



DOT’s Use of Alternative Herbicides

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The Caltrans Division of Research, Innovation and System Information (DRISI) receives and evaluates numerous research problem statements for funding every year. DRISI conducts Preliminary Investigations on these problem statements to better scope and prioritize the proposed research in light of existing credible work on the topics nationally and internationally. Online and print sources for Preliminary Investigations include the National Cooperative Highway Research Program (NCHRP) and other Transportation Research Board (TRB) programs, the American Association of State Highway and Transportation Officials (AASHTO), the research and practices of other transportation agencies, and related academic and industry research. The views and conclusions in cited works, while generally peer reviewed or published by authoritative sources, may not be accepted without qualification by all experts in the field. The contents of this document reflect the views of the authors, who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the California Department of Transportation, the State of California, or the Federal Highway Administration. This document does not constitute a standard, specification, or regulation. No part of this publication should be construed as an endorsement for a commercial product, manufacturer, contractor, or consultant. Any trade names or photos of commercial products appearing in this publication are for clarity only.

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Executive Summary

Background

Caltrans Division of Research, Innovation and System Information (DRISI) was contacted by Caltrans Executive staff to assist Caltrans District 1 Director Matt Brady answer the question: "What types of alternative herbicides are used?" This resulted in a website literature search of other state DOT's.

Summary of Findings

A literature search was performed to find state Departments of Transportation (DOT's) use of alternative herbicides. Most state DOT's have a statewide Integrated Roadside Vegetation Management (IRVM) or similar for roadside maintenance and must provide notice when using herbicides to destroy unwanted plants within their right of way. Many have tried or are using alternative herbicides, although they may cost more and are not as effective as synthetic herbicides. Many use an approved list of chemicals, since organic herbicides are not tested or approved, and may be more hazardous. All DOT's utilize mowing, which is considered an alternative to applying herbicides. Other means of avoiding chemicals for weed control are also practiced, such as using animals like goats.

The list below identifies and defines Caltrans alternative vegetation management practices, which is like other state DOT's:

Chemical- Use of herbicides to control vegetation, synthetic and organic.

Mechanical- Use of power equipment to control vegetation.

Manual- By hand or person on foot, pulling by hand or use of tools. Increases worker exposure by having a field employee on foot, adjacent to the roadway.

Biological- Insects(Bugs), Organisms, Plants, Animals- Dept of Food & Ag are strict if bring these in, need to make sure not invasive species. Goats used, but make sure don't escape into roadway. Insects & Plant control - regulated by County agriculture, animals control falls under Fish and Wildlife.

Cultural- Mulch to prevent weed growth.

Structural- Use of weed mats, rubber mats, asphalt, concrete under guardrail; use of asphalt, crumbcrete, and concrete in gore areas.

Thermal – Use of fire to control vegetation. Concern using fire as a control method due to visibility and air quality issues when using as a control method.

Gaps in Findings

There were no gaps in findings, other than some state DOTs have more information on their website regarding alternative herbicide uses than others.

Next Steps

There are no recommended next steps.

Detailed Findings

State DOTs Literature Search

Colorado CDOT

Roadside Vegetation Management, Guidelines for CDOT Maintenance Manual 1995

<https://www.codot.gov/programs/research/pdfs/1996/roadsidevegetation.pdf>

Discusses methods of vegetation management: Mechanical – Chemical - Biological - Cultural. Provides guidelines for various levels of vegetation management including two general categories of herbicide use: soil-active, used to prevent root growth and foliar-applied, absorbed by the foliage (leaves) which requires multiple treatments. Types of plants to be controlled are categorized as annual, biennial and perennial. This is very important in determining the types of herbicides to use. Use of herbicides along highway roadways may introduce organic chemicals to the underlying ground water system, and organic substances have low solubility in water, while others have high solubility and can migrate into the groundwater.

