase distances between the area treated and waterbodies, as well as to reduce the potential for over-spraying are necessary. These include:

**G. Statements for Ornamental/Recreational Turf**

- "Do not apply when the wind speed is greater than 15 mph."

**H. Statements for Outdoor Applications at Commercial Nurseries**

- "Do not apply when the wind speed is greater than 15 mph."
- "Applicators are required to select the nozzle and pressure that deliver a medium or coarser droplet size (ASABE S572)."
- "For soil or foliar applications, do not apply by ground equipment within 25 feet of lakes, reservoirs, rivers, permanent streams, marshes or natural ponds, estuaries and commercial fish farm ponds."

The Agency has not assessed the impact the application wind speed restriction of no greater than 15 mph for these industry sectors; however, it is likely to decrease the number of days available for applications. However, high wind speeds interfere with proper dispersion of the pesticide, so relatively few applications may be affected by the prohibition.

The Agency does not know how efficacy may be impacted when droplet sizes are determined to be necessary for various insecticides in commercial nurseries. Pyrethroids are contact insecticides, which require thorough coverage of the treated surface for effective pest control. University extension recommendations for contact insecticides such as pyrethroids are for ASABE droplet sizes of fine to medium (Wolf and Bretthauer, 2009). For foliar applications, insect control would likely be negatively impacted by the requirement for a medium or larger droplet size. Growers may be driven to use higher rates, mix with another insecticide, make additional applications per season, or increase application volume with larger droplet sizes to achieve the same efficacy they were able to with finer droplet sizes. However, many pyrethroid products are already subject to droplet size restrictions and buffers to water bodies, so impacts may be limited.

**I. Statements for Crack-and-Crevice Treatments**

- "Treat surfaces to ensure thorough coverage but avoid runoff."

- "To treat insects harbored in voids and cracks-and-crevices, applications must be made in such a manner to limit dripping and avoid runoff onto untreated structural surfaces and plants."

### 3. Mitigation Measures for Agricultural Use Products

**Vegetative Filter Strip (VFS) Language**

To reduce the amount of pyrethroids that enter waterbodies from runoff, EPA has determined that an increase to the existing vegetative filter strip (VFS) for agricultural products to 25 feet is necessary. EPA is concerned that sediment from agricultural land, with which pyrethroids bind, erodes into aquatic habitats exposing aquatic organisms susceptible to these pesticides. Pyrethroid monitoring data have been collected in water and sediment across the United States, with pyrethroid detections widespread that are directly related to agricultural uses. Data supported by the Pyrethroid Working Group and USDA have shown that VFS can be an effective method of reducing sediment transport into aquatic systems when designed with field specific factors and are well maintained. EPA concludes that the expansion of the VFS size alone will reduce risk to aquatic organisms. Based on public comments, EPA is now providing greater flexibility for Western irrigated agriculture and for areas where soil erosion control practices are already present. This flexibility will still reduce risk to aquatic organisms while better preserving the agricultural benefits pyrethroids provide.

Currently, all pyrethroid products, except etofenprox and pyrethrins, already have a 10-foot VFS requirement on the labels. VFS are somewhat expensive to implement and maintain, and they must be maintained or they will lose efficacy and cause channelized flow across the VFS after a few years. VFS are most effective at removing non-source point pollutants (e.g., pesticides) from runoff water sources. However, the effectiveness of a VFS is influenced by various land management practices (*e.g.*, flood and furrow irrigated fields) which may impact their utility.[10] The Agency has considered several additional sources of research that contextualize the benefits of VFS and has determined that increasing the use of VFS is an appropriate mitigation to reduce pyrethroid residues in aquatic habitats.

Product labels are required to include a minimum 25-foot VFS. However, the 25-foot VFS requirement may be reduced to 15 feet if other soil conservation practices are used. Areas that qualify for a reduced 15-feet VFS are: areas considered prime farmland, areas where conservation tillage is implemented, areas with a functional terrace system, areas where water and sediment control basins are present and maintained, and areas that are less than or equal to 10 acres. Prime farmland, as defined in 7 CFR § 657.5, is not excessively erodible and pyrethroids binding to soil particles are less likely to enter adjacent waterways. Conservation

[10] https://www regulations.gov/document?D=EPA-HQ-OPP-2008-0331-0175

tillage also works to reduce soil erosion, because crop residues remain on the field. Terrace farming and the presence of water and sediment control basins also reduce soil erosion. Additionally, based on public comments on the Ecological Risk Mitigation Proposal, the VFS requirement is reduced to 15 feet, if the area of application is less than or equal to 10 acres—this reduces the impact on small-scale operations that are not primary contributors to runoff. These added criteria for a reduced VFS are intended to allow more flexibility for stakeholders.

Further, the Agency has determined that the burden on the arid parts of the country that rely on irrigation to grow agricultural crops (Western irrigated agriculture) to develop and maintain a VFS would be too impractical and therefore has determined that an increase of the existing 10-foot VFS in those areas is not necessary. A larger VFS would be more expensive to maintain, and runoff is less likely in these drier, more arid parts of the country. These areas would likely need irrigation to maintain a VFS, and on fields where water is managed carefully there is less likely to be runoff and erosion into a waterbody, so the existing 10-foot wide VFS is appropriate. These Western states, referred to as "Western irrigated agriculture" include WA, OR, CA, ID, NV, UT, AZ, MT, WY, CO, NM, and TX (west of I-35).

Since sediment control basins may be installed in Western irrigated agriculture to collect runoff and improve drainage and may fulfill similar functions as a VFS, the Agency revised the VFS requirement for Western irrigated agriculture: if a functioning sediment control basin is already present, the Agency has determined that creating or maintaining a 10 foot VFS will no longer be necessary. In many situations a sediment control basin is as effective at controlling runoff and erosion for this type of agriculture. EPA decided to promote the use of sediment control basins for Western irrigated agriculture by allowing growers in these areas to use sediment control basins in lieu of creating and maintaining a VFS when pyrethroids are used. This exception will also reduce the amount of water Western growers will be required to use to maintain a VFS.

The Agency has determined that VFS is not required for rice fields. Since rice berms contain the rice flood water and prevent runoff and off-site sedimentation, there is no need for a VFS. A statement has been added to the label table to clarify that rice fields are not required to have a vegetative filter strip.

The following mitigation measures apply to all pyrethroids with agricultural uses (except pyrethrins). They are determined to be necessary and are separate from the spray drift buffer zones described later in this ID; spray drift buffer zones are still necessary if a vegetative filter strip is present. The vegetative filter strip requirement reads as follows:

> *"Construct and maintain a vegetative filter strip, according to the width specified below, of grass or other permanent vegetation between the field edge and nearby down gradient aquatic habitat (such as, but not limited to, lakes; reservoirs; rivers; streams; marshes or natural ponds; estuaries; and commercial fish farm ponds).*
>
> *Only apply products containing (name of pyrethroid) onto fields where a maintained vegetative filter strip of at* ***least 25 feet*** *exists between the field edge and where a down gradient aquatic habitat exists. This minimum required width of 25 feet may be reduced or removed under the following conditions:*

*For Western irrigated agriculture, a maintained vegetative filter strip of at least 10 feet wide is required. Western irrigated agriculture is defined as irrigated farmland in the following states: WA, OR, CA, ID, NV, UT, AZ, MT, WY, CO, NM, and TX (west of I-35).*

- *For Western irrigated agriculture, if a sediment control basin is present, a vegetative filter strip is not required.*

*In all other areas, a vegetative filter strip with a minimum width of 25 feet is required, unless the following conditions are met. The required vegetative filter strip may be reduced from 25 feet to 15 feet if at least one of the following applies:*

- *The area of application is considered prime farmland (as defined in 7 CFR § 657.5).*
- *Conservation tillage is being implemented on the area of application. Conservation tillage is defined as any system that leaves at least 30% of the soil surface covered by residue after planting. Conservation tillage practices can include mulch-till, no-till, or strip-till.*
- *A functional terrace system is maintained on the area of application.*
- *Water and sediment control basins for the area of application are present, functional, and maintained.*
- *The area of application is less than or equal to 10 acres.*

*Rice fields are not required to have a vegetative filter strip.*

*For further guidance on vegetated filter strips, refer to the following publication for information on constructing and maintaining effective buffers: Conservation Buffers to Reduce Pesticide Losses. Natural Resources Conservation Services.* https://www.regulations.gov/document?D=EPA-HQ-OPP-2008-0331-0175

The impact of the VFS mitigation can be highly localized and depends critically on the size and shape of a field. When growing areas are adjacent to water bodies, vegetative filter strips may require growers to remove land from production thus decreasing revenue while imposing costs to maintain the filter strips. These impacts will disproportionally affect growers producing crops from small acreage fields. As a result of a comments on the proposed mitigation, the Agency will allow application on areas of 10 acres or less to maintain a VFS of 15 feet instead of 25 feet. The reduction in VFS size for areas of application 10 acres or less is intended to lessen the burden on small scale agricultural practices which will likely be using less pyrethroids than larger farms and agricultural operations.

Estimates of losses from increasing the size of the VFS for the 10$^{th}$ percentile and the median field size by crop are available in EPA document *Usage Characterization and Qualitative Overview of Agricultural Importance for Pyrethroid Insecticides for Selected Crops and Impacts of Potential Mitigation for Ecological Risks* (September 25, 2019). These impact estimates vary widely by crop. As an example, for a smaller crop on a smaller field, the 25-foot VFS loss estimate for the 10$^{th}$ percentile cabbage field is almost $1,800 per acre, although the 10$^{th}$ percentile field size is only 0.2 acres. The highest losses estimated were for strawberries and peppers with losses of almost $3,500 per acre on the median strawberry field, and over $1,300 per acre for the median pepper field from an increase in the VFS to 25 feet, and much higher losses for smaller fields. In general, increasing the VFS will have higher losses per acre for

relatively high value crops, like strawberries, peppers, pears, celery and apples. For high acreage crops, the impacts of increasing the VFS is smaller on a per acre basis, because the per acre value of the crop is lower and fields tend to be larger. These losses are only estimates and would not apply to fields where an increase in the width of the VFS is not needed.

In addition to any reduced crop production, growers would need to manage the space taken out of production and put into a VFS. Costs would differ across states and regions, and also vary according to the size and shape of the field. In addition to the cost of establishing the VFS, the cost of annual maintenance must also be considered. Yearly maintenance costs are estimated to be $40 to $240 per acre (for four mowing or weed control applications). Maintenance costs could be higher if additional operations are required such as additional mowing or weed control expenses, reseeding of disturbed areas, or regrading of the filter strip with reseeding if sediment deposition were to jeopardize its function.[11]

These additional costs could lead growers to substitute an alternative insecticide to replace pyrethroids. If the necessary mitigation prevents growers from using pyrethroids, they will most likely replace pyrethroid applications with other insecticides, such as organophosphates and carbamates, which could lead to declining yields and/or increased production costs for growers if the alternatives are less effective, more expensive, or not available.

**Spray Drift Reduction Measures**

Most pyrethroids and pyrethrins labels currently have spray drift language to reduce the potential for the pesticides to drift off-target. EPA has determined that label clarifications to bring all labels up to date with the latest existing spray drift language, to reduce off-target spray drift, and establish a baseline level of protection that is consistent across all affected products for this interim decision are necessary. Reducing spray drift will reduce the extent of environmental exposure and risk to non-target plants and animals. Although the Agency is not making an endangered species finding at this time, these label changes are expected to reduce the extent of exposure and may reduce risk to listed species whose range and/or critical habitat co-occur with the use areas of the pyrethroids.

The Agency has determined that the following spray drift mitigation language is necessary to be included on all product labels for the pesticides addressed in this interim decision. The required spray drift language is mandatory, enforceable statements and supersedes any existing language already on product labels (either advisory or mandatory) covering the same topics. In addition, the Agency is providing language that will allow the registrants to standardize all advisory spray drift language on the product labels (see Appendix B for required advisory language). Registrants must ensure that any existing advisory language left on labels does not contradict or modify the mandatory spray drift statements required in this interim decision once effective.

**Required Statements for Aerial Applications**

- "Do not release spray at a height greater than 10 feet above the vegetative canopy, unless a greater application height is necessary for pilot safety. Applicators are

[11] Lynch and Tjaden, 2003 and Solano and Yolo Co. Resource Conservation. Dist., 2006

required to select nozzle and pressure that deliver medium or coarser droplets (ASABE S641).
- Do not apply when wind speeds exceed 15 mph at the application site. If the wind speed is greater than 10 mph, the boom length must be 65% or less of the wingspan for fixed wing aircraft and 75% or less of the rotor diameter for helicopters. Otherwise, the boom length must be 75% or less of the wingspan for fixed-wing aircraft and 90% or less of the rotor diameter for helicopters.
- If the windspeed is 10 miles per hour or less, applicators must use ½ swath displacement upwind at the downwind edge of the field. When the windspeed is between 11-15 miles per hour, applicators must use ¾ swath displacement upwind at the downwind edge of the field.
- Do not apply during temperature inversions."

**Required Statements for Airblast Applications**
- "Sprays must be directed into the canopy.
- Do not apply when wind speeds exceed 15 mph at the application site.
- User must turn off outward pointing nozzles at row ends and when spraying outer row.
- Do not apply during temperature inversions."

