

Herbicides

Complaints shower local spraying industries...

Editors note: For twenty years, government agencies and private industry in Lane County have been spraying herbicides into our environment. This spring, residents of Lane County have begun fighting back with lawsuits, hearings, and protests.

Wednesday at 7:30 p.m. in Harris Hall, the Lane County Board of Commissioners will hold a public hearing to determine if herbicides shall continue to be budgeted for controlling vegetation along 1,100 miles of county roads.

As a background for that hearing the Emerald takes an in-depth look at herbicide use in Lane County by all agencies. Story by E.G. White-Swift, environmental editor, with staff reporters Chris Junkin, Sarah McDonald, and Anne Sidbury.

Herbicide spraying in Lane County is big business. Most of the attention this spring has been focused on the spraying programs of Siuslaw National Forest and Lane County Department of Transportation. However, even more agencies are involved.

The Bureau of Land Management (BLM) sprayed about 6,000 acres in western Lane County last year. Although the Willamette National Forest (WNF) has not sprayed for five years, right-of-way spraying across WNF land has been completed by the Southern Pacific Railroad, Bonneville Power Administration, Oregon State Highway Department and the Lane County Electric Co-op. The WNF plans to get back into the herbicide business next spring.

The timber industry sprays large areas of the county. Exact totals by all the timber holders are not available. However, Georgia Pacific released information that it sprays about 2,000 acres a year on company lands east of Interstate 5.

The Emerald contacted all the agencies in the last week to determine the extent and

quality of each agency's programs. Each agency was asked the same fourteen questions about their operations, and additional questions as were needed.

The Emerald found that almost all agencies used the herbicide 2,4-D or some variation of it. Most spraying is contracted out to large herbicide operators. The major exception is Lane County, which has its own staff spraying 1,046 miles of county roads.

Each agency has several herbicide specialists, who usually are foresters with herbicide training, and an applicator's permit from the State of Oregon. The Siuslaw National Forest (SNF) herbicide specialist, Tom Turpin, said that none of the forest employees has an applicator's permit, although each mixes the herbicides used on the forest.

The Oregon Department of Agriculture issues licenses for both herbicide commercial operators and individual applicators. The annual license is granted after passing a written examination that covers applicants knowledge of herbicides and laws and regulations governing herbicide application.

As it stands today, an applicator needs take the test only once. If passed, the license can be renewed year after year without re-examination. However, the Department of Agriculture is in the process of updating its regulations.

A proposal which will be discussed at a public hearing this fall will call for re-examination every five years unless three short-courses offered or certified by the Department of Agriculture are attended.

There are about 250 licensed operators in Oregon, with 2,000 licensed applicators. Not all of the applicators are involved in herbicide spraying, as there are 10 categories of applicator's permits.

The department has four full-time agents working on pesticide and herbicide

monitoring and licensing. They are involved in training, investigating damage complaints, checking produce, registering chemicals and approving chemicals for sale and licensing applicants.

Each of the agencies has a safeguard monitoring crew on herbicide spray sites. If aerial spraying occurs, ground crews are in radio contact with the contractors. Ground crews monitor weather conditions as spraying is stopped when wind, temperature or humidity is wrong. They also watch buffer strips on streams, and take water samples to monitor water quality.

The WNF has had an occasional problem with agencies that are spraying on forest land. Ed Stout, forest lands and minerals staff officer, states: "Southern Pacific hasn't been too good about notifying us ahead of time, so spraying operations are sometimes unaccompanied by forest officials. They've promised to do better in the future."

Of all the agencies, Lane County's program appears to have the least amount of monitoring. "There are no safeguards used at spray sites," states Al Driver, director of transportation for Lane County. "However, Lane County does take a few precautions before spraying."

"For example, there is no spraying done in rainy or windy weather," says Driver, "because the rain dissolves the chemicals too much making them less effective as weed killers. The wind disperses the sprays too much, and they will not reach the designated areas."

Most agencies reported an increase in complaints about their spraying programs in recent years. One complaint investigated this year by the Oregon agriculture department involved the spraying of 2,4,5-T in Alton Baker Park.