Connecticut CTDOT

CONNECTICUT DEPARTMENT OF TRANSPORTATION VEGETATION MANAGEMENT GUIDELINES

https://www.ct.gov/dot/lib/dot/documents/dmaintenance/veg_man_guidelines_final_02-15-18.pdf

There's a section on their Herbicide program that discusses usage, pollinator plants to promote biodiversity, and scenic roads. CTDOT employs an integrated approach to vegetation management utilizing manual, mechanical and chemical methods. The herbicide program, including the herbicides used in the program is incorporated into an Integrated Pest Management Plan (IPMP) which is reviewed and approved by the Department of Energy and Environmental Protection (DEEP).

Bill to Prohibit CTDOT from Spraying was Defeated, CT Post, Jim Shay May 25, 2018

<https://www.ctpost.com/local/article/Controversial-herbicide-spraying-to-begin-on-12943420.php>

A bill that would have prohibited the DOT from spraying was approved by the Environment Committee in 2017 but didn't win full passage in the Legislature.

The state Department of Transportation will begin its annual roadside herbicide spraying program starting June 1 and continuing through the fall. Since the mid-1970s, the state has been spraying herbicides to control vegetation under guardrails, signs, and roadside barriers. It says the work is needed to improve the visibility of guardrails and to maintain sight lines on curves and intersections. Herbicides, it says, are also used to reduce fire hazards, maintain drainage and control invasive plants.

Effective Establishment of Native Grasses on Roadsides in New England

New England Transportation Consortium, June 2016

http://nenativeplants.uconn.edu/references_10_2517683307.pdf

The goal of this Manual is to provide guidelines for the establishment of native species on roadsides in New England which will support transportation goals for safety and infrastructure reinforcement while providing economic, ecological and aesthetic advantages.

Michigan MDOT

Use of Pesticides and Herbicides

<https://www.michigan.gov/mdot/0,4616,7-151-9623-331013--,00.html>

The Michigan Department of Transportation (MDOT) may permit pesticide treatments to control unwanted pest infestations. Each request will be reviewed on a case-by-case basis. Herbicide treatment of individual stems or stumps of unwanted species, with approved herbicide, may be permitted if it allows non-target tree and shrub species to grow.

MDOT generally shall not permit any broadcast herbicide application on the State highway Right-of-Way. The term “broadcast” refers to either granular or liquid application that is applied to the ground or to the foliage in a swath covering all of the vegetation in the swath widths.

Applicants must submit an individual permit application package through the Construction Permit System (CPS). If the use of an herbicide/pesticide is requested, the following shall be included with the permit application package:

- Copy of the pesticide label and the Material Safety Data Sheet (MSDS)
- Plan showing the specific geographical location and indicating the size and species of tree/shrub to be treated, if herbicide use
- Adjacent property owner’s authorization letter, if within Easement Right-of-Way

Massachusetts Mass DOT

Herbicide Alternatives Research MDOT, EOT, FHWA July 2008

https://www.mass.gov/files/documents/2017/10/24/Herbicide_Alternatives_0.pdf

Research was conducted for two years. Alternative herbicides that demonstrated immediate or short-term suppression of growth of vegetation were pelargononic acid and clove oil. Because of the cost of materials and labor and need for repeated seasonal applications, all the alternative practices will cost substantially more than the use of conventional herbicides.

Nebraska NDOT

NDOT Roadside Vegetation Establishment and Management, 2019

<https://dot.nebraska.gov/media/4016/veg-manual.pdf>

Discusses management of roadside vegetation, chemical control of weeds, mowing, pesticide usage and permitting, invasive and protected plant species, noxious weeds, seeding, mulching, and managing roadside vegetation including use of pesticides, and safe herbicide handling. Part 1 of NDPT Protocol for Integrated Vegetation Management (IVM) mentions that ... “if an alternative to use of herbicides is available, that alternative is preferred over spraying chemicals.”

Alternatives may include:

- competition vigorous grass growth makes weed species much less competitive,
- mechanical control physical removal of plant material through grazing*
- biological control specific insects known to impact weed species as hosts are released into weed populations,
- chemical control timing of herbicide application is important.