**Ground Boom Applications**
- "User must only apply with the nozzle height recommended by the manufacturer, but no more than 4 feet above the ground or crop canopy. Applicators are required to select nozzle and pressure that deliver medium or coarser droplets (ASABE S572).
- Do not apply when wind speeds are sustained above 15 miles per hour at the application site.
- Do not apply during temperature inversions."

EPA does not expect the requirements for release height to impact users since they largely correspond to current practice and recommendations. Due to the varying use sites and target pests of pyrethroids it is difficult to assess the impacts of a droplet size restriction across all crops. Components of applications, including droplet size, are complex, but essentially insects need to come into contact with, or ingest, a lethal dose of insecticide to be effectively controlled, which requires proper coverage throughout the plant. Pyrethroids are contact insecticides and require a certain amount of coverage for efficacy. For foliar applications, insect control would likely be negatively impacted by requiring a medium droplet size or larger. Growers may be driven to use higher rates, mix with another insecticide, make additional applications per season, or increase gallons applied per acre with larger droplet sizes to achieve the same efficacy they were able to with finer droplet sizes.

The application wind speed restriction of no greater than 15 mph for ground applications and the prohibition on applications during temperature inversions will decrease the number of days available during the growing season for applications and thus result in additional burdens to the grower, lack of pest control, and potentially yield loss depending on the crop. Because such weather conditions are variable, growers may be unable to apply when planned, but may also not be able to apply alternatives if, for example, tanks are already mixed with pyrethroids. Moreover,

temperature inversions may be highly localized and growers or applicators may not be aware they exist.

If the mitigation prevents growers from using pyrethroids, they will most likely replace pyrethroid applications with other insecticides, such as organophosphates and carbamates, which could lead to declining yields and/or increased production costs for growers if the alternatives are less effective, more expensive or not available.

**Required Updates to Spray Drift Buffers**

In addition to the spray drift mitigation measures above, EPA is updating the buffers to water already on labels. The following revised language reflects current spray drift reduction language limiting the amount of spray drift that enters waterbodies. These required clarifications will establish a baseline level of protection for waterbodies against spray drift that is consistent across all products affected by this interim decision. Reducing the overall amount of spray drift that reaches waterbodies will reduce the extent of environmental exposure and risk to aquatic organisms. All pyrethroids labels currently require these buffers to water, except for pyrethrins and etofenprox products. As mentioned previously, pyrethrins are less persistent than the synthetic pyrethroids in most environments, and as such they also do not have the monitoring detects as other chemicals in this group. The Agency is not requiring these spray drift buffers to water for products containing pyrethrins. However, products containing etofenprox do not currently contain these spray drift buffers to water and based on the potential risks identified in the assessment for etofenprox EPA is requiring the addition of these spray drift buffers to those labels. Required label updates encompass the following statements:

- "For ground applications, do not apply within 25 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, streams, marshes, ponds, estuaries, and commercial fish ponds).
- For non-ultra low volume (ULV) aerial applications, do not apply within 150 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, streams, marshes, ponds, estuaries, and commercial fish ponds).
- For ULV aerial applications, do not apply within 450 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, streams, marshes, ponds, estuaries, and commercial fish ponds)."

Many pyrethroid products are already subject to droplet size restrictions and buffers to water bodies, so impacts may be limited. As with VFS, impacts could include yield losses in untreated portions of fields.

## 4. Pollinator Risk Mitigation

Although the Agency has identified potential acute risks of concern to bees and other terrestrial invertebrates from use of the pyrethroids/pyrethrins, risk to invertebrates is expected from use of insecticides, in general. The potential acute risk to bees is considered along with the benefits of pyrethroids/pyrethrins in agriculture. Pyrethroids/pyrethrins benefits were assessed in the *Usage Characterization and Qualitative Overview of Agricultural Importance for Pyrethroid Insecticides for Selected Crops and Impacts of Potential Mitigation for Ecological Risks* (September 25, 2019). Benefits include the following:

1) inexpensive, effective, and broad-spectrum pest control,
2) importance in resistance management programs in rotation with other insecticides,
3) convenience and ease of use due to short restricted entry intervals,
4) effective management of key pests in crops such as alfalfa, cotton, corn, wheat, rice, soybean, sunflower, tree nuts, citrus, blueberries, grapes, and many vegetables.

Alternatives for pyrethroids/pyrethrins, in general, include organophosphates, carbamates and/or neonicotinoid insecticides. These alternatives have their own risk and resistance issues.

In order to educate pesticide users on the importance of pollinator protection and stewardship, the Agency has determined that addition of the following labeling elements to pyrethroids/pyrethrins products formulated for outdoor agricultural use are necessary:

a) updated pollinator environmental hazards language;
b) information on pollinator stewardship/best management practices;
c) information on state managed pollinator protection plans; and
d) information on pollinator incident reporting.

### A. Pollinator Environmental Hazard

EPA has determined that expansion of the existing Pollinator Environmental Hazard language to include a statement referring the reader to the spray drift management section of the label is necessary. The revised statement serves to warn users of potential risk to bees and pollinating insects from outdoor foliar applications to agricultural crops as well as to educate users on the importance of spray drift management. This language is only required for pyrethroid and pyrethrins labels with foliar agricultural uses and excludes products formulated for residential use and Ultra Low Volume (ULV) wide area mosquito control applications, which will be indicated in the label clarifications column of the label table.

The following sentence is required to be added to the existing Pollinator Environmental Hazard on the label:

> *"Protect pollinating insects by following label directions intended to minimize drift and to reduce risk to these organisms."*

### B. Pollinator Stewardship – Promoting Pollinator Best Management Practices

In addition to establishing both advisory and compulsory language for product labels, EPA's registration review process provides an opportunity to inform stakeholders and the general public about opportunities to minimize potential ecological risks and promote pollinator health more generally. Beyond the necessary mitigation measures above, voluntary stewardship activities and use of best management practices (BMPs)[12] to protect pollinators can be effective in further reducing pesticide exposure to non-target organisms. Examples of these activities include:

- promoting the creation of additional pollinator habitat;
- improving pesticide users' understanding of and adherence to label directions that advise users on measures to reduce drift and minimize exposure to pollinators;
- promoting integrated pest management (IPM) solutions; and
- increasing awareness of potential impacts of pesticides through education (*i.e.,* training courses, pamphlets, workshops/conferences, and through television, radio, social media and other communication platforms).

Habitat loss is a significant issue with negative impacts on the health of bees. With access to a healthy and diverse diet through a thriving habitat, bees may be better able to tolerate stressors, such as pests, disease, and exposure to pesticides. As a healthy diet is crucial to maintaining flourishing pollinator populations, and the protection of pollinator habitat is not something that can be directly addressed on a pesticide product label, EPA and other federal/state/tribal and local government agencies and non-government organizations (NGOs) promote pollinator habitat through active education and outreach programs. Helpful guidance on pollinator protection can be found on EPA's pollinator protection webpage[13].

There are several precautions users can employ to minimize potential exposure to pollinators while using pyrethroid/pyrethrin products. First, try to avoid applying pyrethroid/pyrethrin products when bees and other pollinators are actively foraging on pollinator-attractive plants during bloom. Secondly, consider a pesticide's ability to drift to other non-target areas and be aware of the presence of bee colonies or highly bee-attractive plants nearby an application site. Some examples of best management practices (BMPs) to promote pollinator health include:

1. Applying pesticides in the evening and at night when pollinators are not foraging,
2. Improved communication between beekeepers and growers,
3. Identifying and confirming hive locations before spraying,
4. Maintaining buffers between treated areas and hives or foraging habitat, and
5. Controlling blooming weeds, such as dandelions, in or near treatment areas.

Other things the public can do to minimize potential exposure of pollinators are listed on EPA's *What You Can Do to Protect Honey Bees and Other Pollinators* webpage.[14]

The Agency encourages strong pollinator protection stewardship in both the public and private sector in creating tools and fostering effective communication to help reach applicators and

[12] https://www.epa.gov/pollinator-protection/find-best-management-practices-protect-pollinators
[13] https://www.epa.gov/pollinator-protection
[14] https://www.epa.gov/pollinator-protection/what-you-can-do-protect-honey-bees-and-other-pollinators

educate them on practices that can reduce risks to the environment. EPA will continue to work with its partners at the federal, state, tribal, and local levels, along with non-governmental organizations to promote pollinator protection, education, and outreach. This includes coordinating with states and tribes on managed pollinator protection plans (MP3s), coordinating with stakeholders on the implementation of, and education around, existing BMPs, and continued education and outreach to the public on pollinator protection. This language is only required for pyrethroid and pyrethrins labels with foliar agricultural uses and excludes products formulated for residential use and ULV wide area mosquito control applications, which will be indicated in the label clarifications column of the label table.

In order to promote pollinator BMPs, the Agency has determined that adding the following text to pyrethroid/pyrethrin labels is necessary:

> "Following best management practices can help reduce risk to terrestrial pollinators. Examples of best management practices include applying pesticides in the evening and at night when pollinators are not foraging and checking to confirm hive locations before spraying. For additional resources on pollinator best management practices, visit https://www.epa.gov/pollinator-protection/find-best-management-practices-protect-pollinators."

### C. Promoting State Managed Pollinator Protection Plans (MP3s)

The Agency supports state, tribal, and other local efforts to protect pollinators. EPA has been working with states and tribes to encourage the development of MP3s. Although MP3s are voluntary, approximately 80% of states have developed MP3s to promote pollinator protection efforts. The MP3s are developed through open communication among key stakeholders (including beekeepers, growers, landowners, pesticide applicators, and pest control operators). The MP3s vary from state to state according to each state's needs, and represent a more tailored, localized approach to pollinator protection. EPA engaged with states in the development of MP3s in order to give states and tribes the flexibility to do the following:

- adopt a regulatory or voluntary approach;
- expand protection efforts to address other pesticide-related issues;
- include other factors impacting pollinator health (such as habitat creation); and
- expand the scope to address wild bees and other types of pollinators.

In order to promote awareness of MP3s, EPA has determined that adding a statement to pyrethroid/pyrethrin labels to educate pesticide users on the existence of MP3s and to encourage users to follow their state plans is necessary. This language is only required for pyrethroid and pyrethrins labels with foliar agricultural uses and excludes products formulated for residential use and ULV wide area mosquito control applications, which will be indicated in the label clarifications column of the label table.

The Agency has determined that the following text to pyrethroid/pyrethrin labels is necessary:

> "**Managed pollinator protection plans** are developed by states/tribes to promote communication between growers, landowners, farmers, beekeepers, pesticide users, and other

pest management professionals to reduce exposure of bees to pesticides. If available, visit state plans for additional information on how to protect pollinators."

### D. Pollinator Incident Reporting

EPA considers incident reporting data as a line of evidence to inform pesticide regulatory decisions. Information from these reports can help the Agency identify patterns of bee kills associated with specific uses and specific pesticides or classes of pesticides. EPA has determined that adding incident reporting information to pyrethroid/pyrethrin labels to encourage users to report bee kill incidents to the Agency is necessary. This language is only required for pyrethroid and pyrethrins labels with foliar agricultural uses and excludes products formulated for residential use and ULV wide area mosquito control applications, which will be indicated in the label clarifications column of the label table.

The Agency has determined that adding the following text to pyrethroid/pyrethrin labels is necessary:

> **"How to Report Bee Kills -** It is recommended that users contact both the state lead agency and the U.S. Environmental Protection Agency to report bee kills due to pesticide application. Bee kills can be reported to EPA at beekill@epa.gov. To contact your state lead agency, see the current listing of state pesticide regulatory agencies at the National Pesticide Information Center's website: http://npic.orst.edu/reg/state_agencies.html."

### 5. Insecticide Resistance Management

Pesticide resistance occurs when genetic or behavioral changes enable a portion of a pest population to tolerate or survive what would otherwise be lethal doses of a given pesticide. The development of such resistance is influenced by several factors. One important factor is the repeated use of pesticides with the same mode (or mechanism) of action. This practice kills sensitive pest individuals but allows less susceptible ones in the targeted population to survive and reproduce, thus increasing in numbers. These individuals will eventually be unaffected by the repeated pesticide applications and may become a substantial portion of the pest population. An alternative approach, recommended by resistance management experts as part of integrated pest management (IPM) programs, is to use pesticides with different chemical modes (or mechanisms) of action against the same target pest population. This approach may delay and/or prevent the development of resistance to a particular mode (or mechanism) of action without resorting to increased rates and frequency of application, possibly prolonging the useful life of pesticides.

EPA has determined that resistance-management labeling, as listed in Appendix B, for products containing the cypermethrins is necessary in order to provide pesticide users with easy access to important information to help end users delay or even avoid the development of resistance and maintain the effectiveness of useful pesticides. Additional information on EPA's guidance for resistance management can be found at the following website: https://www.epa.gov/pesticide-registration/prn-2017-1-guidance-pesticide-registrants-pesticide-resistance-management.

### 6. Update Glove and Respirator Language

The Agency has determined that updating the gloves statements to be consistent with Chapter 10 of the Label Review Manual is necessary. In particular, the Agency has determined that removing the reference to specific categories in EPA's chemical-resistance category selection chart and specifying the appropriate glove types to use on the labels are necessary. For example, the chemical-resistant glove statements in the label should remove "such as" language and not state the solvent category, but rather add all acceptable glove types that provide high-level chemical resistance for the solvent category as mentioned in Table 3 of Chapter 10 of the Label Review Manual. This minor clarification does not fundamentally change the personal protective equipment that workers are currently required to use.

