



**Minnesota Department of Natural Resources
Pesticide Environmental and Social Risk
Assessment**

Pesticide Active Ingredient: Clopyralid

Version 1.0

2021

Environmental Assessment

<p>Pesticide: Clopyralid</p>	<p>Hazard Status: Clopyralid 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).</p>		
<p>Specific Formulation (CAS#):</p>	<p>Transline (57754-85-5) clopyralid: 3,6-dichloro-2-pyridine carboxylic acid, monoethanolamine salt – 40.9%, other ingredients – 59.1%</p>		
<p>Exposure Elements</p>	<p>Minimum list of values</p>	<p>Description of why/why not a risk</p>	<p>Mitigation strategies defined to minimize risk¹</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Environmental</p>	<p>Soil (erosion, degradation, biota, carbon storage)</p>	<p>Minimal indication of adverse effects to soil was found when clopyralid is used according to label instructions in forestry applications. Additional considerations are provided below.</p> <p>Clopyralid does not readily bind to most types of soil, reducing the risk of off-site movement of the chemical by erosion (1).</p> <p>Clopyralid is moderately persistent in soils. The half-life of clopyralid in soils ranges from 10 to 47 days depending on soil temperature and composition (1). Microbes break down clopyralid in soils, and generally, the more microbes present, the faster clopyralid disappears in soil. (1).</p> <p>Degradation of clopyralid is fastest in soils that are moist with high organic carbon content, while the probability of clopyralid leaching from soil increases as soil organic matter decreases (1).</p>	<p>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). Additional risk mitigation strategies are provided below. Applicators 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.</p> <p>General consideration of exposure variables designed to mitigate risk:</p> <ul style="list-style-type: none"> -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 pesticide’s risk profile. -Seek to minimize the frequency, interval, and amount of application.
	<p>Water (ground water, surface waters, water supplies)</p>	<p>Minimal indication of adverse effects to water was found when clopyralid is used according to label instructions in forestry applications. These are as follows below.</p> <p>Clopyralid can travel through soil and under rare conditions (i.e., in coarse textured soils with minimal microbial activity and following heavy rain) contaminate groundwater which may be used for irrigation or drinking purposes (1).</p> <p>Clopyralid does not break down quickly in water. This property</p>	

		<p>is associated with long-term persistence if the chemical reaches groundwater (1).</p>	<p>-Use the most efficient and effective method of application by seeking to minimize risk to environmental and social values.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Environmental</p>	<p>Atmosphere (air quality, greenhouse gasses)</p>	<p>Minimal indication of adverse effects to atmosphere was found when clopyralid is used according to label instructions in forestry applications.</p> <p>Clopyralid is not highly volatile and appears to have very low acute toxicity when inhaled (1).</p>	<p>-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.</p> <p>-Have appropriate waste management systems in place.</p>
	<p>Non-target species (vegetation, wildlife, bees and other pollinators, pets)</p>	<p>Clopyralid is hazardous to terrestrial plants (macrophytes) so non-target plants are at risk for spray drift and direct spray (1). Additional information for other non-target species is provided below.</p> <p>Clopyralid is toxic to a variety of plant species, particularly forbs, and some shrubs. Clopyralid is most toxic to broadleaf plants when applied to foliage. It is less toxic to grasses. Clopyralid has the ability to accumulate and persist in dead plants (1).</p> <p>Clopyralid is relatively non-toxic to terrestrial and aquatic animals, although data available concerning toxicity to birds and terrestrial invertebrates are not as extensive (1).</p> <p>Clopyralid does not bioaccumulate in aquatic animals. Clopyralid appears to be of low toxicity to soil invertebrates and microbes. Clopyralid appears relatively non-toxic to bees (1).</p>	<p>Mitigating Risk to the Environment: <i>Reduce contact with water resources, follow all label requirements, and minimize application amounts and number of applications.</i></p> <p>- Do not contaminate water when cleaning equipment or disposing of equipment washwaters (2).</p> <p>-Do not contaminate water used for irrigation or domestic purposes (2).</p> <p>-Do not apply in or on dry or water containing irrigation ditches or canals including their outer banks (2).</p> <p>-Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark (2). Surface waters should be adequately buffered.</p> <p>- Do not apply where soils have a rapid to very rapid permeability throughout the profile (such as loamy sand to sand) and the water table of an underlying aquifer is shallow, or to soils containing sinkholes over limestone bedrock, severely fractured surfaces, and substrates which would allow direct</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Environmental</p>	<p>Non-timber forest products (as FSC-STD-01-001 V5-2 FSC Principles and Criteria, criterion 5.1)</p>	<p>Minimal indication of adverse effects to non-timber forest products was found when clopyralid is used according to label instructions in forestry applications.</p> <p>Clopyralid does not introduce substantial risk to the ability to non-timber forest products across the landscape.</p>	<p>to very rapid permeability throughout the profile (such as loamy sand to sand) and the water table of an underlying aquifer is shallow, or to soils containing sinkholes over limestone bedrock, severely fractured surfaces, and substrates which would allow direct</p>