* NDOT has used goats successfully, also, spading, disking, mowing, plowing, cutting and treating stumps, or burning. Not all these treatments are effective on every weed. Mowing thistles when they have produced seed will spread the thistle population, but digging (spading) individual thistle plants is acceptable at any time, with care given to capturing all seeds. Chopping up root material MAY result in a

denser stand because of re-growth abilities of the plant species. Read the information in the links provided in the “Noxious Weed Control” section.

Spraying, mowing and brush removal operations must comply with the Migratory Bird Treaty Act and the Endangered Species Act. NDOT’s procedures are included in its Avian Protection Plan, available at: <http://dot.nebraska.gov/projects/environment/fish-wildlife/>

New York NYSDOT

Testing the Efficacy of Alternatives to Herbicides in Controlling Undesirable Plants on NYSDOT Roadside Rights-of-Way, by State Univ of NY College Environmental Science and Forestry Feb 2014 Research Project partially funded by FHWA

<https://www.dot.ny.gov/divisions/engineering/technical-services/trans-r-and-d-repository/C-06-24%20TASK%203%20%201%20%20NYSDOT%20NATURAL%20HERBICIDES%20FIELD%20TEST%20S.pdf>

On page 7-1 it summarizes that natural herbicides are not effective, are costly, requiring multiple treatments a year. It compares natural, organic and synthetic herbicide use. Natural organic herbicides are toxic. It suggests rotating or alternating years between organic and synthetic herbicides.

North Carolina NCDOT

Herbicide Options for Weed Management in North Carolina Highway Wildflower Program, June 2007

<https://connect.ncdot.gov/projects/research/RNAProjDocs/2005-09FinalReport.pdf>

Methyl Bromide, a broad-spectrum soil fumigant, has been used to prepare roadside areas for wildflower plantings. Out of concern for the atmospheric ozone layer, a complete ban of methyl bromide production by 2005 was agreed to by 160 nations. The loss of methyl bromide facilitated the need for research to find alternative weed control herbicides. Research was conducted with multiple preemergence and postemergence herbicides having differing modes of action on twenty-one wildflower species. Periodic visual evaluations were made to determine wildflower tolerance and weed control. No herbicide evaluated proved to be as versatile as methyl bromide with regards to tolerance.

NC DOT Vegetation Management

<https://connect.ncdot.gov/resources/roadside/Pages/Vegetation-Management.aspx>

The Vegetation Management Section is responsible for developing programs for the establishment and maintenance of all roadside vegetation. This includes turfgrasses and other groundcovers for erosion control, ornamental plantings, and existing vegetation along highway right-of-way. This section coordinates statewide training for Roadside Environmental employees.

North Carolina Vegetation Management Association

<http://www.ncveg.com/mission.php>

It is the mission of the North Carolina Vegetation Management Association (NCVMA) to act as a vehicle *for furthering the knowledge of individuals who have expressed interest and have experience in the* management of vegetation. The intent of this fellowship of vegetation managers is to collect, discuss and disseminate accurate and state-of-the-art information

regarding vegetation management. The objective will be to provide these individuals the tools necessary to make prudent and knowledgeable decisions in managing vegetation.

Symposium Dec 2018, Fall Newsletter

http://www.ncveg.com/pdf/fall_2018.pdf

Article on EPA draft risk assessment of Glyphosate, one of the most widely used agricultural pesticides in the United States, which will be published sometime in 2019.