The Agency is requiring an update to the respirator statement currently on labels. The new respirator language does not fundamentally change the personal protective equipment that workers needs to use, and therefore should impose no impacts on users.

## B. Tolerance Actions

Changes to the tolerance levels, crop listings, and the tolerance expression are anticipated at this time. The Agency intends to update the tolerance expression for cypermethrin in 40 CFR § 180.418(a)(1), and multiple crop groups and individual tolerances to reflect the updated crop groups. For additional details, refer to Section III.A.4. The Agency will use its FFDCA rulemaking authority to make the needed changes to the tolerances.

## C. Interim Registration Review Decision

The Agency is issuing this ID in accordance with 40 C.F.R. §§ 155.56 and 155.58. The Agency has made the following interim decision: (1) additional pollinator data are required at this time; and (2) EPA determines that the cypermethrins do not meet the registration standard without changes to the affected registrations and their labeling. EPA has determined that the language specified in Sections IV.A-B and Appendices A and B, as well as the *Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals* (September 30, 2020), and the *Memorandum: Updated Label Language for the 'Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals'* (February 17, 2021) to be sufficient to address certain concerns.

The Agency conducted detailed human health risk assessments and an ecological risk assessment. As discussed in Section III of this document, EPA has determined that the cypermethrins pose an occupational handler risk of concern associated with the registered uses of cypermethrin for one scenario and pose potential risks of concern for aquatic organisms. The Agency identified potential risks for various aquatic taxa, with the major potential risks of concern focusing on aquatic invertebrates from indoor, outdoor, and agricultural uses, and terrestrial invertebrates from agricultural uses of the cypermethrins. EPA considered the risks,

the benefits, and the use pattern of the cypermethrin occupational handler scenario of concern in evaluating potential risk mitigation. As a result, EPA is not specifying mitigation for this occupational scenario. EPA does not consider this scenario a risk of concern after taking the conservative nature of the assessment into account. The Agency has determined that mitigation is necessary to address potential ecological risks of concern for the cypermethrins. The specified mitigation for potential risks to aquatic and terrestrial invertebrates will benefit the other taxa to the extent that there is any risk.

EPA also determined that continuing to register the cypermethrins provides benefits. The cypermethrins are widely used in agriculture to control a wide variety of pests that cause problems in crop production, and in urban pest control programs for several public-health and nuisance pests.

During registration review, EPA considers whether a pesticide registration "continues to satisfy the FIFRA standard for registration."[15] Here, EPA proposes that the cypermethrins do not meet the FIFRA registration standard without changes to the affected registrations and their labeling, and that the language described in Section IV.A and Appendices A and B would be sufficient to address certain concerns. EPA believes the risk-benefit standard is met for the cypermethrins because the benefits outweigh the risks if the specified mitigation is implemented. EPA also believes the safety standard is met because no dietary or aggregate risks of concern were identified.

EPA determines that there is no human dietary risk from registered uses of the cypermethrins that is inconsistent with the FFDCA safety standard. Taking into consideration the available information on toxicity and exposure, EPA assessed the cypermethrins' potential aggregate risks, including dietary (food and water) and non-occupational residential exposures, and found no risks exceeding the Agency's levels of concern.[16]

EPA concludes that there is a reasonable certainty that no harm will result from aggregate exposure to the cypermethrins, including all anticipated dietary exposures and all other exposures for which there is reliable information. Therefore, the cypermethrins' residues are safe. EPA intends to leave the tolerances in place as well as make several modifications, as EPA's analysis indicates that such actions would be safe.

In this ID, the Agency is not making any human health or environmental safety findings associated with the Endocrine Disruptor Screening Program (EDSP) screening of the

[15] 40 C.F.R. § 155.40(a); 7 U.S.C. § 136a(c)(5); *see also* 7 U.S.C. §§ 136(bb) (defining "unreasonable adverse effects on the environment" as encompassing both "any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide" [FIFRA's risk-benefit standard] **and** "a human dietary risk from residues that result from a use of a pesticide in or on any food inconsistent with the [FFDCA safety standard]"). In a PID, EPA sets out a proposed interim decision that includes EPA's "proposed findings with respect to the FIFRA standard for registration and describe the basis for such proposed findings." 40 C.F.R. §§ 155.56, 155.58(b)(1).

[16] *Cypermethrin, Zeta-cypermethrin, and Alpha-cypermethrin. Draft Human Health Risk Assessment for Registration Review* (December 21, 2017) and *Cypermethrin, Zeta-cypermethrin, and Alpha-cypermethrin. Revised Draft Human Health Risk Assessment for Registration Review* (June 19, 2020.

cypermethrins. Similarly, the Agency is not making a complete endangered species finding, though the specified mitigation is expected to reduce the extent of environmental exposure and may reduce risk to listed species whose range or critical habitat co-occur with the use of the cypermethrins. The Agency will complete a listed-species assessment and any necessary Endangered Species Act (ESA) Section 7 consultation with the Services, and make an EDSP determination before issuing a final registration review decision for the cypermethrins.

### D. Data Requirements

There are several ecological effects studies that are outstanding from the registration review GDCIs— GDCI-109702-1208 (cypermethrin), GDCI-129064-1209 (zeta-cypermethrin), and GDCI-209600-1329 (alpha-cypermethrin); please refer to Section III.B.1 for a detailed list. EPA has determined that pollinator data listed under Section III.B is necessary and will issue a DCI for the data.

*Generic Data Call-in Notice GDCI-109702-1107 (cypermethrin) and GDCI-129064-1097 (zeta-cypermethrin)* for guideline 875.1700 (product use information) is partially satisfied; EPA has received and accepted data from the companies who represent the Residential Exposure Joint Venture. EPA continues to evaluate data submitted from companies comprising the Generic Residential Exposure Task Force (GRETF) and is partially satisfied. EPA continues to evaluate data submitted from companies comprising the GRETF and will update the status of this DCI when the review is completed.

## V. NEXT STEPS AND TIMELINE

### A. Interim Registration Review Decision

A Federal Register Notice will announce the availability of this interim decision for the cypermethrins. A final decision on the cypermethrins registration review case will occur after: (1) an EDSP FFDCA § 408(p) determination and (2) an endangered species determination under the ESA and any needed § 7 consultation with the Services.

### B. Implementation of Mitigation Measures

Once the Interim Registration Review Decision is issued, the cypermethrins registrants must submit amended labels that include the label changes described in Appendices A and B. The revised labels and requests for amendment of registrations must be submitted to the Agency for review within 120 days following issuance of the Interim Registration Review Decision.

Registrants must submit a cover letter, a completed Application for Registration (EPA form 8570-1) and electronic copies of the amended product labels. Two copies for each label must be submitted, a clean copy and an annotated copy with changes. In order for the application to be processed, registrants must include the following statement on the Application for Registration (EPA form 8570-1):

"I certify that this amendment satisfies the requirements of the Cypermethrins Interim Registration Review Decision and EPA regulations at 40 CFR Section 152.44, and no other changes have been made to the labeling of this product. I understand that it is a violation of 18 U.S.C. Section 1001 to willfully make any false statement to EPA. I further understand that if this amendment is found not to satisfy the requirements of the Cypermethrins Interim Registration Review Decision and 40 CFR Section 152.44, this product may be in violation of FIFRA and may be subject to regulatory and/or enforcement action and penalties under FIFRA."

Within the required timeframe, registrants must submit the required documents to the Re-evaluation section of EPA's Pesticide Submission Portal (PSP), which can be accessed through EPA's Central Data Exchange (CDX) using the following link: https://cdx.epa.gov/. Registrants may instead send paper copies of their amended product labels, with an application for a fast-track, Agency-initiated non-PRIA label amendment to Susan Bartow at one of the following addresses, so long as the labels and application are submitted within the required timeframe:

VIA US Mail
USEPA Office of Pesticide Programs
Pesticide Re-evaluation Division
Mail Code 7508P
1200 Pennsylvania Ave NW
Washington, DC 20460-0001

VIA Courier
Pesticide Re-evaluation Division
c/o Front End Processing
Room S-4910, One Potomac Yard
2777 South Crystal Drive
Arlington, VA 22202-4501

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## Appendix A: Summary of Required Actions for the Cypermethrins

| Affected Population(s) | Source of Exposure | Route of Exposure | Duration of Exposure | Potential Risk(s) of Concern | Actions |
|---|---|---|---|---|---|
| Aquatic invertebrates | • Water (non-dietary)<br>• Residues (at/on site of treatment) | • Contact<br>• Ingestion | • Acute<br>• Sub-chronic<br>• Chronic | • Growth<br>• Mortality | • Label clarity and consistency<br>• Advisory storage and disposal statements<br>• Reduced perimeter treatments<br>• Defined spot treatment size<br>• Rain statements<br>• Buffers to water bodies<br>• Spray drift management language<br>• Precautionary statements<br>• Increased width of vegetative filter strips |
| Fish | • Water (non-dietary)<br>Residues (at/on site of treatment) | • Contact<br>• Ingestion | • Acute<br>• Sub-chronic<br>• Chronic | • Growth<br>• Mortality | • Label clarity and consistency<br>• Advisory storage and disposal statements<br>• Reduced perimeter treatments<br>• Defined spot treatment size<br>• Rain statements<br>• Buffers to water bodies<br>• Spray drift management language<br>• Precautionary statements<br>• Increased width of vegetative filter strips |
| Pollinators | • Residues (at/on site of treatment | • Contact<br>• Ingestion | • Acute | • Mortality | • Stewardship information<br>• Incident reporting information<br>• Pollinator data requirements |

# Appendix B.1: Labeling Changes for Cypermethrin Products

| Description | Required Label Language for Cypermethrin Products | Placement on Label |
|---|---|---|
| **All Cypermethrin End Use Products (unless specified otherwise)** | | |
| **Mode of Action Group Number**<br><br>*Applies only to products with agricultural and/or wide-area mosquito uses* | **Note to registrant:**<br>• Include the name of the **ACTIVE INGREDIENT** in the first column<br>• Include the word "**GROUP**" in the second column<br>• Include the **MODE/MECHANISM/SITE OF ACTION CODE** in the third column (for fungicides this is the FRAC Code, and for insecticides this is the Primary Site of Action; for Herbicides this is **SITE OF ACTION)**<br>• Include the type of pesticide (*i.e.*, **INSECTICIDE)** in the fourth column.<br><br>**Cypermethrin** \| **GROUP** \| **3A** \| **INSECTICIDE** | Front Panel, upper right quadrant.<br>All text should be black, bold face and all caps on a white background, except the mode of action code, which should be white, bold face and all caps on a black background; all text and columns should be surrounded by a black rectangle. |
| **Updated Gloves Statement** | Update the gloves statements to be consistent with Chapter 10 of the Label Review Manual. In particular, remove reference to specific categories in EPA's chemical-resistance category selection chart and list the appropriate chemical-resistant glove types to use. | In the Personal Protective Equipment (PPE) within the Precautionary Statements and Agricultural Use Requirements, if applicable |
| **Updated Respirator Language** | [**Note to registrant**: If your end-use product only requires protection from particulates only (low volatility), use the following language:] | In the Personal Protective Equipment (PPE) within the |

| | | |
|---|---|---|
| | "Wear a minimum of a NIOSH-approved particulate filtering facepiece respirator with any N*, R or P filter; OR a NIOSH-approved elastomeric particulate respirator with any N*, R or P filter; OR a NIOSH-approved powered air purifying respirator with HE filters."<br>*Drop the "N" option if there is oil in the product's formulation and/or the product is labeled for mixing with oil-containing products.<br><br>[**Note to registrant:** For respiratory protection from organic vapor a**nd** particulates (or aerosols), use the following language:]<br>"Wear a minimum of a NIOSH-approved elastomeric half mask respirator with organic vapor (OV) cartridges and combination N*, R, or P filters; OR a NIOSH-approved gas mask with OV canisters; OR a NIOSH-approved powered air purifying respirator with OV cartridges and combination HE filters."<br><br>[**Note to registrant:** For products requiring protection for organic vapor only, use the following language:]<br>"Wear a minimum of a NIOSH-approved elastomeric half mask respirator with organic vapor (OV) cartridges; OR a NIOSH-approved full face respirator with OV cartridges; OR a gas mask with OV canisters; OR a powered air purifying respirator with OV cartridges."<br><br>*Drop the "N" option if there is oil in the product's formulation and/or the product is labeled for mixing with oil-containing products. | Precautionary Statements |
| **Resistance-management labeling statements for insecticides**<br>*Applies only to products with agricultural and/or wide-area mosquito uses* | Include resistance management label language for insecticides/acaricides from PRN 2017-1 (https://www.epa.gov/pesticide-registration/pesticide-registration-notices-year) | Directions for Use, prior to directions for specific crops |
| **Additional Required Labeling Action. Applies to all products delivered via liquid spray applications (except those with mosquito adulticide use)** | Remove information about volumetric mean diameter from all labels delivered via liquid spray application, except from products with mosquito adulticide use, where such information currently appears. | Directions for Use |
| **Directions for mixing/loading products packaged in water soluble bags** | Instructions for Introducing Water Soluble Packages Directly into Spray tanks:<br><br>"Soluble Packages (WSPs) are designed to dissolve in water. Agitation may be used, if necessary, to help dissolve the WSP. Failure to follow handling and mixing instructions can increase your exposure to the pesticide products in WSPs. WSPs, when used properly, qualify as a closed mixing/loading system under the Agricultural Worker Protection Standard [40 CFR 170.607(d)].<br><br>Handling Instructions<br>Follow these steps when handling pesticide products in WSPs. | Directions for Use |

1. Mix in spray tank only.
2. Handle the WSP in a manner that protects package from breakage and/or unintended release of contents. If package is broken, put on PPE required for clean-up and then continue with mixing instructions.
3. Keep the WSP in outer packaging until just before use.
4. Keep the WSP dry prior to adding to the spray tank.
5. Handle with dry gloves and according to the label instructions for PPE.
6. Keep the WSP intact. Do not cut or puncture the WSP.
7. Reseal the WSP outer packaging to protect any unused WSP(s).