	<p>High Conservation Values (particularly HCV 1-4)</p>	<p>Minimal indication of adverse effects to high conservation values was found when clopyralid is used according to label instructions in forestry applications. Additional considerations are provided below.</p> <p>Clopyralid may be applied in or near HCVF areas to target invasive, exotic, and/or noxious weed species. This is done to restore and conserve native plant and animal species and/or restore and retain ecological balance.</p>	<p>introduction into an aquifer (2).</p> <ul style="list-style-type: none"> - Do not make applications when circumstances favor movement from treatment site such as forecasted heavy rainfall. Runoff of this product will be reduced by avoiding applications when rainfall is forecasted to occur within 48 hours (1). - A level, well-maintained vegetative buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce the potential loading of clopyralid from runoff water. - Do not apply or otherwise permit this product or sprays containing this product to come into contact with any non-target crop or desirable vegetation (1). - Do not apply when the soil is frozen or covered with snow (1). - Applications should be made only when there is little or no hazard from spray drift. Very small quantities of spray, which may not be visible, may seriously injure susceptible plants (1).
	<p>Landscape (aesthetics, cumulative impacts)</p>	<p>Minimal indication of adverse effects to landscape values was found when clopyralid is used according to label instructions in forestry applications. Additional considerations are provided, below.</p> <p>Application of clopyralid for the purposes of vegetation management or vegetative release on forested lands to control unwanted plant species is expected to enhance the landscape over time by enabling timely reforestation and invasive species control.</p>	
	<p>Ecosystem services (water, soil, carbon sequestration, tourism)</p>	<p>Minimal indication of adverse effects to ecosystem services was found when clopyralid is used according to label instructions in forestry applications. Additional considerations are provided, below.</p> <p>Clopyralid is not expected to degrade ecosystem services such as water and soil quality and the forests' ability to sequester carbon if applied according to the label. Beyond the restricted entry interval following silviculture applications, the application of clopyralid does not decrease access to the forests.</p>	

¹ Mitigation strategies have been categorized to avoid redundancy.

Sources

- (1) USDA, Forest Service. 1999. Clopyralid (Transline) – Final Report. Human Health and Ecological Risk Assessment. Prepared by Syracuse Environmental Research Associates, Inc. under USDA Forest Service Contract 53-3187-5-12. Retrieved from https://www.fs.fed.us/r5/hfqlg/publications/herbicide_info/1999a_clopyralid.pdf
- (2) Corteva Agriscience. Pesticide Product Label [Transline]. Retrieved from https://s3-us-west-1.amazonaws.com/agrian-cg-fs1-production/pdfs/Transline_Label1e.pdf

Social Assessment

Pesticide: Clopyralid	Hazard Status: Clopyralid 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).
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Specific Formulation (CAS#):	Transline (57754-85-5) clopyralid: 3,6-dichloro-2-pyridine carboxylic acid, monoethanolamine salt – 40.9%, other ingredients – 59.1%		
Exposure Elements	Minimum list of values	Description of why/why not a risk	Mitigation strategies defined to minimize risk¹
Social	High Conservation Values (especially HCV 5-6)	<p>Minimal indication of adverse effects to high conservation values was found when clopyralid is used according to label instructions in forestry applications. Additional considerations are provided below.</p> <p>Beyond the limited entry interval following applications, clopyralid does not decrease access to the forests.</p>	<p>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). Additional risk mitigation strategies are provided below. Applicators should take reasonable steps to avoid environmental and social impacts by considering the mitigation strategies provided below, as well as application-, Organization-, or location-specific strategies.</p> <p>General consideration of exposure variables designed to mitigate risk:</p> <ul style="list-style-type: none"> -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 pesticide’s 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
	Health (fertility, reproductive health, respiratory health, dermatologic, neurological and gastrointestinal problems, cancer and hormonal imbalance)	<p>Minimal indication of adverse effects to human health was found when clopyralid is used according to label instructions in forestry applications. Additional considerations are provided below.</p> <p>Clopyralid has low toxicity if individuals accidentally eat, touch, or inhale residues (1, 3).</p> <p>Clopyralid exposure to eyes and skin as in the case of spills or splashes can cause short-term damage and irritation (1, 2, 3). These effects can be minimized by safe handling and application following label instructions including at a minimum label required PPE (2). Splash proof eye protection is recommended in addition to labeled required PPE.</p> <p>Clopyralid causes only slight changes in body, liver, and kidney weight and some changes in stomach tissue structure when fed to rats for 2 years at moderate to high doses (1).</p> <p>The EPA lists clopyralid as a Group E human carcinogen, which means they have found no evidence of carcinogenicity. Findings suggest that when workers apply clopyralid at recommended levels, it is unlikely to</p>	