According to the complaint, 2,4,5-T was sprayed under the supervision of Steve Puett of Lane County's vegetation control office. The intention of the spraying was to control undesirable vegetation adjacent to the bicycle path. The 2,4,5-T label states, "Not to be used in recreational areas."

The complaint investigator states "Mr. Puett is presently aware that 2,4,5-T is not registered for use in recreational areas, and that the herbicide Silvex can be used. Mr. Puett expressed his sincere regrets and apologizes that the material 2,4,5-T was used."

Many residents of Lane County have become increasingly alarmed by herbicide use in the county. They feel that complaint responses and environmental monitoring have been insufficient, as the programs continue. A group of rural residents banded together to form Citizens Against Toxic Spray, Inc. (CATS) to oppose spraying programs.

They have requested, along with Hoedads, Inc. (a tree-planting cooperative), the Spencer Butte Improvement Association and the Wilderness Society that Lane County discontinue the use of all herbicides. A similar action in Los Angeles two years ago brought about the ban of all use of 2,4,5-T in Los Angeles County.

CATS, in conjunction with Hoedads and the Oregon Environmental Council, has also brought suit in U.S. District Court against SNF to enjoin forest officials from spraying phenoxy herbicides, who spray between 6-8,000 acres per year. A request by CATS for a temporary restraining order to prevent spraying this year was denied, but a hearing on a permanent injunction has been proceeding quickly and a decision could come this summer.

If phenoxy herbicides are banned by Lane County and in the SNF, what are the alternatives?

Turpin says of the Siuslaw, "I would take 20-30 years for the impact on the forest industry to be felt. Our alternatives would include handcutting, at \$125-\$150 per acre, and bulldozing the areas at \$85 an acre. We could attempt biological control, importing a virus or bug, but we don't know enough about that yet."

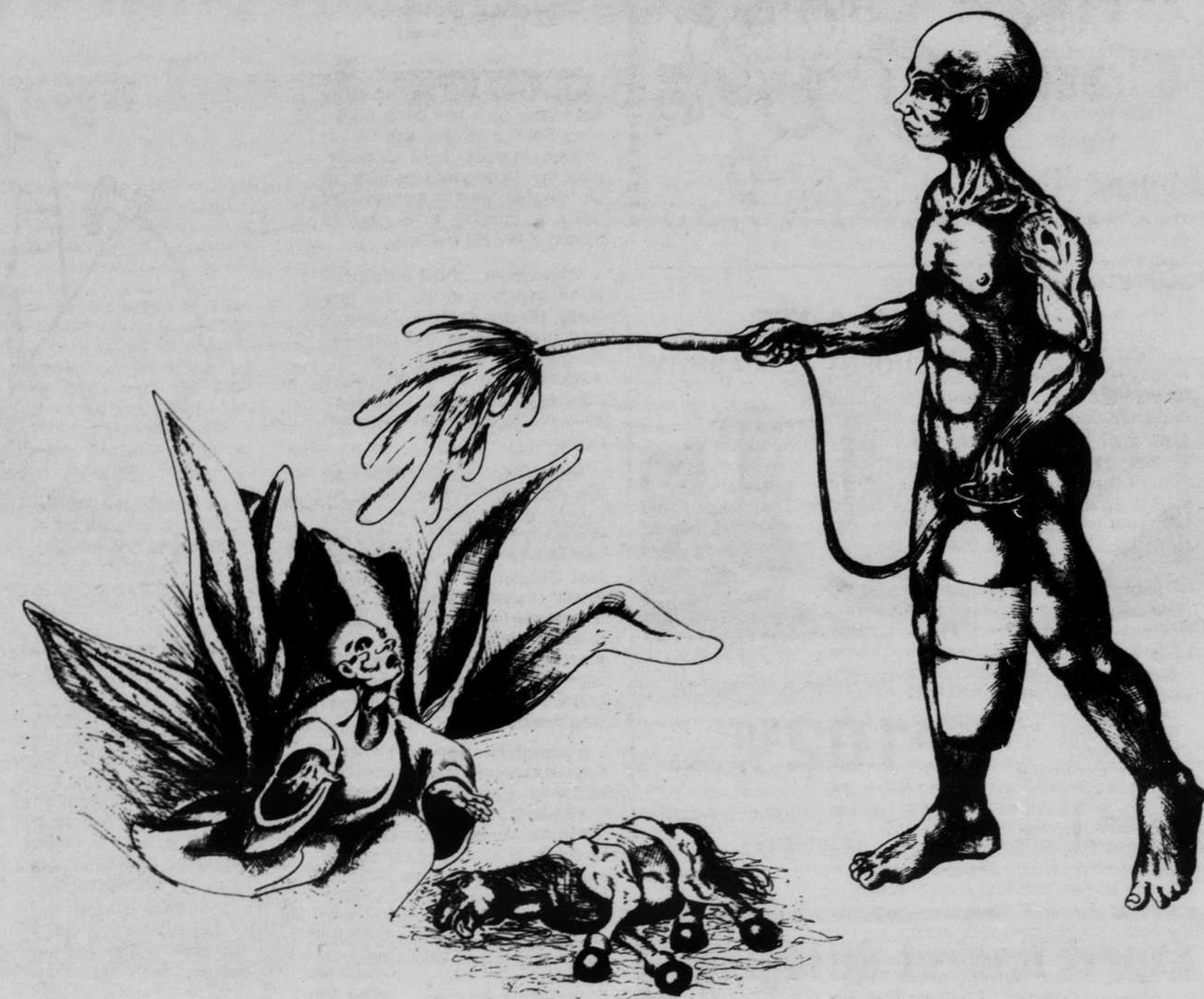
Turpin also suggested that fire might be used for site preparation, but it would be no good in release of conifers. The other alternative to the \$15-\$45 an acre herbicide spraying program would be no treatment.