Oregon ODOT

Oregon Department of Transportation Herbicide Reduction Strategy

<https://www.oregon.gov/ODOT/Maintenance/Documents/Herbicide%20Reduction%20Final%20Report%20April%202016.pdf>

In 2010, ODOT committed to a 25 percent reduction in herbicide use as part of a comprehensive review of its integrated vegetation management program. After five years, ODOT exceeded the reduction goal, achieving an average 44 percent reduction. The reduction goal was predominantly met by switching to a product with less active ingredient. Lesser contributing factors include: upgrading application equipment; reducing shoulder widths; and using the proper calibration. This paper discusses mechanical, chemical, biological methods. No significant drop in level of service was realized because of the herbicide reduction. This is because the replacement (lighter) herbicides used were effective in maintaining bare shoulders and broadleaf control in transition zones. The result was more efficient applications that resulted in more acres per day being sprayed, thus lowering labor and equipment expenses.

- There is a high level of confidence that ODOT will not revert to 2010 levels and the 25 percent statewide reduction can be maintained.
- Affordable herbicide formulations with less active ingredient becoming available for use made the transition to alternative herbicides practical.
- More time is needed to determine whether the efficacy of the alternative formulations will be long-lived.

Texas TxDOT

Texas DOT 2018 Herbicide Operations Manual, Maintenance Field Support for Vegetation Management

<https://ftp.dot.state.tx.us/pub/txdot-info/mnt/herbicide-manual.pdf>

Physical methods of vegetation control include hand-pulling, hoeing, plowing, cultivating, trimming and mowing. Chemical methods include the application of approved herbicides to control specific vegetation problems. TxDOT's herbicide program is based upon extensive research for chemicals which will provide the desired control of the target species while presenting the minimum possibility of harm to the environment, the applicator, and to the traveling public. The use of herbicides is a key element to be used in combination with physical vegetation control methods to manage right of way vegetation.

Discusses applicability, toxicity, operations, laws, noxious weeds in right-of-way, weed control, approved chemical use, use precautions, and proper usage.

TXDOT Vegetation Management Publications

<https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/vegetation.html>

TxDOT's Herbicide Operations Manual provides guidelines and best practices for the application of approved herbicides to control specific vegetation problems along highways. This document is part of TxDOT's Roadside Vegetation Management Manual, which contains the complete statewide guidelines for maintaining highway vegetation in a uniform manner using integrated pest management practices. It discusses alternative vegetation management guidelines for native and introduced grasses, wildflowers and legumes as well as wildlife habitat, as well as mowing guidelines.

Washington WSDOT

Assessment of Alternative in Roadside Vegetation Management Dec 2005

<http://198.238.212.152/NR/rdonlyres/0CB59701-542E-4DF2-B8C8-1ACA3CB72172/0/FinalUWReport.pdf>

This study was conducted for WSDOT to explore both the need for and the variety of alternatives to the use of annual application of herbicides for removing vegetation. Interviews, surveys and literature searches conducted. Developed a decision framework to guide WSDOT staff in a vegetation management plan.

Maintaining Vegetation along our Highways- WSDOT website-links to pesticides

<http://www.wsdot.wa.gov/Maintenance/Roadside/vegetation.htm>

An integrated roadside vegetation management plan (IRVM) is a "how to" guide for the best way to manage roadsides throughout Washington. The plans, including prescribed methods and timing, vary by location due to the diverse climates and surrounding land uses. What is used to maintain vegetation:

- Mowing and trimming
- Selectively using herbicides
- Release of weed-eating insects
- Improving Soils
- Planting native plants

Minimizing risk from Herbicide Use WSDOT

http://www.wsdot.wa.gov/Maintenance/Roadside/herbicide_use.htm

Preliminary Investigation

Caltrans Division of Research, Innovation and System Information

Research on Vegetation Management, Herbicides and Alternatives

Exploring Alternative Methods for Vegetation Control and Maintenance Along Roadsides Caltrans Research for Division of Design, Landscape Architecture, 2003

http://www.dot.ca.gov/research/researchreports/2002-2006/2003/task_0101-design_and_construction.pdf

