Pollinator Stewardship Council

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Please accept these comments on behalf of Pollinator Stewardship Council, the American Beekeeping Federation, the American Honey Producers Association, Steve Ellis and Bret Adee in response to EPA's ecological risk assessment and decision document for the proposed registration of tetraniliprole. The Pollinator Stewardship Council appreciates the opportunity to comment on EPA's ecological risk assessment and decision document for the proposed registration of tetraniliprole. Tetraniliprole is a diamide in the same class of systemic insecticides (IRAC Group 28) as cyantraniliprole, chlorantraniliprole, flubendiamide and cyclaniliprole. These pesticides are of great concern to beekeepers and growers who depend on pollinators, because they are extremely toxic to honeybee larvae, butterfly larvae, adult honeybees and other pollinators. Industry-submitted studies conducted on honeybee larvae showed that tetraniliprole reduced the emergence of adult larvae by 81% - 71% in a 22-day study. Decreasing the larval population of honeybees will decrease the adult population of honeybees.

Butterflies also pollinate flowering plants and crops and are an important component of terrestrial ecosystems. A recent study conducted in Dr. Steven Bradbury's laboratory showed that pesticides play a role in the precipitous decline of butterflies. (https://setac.onlinelibrary.wiley.com/doi/abs/10.1002/etc.4672). In their study, the researchers exposed monarch butterfly larvae to five common insecticides (beta-cyfluthrin, chlorantraniliprole, chlorpyrifos, imidacloprid, and thiamethoxam). They found that the diamide chlorantraniliprole was one of the most toxic insecticides to monarch butterflies and that dermal and dietary exposure to chlorantraniliprole resulted in high levels of larval mortality. Dr. Vera Krischik's 2020 research further corroborates chlorantraniliprole's toxicity to lepidoptera larva. "Chlorantraniliprole was highly toxic to butterflies and should not be used near butterfly habitat... Monarch butterfly larvae were killed at 0.2 ppm [by chlorantraniliprole] while Painted lady butterfly larvae were killed at 0.03 ppm and adults were killed at 0.05 ppm chlorotraniliprole. This new and highly popular bee friendly insecticide is not butterfly friendly." (2017-2020 LCCMR 153f Conservation biocontrol of beneficial insects, Dr. Vera Krischik, University of Minnesota, https://ncipmhort.cfans.umn.edu/research/research-projects.) Another recent study detected chlorantraniliprole in 91 percent of milkweed samples from California. (https://www.frontiersin.org/articles/10.3389/fevo.2020.00162/full; Attachment 1).

After reviewing EPA's ecological risk assessment and decision document for tetraniliprole, we would like to highlight certain areas that need to be addressed.

1. As indicated in the ecological risk assessment, tetraniliprole is highly toxic to all stages of bee development from larval, pupal, to adult. The bee larvae, though, are the most sensitive to tetraniliprole, with NOAEL/LOAEL values that are several times lower than those for adult bees. As such, EPA's risk assessment for terrestrial invertebrates should be based on risks to bee larvae instead of risks to adult bees. EPA's risk characterization for a pesticide is usually based on the most sensitive endpoint. For tetraniliprole, the most sensitive endpoint for terrestrial invertebrates is the chronic bee larval endpoint. An important point to understand is that if you kill the bee larvae, you will not have adult bees. Although certain mitigation measures are mentioned in the decision document for adult bees foraging on certain crops, there are no mitigation measures proposed for bee larvae.
2. The decision document lists a myriad number of mitigation measures and other actions related to adult bees exposed to tetraniliprole, and these mitigation measures and actions differ depending on the type of crop groups/use sites. Reading and following all these detailed directions and measures on a pesticide label will be daunting and most likely will be ignored if it is overkill. Before EPA overwhelms growers and others with these large number of mitigation measures and other actions, they need to verify if they will work.
3. The ecological risk assessment for bees focuses solely on nectar and pollen as the exposure routes for honeybees. In the past, EPA claimed that other exposure routes are not important, or there is not sufficient research associated with other exposure routes. Many studies have shown that bees collect water from the landscape, including guttation fluid, puddle water, and surface water. Not including water as an exposure route underestimates the risk of pesticides to bees. European assessments do include exposure of bees to contaminated water and would be a useful reference for learning how to incorporate this important exposure route. Another important exposure route is contaminated dust from planting pesticide-coated seeds. EPA's claim that risk to bees from tetraniliprole-treated corn seed is low is misleading since the agency's risk assessment does not include contaminated dust from planting the corn seeds. Even though the pesticide industry has assured EPA that this problem can be solved with the right technology, we are not there yet. There are many studies that have measured the amount of pesticides that are abraded from treated seed during planting. Furthermore, European assessments are able to include this exposure route in their risk assessments. European scientists who know how to incorporate this exposure route in their risk assessments could help EPA scientists learn how to include this important exposure route. Another important route of exposure is contaminated soil. Since the majority of native bees live in soil, these bees and these routes of exposure should be considered in EPA's risk assessments.
4. The semi-field tunnel studies conducted for tetraniliprole have major problems which limit their usefulness even as lines of evidence. The studies were of short duration: 28 days with 7-8 days of exposure to tetraniliprole. Furthermore, toxicity studies involving

soil applications were conducted at 28% of the proposed maximum application rate, while toxicity studies involving foliar applications were conducted at 2 – 56% of the maximum application rate. The treated flower which was used in the tunnel studies was *Phacelia.* Studies have shown that bees rarely consume the pollen from this plant, making it a poor surrogate for crops that have been treated with pesticides. (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5119232/). In addition, residue analyses were not completed for a number of the tunnel studies, which makes the results uncertain.