The WNF has not sprayed for the last five years, although they plan to start again. The main reasons they cited for discontinuing were "specific public questioning of WNF practices, especially in the French Pete area" and many unanswered questions about the herbicides being used.

Why are they restarting a herbicide program? Forest officials claim that in certain areas the conifers are being covered up by the non-commercial species. They also feel that "scientific research has come up with acceptable answers concerning chemicals such as 2,4,5-T."

The WNF wanted to begin spraying this spring, but couldn't get through the red tape in time. An Environmental Impact Statement on the spraying program is available for public inspection in the WNF headquarter's library in downtown Eugene.

There is also one agency which has permanently chosen to discontinue phenoxy herbicide use along its rights-of-way. The Eugene Water and Electric Board (EWB) has been mowing with a tractor since 1970 areas that it normally sprayed. EWB officials state that it is more expensive and not as positive, but it has been "getting the job done."



Drawing by Terry MacBride

... Only few herbicides prove useful for positive control

Degree of control achieved with foliar applications of 2,4,5-T and other herbicides in Pacific Northwest forests¹

Species	Herbicide				
	2,4-D	2,4,5-T	Silvex	Dichlorprop	Amitrole T
--- Per cent topkill/per cent plants dead ---					
Alder, red	92/90	100/100	50/50	70/70	--
Ceanothus, deerbrush	100/90	100/85	--	--	--
Ceanothus, snowbrush	96/20	100/30	100/0	99/50	--
Ceanothus, varnishleaf	74/45	93/65	88/60	60/30	--
Chinkapin, golden	38/0	61/0	58/0	51/0	--
Chinkapin, golden-evergreen	58/0	67/0	44/0	82/0	--
Chinkapin, Sierra evergreen	98/0	100/0	--	--	--
Hazel, California	--	100/40	98/0	98/0	--
Manzanita, greenleaf	95/15	84/0	--	--	--
Manzanita, hairy	100/100	95/90	--	--	--
Manzanita, hoary	100/100	97/85	--	--	--
Manzanita, Howell	100/95	96/85	--	--	--
Maple, vine	--	100/80	100/90	46/30	--
Oak, canyon live	44/0	32/0	--	--	74/70
Salmonberry	--	100/50	100/20	100/40	--
Serviceberry, Saskatoon	50/0	68/0	--	--	--
Tanoak, scrub	40/0	43/0	--	--	--
Thimbleberry	--	100/10	100/10	100/10	--
Whitethorn, mountain	100/5	100/20	--	100/0	--

¹Data from Gratkowski (1959) and Stewart (1974b).