This work was initiated to find alternatives to the traditional methods for roadside vegetation maintenance that includes the use of registered synthetic herbicides and regular mowing. In this 2 ½ year study, the materials and methods considered included bioherbicides, ultra violet light, barriers/mats, cultivation, mechanical/chemical combined, grazing, steam, natural-based products and flaming. Alternatives such as animals for grazing, UV light to burn foliage and mechanical/chemical combined required liability insurance or large capital investments. Natural-based products were found to be the most easily substituted materials for currently used synthetic herbicides. These products are plant-based materials that degrade quickly in the environment and usually are low toxicity. All the natural-based products caused damage to the vegetation. For control comparable to the synthetic standard of glyphosate (Roundup™) in most cases, several applications and higher volumes of the active ingredient were required for the natural-based products. The number of applications for most of the products ranged from three to five with control still less than 100%. Coconut oil and fatty acids, the active ingredient in Bio-SAFE™ and Greenscape™, respectively, were the most effective natural-based products for vegetation control after one season. Another natural-based product, Bioganic™ (active ingredient: plant essential oils) also showed good vegetation control after one year. In terms of efficacy, all three natural based products showed potential for use as broad spectrum roadside vegetation control treatments as substitutes for glyphosate (like Roundup™). Because of the higher volumes and repeat applications of the natural-based products, the cost was several times higher than one, low volume application of glyphosate. Flaming and mowing were two alternative methods that were tested and found to be effective and inconclusive, respectively, for controlling mostly annual vegetation. At this point, the alternatives for controlling roadside vegetation are not as effective and more costly than the standard synthetic herbicides.

Exploring Alternative Methods for Vegetation Control and Maintenance Along Roadsides

Caltrans Research for Division of Design, Landscape Architecture

http://www.dot.ca.gov/research/researchreports/2002-2006/2003/task_0101-design_and_construction.pdf

The use of herbicides on Caltrans-managed acreage has raised concerns of environmental quality, public health, and worker safety, especially in the North Coast area of California. An Environmental Impact Report (EIR) was completed in late 1992 which assessed the risks of the agency's use of chemical vegetation control programs. Following the issuance of this document, Caltrans adopted an integrated vegetation management program and set goals for reduction of chemical use: a 50% reduction by 2000, and an 80% reduction by 2012. Currently, Caltrans District 1 has severely limited its use of herbicides within two counties (Mendocino and Humboldt) within its district borders. Alternative methods of vegetation control need to be

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developed and proven effective in a variety of types of plant communities and climates for Caltrans to be able to continue its mandate in these counties and elsewhere. Caltrans only must send a notice of intent to either Humboldt or Mendocino County that it is planning to treat roadsides with the use of chemical vegetation control.

AASHTO's Guidelines for Vegetation Management, March 2011.

<https://store.transportation.org/item/publicationdetail/1754>

A full report can be downloaded if requested via Caltrans Librarian.



NCHRP Report
14-16 Vegetation Ma Power Point Overview

Natural Herbicides: Are they Effective?

UC Davis Weed Science Jan 2012

<https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=6498>

So, the question is: Are natural herbicides safe and effective? If used as part of an integrated pest management program, the contact herbicides fit very well. Users should know that they won't get the same kind of long-term weed control as products containing glyphosate (e.g., Roundup). The user should also be aware that many of the plant based or "natural" products can cause skin irritation or eye or lung problems. Eye protection and gloves as well as any other label requirements should be worn when using these natural herbicides, even if they are listed as exempt products. Note that some of the acetic acid products can be quite hazardous to handle.

Alternatives to Herbicides and Pesticides, Healthfully Article, June 2017

<https://healthfully.com/226714-alternatives-to-herbicides-pesticides.html>

Unfortunately, organic pesticides can kill off natural pest control, good bugs.

16 Natural Alternatives to Herbicide Use Greenside Up November 2015

<http://greensideup.ie/16-natural-alternatives-to-herbicide-why-you-should-use-them/>

Discusses Roundup, DDT and use of natural alternatives. Garden Design, Mulching, Ground Cover, Crop Rotation, Good Soil Management, Organic Weed killers, Flame Guns, Hard Work & Hand Weeding, Strimming (weed whacker), Power Washing, Livestock, Weed Identification, Edible Weeds, Love Weeds.