Mixing Instructions
Follow the steps below when mixing this product, including if it is tank-mixed with other pesticide products. If being tank-mixed, the mixing directions 1 through 9 below take precedence over the mixing directions of the other tank mix products. WSPs may, in some cases, be mixed with other pesticide products so long as the directions for use of all the pesticide product components do not conflict. Do not tank-mix this product with products that prohibit tank-mixing or have conflicting mixing directions.

1. If a basket or strainer is present in the tank hatch, remove prior to adding the WSP to the tank.
2. Fill tank with water to approximately one-third to one-half of the desired final volume of spray.
3. Stop adding water and stop any agitation.
4. Place intact/unopened WSP into the tank.
5. Do not spray water from a hose or fill pipe to break or dissolve the WSP.
6. Start mechanical and recirculation agitation from the bottom of tank without using any overhead recirculation, if possible. If overhead recirculation cannot be turned off, close the hatch before starting agitation.
7. Dissolving the WSP may take up to 5 minutes or longer, depending on water temperature, water hardness and intensity of agitation.
8. Stop agitation before tank lid is opened.
9. Open the lid to the tank, exercising caution to avoid contact with dusts or spray mix, to verify that the WSP has fully dissolved and the contents have been thoroughly mixed into the solution.
10. Do not add other allowed products or complete filling the tank until the bags have fully dissolved and pesticide is thoroughly mixed.
11. Once the WSP has fully dissolved and any other products have been added to the tank, resume filling the tank with water to the desired level, close the tank lid, and resume agitation.
12. Use the spray solution when mixing is complete.
13. Maintain agitation of the diluted pesticide mix during transport and application.
14. It is unlawful to use any registered pesticide, including WSPs, in a manner inconsistent with its label."

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| | For Toxicity Category I and II products:<br><br>"ENGINEERING CONTROLS STATEMENT<br>Water soluble packets, when used correctly, qualify as a closed mixing/loading system under the Worker Protection Standard [40 CFR 170.607(d)]. Mixers and loaders handling this product while it is enclosed in intact water soluble packets may elect to wear reduced PPE of long-sleeved shirt, long pants, shoes, socks, a chemical-resistant apron, and chemical-resistant gloves. When reduced PPE is worn because a closed system is being used, handlers must be provided all PPE specified above for "applicators and other handlers" and have such PPE immediately available for use in an emergency, such as a spill or equipment break-down."<br><br>For Toxicity Category III and IV products:<br><br>"ENGINEERING CONTROLS STATEMENT<br>Water soluble packets, when used correctly, qualify as a closed mixing/loading system under the Worker Protection Standard [40 CFR 170.607(d)]. Mixers and loaders handling this product while it is enclosed in intact water soluble packets may elect to wear reduced PPE of long-sleeved shirt, long pants, shoes, socks. When reduced PPE is worn because a closed system is being used, handlers must be provided all PPE specified above for "applicators and other handlers" and have such PPE immediately available for use in an emergency, such as a spill or equipment break-down." | |
| **Cypermethrin end-use products with indoor residential uses** | | |
| **For all products that have indoor uses only** | Add the following language:<br><br>"For indoor use only." | Front Label Panel and/or Directions for Use |
| **For all products that have both indoor and outdoor uses** | Add the following language:<br><br>"For both indoor and outdoor use." | Front Label Panel and/or Directions for Use |
| **For all products used on pets** | Add the following language:<br><br>"Application of product on pets must only be done indoors." | Directions for Use |
| **Required disposal statement for products not labeled for use directly into drains and sewers.** | "Do not pour or dispose down-the-drain or sewer. Call your local solid waste agency for local disposal options." | Storage and Disposal |
| **Stewardship statement that includes a Spanish translation** | Note to registrants: If adding stewardship statements on end-use consumer products, the followings language is required and placed in a prominent location: | Directions for Use |

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| **(Stewardship statement not required for products applied to pets)** | For products without drain treatment uses:<br>"Do not allow to enter indoor or outdoor drains"<br>*"No permita la entrada a desagües internos o externos."*<br><br>For products with drain treatment uses:<br>"Do not allow to enter indoor or outdoor drains unless labeled for drain treatments."<br>*"No permita la entrada a desagües internos o externos a menos que el etiquetado indique que está permitido el uso del producto para tratamiento de desagües."*<br><br>For products with and without drain treatment uses:<br>"Follow proper disposal procedures on this label"<br>*"Siga las indicaciones del etiquetado para el desecho apropiado del producto."*<br><br>Graphic on the product package showing an image of a diagonal strikethrough over a drain. The pictogram must be legible (*i.e.* no smaller than 1.5 square centimeters or 0.25 square inches unless this size is greater than 10% of the size of the label).<br><br>**Use the following pictogram on product labels:**<br>  | |
| **Cypermethrin end-use products with outdoor, urban, non-agricultural uses** | | |
| **For all products that have outdoor uses only** | Add the following language:<br><br>"For outdoor use only." | Front Label Panel and/or Directions for Use |
| **For all products that have both indoor and outdoor uses** | Add the following language:<br><br>"For both indoor and outdoor use." | Front Label Panel and/or Directions for Use |
| **General Outdoor Application Statement to replace existing general outdoor statement** | "All outdoor spray applications must be limited to spot or crack-and-crevice treatments only, except for the following permitted uses:<br><br>1. Application to pervious surfaces such as soil, lawn, turf, and other vegetation; | Directions for Use |

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| **Application Restrictions for Residential Outdoor Surface and Space Sprays; excludes outdoor fogging devices**<br><br>**[Registrants may not add new uses from items 1-6 which are not currently on the existing label. Registrants are required to choose only the uses from items 1-6 which apply to their product.]** | 2. Perimeter band treatments of 7 feet wide or less from the base of a man-made structure to pervious surfaces (*e.g.*, soil, mulch, or lawn);<br><br>3. Applications to underside of eaves, soffits, doors, or windows permanently protected from rainfall by a covering, overhang, awning, or other structure;<br><br>4. Applications around potential exterior pest entry points into man-made structures such as doorways and windows, when limited to a band not to exceed one inch;<br><br>5. Applications to vertical surfaces (such as the side of a man-made structure) directly above impervious surfaces (e.g., driveways, sidewalks, etc.), up to 2 feet above ground level;<br><br>6. Applications to vertical surfaces directly above pervious surfaces, such as soil, lawn, turf, mulch or other vegetation) only if the pervious surface does not drain into ditches, storm drains, gutters, or surface waters." | |
| **Spot Treatment Guidance Statement** | "Spot treatments must not exceed two square feet in size (for example, 2 ft. by 1 ft. or 4 ft. by 0.5 ft.)." | Directions for Use |
| **Buffer from Water Statement for granular and liquid formulations.** | "For soil or foliar applications, do not apply by ground within 25 feet of lakes, reservoirs, rivers, permanent streams, marshes or natural ponds, estuaries and commercial fish farm ponds." | Directions for Use |
| **Water Protection Statements for granular and liquid formulations.** | "Do not apply the product into fish pools, ponds, streams, or lakes. Do not apply directly to sewers or storm drains, or to any area like a drain or gutter where drainage to sewers, storm drains, water bodies, or aquatic habitat can occur."<br><br>"Do not allow the product to enter any drain during or after application."<br><br>"Do not apply directly to impervious horizontal surfaces such as sidewalks, driveways, and patios except as a spot or crack-and-crevice treatment."<br><br>"Do not apply or irrigate to the point of runoff." | Directions for Use |
| **Rain-Related Statements (except for products that require watering-in)** | "Do not make applications during rain. Avoid making applications when rainfall is expected before the product has sufficient time to dry (minimum 4 hours)."<br><br>"Rainfall within 24 hours after application may cause unintended runoff of pesticide application." | Directions for Use |
| **Wind speed requirement for ornamental/ recreational turf applications for granular and liquid formulations** | "Do not apply when the wind speed is greater than 15 mph." | Directions for Use |
| **Spray drift management for commercial nurseries** | For outdoor applications to commercial nurseries:<br>• "Do not apply when the wind speed is greater than 15 mph." | Directions for Use |

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| | • "Applicators are required to select the nozzle and pressure that deliver a Medium or coarser droplet size (ASABE S572)"<br>• "For soil or foliar applications, do not apply by ground equipment within 25 feet of lakes, reservoirs, rivers, permanent streams, marshes or natural ponds, estuaries and commercial fish farm ponds." | |
| **Crack-and-crevice treatments** | • "Treat surfaces to ensure thorough coverage but avoid runoff."<br><br>"To treat insects harbored in voids and cracks-and-crevices, applications must be made in such a manner to limit dripping and avoid runoff onto untreated structural surfaces and plants." | Directions for Use |
| **Cypermethrin end-use products with agricultural uses** | | |
| **Enforceable Spray Drift Management Language** for products that allow aerial applications | Aerial Applications:<br>• Do not release spray at a height greater than 10 feet above the vegetative canopy, unless a greater application height is necessary for pilot safety.<br>• Applicators are required to select nozzle and pressure that deliver Medium or coarser droplets (ASABE S641).<br>• Do not apply when wind speeds exceed 15 mph at the application site. If the wind speed is greater than 10 mph, the boom length must be 65% or less of the wingspan for fixed wing aircraft and 75% or less of the rotor diameter for helicopters. Otherwise, the boom length must be 75% or less of the wingspan for fixed-wing aircraft and 90% or less of the rotor diameter for helicopters.<br>• If the windspeed is 10 miles per hour or less, applicators must use ½ swath displacement upwind at the downwind edge of the field. When the windspeed is between 11-15 miles per hour, applicators must use ¾ swath displacement upwind at the downwind edge of the field.<br>• Do not apply during temperature inversions. | Directions for Use, in a box titled "Mandatory Spray Drift Management" under the heading "Aerial Applications" Placement for these statements should be in general directions for use, before the use-specific directions for use. |
| **Enforceable Spray Drift Management Language** | Airblast Applications:<br>• Sprays must be directed into the canopy.<br>• Do not apply when wind speeds exceed 15 mph at the application site.<br>• User must turn off outward pointing nozzles at row ends and when spraying outer row.<br>• Do not apply during temperature inversions. | Directions for Use, in a box titled "Mandatory Spray Drift Management" under the heading "Airblast Applications" |
| **Enforceable Spray Drift Management Language** for products that allow ground boom applications | Ground Boom Applications:<br>• User must only apply with the nozzle height recommended by the manufacturer, but no more than 4 feet above the ground or crop canopy.<br>• •Applicators are required to select nozzle and pressure that deliver Medium or coarser droplets (ASABE S572).<br>• Do not apply when wind speeds exceed 15 mph at the application site.<br>• Do not apply during temperature inversions. | Directions for Use, in a box titled "Mandatory Spray Drift Management" under the heading "Ground Boom Applications" |

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| **Advisory Spray Drift Management Language** for all products that allow aerial and ground boom uses | **THE APPLICATOR IS RESPONSIBLE FOR AVOIDING OFF-SITE SPRAY DRIFT.**<br>**BE AWARE OF NEARBY NON-TARGET SITES AND ENVIRONMENTAL CONDITIONS.**<br><br>**IMPORTANCE OF DROPLET SIZE**<br>An effective way to reduce spray drift is to apply large droplets. Use the largest droplets that provide target pest control. While applying larger droplets will reduce spray drift, the potential for drift will be greater if applications are made improperly or under unfavorable environmental conditions.<br><br>Controlling Droplet Size – Ground Boom<br>• Volume - Increasing the spray volume so that larger droplets are produced will reduce spray drift. Use the highest practical spray volume for the application. If a greater spray volume is needed, consider using a nozzle with a higher flow rate.<br>• Pressure - Use the lowest spray pressure recommended for the nozzle to produce the target spray volume and droplet size.<br>• Spray Nozzle - Use a spray nozzle that is designed for the intended application. Consider using nozzles designed to reduce drift.<br><br>Controlling Droplet Size – Aircraft<br>• Adjust Nozzles - Follow nozzle manufacturers recommendations for setting up nozzles. Generally, to reduce fine droplets, nozzles should be oriented parallel with the airflow in flight.<br><br>BOOM HEIGHT – Ground Boom<br>• For ground equipment, the boom should remain level with the crop and have minimal bounce.<br><br>RELEASE HEIGHT - Aircraft<br>• Higher release heights increase the potential for spray drift.<br><br>SHIELDED SPRAYERS<br>• Shielding the boom or individual nozzles can reduce spray drift. Consider using shielded sprayers. Verify that the shields are not interfering with the uniform deposition of the spray on the target area.<br><br>TEMPERATURE AND HUMIDITY<br>• When making applications in hot and dry conditions, use larger droplets to reduce effects of evaporation.<br><br>TEMPERATURE INVERSIONS<br>• Drift potential is high during a temperature inversion. Temperature inversions are characterized by increasing temperature with altitude and are common on nights with limited cloud cover and light to no wind. The | Directions for Use, just below the Spray Drift box, under the heading "Spray Drift Advisories" |

