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layout: post

title: My Days Precipitating Ecocide

date: 2017-06-07 12:00:00 -0400

categories: invasive species; pesticides; environmentalism

excerpt: For years, I sprayed Tordon along Forest Service roads and up and down wilderness trails in Montana. My targets were problematic plants, usually referred to as "invasive species" and "noxious weeds." Many environmental groups lauded, supported, and participated in these efforts. But environmentalists in the 1960s would have been horrified by the widespread use of Tordon. In fact, they were.

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For years, I sprayed Tordon along Forest Service roads and up and down wilderness trails in Montana. My targets were problematic plants, usually referred to as "invasive species" and "noxious weeds." When I worked with volunteers, I emphasized the importance of controlling these problematic plants in order to allow native plants to flourish, among other ecological benefits. Many environmental groups lauded, supported, and participated in the efforts by the Forest Service and other natural resource managers to eliminate invasive plants with the use of Tordon and other herbicides.

But environmentalists in the 1960s would have been horrified by the widespread use of Tordon. In fact, they were.

![Leif Fredrickson spraying orange hawkweed with herbicide from handsprayer]({{site.github.url}}/images/hawkweed.jpg){: width="700px"; height="auto"}

{:.image-caption}

\*The war on weeds: Spraying orange hawkweed (Hieracium aurantiacum) with herbicide in the Scapegoat Wilderness, Montana.\*

My last few seasons working for the Forest Service overlapped with me beginning graduate school for history at the University of Montana. I started looking at and exploring many things through an historical lens. Aware of the way objections to pesticides had been central to the rise of the post-war environmental movement (e.g., Rachel Carson's *Silent Spring*), I got interested in how many environmentalists had come to embrace the use of herbicides as a way to maintain ecological "health" or "balance" (as they saw it).

As I dabbled into the history of Tordon to see how perceptions of the herbicide had changed over time. To my surprise, I found that Tordon, Dow Chemical company's trade name for the herbicide picloram, had been one of the key chemicals used in the notorious defoliation campaign during the Vietnam War that attempted to uncover guerilla war activities and destroy food. That campaign was called Operation Ranch Hand, and the most famous chemical cocktail used during the campaign was Agent Orange.

![Four planes dispersing herbicide over a forest during the Vietnam War]({{site.github.url}}/images/ranch-hand.jpg){: width="700px"; height="auto"}

{:.image-caption}

\*Planes dispersing herbicides during Operation Ranch Hand, a campaign that used chemicals to defoliate trees and destroy crops during the Vietnam War. Photo: National Museum of the U.S. Air Force photo [071002-F-1234P-022](http://www.nationalmuseum.af.mil/shared/media/photodb/photos/071002-F-1234P-022.jpg).\*

Much has been written about the controversial human health effects of Agent Orange, a combination of the herbicides 2,4-D and 2,4,5-T. But there were other "agents" besides orange. One was Agent White, a mixture of picloram and 2,4-D (a mixture I also used for the Forest Service). Although less commonly used than Agent Orange, Agent White was considered the more powerful concoction, largely because of the inclusion of picloram, which is a highly persistent herbicide. It can last for months in the soil.

During the defoliation campaign in Vietnam, environmentalists and scientists became worried about the ecological and human effects of widespread use of powerful herbicides in Vietnam. One prominent botanist, Arthur Galston, became so concerned he invented a new term for the massive, potentially permanent effects of the Ranch Hand campaign: "ecocide" -- the ecological equivalent of genocide.

Although Galston was concerned about all the herbicides used during Ranch Hand, it was picloram, with its powerful, persistent characteristics that was most worrisome to him. The dark cloud over picloram outlasted the Vietnam War, with many environmentalists and scientists concerned about its use in the United States in agriculture, forestry and in the clearing of the border between the U.S. and Canada. Concern and outrage at the use of picloram in the 1970s and after often referenced the use of the chemical in herbicidal warfare and its “ecocidal” associations.

For an earlier generation of environmentalists, my job spraying weeds with Tordon for the Forest Service was ecocidal (or at least held that potential). But by the 2000s, that attitude had changed, at least among a number of environmentalists. In “From Ecocide to Eco-ally: Picloram, Herbicidal Warfare, and Invasive Species, 1963-2005” (*Global Environment*, vol. 7, no. 1, 2014) I set out to try to explain that change and its implications.

Here are the links: [(External Link - Paywall)](http://www.ingentaconnect.com/content/whp/ge/2014/00000007/00000001/art00008) [(Download Preprint)]({{site.github.url}}/docs/fredrickson-ecocide.pdf)

Here is the abstract:

This article is a history of picloram, one of the most powerful defoliants used during the Vietnam War, and its relationship to environmentalism. During the war, picloram became a symbol of “ecocide” – the worst thing that could happen to the environment. But as environmentalists became concerned about invasive plants, they held their noses and embraced it as a technology that could wipe out unwanted plants and restore the “natural” environment. The change in thinking about this pesticide, I argue, revealed latent fault lines in the environmental movement over ecological versus human health and short-term versus long-term problems.

# Cut

Tordon is Dow Chemical's trade name for picloram. Picloram a systemic herbicide, which means it is absorbed into the plant and effects the whole organism. It tricks the plant into growing itself to death. It is also a selective herbicide, in that it does not usually affect plants in the grass family (including cultivated grasses like corn and wheat). And a finaly important characteristic of picloram is that it is persistent, staying active in soil for weeks or months.

These characteristics make picloram a very desirable herbicide for controlling problematic plants in a number of settings. Many problematic plants are perennials