Minnesota Department of Natural Resources Pesticide Environmental and Social Risk Assessment

Pesticide Active Ingredient: Florpyrauxifen-benzyl

Version 1.1

2022

Environmental Assessment

Pesticide: Florpyrauxifen-benzyl	**Hazard Status:** Florpyrauxifen-benzyl is not considered a highly hazardous pesticide (HHP) per the FSC Pesticides Policy (FSC-POL-30-001 V3-0 EN) and the FSC Lists of Highly Hazardous Pesticides (FSC-POL-30-001a EN).
Specific Formulation (CAS#):	**TerraVue*** (1390661-72-9, 566191-87-5): aminopyralid – 71.01%, florpyrauxifen-benzyl – 6.0%, other ingredients – 22.99% *Formulation contains another pesticide requiring an ESRA
Environmental values	**Description of why/why not a risk**
Soil (erosion, degradation, biota, carbon storage)	**Minimal indication of adverse effects to soil was found when florpyrauxifen-benzyl is used according to label instructions in forestry applications. Additional considerations are provided, below.** Florpyrauxifen-benzyl is tightly bound to soil with low risk for movement in the soil (2). It shows low mobility in soils and readily binds to soil or sediment (3).
Water (ground water, surface waters, water supplies)	**Minimal indication of adverse effects to water was found when florpyrauxifen-benzyl is used according to label instructions in forestry applications. Additional considerations are provided, below.** Because of low mobility, florpyrauxifen-benzyl is not expected to leach into groundwater (3). However, other active ingredients often mixed with this product – e.g., aminopyralid in TerraVue – can require a groundwater advisory statement on the label (2).
Atmosphere (air quality, greenhouse gasses)	**Minimal indication of adverse effects to atmosphere was found when florpyrauxifen-benzyl is used according to label instructions in forestry applications. Additional considerations are provided, below.** Florpyrauxifen-benzyl has a relatively low potential for volatility from water, moist soils, and dry surfaces (3).
Non-target species (vegetation, wildlife, bees and other pollinators, pets)	**Negative impacts on non-target species exist for terrestrial and aquatic plants and fish. Additional considerations are provided, below.** Florpyrauxifen-benzyl is toxic to plants and may pose a risk to non-target aquatic and terrestrial plants through spray drift (3). Sensitive plants (e.g., soybeans, grapes, tomatoes) may be especially susceptible to drift (2).

	Trees adjacent to or in a treated area can occasionally be affected by root uptake of TerraVue (a formulation that includes both florpyrauxifen-benzyl and aminopyralid), especially roses and leguminous trees such as locusts, redbud, mimosa, and caragana (1). Florpyrauxifen-benzyl is practically non-toxic to birds, mammals, reptiles, and bees (3). At levels higher than would be expected due to drift onto surface water, acute risks to freshwater fish and invertebrates slightly exceeded the USEPA's level of concern (3).
Non-timber forest products (as FSC-STD-01-001 V5-2 FSC Principles and Criteria, criterion 5.1)	**Minimal indication of adverse effects to non-timber forest products was found when florpyrauxifen-benzyl is used according to label instructions in forestry applications. Additional considerations are provided below.** Secondary effects to habitats and food availability could occur, which would affect virtually all non-target organisms. These secondary effects caused by herbicide or mechanical methods could either be detrimental or beneficial to affected species (1).
High Conservation Values (particularly HCV 1-4)	**Minimal indication of adverse effects to high conservation values was found when florpyrauxifen-benzyl is used according to label instructions in forestry applications. Additional considerations are provided below.** Unintentional secondary effects on habitat, landscape and ecosystem are possible (1).
Landscape (aesthetics, cumulative impacts)	**Minimal indication of adverse effects to landscape was found when florpyrauxifen-benzyl is used according to label instructions in forestry applications. Additional considerations are provided below.** Unintentional habitat/landscape effects are possible (1).
Ecosystem services (water, soil, carbon sequestration, tourism)	**Minimal indication of adverse effects to ecosystem services was found when florpyrauxifen-benzyl is used according to label instructions in forestry applications. Additional considerations are provided below.** Potential for secondary effects on terrestrial or aquatic animals and plants, including changes in food availability and habitat quality (1).