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| | presence of an inversion can be indicated by ground fog or by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing. Avoid applications during temperature inversions.<br><br>WIND<br>• Drift potential generally increases with wind speed. AVOID APPLICATIONS DURING GUSTY WIND CONDITIONS.<br>• Applicators need to be familiar with local wind patterns and terrain that could affect spray drift.<br><br>NON-TARGET ORGANISM ADVISORY STATEMENT (Environmental Hazards):<br>• This product is highly toxic to bees and other pollinating insects exposed to direct treatment or to residues in/on blooming crops or weeds. Protect pollinating insects by following label directions intended to minimize drift and reduce pesticide risk to these organisms. | |
| **Advisory Spray Drift Management Language** for all products that allow liquid applications with handheld technologies | **"SPRAY DRIFT ADVISORIES**<br>**<u>Handheld Technology Applications:</u>**<br>• Take precautions to minimize spray drift." | Directions for Use, just below the Spray Drift box, under the heading "Spray Drift Advisories" |
| **Vegetative Filter Strips**<br><br>Note: This requirement is separate and in addition to buffer zones to aquatic areas, which are still required if a vegetated filter strip is present. | "VEGETATIVE FILTER STRIPS<br>Construct and maintain a vegetative filter strip, according to the width specified below, of grass or other permanent vegetation between the field edge and nearby down gradient aquatic habitat (such as, but not limited to, lakes; reservoirs; rivers; streams; marshes or natural ponds; estuaries; and commercial fish farm ponds).<br><br>Only apply products containing (name of pyrethroid) onto fields where a maintained vegetative filter strip of at **least 25 feet** exists between the field edge and where a down gradient aquatic habitat exists. This minimum required width of 25 feet may be reduced or removed under the following conditions:<br>• For Western irrigated agriculture, a maintained vegetative filter strip of at least 10 feet wide is required. Western irrigated agriculture is defined as irrigated farmland in the following states: WA, OR, CA, ID, NV, UT, AZ, MT, WY, CO, NM, and TX (west of I-35).<br>o For Western irrigated agriculture, if a sediment control basin is present, a vegetative filter strip is not required.<br>• In all other areas, a vegetative filter strip with a minimum width of 25 feet is required, unless the following conditions are met. The vegetative filter strip requirement may be reduced from 25 feet to 15 feet if at least one of the following applies:<br>o The area of application is considered prime farmland (as defined in 7 CFR § 657.5). | Directions for Use |

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| | ○ Conservation tillage is being implemented on the area of application. Conservation tillage is defined as any system that leaves at least 30% of the soil surface covered by residue after planting. Conservation tillage practices can include mulch-till, no-till, or strip-till.<br>○ A functional terrace system is maintained on the area of application.<br>○ Water and sediment control basins for the area of application are functional and maintained.<br>○ The area of application is less than or equal to 10 acres.<br>For further guidance on vegetated filter strips, refer to the following publication for information on constructing and maintaining effective buffers: Conservation Buffers to Reduce Pesticide Losses. Natural Resources Conservation Services. https://www regulations.gov/document?D=EPA-HQ-OPP-2008-0331-0175" | |
| **Buffer Zones to Water Bodies** | Ground Application<br>• "Do not apply within 25 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, streams, marshes, ponds, estuaries, and commercial fish ponds)."<br><br>Ultra Low Volume (ULV) Aerial Application<br>• "Do not apply within 450 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, streams, marshes, ponds, estuaries, and commercial fish ponds). Applications made by mosquito control districts and other public health officials are exempt from this requirement."<br><br>Non-ULV Aerial Application<br>• "Do not apply within 150 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, streams, marshes, ponds, estuaries, and commercial fish ponds)." | Directions for Use |
| **New text to include under Environmental Hazard statements:**<br>(For liquid products formulated for outdoor foliar applications to agricultural row crops.)<br><br>*Excludes products formulated for residential use and/or Ultra Low Volume (ULV) wide area mosquito control applications* | Update the Environmental Hazard with the bolded statement:<br><br>"This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area. **Protect pollinating insects by following label directions intended to minimize drift and to reduce risk to these organisms."** | Environmental Hazard |
| **Link to pollinator best management practices** (For liquid products formulated for outdoor foliar applications to agricultural row crops.) | "Following best management practices can help reduce risk to terrestrial pollinators. Examples of best management practices include applying pesticides in the evening and at night when pollinators are not foraging and checking to confirm hive locations before spraying. For additional resources on pollinator best management practices, visit https://www.epa.gov/pollinator-protection/find-best-management-practices-protect-pollinators." | Directions for Use, prior to crop specific directions |

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| *Excludes products formulated for residential use and/or Ultra Low Volume (ULV) wide area mosquito control applications* | | |
| **Information on state managed pollinator protection plans** (For liquid products formulated for outdoor foliar applications to agricultural row crops.)<br><br>*Excludes products formulated for residential use and/or Ultra Low Volume (ULV) wide area mosquito control applications* | "**Managed pollinator protection plans** are developed by states/tribes to promote communication between growers, landowners, farmers, beekeepers, pesticide users, and other pest management professionals to reduce exposure of bees to pesticides. If available, visit state plans for additional information on how to protect pollinators." | Directions for Use, prior to crop specific directions |
| **Information on how to report bee incidents** (For liquid products formulated for outdoor foliar applications to agricultural row crops.)<br><br>*Excludes products formulated for residential use and/or Ultra Low Volume (ULV) wide area mosquito control applications* | **"How to Report Bee Kills**<br>It is recommended that users contact both the state lead agency and the U.S. Environmental Protection Agency to report bee kills due to pesticide application. Bee kills can be reported to EPA at beekill@epa.gov. To contact your state lead agency, see the current listing of state pesticide regulatory agencies at the National Pesticide Information Center's website: http://npic.orst.edu/reg/state_agencies.html." | Directions for Use, prior to crop specific directions |

## Appendix B.2: Labeling Changes for Alpha-Cypermethrin Products

<table>
<tr><th>Description</th><th>Required Label Language for Alpha-Cypermethrin Products</th><th>Placement on Label</th></tr>
<tr><td colspan="3">All Alpha-Cypermethrin End Use Products (unless specified otherwise)</td></tr>
<tr><td>Mode of Action Group Number<br><br>Applies only to products with agricultural and/or wide-area mosquito uses</td><td>Note to registrant:<ul><li>Include the name of the ACTIVE INGREDIENT in the first column</li><li>Include the word “GROUP” in the second column</li><li>Include the MODE/MECHANISM/SITE OF ACTION CODE in the third column (for fungicides this is the FRAC Code, and for insecticides this is the Primary Site of Action; for Herbicides this is SITE OF ACTION)</li><li>Include the type of pesticide (i.e., INSECTICIDE) in the fourth column.</li></ul><table><tr><td>Alpha-Cypermethrin</td><td>GROUP</td><td>3A</td><td>INSECTICIDE</td></tr></table></td><td>Front Panel, upper right quadrant.<br>All text should be black, bold face and all caps on a white background, except the mode of action code, which should be white, bold face and all caps on a black background; all text and columns should be surrounded by a black rectangle.</td></tr>
<tr><td>Updated Gloves Statement</td><td>Update the gloves statements to be consistent with Chapter 10 of the Label Review Manual. In particular, remove reference to specific categories in EPA’s chemical-resistance category selection chart and list the appropriate chemical-resistant glove types to use.</td><td>In the Personal Protective Equipment (PPE) within the Precautionary Statements and Agricultural Use Requirements, if applicable</td></tr>
<tr><td>Updated Respirator Language</td><td>[Note to registrant: If your end-use product only requires protection from particulates only (low volatility), use the following language:]</td><td>In the Personal Protective Equipment</td></tr>
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| | "Wear a minimum of a NIOSH-approved particulate filtering facepiece respirator with any N*, R or P filter; OR a NIOSH-approved elastomeric particulate respirator with any N*, R or P filter; OR a NIOSH-approved powered air purifying respirator with HE filters."<br>*Drop the "N" option if there is oil in the product's formulation and/or the product is labeled for mixing with oil-containing products.<br><br>[**Note to registrant:** For respiratory protection from organic vapor a**nd** particulates (or aerosols), use the following language:]<br>"Wear a minimum of a NIOSH-approved elastomeric half mask respirator with organic vapor (OV) cartridges and combination N*, R, or P filters; OR a NIOSH-approved gas mask with OV canisters; OR a NIOSH-approved powered air purifying respirator with OV cartridges and combination HE filters."<br><br>[**Note to registrant:** For products requiring protection for organic vapor only, use the following language:]<br>"Wear a minimum of a NIOSH-approved elastomeric half mask respirator with organic vapor (OV) cartridges; OR a NIOSH-approved full face respirator with OV cartridges; OR a gas mask with OV canisters; OR a powered air purifying respirator with OV cartridges."<br><br>*Drop the "N" option if there is oil in the product's formulation and/or the product is labeled for mixing with oil-containing products. | (PPE) within the Precautionary Statements |
| **Resistance-management labeling statements for insecticides**<br>*Applies only to products with agricultural and/or wide-area mosquito uses* | Include resistance management label language for insecticides/acaricides from PRN 2017-1 (https://www.epa.gov/pesticide-registration/pesticide-registration-notices-year) | Directions for Use, prior to directions for specific crops |
| **Additional Required Labeling Action. Applies to all products delivered via liquid spray applications (except those with mosquito adulticide use)** | Remove information about volumetric mean diameter from all labels delivered via liquid spray application, except from products with mosquito adulticide use, where such information currently appears. | Directions for Use |
| **Directions for mixing/loading products packaged in water soluble bags** | Instructions for Introducing Water Soluble Packages Directly into Spray tanks:<br><br>"Soluble Packages (WSPs) are designed to dissolve in water. Agitation may be used, if necessary, to help dissolve the WSP. Failure to follow handling and mixing instructions can increase your exposure to the pesticide products in WSPs. WSPs, when used properly, qualify as a closed mixing/loading system under the Agricultural Worker Protection Standard [40 CFR 170.607(d)].<br><br>Handling Instructions<br>Follow these steps when handling pesticide products in WSPs. | Directions for Use |

8. Mix in spray tank only.
9. Handle the WSP in a manner that protects package from breakage and/or unintended release of contents. If package is broken, put on PPE required for clean-up and then continue with mixing instructions.
10. Keep the WSP in outer packaging until just before use.
11. Keep the WSP dry prior to adding to the spray tank.
12. Handle with dry gloves and according to the label instructions for PPE.
13. Keep the WSP intact. Do not cut or puncture the WSP.
14. Reseal the WSP outer packaging to protect any unused WSP(s).

Mixing Instructions
Follow the steps below when mixing this product, including if it is tank-mixed with other pesticide products. If being tank-mixed, the mixing directions 1 through 9 below take precedence over the mixing directions of the other tank mix products. WSPs may, in some cases, be mixed with other pesticide products so long as the directions for use of all the pesticide product components do not conflict. Do not tank-mix this product with products that prohibit tank-mixing or have conflicting mixing directions.

15. If a basket or strainer is present in the tank hatch, remove prior to adding the WSP to the tank.
16. Fill tank with water to approximately one-third to one-half of the desired final volume of spray.
17. Stop adding water and stop any agitation.
18. Place intact/unopened WSP into the tank.
19. Do not spray water from a hose or fill pipe to break or dissolve the WSP.
20. Start mechanical and recirculation agitation from the bottom of tank without using any overhead recirculation, if possible. If overhead recirculation cannot be turned off, close the hatch before starting agitation.
21. Dissolving the WSP may take up to 5 minutes or longer, depending on water temperature, water hardness and intensity of agitation.
22. Stop agitation before tank lid is opened.
23. Open the lid to the tank, exercising caution to avoid contact with dusts or spray mix, to verify that the WSP has fully dissolved and the contents have been thoroughly mixed into the solution.
24. Do not add other allowed products or complete filling the tank until the bags have fully dissolved and pesticide is thoroughly mixed.
25. Once the WSP has fully dissolved and any other products have been added to the tank, resume filling the tank with water to the desired level, close the tank lid, and resume agitation.
26. Use the spray solution when mixing is complete.
27. Maintain agitation of the diluted pesticide mix during transport and application.
28. It is unlawful to use any registered pesticide, including WSPs, in a manner inconsistent with its label."