Are there alternatives to Glyphosate for Weed Control in Landscapes?

North Carolina State University Publications, October 2018

<https://content.ces.ncsu.edu/are-there-alternatives-to-glyphosate-for-weed-control-in-landscapes>

Although there are effective alternatives to glyphosate, each of these alternatives will be, in some way, less effective, less convenient, and / or more expensive. Contact herbicides will be less effective on larger weeds requiring multiple applications. Natural product alternatives will be significantly more expensive. Selective postemergence grass herbicides will be convenient but more expensive and do not control broadleaf weeds. Synthetic auxin herbicides are effective on perennial broadleaf weeds but may result in damage to desirable plants through either spray drift or root uptake. Mechanical controls or hand removal will be labor intensive and expensive.

Many landscape maintenance professionals have grown reliant on glyphosate for weed control. Landscape weed control without glyphosate is certainly possible but will require more planning, careful consideration of alternative treatments, more frequent site visits, and higher costs. But, it can be done.

Other State DOT's

Below is a partial search list of state DOT's that yielded limited information regarding alternative herbicide use.

Arkansas ArDOT

Vegetation Management Program

http://www.arkansashighways.com/maintenance_division/facilities_management.aspx

Limited information posted on a website, no PDF or manual provided.

Vegetation management consists of both mechanical and chemical means. Mechanical methods of vegetation control include hand pulling, cultivation, trimming, and mowing. Chemical methods include the application of approved herbicides to control or suppress problem vegetation. Herbicide use is a key element to be used in combination with mechanical methods for roadside vegetation management.

Florida FDOT

FDOT Landscape Architecture- Useful Links for Highway Landscape Projects

<https://www.fdot.gov/designsupport/highwaybeautification/usefullinks.shtm>

It was difficult to find anything for Florida's use of alternative herbicides, or a recent vegetation management plan.

A Guide for Roadside Vegetation Management, October 2009

https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/research-center/research-center/completed_proj/summary_mnt/fdot_bdk75_977-11_rpt.pdf?sfvrsn=41bec64d_0

Discusses weed management, pesticide safety, mowing, operator safety.

Hawaii HiDOT

Herbicidal Weed Control Methods for Pastures and Natural Areas of Hawaii

Cooperative Extension Service, University of Hawaii, November 2002

https://passel.unl.edu/Image/Robles%20VazquezWilfredo1129928587/weed_control_hawaii.pdf

Use of herbicides is an effective and efficient means of managing weeds. Contrary to popular perception, it is also very safe. In many cases there are no practical alternatives to chemical weed control methods. However, herbicides can easily be misused and inflict unintended injury to non-target organisms. In order to ensure efficacy, efficiency, and economy—and non-target safety—users of herbicides must have an understanding of herbicide application principles and plant responses to herbicides. Discussed cultural, mechanical or manual, and bio (insects, microorganism) controls. Mechanical can also be a dangerous occupation, herbicides can provide greater efficiency at lower costs. A detailed, comprehensive manual, however, no alternative herbicides, such as organics listed.

Resolution 19-1 Supporting the use of Science in Herbicide Regulation Feb 1, 2019

Hawaii Invasive Species Council

<https://dlnr.hawaii.gov/hisc/news/resolution-19-1-supporting-the-use-of-science-in-herbicide-regulation/>

On January 29, 2019, the Hawaii Invasive Species Council adopted a resolution supporting the use of best available science in regulation of herbicides and recognizing the utility of glyphosate (Roundup) as a tool for invasive species control. The working group has adopted a position that future policy discussions relating to glyphosate should be based on scientific evidence and include a careful consideration of hazard versus risk.