Mitigation strategies defined to minimize environmental risk[1]
Follow all pesticide label application instructions. Follow applicable criterion and indicators from the FSC US FM Standard V1.0 (e.g., Criterion 4.3 for worker safety, Criterion 7.3 for worker training, Criterion 6.5 for protecting water resources, and Criteria 8.1 and 8.2 for Monitoring). Applicators or persons supervising application of restricted use pesticides are required to be certified in accordance with EPA regulations and state, territorial and tribal laws. Additional risk mitigation strategies are provided below. Organizations should take reasonable steps to avoiding environmental and social impacts by considering the mitigation strategies provided below as well as application-, Organization-, or location-specific strategies.

General consideration of exposure variables designed to mitigate risk:
- Know and understand the specific pesticide formulation and/or tank mixture, as its unique formulation may provide a different risk characterization.
- Understand how the mixture of active ingredients affects the pesticides risk profile.
- Seek to minimize the frequency, interval, and amount of application.
- Use the most efficient and effective method of application by seeking to minimize risk to environmental and social values.
- Understand the site (e.g., soil type, topography, etc.) and climatic (e.g., wind, temperature, and humidity) conditions and the likely effect on risk to environmental and social values.
- Have appropriate waste management systems in place.

Mitigating risk to the environment:

General and non-target species:
- Minimize risk of spray drift: unintentional spray drift has potential to significantly increase risk to the environment and public welfare. Follow product-specific guidelines for reducing spray drift for specific application scenarios.
- Avoid applying during periods of intense rainfall, to soils saturated with water, or surfaces paved with materials such as asphalt on concrete to avoid situations that may result in runoff and movement of product into adjacent susceptible crops or plants (1).
- Trees adjacent to or in a treated area can occasionally be affected by root uptake of TerraVue, especially roses and leguminous trees such as locusts, redbud, mimosa, and caragana. Do not apply TerraVue within the root zone of desirable trees unless such injury can be tolerated (1).

Water:
- Do not apply directly to water. Take care to minimize the incidental overspray along the shoreline when applying to terrestrial plants at the water's edge or to water in areas where surface water is present. Do not apply to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwater or rinsate (1).
-Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority.
-Do not apply to open water (1).
-Do not apply on ditches that are used to transport irrigation water (1).

[1] Mitigation strategies have been categorized to avoid redundancy

Sources

(1) Corteva Agriscience (2020). Pesticide Product Label [TerraVue]. Retrieved from: https://www.corteva.us/products-and-solutions/land-management/terravue.html
(2) Renz, Mark – University of Wisconsin (2021). Letter regarding regulation of use of florpyrauxifen on Wisconsin Department of Natural Resources lands. Retrieved from: https://dnr.wisconsin.gov/sites/default/files/topic/TimberSales/ESRA_florpyrauxifen_UW.pdf
(3) Minnesota Department of Agriculture (2018). New active ingredient review: Florpyrauxifen-benzyl. Retrieved from: https://www.mda.state.mn.us/sites/default/files/inline-files/Florpyrauxifen-benzyl.pdf

Social Assessment

Pesticide: Florpyrauxifen-benzyl	**Hazard Status:** Florpyrauxifen-benzyl is not considered a highly hazardous pesticide (HHP) per the FSC Pesticides Policy (FSC-POL-30-001 V3-0 EN) and the FSC Lists of Highly Hazardous Pesticides (FSC-POL-30-001a EN).
Specific Formulation (CAS#):	**TerraVue*** (1390661-72-9, 566191-87-5): aminopyralid – 71.01%, florpyrauxifen-benzyl – 6.0%, other ingredients – 22.99% *Formulation contains another pesticide requiring an ESRA
Social values	**Description of why/why not a risk**
High Conservation Values (especially HCV 5-6)	**Minimal indication of adverse effects to high conservation values was found when florpyrauxifen-benzyl is used according to label instructions in forestry applications.**
Health (fertility, reproductive health, respiratory health, dermatologic, neurological and gastrointestinal problems, cancer and hormonal imbalance)	**Minimal indication of adverse effects to human health was found when florpyrauxifen-benzyl is used according to label instructions in forestry applications. Additional considerations are provided below.** Florpyrauxifen-benzyl is classified by the USEPA as not likely to be carcinogenic to humans (3). USEPA did not identify any risks of concern from the qualitative human health risk assessments (3). Toxicity studies indicate that florpyrauxifen has very low acute toxicity as studies found no adverse effects from inhalation, ingestion, or dermal exposures (2). Developmental and reproductive toxicity studies found no adverse effect of this compound when administered to lab animals at high rates (2). Occupational risks to florpyrauxifen-benzyl do not post a significant human health risk regardless of the route of exposure (3).
Welfare	**Minimal indication of adverse effects to welfare was found when florpyrauxifen-benzyl is used according to label instructions in forestry applications.**
Food and water	**Minimal indication of adverse effects to food and water when florpyrauxifen-benzyl is used according to label instructions in forestry applications. Additional considerations are provided below.** Because of low mobility of florpyrauxifen-benzyl, leaching into groundwater is not expected (3). Toxicity studies indicate that florpyrauxifen has very low acute toxicity as studies found no adverse effects from inhalation, ingestion, or dermal exposures (2).