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| | For Toxicity Category I and II products:<br><br>"ENGINEERING CONTROLS STATEMENT<br>Water soluble packets, when used correctly, qualify as a closed mixing/loading system under the Worker Protection Standard [40 CFR 170.607(d)]. Mixers and loaders handling this product while it is enclosed in intact water soluble packets may elect to wear reduced PPE of long-sleeved shirt, long pants, shoes, socks, a chemical-resistant apron, and chemical-resistant gloves. When reduced PPE is worn because a closed system is being used, handlers must be provided all PPE specified above for "applicators and other handlers" and have such PPE immediately available for use in an emergency, such as a spill or equipment break-down."<br><br>For Toxicity Category III and IV products:<br><br>"ENGINEERING CONTROLS STATEMENT<br>Water soluble packets, when used correctly, qualify as a closed mixing/loading system under the Worker Protection Standard [40 CFR 170.607(d)]. Mixers and loaders handling this product while it is enclosed in intact water soluble packets may elect to wear reduced PPE of long-sleeved shirt, long pants, shoes, socks. When reduced PPE is worn because a closed system is being used, handlers must be provided all PPE specified above for "applicators and other handlers" and have such PPE immediately available for use in an emergency, such as a spill or equipment break-down." | |
| **Alpha-cypermethrin end-use products with indoor residential uses** | | |
| **For all products that have indoor uses only** | Add the following language:<br><br>"For indoor use only." | Front Label Panel and/or Directions for Use |
| **For all products that have both indoor and outdoor uses** | Add the following language:<br><br>"For both indoor and outdoor use." | Front Label Panel and/or Directions for Use |
| **For all products used on pets** | Add the following language:<br><br>"Application of product on pets must only be done indoors." | Directions for Use |
| **Required disposal statement for products not labeled for use directly into drains and sewers.** | "Do not pour or dispose down-the-drain or sewer. Call your local solid waste agency for local disposal options." | Storage and Disposal |
| **Stewardship statement that includes a Spanish translation** | Note to registrants: If adding stewardship statements on end-use consumer products, the followings language is required and placed in a prominent location: | Directions for Use |

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| **(Stewardship statement not required for products applied to pets)** | For products without drain treatment uses:<br>"Do not allow to enter indoor or outdoor drains"<br>*"No permita la entrada a desagües internos o externos."*<br><br>For products with drain treatment uses:<br>"Do not allow to enter indoor or outdoor drains unless labeled for drain treatments."<br>*"No permita la entrada a desagües internos o externos a menos que el etiquetado indique que está permitido el uso del producto para tratamiento de desagües."*<br><br>For products with and without drain treatment uses:<br>"Follow proper disposal procedures on this label"<br>*"Siga las indicaciones del etiquetado para el desecho apropiado del producto."*<br><br>Graphic on the product package showing an image of a diagonal strikethrough over a drain. The pictogram must be legible (*i.e.* no smaller than 1.5 square centimeters or 0.25 square inches unless this size is greater than 10% of the size of the label).<br><br>**Use the following pictogram on product labels:**<br>  | |
| **Alpha-cypermethrin end-use products with outdoor, urban, non-agricultural uses** | | |
| **For all products that have outdoor uses only** | Add the following language:<br><br>"For outdoor use only." | Front Label Panel and/or Directions for Use |
| **For all products that have both indoor and outdoor uses** | Add the following language:<br><br>"For both indoor and outdoor use." | Front Label Panel and/or Directions for Use |
| **General Outdoor Application Statement to replace existing general outdoor statement** | "All outdoor spray applications must be limited to spot or crack-and-crevice treatments only, except for the following permitted uses:<br><br>1. Application to pervious surfaces such as soil, lawn, turf, and other vegetation; | Directions for Use |

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| **Application Restrictions for Residential Outdoor Surface and Space Sprays; excludes outdoor fogging devices**<br><br>**[Registrants may not add new uses from items 1-6 which are not currently on the existing label. Registrants are required to choose only the uses from items 1-6 which apply to their product.]** | 2. Perimeter band treatments of 7 feet wide or less from the base of a man-made structure to pervious surfaces (*e.g.*, soil, mulch, or lawn);<br><br>3. Applications to underside of eaves, soffits, doors, or windows permanently protected from rainfall by a covering, overhang, awning, or other structure;<br><br>4. Applications around potential exterior pest entry points into man-made structures such as doorways and windows, when limited to a band not to exceed one inch;<br><br>5. Applications to vertical surfaces (such as the side of a man-made structure) directly above impervious surfaces (e.g., driveways, sidewalks, etc.), up to 2 feet above ground level;<br><br>6. Applications to vertical surfaces directly above pervious surfaces, such as soil, lawn, turf, mulch or other vegetation) only if the pervious surface does not drain into ditches, storm drains, gutters, or surface waters." | |
| **Spot Treatment Guidance Statement** | "Spot treatments must not exceed two square feet in size (for example, 2 ft. by 1 ft. or 4 ft. by 0.5 ft.)." | Directions for Use |
| **Buffer from Water Statement for granular and liquid formulations.** | "For soil or foliar applications, do not apply by ground within 25 feet of lakes, reservoirs, rivers, permanent streams, marshes or natural ponds, estuaries and commercial fish farm ponds." | Directions for Use |
| **Water Protection Statements for granular and liquid formulations.** | "Do not apply the product into fish pools, ponds, streams, or lakes. Do not apply directly to sewers or storm drains, or to any area like a drain or gutter where drainage to sewers, storm drains, water bodies, or aquatic habitat can occur."<br><br>"Do not allow the product to enter any drain during or after application."<br><br>"Do not apply directly to impervious horizontal surfaces such as sidewalks, driveways, and patios except as a spot or crack-and-crevice treatment."<br><br>"Do not apply or irrigate to the point of runoff." | Directions for Use |
| **Rain-Related Statements (except for products that require watering-in)** | "Do not make applications during rain. Avoid making applications when rainfall is expected before the product has sufficient time to dry (minimum 4 hours)."<br><br>"Rainfall within 24 hours after application may cause unintended runoff of pesticide application." | Directions for Use |
| **Wind speed requirement for ornamental/ recreational turf applications for granular and liquid formulations** | "Do not apply when the wind speed is greater than 15 mph." | Directions for Use |
| **Spray drift management for commercial nurseries** | For outdoor applications to commercial nurseries:<br>• "Do not apply when the wind speed is greater than 15 mph." | Directions for Use |

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| | • "Applicators are required to select the nozzle and pressure that deliver a Medium or coarser droplet size (ASABE S572)"<br>• "For soil or foliar applications, do not apply by ground equipment within 25 feet of lakes, reservoirs, rivers, permanent streams, marshes or natural ponds, estuaries and commercial fish farm ponds." | |
| **Crack-and-crevice treatments** | • "Treat surfaces to ensure thorough coverage but avoid runoff."<br><br>"To treat insects harbored in voids and cracks-and-crevices, applications must be made in such a manner to limit dripping and avoid runoff onto untreated structural surfaces and plants." | Directions for Use |
| **Alpha-cypermethrin end-use products with agricultural uses** | | |
| **Enforceable Spray Drift Management Language** for products that allow aerial applications | Aerial Applications:<br>• Do not release spray at a height greater than 10 feet above the vegetative canopy, unless a greater application height is necessary for pilot safety.<br>• Applicators are required to select nozzle and pressure that deliver Medium or coarser droplets (ASABE S641).<br>• Do not apply when wind speeds exceed 15 mph at the application site. If the wind speed is greater than 10 mph, the boom length must be 65% or less of the wingspan for fixed wing aircraft and 75% or less of the rotor diameter for helicopters. Otherwise, the boom length must be 75% or less of the wingspan for fixed-wing aircraft and 90% or less of the rotor diameter for helicopters.<br>• If the windspeed is 10 miles per hour or less, applicators must use ½ swath displacement upwind at the downwind edge of the field. When the windspeed is between 11-15 miles per hour, applicators must use ¾ swath displacement upwind at the downwind edge of the field.<br>• Do not apply during temperature inversions. | Directions for Use, in a box titled "Mandatory Spray Drift Management" under the heading "Aerial Applications" Placement for these statements should be in general directions for use, before the use-specific directions for use. |
| **Enforceable Spray Drift Management Language** | Airblast Applications:<br>• Sprays must be directed into the canopy.<br>• Do not apply when wind speeds exceed 15 mph at the application site.<br>• User must turn off outward pointing nozzles at row ends and when spraying outer row.<br>• Do not apply during temperature inversions. | Directions for Use, in a box titled "Mandatory Spray Drift Management" under the heading "Airblast Applications" |
| **Enforceable Spray Drift Management Language** for products that allow ground boom applications | Ground Boom Applications:<br>• User must only apply with the nozzle height recommended by the manufacturer, but no more than 4 feet above the ground or crop canopy.<br>• •Applicators are required to select nozzle and pressure that deliver Medium or coarser droplets (ASABE S572).<br>• Do not apply when wind speeds exceed 15 mph at the application site.<br>• Do not apply during temperature inversions. | Directions for Use, in a box titled "Mandatory Spray Drift Management" under the heading "Ground Boom Applications" |

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| **Advisory Spray Drift Management Language** for all products that allow aerial and ground boom uses | **THE APPLICATOR IS RESPONSIBLE FOR AVOIDING OFF-SITE SPRAY DRIFT. BE AWARE OF NEARBY NON-TARGET SITES AND ENVIRONMENTAL CONDITIONS.**<br><br>**IMPORTANCE OF DROPLET SIZE**<br>An effective way to reduce spray drift is to apply large droplets. Use the largest droplets that provide target pest control. While applying larger droplets will reduce spray drift, the potential for drift will be greater if applications are made improperly or under unfavorable environmental conditions.<br><br>Controlling Droplet Size – Ground Boom<br>• Volume - Increasing the spray volume so that larger droplets are produced will reduce spray drift. Use the highest practical spray volume for the application. If a greater spray volume is needed, consider using a nozzle with a higher flow rate.<br>• Pressure - Use the lowest spray pressure recommended for the nozzle to produce the target spray volume and droplet size.<br>• Spray Nozzle - Use a spray nozzle that is designed for the intended application. Consider using nozzles designed to reduce drift.<br><br>Controlling Droplet Size – Aircraft<br>• Adjust Nozzles - Follow nozzle manufacturers recommendations for setting up nozzles. Generally, to reduce fine droplets, nozzles should be oriented parallel with the airflow in flight.<br><br>BOOM HEIGHT – Ground Boom<br>• For ground equipment, the boom should remain level with the crop and have minimal bounce.<br><br>RELEASE HEIGHT - Aircraft<br>• Higher release heights increase the potential for spray drift.<br><br>SHIELDED SPRAYERS<br>• Shielding the boom or individual nozzles can reduce spray drift. Consider using shielded sprayers. Verify that the shields are not interfering with the uniform deposition of the spray on the target area.<br><br>TEMPERATURE AND HUMIDITY<br>• When making applications in hot and dry conditions, use larger droplets to reduce effects of evaporation.<br><br>TEMPERATURE INVERSIONS<br>• Drift potential is high during a temperature inversion. Temperature inversions are characterized by increasing temperature with altitude and are common on nights with limited cloud cover and light to no wind. The | Directions for Use, just below the Spray Drift box, under the heading "Spray Drift Advisories" |

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| | presence of an inversion can be indicated by ground fog or by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing. Avoid applications during temperature inversions.<br><br>WIND<br>• Drift potential generally increases with wind speed. AVOID APPLICATIONS DURING GUSTY WIND CONDITIONS.<br>• Applicators need to be familiar with local wind patterns and terrain that could affect spray drift.<br><br>NON-TARGET ORGANISM ADVISORY STATEMENT (Environmental Hazards):<br>• This product is highly toxic to bees and other pollinating insects exposed to direct treatment or to residues in/on blooming crops or weeds. Protect pollinating insects by following label directions intended to minimize drift and reduce pesticide risk to these organisms. | |
| **Advisory Spray Drift Management Language** for all products that allow liquid applications with handheld technologies | **"SPRAY DRIFT ADVISORIES**<br>**<u>Handheld Technology Applications:</u>**<br>• Take precautions to minimize spray drift." | Directions for Use, just below the Spray Drift box, under the heading "Spray Drift Advisories" |
| **Vegetative Filter Strips**<br><br>**This does not apply to use on rice.**<br><br>Note: This requirement is separate and in addition to buffer zones to aquatic areas, which are still required if a vegetated filter strip is present. | "VEGETATIVE FILTER STRIPS<br>Construct and maintain a vegetative filter strip, according to the width specified below, of grass or other permanent vegetation between the field edge and nearby down gradient aquatic habitat (such as, but not limited to, lakes; reservoirs; rivers; streams; marshes or natural ponds; estuaries; and commercial fish farm ponds).<br><br>Only apply products containing (name of pyrethroid) onto fields where a maintained vegetative filter strip of at **least 25 feet** exists between the field edge and where a down gradient aquatic habitat exists. This minimum required width of 25 feet may be reduced or removed under the following conditions:<br>• For Western irrigated agriculture, a maintained vegetative filter strip of at least 10 feet wide is required. Western irrigated agriculture is defined as irrigated farmland in the following states: WA, OR, CA, ID, NV, UT, AZ, MT, WY, CO, NM, and TX (west of I-35).<br>o For Western irrigated agriculture, if a sediment control basin is present, a vegetative filter strip is not required.<br>• In all other areas, a vegetative filter strip with a minimum width of 25 feet is required, unless the following conditions are met. The vegetative filter strip requirement may be reduced from 25 feet to 15 feet if at least one of the following applies:<br>o The area of application is considered prime farmland (as defined in 7 CFR § 657.5). | Directions for Use |