Understanding the Value of Glyphosate in Protecting Hawaii

<https://dlnr.hawaii.gov/hisc/files/2019/01/HISC-RTWG-Position-on-Glyphosate-2019-1.pdf>

Oklahoma ODOT

Oklahoma Roadside Vegetation Management Guidelines- 4th Edition

ODOT Technical Report FHWA OK 09-02 Jan 2010 <https://www.ok.gov/odot/>

<http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-3158/Roadside+Vegetation.pdf>

The guidelines serve as a training and reference manual for Oklahoma Department of Transportation (ODOT) employees that are responsible for herbicide application as a part of maintaining roadside vegetation in Oklahoma. The manual stresses the important concepts of weed identification, and the integration of proper mowing practices with sound herbicide selection and responsible product use. When properly implemented, the guidelines will aid in achieving cost effective, reduced risk weed control in desirable roadside vegetation. Herbicide products and biological weed control agents are discussed. An ODOT approved herbicide and adjuvant (material added herbicide spray) list is also discussed, as well as laws and procedures.

Protecting your Vineyards from Phenoxy (Hormone) Herbicide Effects

Oklahoma Dept of Agriculture, Food and Forestry

<http://www.ag.ok.gov/cps/grapebroc.pdf>

Consider using a herbicide with a different active ingredient, such as glyphosate (Roundup), when you are trying to control difficult weeds such as blackberry or poison oak.

New Mexico NMDOT

Integrated Noxious Weed Management: New Mexico DOT Research Bureau June 2003

<http://dot.state.nm.us/content/dam/nmdot/Research/NM02ENV02IntegratedNoxiousWeedMgmtNM2003.pdf>

A change in environmental legislation and public concern regarding the effects of chemicals has resulted in the development of a more diverse system of weed control: Integrated Weed Management (IPM). This report summarizes Integrated Weed Management as a primary means of minimizing the use of chemicals and determines methods available for control of noxious weeds. The study included online literature searches and telephone interviews to identify model programs and best practices in other states.

New Jersey NJDOT

NJDOT Website

<https://www.state.nj.us/transportation/about/directory/servicesatoz.shtm>

Could not find anything on the NJDOT website or it's directory

New Jersey Information Network for Pesticides and Alternative Strategies Archive

<http://njinpas.rutgers.edu/PesticideRegistration/NJregistrations.htm>

In New Jersey, the state lead agency is the New Jersey Department of Environmental Protection (NJDEP). The NJDEP applies to the EPA for an emergency exemption for the pesticide product to deal with the emergency pest condition. The exemption (also known as a 'Section 18') will be categorized as specific, quarantine, or public health. If approved, the EPA then issues the NJDEP a letter granting an exemption from registration for the pesticide product for a prescribed time period.

Virginia VDOT

VDOT Maintenance Division, Best Practices Manual, October 2010

https://www.virginiadot.org/projects/resources/VDOT_VegetationMgmtPolicyFinal_VDOTwebsite.pdf

Difficult to navigate in this PDF document and no table of contents, appears to be a mowing guideline.

All States Pesticides Fact Sheet

Beyond Pesticides Fact Sheet

<https://www.beyondpesticides.org/assets/media/documents/infoservices/pesticidesandyou/documents/UpdatedROW.pdf>

Has table on several state DOT's notification to the public and legislation of applying pesticides in state rights-of-way (ROW). AK, CN, CA, IA, FL, ME, MT, MI, MN, NH, PA, NY, NC, VT, OR, WA, WI

Caltrans

Caltrans staff was contacted included: S. Williams, J. Broadbent of HQ Landscape Architecture, K. Murray of HQ Maintenance and D. Bongio of D1. Here's a synopsis of what was learned:

Summary

There are 7 types of alternative vegetative management practices: Chemical, Mechanical, Manual, Biological, Cultural, Structural and Thermal. Most of the Caltrans integrated vegetative management practices (IVM) consists of Mechanical, Manual or Chemical practices. A minimal amount consists of mulching or use of biological insects. The use of any kind of weed control is determined by the Caltrans District Landscape Specialist.