5. The risk assessment for bees was based on residue studies and the results of one colony feeding study with the technical active ingredient plus a limit test with an end product. Residue data were not available for a number of major crops, including foliar, pre-bloom for citrus and grapes, foliar application to corn, and soil application to soybeans. The colony feeding studies also had major problems. The study conducted with the technical active ingredient experienced high mortality in the control and could not provide results for overwintering. This study was not able to generate a LOAEC or dose response curve. The results of a limit test, which was conducted at a higher concentration than the colony feeding study, was used to generate a LOAEC, but there were no controls for this study. Furthermore, analyses were not presented to determine if the bees consumed alternative food sources other than the spiked sucrose. Since the bees were allowed to forage freely in an open field, they would be able to consume food from untreated crops. If this were the case, then the risk to foraging bees is highly uncertain. Given the problems with high mortality in the controls/lack of controls and the lack of exposure data, these studies cannot be used quantitatively in a risk assessment.
6. EPA's ecological risk assessment also indicates that tetraniliprole is hazardous to aquatic invertebrates, particularly benthic invertebrates. It also is more toxic to aquatic invertebrates than other diamides. Similar to terrestrial invertebrates, tetraniliprole reduces the emergence/development rate (90%/27%) of larval aquatic invertebrates. In this case, the larval LOAEC may be the most sensitive endpoint for aquatic invertebrates.
7. EPA's ecological risk assessment indicates that tetraniliprole poses a risk to birds from corn seed treatment. A medium size bird would only need to eat 8 corn seeds to exceed the safe level, while a large bird would need to eat 72 seeds to exceed the safe level. The assessment did not include the number of seeds needed for small birds. Instead, the risk assessment assumed that small birds would not eat large seeds. However, recent studies conducted by University of Minnesota researchers found that small birds can crack open large seeds and consume them (https://www.ncbi.nlm.nih.gov/pubmed/31121352; https://files.dnr.state.mn.us/wildlife/research/summaries/forest/2016_neonictoids.pdf). The decision document indicated that risk from treated seeds for all field birds is low because every farmer in the U.S. will make sure there is no spilled seed on the ground after planting. Even if this amazing feat can happen, birds can dig up treated seeds after they have been planted.

8. The proposed decision document for tetraniliprole is dominated by a detailed benefits assessment that was largely written by the pesticide manufacturers. Even the risk assessment sections contain benefit information. Under these circumstances, EPA should seek independent verification of the claims that the pesticide industry has made before accepting their assumptions regarding the benefits of tetraniliprole in comparison to other pesticides. Allowing the pesticide industry to dominate the benefit assessments for EPA's decision documents undermines the credibility of EPA as an independent regulatory agency.

After reviewing EPA's proposed decision document for tetraniliprole, the Pollinator Stewardship Council has concluded that EPA's benefit and risk assessments are flawed. Given the high risk of tetraniliprole to bees, butterflies, aquatic invertebrates, and birds, it cannot possibly qualify as a "good IPM fit." It also cannot qualify for a "new resistance management tool" since three other diamides with similar characteristics as tetraniliprole are already on the market. Tetraniliprole does not meet the regulatory standard under FIFRA as it poses adverse effects to the environment. One of the most serious problems with EPA's risk assessment for tetraniliprole is that it is not based on the most sensitive endpoint: the chronic larval bee NOAEL. If the bee larvae are killed, you will not have adult bees. (The larval stage comes before the adult bee life stage). Somehow this critical point has been overlooked in EPA's risk assessments.

For the past several years, beekeepers have been experiencing heavy losses of 40 – 90% of their hives. (Attachment 2.) In the eastern U.S., populations of monarch butterflies have declined by 90% while in the western U.S., monarch butterflies have declined by more than 99%. Farmland birds are also rarely found in corn and soybean fields since pesticide-treated seeds have become the common application method for corn and soybeans. Under these circumstances, it does not make sense to approve another pesticide that kills bees, butterflies, birds, and aquatic insects. The existing scientific data is insufficient for EPA to conclude the risks associated with the proposed registration of tetraniliprole are reasonable. We urge EPA to revisit the risk and benefit assessments for this chemical and carefully analyze the impact of tetraniliprole on invertebrate larvae and on other organisms. We also recommend that EPA base its risk assessment for this chemical on the most sensitive species and the most sensitive life stage for the animals that are tested.

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Please review the relevant attached literature.

1. Haslch et al. 2020: Pesticide Contamination of Milkweeds Across the Agricultural, Urban, and Open Spaces of Low-Elevation Northern California
2. Buckner et al 2020: 2019-2020 Honey Bee Colony Losses in the United States: Preliminary Results
3. The following provide useful summaries of the economic significance of pollination services, which we urge the EPA to consider as part of your cost-benefit analysis.
    - DeGrandi-Hoffman 2019: The Economics of Honey Bee (Hymenoptera: Apidae) Management and Overwintering Strategies for Colonies Used to Pollinate Almonds
    - USDA 2017: Land Use, Land Cover, and Pollinator Health: A Review and Trend Analysis