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| | ○ Conservation tillage is being implemented on the area of application. Conservation tillage is defined as any system that leaves at least 30% of the soil surface covered by residue after planting. Conservation tillage practices can include mulch-till, no-till, or strip-till.<br>○ A functional terrace system is maintained on the area of application.<br>○ Water and sediment control basins for the area of application are functional and maintained.<br>○ The area of application is less than or equal to 10 acres.<br><br>**Rice fields are not required to have a vegetative filter strip.**<br><br>For further guidance on vegetated filter strips, refer to the following publication for information on constructing and maintaining effective buffers: Conservation Buffers to Reduce Pesticide Losses. Natural Resources Conservation Services. https://www regulations.gov/document?D=EPA-HQ-OPP-2008-0331-0175" | |
| **Buffer Zones to Water Bodies** | Ground Application<br>• "Do not apply within 25 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, streams, marshes, ponds, estuaries, and commercial fish ponds)."<br><br>Ultra Low Volume (ULV) Aerial Application<br>• "Do not apply within 450 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, streams, marshes, ponds, estuaries, and commercial fish ponds). Applications made by mosquito control districts and other public health officials are exempt from this requirement."<br><br>Non-ULV Aerial Application<br>• "Do not apply within 150 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, streams, marshes, ponds, estuaries, and commercial fish ponds)." | Directions for Use |
| **New text to include under Environmental Hazard statements:**<br>(For liquid products formulated for outdoor foliar applications to agricultural row crops.)<br><br>*Excludes products formulated for residential use and/or Ultra Low Volume (ULV) wide area mosquito control applications* | Update the Environmental Hazard with the bolded statement:<br><br>"This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area. **Protect pollinating insects by following label directions intended to minimize drift and to reduce risk to these organisms."** | Environmental Hazard |
| **Link to pollinator best management practices** (For liquid products formulated for | "Following best management practices can help reduce risk to terrestrial pollinators. Examples of best management practices include applying pesticides in the evening and at night when pollinators are not foraging and checking to confirm hive locations before spraying. For additional resources on pollinator best management practices, visit https://www.epa.gov/pollinator-protection/find-best-management-practices-protect-pollinators." | Directions for Use, prior to crop specific directions |

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| outdoor foliar applications to agricultural row crops.)<br><br>*Excludes products formulated for residential use and/or Ultra Low Volume (ULV) wide area mosquito control applications* | | |
| **Information on state managed pollinator protection plans** (For liquid products formulated for outdoor foliar applications to agricultural row crops.)<br><br>*Excludes products formulated for residential use and/or Ultra Low Volume (ULV) wide area mosquito control applications* | "**Managed pollinator protection plans** are developed by states/tribes to promote communication between growers, landowners, farmers, beekeepers, pesticide users, and other pest management professionals to reduce exposure of bees to pesticides. If available, visit state plans for additional information on how to protect pollinators." | Directions for Use, prior to crop specific directions |
| **Information on how to report bee incidents** (For liquid products formulated for outdoor foliar applications to agricultural row crops.)<br><br>*Excludes products formulated for residential use and/or Ultra Low Volume (ULV) wide area mosquito control applications* | **"How to Report Bee Kills**<br>It is recommended that users contact both the state lead agency and the U.S. Environmental Protection Agency to report bee kills due to pesticide application. Bee kills can be reported to EPA at beekill@epa.gov. To contact your state lead agency, see the current listing of state pesticide regulatory agencies at the National Pesticide Information Center's website: http://npic.orst.edu/reg/state_agencies.html." | Directions for Use, prior to crop specific directions |

## Appendix B.3: Labeling Changes for Zeta-Cypermethrin Products

<table>
<tr><th>Description</th><th>Required Label Language for Zeta-Cypermethrin Products</th><th>Placement on Label</th></tr>
<tr><td colspan="3">All Zeta-Cypermethrin End Use Products (unless specified otherwise)</td></tr>
<tr><td>Mode of Action Group Number<br><br>Applies only to products with agricultural and/or wide-area mosquito uses</td><td>Note to registrant:<br>• Include the name of the ACTIVE INGREDIENT in the first column<br>• Include the word “GROUP” in the second column<br>• Include the MODE/MECHANISM/SITE OF ACTION CODE in the third column (for fungicides this is the FRAC Code, and for insecticides this is the Primary Site of Action; for Herbicides this is SITE OF ACTION)<br>• Include the type of pesticide (i.e., INSECTICIDE) in the fourth column.<br><br>Zeta-Cypermethrin | GROUP | 3A | INSECTICIDE</td><td>Front Panel, upper right quadrant.<br>All text should be black, bold face and all caps on a white background, except the mode of action code, which should be white, bold face and all caps on a black background; all text and columns should be surrounded by a black rectangle.</td></tr>
<tr><td>Updated Gloves Statement</td><td>Update the gloves statements to be consistent with Chapter 10 of the Label Review Manual. In particular, remove reference to specific categories in EPA’s chemical-resistance category selection chart and list the appropriate chemical-resistant glove types to use.</td><td>In the Personal Protective Equipment (PPE) within the Precautionary Statements and Agricultural Use Requirements, if applicable</td></tr>
<tr><td>Updated Respirator Language</td><td>[Note to registrant: If your end-use product only requires protection from particulates only (low volatility), use the following language:]</td><td>In the Personal Protective Equipment</td></tr>
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| | "Wear a minimum of a NIOSH-approved particulate filtering facepiece respirator with any N*, R or P filter; OR a NIOSH-approved elastomeric particulate respirator with any N*, R or P filter; OR a NIOSH-approved powered air purifying respirator with HE filters."<br>*Drop the "N" option if there is oil in the product's formulation and/or the product is labeled for mixing with oil-containing products.<br><br>[**Note to registrant:** For respiratory protection from organic vapor a**nd** particulates (or aerosols), use the following language:]<br>"Wear a minimum of a NIOSH-approved elastomeric half mask respirator with organic vapor (OV) cartridges and combination N*, R, or P filters; OR a NIOSH-approved gas mask with OV canisters; OR a NIOSH-approved powered air purifying respirator with OV cartridges and combination HE filters."<br><br>[**Note to registrant:** For products requiring protection for organic vapor only, use the following language:]<br>"Wear a minimum of a NIOSH-approved elastomeric half mask respirator with organic vapor (OV) cartridges; OR a NIOSH-approved full face respirator with OV cartridges; OR a gas mask with OV canisters; OR a powered air purifying respirator with OV cartridges."<br><br>*Drop the "N" option if there is oil in the product's formulation and/or the product is labeled for mixing with oil-containing products. | (PPE) within the Precautionary Statements |
| **Resistance-management labeling statements for insecticides**<br>*Applies only to products with agricultural and/or wide-area mosquito uses* | Include resistance management label language for insecticides/acaricides from PRN 2017-1 (https://www.epa.gov/pesticide-registration/pesticide-registration-notices-year) | Directions for Use, prior to directions for specific crops |
| **Additional Required Labeling Action. Applies to all products delivered via liquid spray applications (except those with mosquito adulticide use)** | Remove information about volumetric mean diameter from all labels delivered via liquid spray application, except from products with mosquito adulticide use, where such information currently appears. | Directions for Use |
| **Directions for mixing/loading products packaged in water soluble bags** | Instructions for Introducing Water Soluble Packages Directly into Spray tanks:<br><br>"Soluble Packages (WSPs) are designed to dissolve in water. Agitation may be used, if necessary, to help dissolve the WSP. Failure to follow handling and mixing instructions can increase your exposure to the pesticide products in WSPs. WSPs, when used properly, qualify as a closed mixing/loading system under the Agricultural Worker Protection Standard [40 CFR 170.607(d)].<br><br>Handling Instructions<br>Follow these steps when handling pesticide products in WSPs. | Directions for Use |

15. Mix in spray tank only.
16. Handle the WSP in a manner that protects package from breakage and/or unintended release of contents. If package is broken, put on PPE required for clean-up and then continue with mixing instructions.
17. Keep the WSP in outer packaging until just before use.
18. Keep the WSP dry prior to adding to the spray tank.
19. Handle with dry gloves and according to the label instructions for PPE.
20. Keep the WSP intact. Do not cut or puncture the WSP.
21. Reseal the WSP outer packaging to protect any unused WSP(s).

Mixing Instructions
Follow the steps below when mixing this product, including if it is tank-mixed with other pesticide products. If being tank-mixed, the mixing directions 1 through 9 below take precedence over the mixing directions of the other tank mix products. WSPs may, in some cases, be mixed with other pesticide products so long as the directions for use of all the pesticide product components do not conflict. Do not tank-mix this product with products that prohibit tank-mixing or have conflicting mixing directions.

29. If a basket or strainer is present in the tank hatch, remove prior to adding the WSP to the tank.
30. Fill tank with water to approximately one-third to one-half of the desired final volume of spray.
31. Stop adding water and stop any agitation.
32. Place intact/unopened WSP into the tank.
33. Do not spray water from a hose or fill pipe to break or dissolve the WSP.
34. Start mechanical and recirculation agitation from the bottom of tank without using any overhead recirculation, if possible. If overhead recirculation cannot be turned off, close the hatch before starting agitation.
35. Dissolving the WSP may take up to 5 minutes or longer, depending on water temperature, water hardness and intensity of agitation.
36. Stop agitation before tank lid is opened.
37. Open the lid to the tank, exercising caution to avoid contact with dusts or spray mix, to verify that the WSP has fully dissolved and the contents have been thoroughly mixed into the solution.
38. Do not add other allowed products or complete filling the tank until the bags have fully dissolved and pesticide is thoroughly mixed.
39. Once the WSP has fully dissolved and any other products have been added to the tank, resume filling the tank with water to the desired level, close the tank lid, and resume agitation.
40. Use the spray solution when mixing is complete.
41. Maintain agitation of the diluted pesticide mix during transport and application.
42. It is unlawful to use any registered pesticide, including WSPs, in a manner inconsistent with its label."

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| | For Toxicity Category I and II products:<br><br>"ENGINEERING CONTROLS STATEMENT<br>Water soluble packets, when used correctly, qualify as a closed mixing/loading system under the Worker Protection Standard [40 CFR 170.607(d)]. Mixers and loaders handling this product while it is enclosed in intact water soluble packets may elect to wear reduced PPE of long-sleeved shirt, long pants, shoes, socks, a chemical-resistant apron, and chemical-resistant gloves. When reduced PPE is worn because a closed system is being used, handlers must be provided all PPE specified above for "applicators and other handlers" and have such PPE immediately available for use in an emergency, such as a spill or equipment break-down."<br><br>For Toxicity Category III and IV products:<br><br>"ENGINEERING CONTROLS STATEMENT<br>Water soluble packets, when used correctly, qualify as a closed mixing/loading system under the Worker Protection Standard [40 CFR 170.607(d)]. Mixers and loaders handling this product while it is enclosed in intact water soluble packets may elect to wear reduced PPE of long-sleeved shirt, long pants, shoes, socks. When reduced PPE is worn because a closed system is being used, handlers must be provided all PPE specified above for "applicators and other handlers" and have such PPE immediately available for use in an emergency, such as a spill or equipment break-down." | |
| **Zeta-cypermethrin end-use products with indoor residential uses** | | |
| **For all products that have indoor uses only** | Add the following language:<br><br>"For indoor use only." | Front Label Panel and/or Directions for Use |
| **For all products that have both indoor and outdoor uses** | Add the following language:<br><br>"For both indoor and outdoor use." | Front Label Panel and/or Directions for Use |
| **For all products used on pets** | Add the following language:<br><br>"Application of product on pets must only be done indoors." | Directions for Use |
| **Required disposal statement for products not labeled for use directly into drains and sewers.** | "Do not pour or dispose down-the-drain or sewer. Call your local solid waste agency for local disposal options." | Storage and Disposal |
| **Stewardship statement that includes a Spanish translation** | Note to registrants: If adding stewardship statements on end-use consumer products, the followings language is required and placed in a prominent location: | Directions for Use |

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| **(Stewardship statement not required for products applied to pets)** | For products without drain treatment uses:<br>"Do not allow to enter indoor or outdoor drains"<br>*"No permita la entrada a desagües internos o externos."*<br><br>For products with drain treatment uses:<br>"Do not allow to enter indoor or outdoor drains unless labeled for drain treatments."<br>*"No permita la entrada a desagües internos o externos a menos que el etiquetado indique que está permitido el uso del producto para tratamiento de desagües."*<br><br>For products with and without drain treatment uses:<br>"Follow proper disposal procedures on this label"<br>*"Siga las indicaciones del etiquetado para el desecho apropiado del producto."*<br><br>Graphic on the product package showing an image of a diagonal strikethrough over a drain. The pictogram must be legible (*i.e.* no smaller than 1.5 square centimeters or 0.25 square inches unless this size is greater than 10% of the size of the label).<br><br>**Use the following pictogram on product labels:**<br>  | |
| **Zeta-cypermethrin end-use products with outdoor, urban, non-agricultural uses** | | |
| **For all products that have outdoor uses only** | Add the following language:<br><br>"For outdoor use only." | Front Label Panel and/or Directions for Use |
| **For all products that have both indoor and outdoor uses** | Add the following language:<br><br>"For both indoor and outdoor use." | Front Label Panel and/or Directions for Use |
| **General Outdoor Application Statement to replace existing general outdoor statement** | "All outdoor spray applications must be limited to spot or crack-and-crevice treatments only, except for the following permitted uses:<br><br>1. Application to pervious surfaces such as soil, lawn, turf, and other vegetation; | Directions for Use |