Organics do not go through the extensive testing procedures, and these chemicals do and can potentially be more toxic. On the other hand, for approved chemicals, a manufacturer must go through over ten years of extensive testing of their product through market and experience. The testing process to get a CA label must go through the EPA AND the CAL EPA, Department of Pesticide Regulations. Depending on the PH, either Hi Acidic or Low Basic, organics can attack metal guard rails and do damage to other safety devices. Some have been used by Caltrans but don't work.

District 1 Landscape Maintenance – Alternative Vegetation Control

Information was obtained from Caltrans D1 maintenance Dominic Bongio which has been helpful. It appears that in this northern most District which includes Humboldt and Mendocino counties that Caltrans has explored and tried virtually every alternative method of vegetation control. 88.5% of chemical herbicide use has occurred, resulting in less than 200 acres that use chemicals. With the “alternative uses” examined and trialed, D1 settled on primarily using mechanical methods (i.e., mowing) and manual methods (i.e., string trimming, hand pulling, chainsaws, hoes, weed wrench pullers, etc.). In D1, chemical vegetation control is the “alternative” method. Here are the facts about D1’s usage of methods of vegetation control by year:

D1 Usage History of Vegetation Control Methods by Acres

Year	% Mechanical	% Manual	% Chemical	% Reduction in Chemical from Baseline Year
2019	72.9%	23.2%	3.9%	--
2018	79.1%	17.9%	3.1%	87.8%
2017	76.6%	18.4%	5.0%	88.8%
2016	84.7%	11.2%	4.1%	86.1%
2015	74.6%	20.9%	4.5%	88.4%
2014	81.2%	15.8%	3.0%	88.6%
2013	71.4%	24.3%	4.4%	89.4%
2012	69.7%	25.9%	4.3%	89.5%
2011	66.4%	27.1%	6.5%	83.6%
2010	64.3%	31.1%	4.6%	94.3%
10 Yr. Avg:	74.1%	21.6%	4.3%	88.5%

D1 mows 74% of the acres, string-trims/chainsaws/pulls 22% of the acres, and chemically treats 4% of the acres. The percent reduction of chemical from the baseline year represents the statewide goal of the Caltrans to reduce chemical use by 80% by year 2012. D1 includes ALL chemical applied, including adjuvants. Roughly 45% of the chemical applied is non-herbicidal (i.e., surfactants, drift retardants, and dyes). D1 is using ‘alternative methods’ on 96% of the roadside that has vegetation control.

Caltrans Approved Chemical List

Mr. Ken Murray, Office of Roadside Management, Caltrans Division of Maintenance, April 2019. Caltrans has an Integrated Vegetation Management (IVM) Program with a list of approved chemical list:

<https://maintenance.onramp.dot.ca.gov/roadsidemgmt/integrated-vegetation-management-program-approved-list-products>

Caltrans Weed and Pest Control Research, Landscape Architecture Website

http://www.dot.ca.gov/hq/LandArch/16_la_design/research/weeds_and_pests.htm

This is the Caltrans website. Invasive and noxious species are studied to prevent and control their spread within and from the highway right-of-way.

California Department of Pesticide Regulation

<https://www.cdpr.ca.gov/>

This has a list of approved chemicals that Caltrans can use, these products can be looked up based on product name, chemical name or manufacturer.

California Food and Agricultural Code Section 11501-11518

http://www.oclaw.org/research/code/ca/FAC/11501.1./content.html#.XMNOI6bQa_4

11501.1. (a) This division and Division 7 (commencing with Section 12501) are of statewide concern and occupy the whole field of regulation regarding the registration, sale, transportation, or use of pesticides to the exclusion of all local regulation. Except as otherwise specifically provided in this code, no ordinance or regulation of local government, including, but not limited to, an action by a local governmental agency or department, a county board of supervisors or a city council, or a local regulation adopted by the use of an initiative measure, may prohibit or in any way attempt to regulate any matter relating to the registration, sale, transportation, or use of pesticides, and any of these ordinances, laws, or regulations are void and of no force or effect.