Common name	Chemical name
2,4-D	(2,4-dichlorophenoxy) acetic acid
2,4,5-T	(2,4,5-trichlorophenoxy) acetic acid
amitrole-T	3-amino-s-triazole plus ammonium thiocyanate
silvex (2,4,5-TP)	2-(2,4,5-trichlorophenoxy) propionic acid
dichlorprop (2,4-DP)	2-(2,4-dichlorophenoxy) propionic acid
pictoram	4-amino-3,5,6-trichloropropionic acid
dicamba	3,6-dichloro-o-anisic acid
cadicylic acid	hydroxydimethylarsinic acid
atrazine	2-chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine
dalapon	2,2-dichloropropionic acid

Charts courtesy U.S. Dept. of Agriculture Forest Service Portland, Ore.

By E.G. WHITE-SWIFT
Of the Emerald

Herbicides are "plant poisons" which operate by interfering with chemical mechanisms basic to plant life. The success of a herbicide is determined by its ability to eradicate a target plant species.

Many chemicals have herbicidal activity, but the way they are used and their effectiveness depend upon the physical characteristics of the chemical and the way it is formulated.

The two main objectives in formulating herbicides are to put the chemical in the best possible form for use in the field and to improve the herbicide's performance by increasing its penetration, translocation and accumulation within the plants to be controlled.

Most herbicidal compounds are initially produced as white crystalline acids or powders insoluble in water. In this form they would be difficult to apply and relatively ineffective on woody plants. Therefore, the basic herbicidal compounds are chemically modified to increase their biological activity, allow small amounts to be spread over large areas, and ease handling and mixing in the field.

Research and experience over the past 20 years have shown that only a limited number of herbicides are useful for woody plant control and broadleaf weed elimination. The phenoxy (or hormone) herbicides, especially low volatile esters of 2,4-D and 2,4,5-T, are particularly im-

portant in the silvicultural development in Pacific Northwest forests. Those chemicals are used on approximately 75 per cent of the acreage treated annually, and they are the most important chemicals for controlling woody plants. Also used widely are the chemicals atrazine, picloram, silvex, and amitrole-T.

One of the main ingredients of Agent Orange, a chemical weapon of defoliation in Vietnam, is 2,4,5-T. In 1970, the Environmental Protection Agency (EPA) decided to temporarily ban the use of 2,4,5-T on crops and water areas. The ban was cancelled after Dow Chemicals and Hercules, Inc. petitioned to review the decision.

The major advantage of using phenoxy herbicides is the great range of selective activity that can be obtained by changing carriers and by varying rates and seasons of application. None of the other herbicides allows such selective control. This versatility makes 2,4-D and 2,4,5-T invaluable in herbicidal programs.

Low volatile esters of 2,4-D and 2,4,5-T are the most widely used formulations of herbicides on forest lands, according to a technical report of the Pacific Northwest Forest and Range Experiment Station in Portland. These are liquid formulations with the esters dissolved in oil. They are easily transported and mixed in the field. In addition, they are readily absorbed into leaves and stems, are biologically active at very low rates and a variety of formulations are available that provide stable spray mixtures in the

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several different carriers required for selective silvicultural use.

Esters are formed by the reaction of a parent acid such as 2,4-D with an alcohol and are generally named for the alcohol from which they are made. Low volatile esters will begin to vaporize during application when air temperatures approach 90 degrees. Soil, bark and leaf surfaces may reach this temperature when air tempera-

analysis

ture is considerably lower than 90 degrees. As a result, contract specifications usually require that aerial spraying must cease when air temperature exceeds 70 degrees.