Social Infrastructure; (schools and hospitals, recreational infrastructure, infrastructure adjacent to the management unit)	**Minimal indication of adverse effects to social infrastructure was found when florpyrauxifen-benzyl is used according to label instructions in forestry applications.**
Economic viability (agriculture, livestock, tourism)	**Minimal indication of adverse effects to economic viability was found when florpyrauxifen-benzyl is used according to label instructions in forestry applications. Additional considerations are provided below.** Risks to non-target plant species due to drift (1). Florpyrauxifen-benzyl is toxic to plants and may pose a risk to non-target aquatic and terrestrial plants through spray drift (3). Sensitive plants (e.g., soybeans, grapes, tomatoes) may be especially susceptible to drift (2). Exposure of non-target plants is possible through contaminated irrigation water if the product is spilled or disposed of improperly (1).
Rights (legal and customary)	**Minimal indication of adverse effects to rights was found when florpyrauxifen-benzyl is used according to label instructions in forestry applications.**
Others	**No additional values were identified in this assessment.**

Mitigation strategies defined to minimize social risk[1]
Follow all pesticide label application instructions. Follow applicable criterion and indicators from the FSC US FM Standard V1.0 (e.g., Criterion 4.3 for worker safety, Criterion 7.3 for worker training, Criterion 6.5 for protecting water resources, and Criteria 8.1 and 8.2 for Monitoring). Applicators or persons supervising application of restricted use pesticides are required to be certified in accordance with EPA regulations and state, territorial and tribal laws. Additional risk mitigation strategies are provided below. Organizations should

take reasonable steps to avoiding environmental and social impacts by considering the mitigation strategies provided below as well as application-, Organization-, or location-specific strategies.

General consideration of exposure variables designed to mitigate risk:
- Know and understand the specific pesticide formulation, as its unique formulation may provide a different risk characterization.
- Understand how the mixture of active ingredients affects the pesticides risk profile.
- Seek to minimize the frequency, interval, and amount of application.
- Use the most efficient and effective method of application by seeking to minimize risk to environmental and social values.
- Understand the site (e.g., soil type, topography, etc.) and climatic (e.g., wind, temperature, and humidity) conditions and the likely effect on risk to environmental and social values.
- Have appropriate waste management systems in place.

Mitigating risk to water and food resources:
See Environmental Risk Assessment mitigation strategies.

Mitigating Risk to Workers: *When applying pesticides, label instructions should be followed.*

- Applicators and other handlers must wear personal protective equipment (PPE), including the following as found on the TerraVue pesticide label (1):
    - Long-sleeved shirt and long pants
    - Waterproof gloves
    - Shoes plus socks
    - Protective eyewear

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.
- Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse these items. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

Mitigating Risk to Public Access/Public Welfare:

- Reduce the possibility of public consumption of contaminated wild food (e.g., fruit or fungi) and public exposure to pesticides through public outreach and engagement, limiting access, and/or appropriate signage. For instance, users of the forest may be excluded from the area using barriers or signage until the pesticide dries (1).
- Consider effects on local communities and indigenous peoples when considering limiting access to treatment areas.
- Do not allow children or pets to enter the treated area until it has dried.

[1] Mitigation strategies have been categorized to avoid redundancy

Sources

(1) Corteva Agriscience (2020). Pesticide Product Label [TerraVue]. Retrieved from: https://www.corteva.us/products-and-solutions/land-management/terravue.html

(2) Renz, Mark – University of Wisconsin (2021). Letter regarding regulation of use of florpyrauxifen on Wisconsin Department of Natural Resources lands. Retrieved from: https://dnr.wisconsin.gov/sites/default/files/topic/TimberSales/ESRA_florpyrauxifen_UW.pdf

(3) Minnesota Department of Agriculture (2018). New active ingredient review: Florpyrauxifen-benzyl. Retrieved from: https://www.mda.state.mn.us/sites/default/files/inline-files/Florpyrauxifen-benzyl.pdf