		<p>cause reproductive effects in humans (1). However, a peer review of a risk assessment done by the European Food and Safety Authority recommended categorizing clopyralid as “Reproductive Category 2” because deficiencies in the study of clopyralid effects on animal or human reproduction and development make the quality of evidence supporting the position less convincing (3).</p> <p>A byproduct of production of technical clopyralid is hexachlorobenzene, a potential human carcinogen. It is not thought that the levels of hexachlorobenzene during label supported handling and application would significantly raise the exposure risk of handlers and applicators to hexachlorobenzene (1).</p>	<p>social values.</p> <p>-Have appropriate waste management systems in place.</p> <p>Mitigating Risk to Workers: <i>When applying pesticides, label instructions should be followed.</i> Use appropriate personal protective equipment in handling and applying pesticides</p> <p>Personal Protective Equipment (PPE), applicators and other handlers must wear (2):</p> <ul style="list-style-type: none"> • Long-sleeved shirt and long pants • Chemical resistant gloves made of any waterproof material • Shoes plus socks • Splash resistant eye protection (not a minimum requirement on label, but recommended)
	Welfare	<p>Minimal indication of adverse effects to welfare was found when clopyralid is used according to label instructions in forestry applications.</p> <p>Application of chemical has no known impacts upon welfare.</p>	<p>Applicators should (2):</p> <ul style="list-style-type: none"> • Remove clothing/PPE 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. • Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
	Food and water	<p>Minimal indication of adverse effects to food was found when clopyralid is used according to label instructions in forestry applications. Some indication of adverse effects to water was found when clopyralid is used according to label instructions in forestry applications. These are as follows below.</p> <p>While clopyralid is relatively quickly broken down by microbes in soil, it does not break down quickly in water. This property is associated with long-term persistence if the chemical reaches groundwater.</p>	
Social	Social Infrastructure; (schools and hospitals, recreational infrastructure, infrastructure adjacent	<p>Minimal indication of adverse effects to social infrastructure was found when clopyralid is used according to label instructions in forestry applications.</p>	<p>Mitigating Risk to Public Access/Public Welfare:</p> <p>-Reduce the possibility of public consumption</p>

	to the management unit)		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.
	Economic viability (agriculture, livestock, tourism)	<p>Minimal indication of adverse effects to economic viability was found when clopyralid is used according to label instructions in forestry applications. However, additional considerations are provided below.</p> <p>There is a potential for spray drift to adversely affect terrestrial plant species, including food crops (2).</p> <p>Given no documented adverse effects on terrestrial mammals (1), there is low risk for economic viability of livestock or tourism.</p>	<p>-Consider effects on resource access to local communities and indigenous peoples when considering limiting access to treatment areas.</p> <p>Minimizing Risk to Food Resources:</p> <p>- Applications should be made only when there is little or no hazard from spray drift. Very small quantities of spray, which may not be visible, may seriously injure susceptible plants (1).</p>
	Rights (legal and customary)	<p>Minimal indication of adverse effects to rights was found when clopyralid is used according to label instructions in forestry applications.</p>	<p>- Do not apply through any type of irrigation system (1).</p> <p>- Do not contaminate water intended for irrigation. To avoid injury to crops or other desirable vegetation, do not treat or allow spray drift or run-off to fall onto banks or bottoms of irrigation ditches, either dry or containing water, or other channels that carry water that may be used for irrigation purposes (1).</p>
	Others	<p>No additional values were identified in this assessment.</p>	<p>- Do not graze or feed forage, hay, or straw from treated areas to livestock (1).</p> <p>- Do not use plant material treated with this product for mulch or compost (1).</p> <p>- Do not plant broadleaf crops in treated area until a bioassay with a sensitive plant shows clopyralid levels are low enough as to not damage that crop (1).</p>

¹ Mitigation strategies have been categorized to avoid redundancy.

Sources

(1) USDA, Forest Service. 1999. Clopyralid (Transline) – Final Report. Human Health and Ecological Risk Assessment. Prepared by Syracuse Environmental

Research Associates, Inc. under USDA Forest Service Contract 53-3187-5-12. Retrieved from:

https://www.fs.fed.us/r5/hfqlg/publications/herbicide_info/1999a_clopyralid.pdf

- (2) Corteva Agriscience. Pesticide Product Label [Transline]. Retrieved from: https://s3-us-west-1.amazonaws.com/agrian-cg-fs1-production/pdfs/Transline_Label1e.pdf
- (3) European Food and Safety Authority. 2018. Conclusion on Pesticides Peer Review: Peer Review of the Pesticide Risk Assessment of the Active Substance Clopyralid. Retrieved from: <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2018.5389>