In selecting a herbicidal treatment for a particular site, the choice is usually dictated by two to four species that are predominant in the brushfield. Rates of application of the herbicide per acre depend upon silvicultural objectives. Proper rates are necessary not only to achieve a desired degree of brush control but to minimize damage to conifers in release spraying as well. Release spraying is an attempt to kill competing non-commercial species on a site to release commercial species from the underbrush and speed regrowth.

Movement of phenoxy herbicides is associated with translocation of carbohydrates in plants. With deciduous species, especially during spring, high concentrations of herbicides are absorbed from soil through

trations of herbicides may kill leaves too quickly, reduce absorption of the chemicals, stop or reduce photosynthesis, minimize production and translocation of sugars and thus reduce intake and movement of the herbicides into stems and roots, reducing the degree of brush control.

Volume of spray applied per acre is primarily dependent upon height and density of brush species and weed trees. The greater the density or the taller the height, the larger the volume of spray required to obtain adequate coverage. Volume of aerosol spray in most cases has been standardized at 10 gallons per acre, although there are occasional variances.

For aerial application, herbicides are diluted in one of three carriers: oil, water, or oil-in-water emulsions. The carriers may be considered biologically inactive and form 80 to 95 per cent of the spray volume, improve spray coverage, and allow uniform distribution of the small amount of active ingredient over a large area in herbicidal sprays.

Another prime function of the carriers is to insure that a maximum amount of herbicides enters the plant. Choice of carrier depends primarily upon species and season of application.

Oil is used as the carrier in early spring at the beginning of the growing season, when herbicides must be absorbed through the bark of leafless stems and branches of deciduous species.

Water is the preferred carrier for herbicides to be absorbed from soil through

roots or from foliage sprays on tender, immature leaves of deciduous species early in the growing season. Oil-in-water emulsions are used for foliage sprays that must be absorbed through heavily waxed leaves of evergreen species or through hardened, mature leaves of deciduous species.

One of the concerns about the heavy use of phenoxy herbicides on our forests is a by-product of the manufacturing process called dioxin. Dioxin is about as toxic as anything known to man. Not much is known about its carcinogenicity (capability to cause cancer) or its mutagenicity (capacity to damage and alter genes). Studies have shown dioxin to be teratogenic (capable of causing birth defects) in several types of animals.

Investigations of Vietnamese people exposed to herbicide defoliation during the war indicate a possible correlation with increased stillbirths and malformations.

There have been official acknowledgements of the dangers of herbicides. Restrictions have been placed on the use of products containing 2,4,5-T in an effort to prevent exposure to humans, livestock and crops.

Last year, courts in Wisconsin, Michigan and Arkansas stopped the Forest Service from engaging in 2,4,5-T spraying operations. Some state and other agencies have cut down their own usage of the herbicides.

Heavy use continues on forests, rangeland, pastures, rights-of-way and rice fields on the general theory that such uses

are not hazardous.

The dangers of direct 2,4,5-T exposure due to current uses have been discounted for several reasons. It is argued by industry representatives, government officials and many scientists that there is no proof of ill effects on humans. They also state that the amounts of 2,4,5-T or dioxin employed are too small to constitute a threat or that label instructions and spraying regulations are strict and assure reasonable safety.

Countering the "dioxin is safe" arguments are the questions on whether or not reasonable danger exists to humans from the distribution of herbicides by a wide range of agencies across thousands of acres of our land.

Also, no "safe" dose levels directly applicable to humans have been established. The half-life of dioxins in the environment has not been proved and it is unclear whether or not dioxins accumulate in the food chain.

The use of toxic substances may eventually be regulated by Congress. But, according to a Sierra Club report, the Toxic Substances Control Act continues to be bogged down after five-and-a-half years of efforts to pass the bill. They state the roadblock is Rep. Harley Staggers, D-West Virginia, chairman of the House Commerce Committee.

Staggers has been refusing to schedule prompt action on the bill, HR-10318, thus eliminating the possibility for funding in the fiscal year 1977 budget.

The arguments continue, but so does the spraying.