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| **Application Restrictions for Residential Outdoor Surface and Space Sprays; excludesoutdoor fogging devices**<br><br>**[Registrants may not add new uses from items 1-6 which are not currently on the existing label. Registrants are required to choose only the uses from items 1-6 which apply to their product.]** | 2. Perimeter band treatments of 7 feet wide or less from the base of a man-made structure to pervious surfaces (*e.g.*, soil, mulch, or lawn);<br><br>3. Applications to underside of eaves, soffits, doors, or windows permanently protected from rainfall by a covering, overhang, awning, or other structure;<br><br>4. Applications around potential exterior pest entry points into man-made structures such as doorways and windows, when limited to a band not to exceed one inch;<br><br>5. Applications to vertical surfaces (such as the side of a man-made structure) directly above impervious surfaces (e.g., driveways, sidewalks, etc.), up to 2 feet above ground level;<br><br>6. Applications to vertical surfaces directly above pervious surfaces, such as soil, lawn, turf, mulch or other vegetation) only if the pervious surface does not drain into ditches, storm drains, gutters, or surface waters." | |
| **Spot Treatment Guidance Statement** | "Spot treatments must not exceed two square feet in size (for example, 2 ft. by 1 ft. or 4 ft. by 0.5 ft.)." | Directions for Use |
| **Buffer from Water Statement for granular and liquid formulations.** | "For soil or foliar applications, do not apply by ground within 25 feet of lakes, reservoirs, rivers, permanent streams, marshes or natural ponds, estuaries and commercial fish farm ponds." | Directions for Use |
| **Water Protection Statements for granular and liquid formulations.** | "Do not apply the product into fish pools, ponds, streams, or lakes. Do not apply directly to sewers or storm drains, or to any area like a drain or gutter where drainage to sewers, storm drains, water bodies, or aquatic habitat can occur."<br><br>"Do not allow the product to enter any drain during or after application."<br><br>"Do not apply directly to impervious horizontal surfaces such as sidewalks, driveways, and patios except as a spot or crack-and-crevice treatment."<br><br>"Do not apply or irrigate to the point of runoff." | Directions for Use |
| **Rain-Related Statements (except for products that require watering-in)** | "Do not make applications during rain. Avoid making applications when rainfall is expected before the product has sufficient time to dry (minimum 4 hours)."<br><br>"Rainfall within 24 hours after application may cause unintended runoff of pesticide application." | Directions for Use |
| **Wind speed requirement for ornamental/ recreational turf applications for granular and liquid formulations** | "Do not apply when the wind speed is greater than 15 mph." | Directions for Use |
| **Spray drift management for commercial nurseries** | For outdoor applications to commercial nurseries:<br>• "Do not apply when the wind speed is greater than 15 mph." | Directions for Use |

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| | • "Applicators are required to select the nozzle and pressure that deliver a Medium or coarser droplet size (ASABE S572)"<br>• "For soil or foliar applications, do not apply by ground equipment within 25 feet of lakes, reservoirs, rivers, permanent streams, marshes or natural ponds, estuaries and commercial fish farm ponds." | |
| **Crack-and-crevice treatments** | • "Treat surfaces to ensure thorough coverage but avoid runoff."<br><br>"To treat insects harbored in voids and cracks-and-crevices, applications must be made in such a manner to limit dripping and avoid runoff onto untreated structural surfaces and plants." | Directions for Use |
| **Zeta-cypermethrin end-use products with agricultural uses** | | |
| **Enforceable Spray Drift Management Language** for products that allow aerial applications | Aerial Applications:<br>• Do not release spray at a height greater than 10 feet above the vegetative canopy, unless a greater application height is necessary for pilot safety.<br>• Applicators are required to select nozzle and pressure that deliver Medium or coarser droplets (ASABE S641).<br>• Do not apply when wind speeds exceed 15 mph at the application site. If the wind speed is greater than 10 mph, the boom length must be 65% or less of the wingspan for fixed wing aircraft and 75% or less of the rotor diameter for helicopters. Otherwise, the boom length must be 75% or less of the wingspan for fixed-wing aircraft and 90% or less of the rotor diameter for helicopters.<br>• If the windspeed is 10 miles per hour or less, applicators must use ½ swath displacement upwind at the downwind edge of the field. When the windspeed is between 11-15 miles per hour, applicators must use ¾ swath displacement upwind at the downwind edge of the field.<br>• Do not apply during temperature inversions. | Directions for Use, in a box titled "Mandatory Spray Drift Management" under the heading "Aerial Applications" Placement for these statements should be in general directions for use, before the use-specific directions for use. |
| **Enforceable Spray Drift Management Language** | Airblast Applications:<br>• Sprays must be directed into the canopy.<br>• Do not apply when wind speeds exceed 15 mph at the application site.<br>• User must turn off outward pointing nozzles at row ends and when spraying outer row.<br>• Do not apply during temperature inversions. | Directions for Use, in a box titled "Mandatory Spray Drift Management" under the heading "Airblast Applications" |
| **Enforceable Spray Drift Management Language** for products that allow ground boom applications | Ground Boom Applications:<br>• User must only apply with the nozzle height recommended by the manufacturer, but no more than 4 feet above the ground or crop canopy.<br>• •Applicators are required to select nozzle and pressure that deliver Medium or coarser droplets (ASABE S572).<br>• Do not apply when wind speeds exceed 15 mph at the application site.<br>• Do not apply during temperature inversions. | Directions for Use, in a box titled "Mandatory Spray Drift Management" under the heading "Ground Boom Applications" |

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| **Advisory Spray Drift Management Language** for all products that allow aerial and ground boom uses | **THE APPLICATOR IS RESPONSIBLE FOR AVOIDING OFF-SITE SPRAY DRIFT. BE AWARE OF NEARBY NON-TARGET SITES AND ENVIRONMENTAL CONDITIONS.**<br><br>**IMPORTANCE OF DROPLET SIZE**<br>An effective way to reduce spray drift is to apply large droplets. Use the largest droplets that provide target pest control. While applying larger droplets will reduce spray drift, the potential for drift will be greater if applications are made improperly or under unfavorable environmental conditions.<br><br>Controlling Droplet Size – Ground Boom<br>• Volume - Increasing the spray volume so that larger droplets are produced will reduce spray drift. Use the highest practical spray volume for the application. If a greater spray volume is needed, consider using a nozzle with a higher flow rate.<br>• Pressure - Use the lowest spray pressure recommended for the nozzle to produce the target spray volume and droplet size.<br>• Spray Nozzle - Use a spray nozzle that is designed for the intended application. Consider using nozzles designed to reduce drift.<br><br>Controlling Droplet Size – Aircraft<br>• Adjust Nozzles - Follow nozzle manufacturers recommendations for setting up nozzles. Generally, to reduce fine droplets, nozzles should be oriented parallel with the airflow in flight.<br><br>BOOM HEIGHT – Ground Boom<br>• For ground equipment, the boom should remain level with the crop and have minimal bounce.<br><br>RELEASE HEIGHT - Aircraft<br>• Higher release heights increase the potential for spray drift.<br><br>SHIELDED SPRAYERS<br>• Shielding the boom or individual nozzles can reduce spray drift. Consider using shielded sprayers. Verify that the shields are not interfering with the uniform deposition of the spray on the target area.<br><br>TEMPERATURE AND HUMIDITY<br>• When making applications in hot and dry conditions, use larger droplets to reduce effects of evaporation.<br><br>TEMPERATURE INVERSIONS<br>• Drift potential is high during a temperature inversion. Temperature inversions are characterized by increasing temperature with altitude and are common on nights with limited cloud cover and light to no wind. The | Directions for Use, just below the Spray Drift box, under the heading "Spray Drift Advisories" |

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| | presence of an inversion can be indicated by ground fog or by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing. Avoid applications during temperature inversions.<br><br>WIND<br>• Drift potential generally increases with wind speed. AVOID APPLICATIONS DURING GUSTY WIND CONDITIONS.<br>• Applicators need to be familiar with local wind patterns and terrain that could affect spray drift.<br><br>NON-TARGET ORGANISM ADVISORY STATEMENT (Environmental Hazards):<br>• This product is highly toxic to bees and other pollinating insects exposed to direct treatment or to residues in/on blooming crops or weeds. Protect pollinating insects by following label directions intended to minimize drift and reduce pesticide risk to these organisms. | |
| **Advisory Spray Drift Management Language** for all products that allow liquid applications with handheld technologies | **"SPRAY DRIFT ADVISORIES**<br>**<u>Handheld Technology Applications:</u>**<br>• Take precautions to minimize spray drift." | Directions for Use, just below the Spray Drift box, under the heading "Spray Drift Advisories" |
| **Vegetative Filter Strips**<br><br>**This does not apply to use on rice.**<br><br>Note: This requirement is separate and in addition to buffer zones to aquatic areas, which are still required if a vegetated filter strip is present. | "VEGETATIVE FILTER STRIPS<br>Construct and maintain a vegetative filter strip, according to the width specified below, of grass or other permanent vegetation between the field edge and nearby down gradient aquatic habitat (such as, but not limited to, lakes; reservoirs; rivers; streams; marshes or natural ponds; estuaries; and commercial fish farm ponds).<br><br>Only apply products containing (name of pyrethroid) onto fields where a maintained vegetative filter strip of at **least 25 feet** exists between the field edge and where a down gradient aquatic habitat exists. This minimum required width of 25 feet may be reduced or removed under the following conditions:<br>• For Western irrigated agriculture, a maintained vegetative filter strip of at least 10 feet wide is required. Western irrigated agriculture is defined as irrigated farmland in the following states: WA, OR, CA, ID, NV, UT, AZ, MT, WY, CO, NM, and TX (west of I-35).<br>o For Western irrigated agriculture, if a sediment control basin is present, a vegetative filter strip is not required.<br>• In all other areas, a vegetative filter strip with a minimum width of 25 feet is required, unless the following conditions are met. The vegetative filter strip requirement may be reduced from 25 feet to 15 feet if at least one of the following applies:<br>o The area of application is considered prime farmland (as defined in 7 CFR § 657.5). | Directions for Use |

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| | ○ Conservation tillage is being implemented on the area of application. Conservation tillage is defined as any system that leaves at least 30% of the soil surface covered by residue after planting. Conservation tillage practices can include mulch-till, no-till, or strip-till.<br>○ A functional terrace system is maintained on the area of application.<br>○ Water and sediment control basins for the area of application are functional and maintained.<br>○ The area of application is less than or equal to 10 acres.<br><br>**Rice fields are not required to have a vegetative filter strip.**<br><br>For further guidance on vegetated filter strips, refer to the following publication for information on constructing and maintaining effective buffers: Conservation Buffers to Reduce Pesticide Losses. Natural Resources Conservation Services. https://www regulations.gov/document?D=EPA-HQ-OPP-2008-0331-0175" | |
| **Buffer Zones to Water Bodies** | Ground Application<br>• "Do not apply within 25 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, streams, marshes, ponds, estuaries, and commercial fish ponds)."<br><br>Ultra Low Volume (ULV) Aerial Application<br>• "Do not apply within 450 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, streams, marshes, ponds, estuaries, and commercial fish ponds). Applications made by mosquito control districts and other public health officials are exempt from this requirement."<br><br>Non-ULV Aerial Application<br>• "Do not apply within 150 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, streams, marshes, ponds, estuaries, and commercial fish ponds)." | Directions for Use |
| **New text to include under Environmental Hazard statements:**<br>(For liquid products formulated for outdoor foliar applications to agricultural row crops.)<br><br>*Excludes products formulated for residential use and/or Ultra Low Volume (ULV) wide area mosquito control applications* | Update the Environmental Hazard with the bolded statement:<br><br>"This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area. **Protect pollinating insects by following label directions intended to minimize drift and to reduce risk to these organisms."** | Environmental Hazard |
| **Link to pollinator best management practices** (For liquid products formulated for | "Following best management practices can help reduce risk to terrestrial pollinators. Examples of best management practices include applying pesticides in the evening and at night when pollinators are not foraging and checking to confirm hive locations before spraying. For additional resources on pollinator best management practices, visit https://www.epa.gov/pollinator-protection/find-best-management-practices-protect-pollinators." | Directions for Use, prior to crop specific directions |

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| outdoor foliar applications to agricultural row crops.)<br><br>*Excludes products formulated for residential use and/or Ultra Low Volume (ULV) wide area mosquito control applications* | | |
| **Information on state managed pollinator protection plans** (For liquid products formulated for outdoor foliar applications to agricultural row crops.)<br><br>*Excludes products formulated for residential use and/or Ultra Low Volume (ULV) wide area mosquito control applications* | "**Managed pollinator protection plans** are developed by states/tribes to promote communication between growers, landowners, farmers, beekeepers, pesticide users, and other pest management professionals to reduce exposure of bees to pesticides. If available, visit state plans for additional information on how to protect pollinators." | Directions for Use, prior to crop specific directions |
| **Information on how to report bee incidents** (For liquid products formulated for outdoor foliar applications to agricultural row crops.)<br><br>*Excludes products formulated for residential use and/or Ultra Low Volume (ULV) wide area mosquito control applications* | **"How to Report Bee Kills**<br>It is recommended that users contact both the state lead agency and the U.S. Environmental Protection Agency to report bee kills due to pesticide application. Bee kills can be reported to EPA at beekill@epa.gov. To contact your state lead agency, see the current listing of state pesticide regulatory agencies at the National Pesticide Information Center's website: http://npic.orst.edu/reg/state_agencies.html." | Directions for Use, prior to crop specific directions |