Caltrans and Roadside Weed Control

Larry Shields, Caltrans

The California Department of Transportation (Caltrans) maintains approximately 15,000 miles of highway and more than 230,000 acres of right-of-way. The maintenance effort also includes 26,000 acres of planted landscape areas, 86 Safety Roadside Rest and approximately 500 Vista Points and Park and Ride facilities.

California is a geographical and environmental diverse state. Annual rainfall can vary from two inches in Death Valley to over one hundred inches on the North Coast. Highway elevations range from below sea level to over eight thousand feet. Vegetation control strategies vary from region to region. Adjoining land use influences vegetation control requirements for roadside maintenance. When communities develop along a highway corridor, higher levels of vegetation control are needed.

Caltrans utilizes the Integrated Vegetation Management (IVM) philosophy. The idea of IVM is to use the right tool at the right time. The control methods in Caltrans vegetation control program are as follows: Chemical, Mechanical (mowing), Manual, Cultural, Biological, Thermal and Structural.

Objectives of Vegetation Control Program

- provide fire risk control
- sight lines to safety devices
- visibility around curves and at intersections
- protecting the pavements edge from weed damage
- control noxious weeds

Environmental Impact Report (EIR)

In 1992 Caltrans completed an EIR on its vegetation control program. The document included a risk assessment of chemical vegetation control. The findings of the EIR indicated that the chemical program did not pose an environmental risk. However, the department set goals for reducing the use of chemicals because of public concerns: A 50% reduction by 2000 and an 80% reduction by 2012.

Caltrans achieved the first herbicide reduction goal in July 2000 with a 51.6% reduction. The second reduction goal, 80% by 2012, will be achieved by improvements in highway design.
Caltrans new design program, called the “New Perspective” will minimize the need for vegetation control thus reducing the need for chemicals. The new design strategies are in the development stage but may include establishing desirable grasses at the pavement edge that will not need mowing and stay green thus creating a fire break. For more information on the design program, you may visit Caltrans web site, http://www.dot.ca.gov/hq/maint/roadside/.

Reduction strategies

The 50% reduction was accomplished in stages using the following strategies:

Site specific planning - assessing fire risk based on site conditions, keeping the chemical control to a minimum

Better equipment – smart sprayers, WeedSeeker technology senses weeds and applies the required amount of herbicide to achieve control, computerized spray rigs mix precise amount of herbicide

Low volume technology, control droplet application (CDA)

Increase manual control effort:

California Conservation Corps (CCC)

Court referrals (County)

California Youth Authority (CYA)

Department of Corrections

Searching For Herbicide Alternatives

Caltrans is committed to reducing the use of herbicides to control vegetation and is diligently searching for alternatives. The search has been ongoing for several years and will continue into the future. The following list reflects several control devices or strategies that have either been tried or is still being evaluated.

Aqua-Heat

• Diesel fired burner heats water to over 200 degrees

• Hot water applied from a boom a few inches above the ground followed by a tarp shroud to retain heat

• Speed of travel 3 MPH, uses 2000 gallons of water per acre and about 50 gallons of fuel

• Hot water cooks the weed and the weed lays over
**Corn Gluten**

- A corn byproduct that has weed suppressing value
- 600 to 800 pounds per acre
- repeated application needed

**Super Heat (Ag Industrial Manufacturing, Inc, Lodi CA)**

- Modified steam cleaner, dry steam
- Heats air to temperatures 400 to 600 degrees
- Travels 1-3 MPH
- Hot air destroys plant tissue, plant yellows and lays over
- Controls annual weeds

**Roofing Foam (Polyurethane foam)**

- Foam is applied under guardrail as a layer, shuts off sunlight to prevent weeds growth
- Fire and ultraviolet resistant
- Hard surface, can be colored or covered with mulch to blend into the roadside

**Fabric (Weed-Ender, by Uteck)**

- Fabric is placed in strips under guardrail to shut off sunlight to prevent weeds growth
- Not a landscape fabric – a non-woven material, multi-directional needling of synthetic polyester fibers
- Long lasting, 10 year
- Guardrails – signs - delineators

**Vegetative Covers (Road Edge Treatment)**

Select vegetation covers that will be planted at the road edge, will be self-sustaining, low growing and will crowd out weeds.

**Organic Mulch**

Apply a layer of mulch 4 to 6 inches over bare soil to shut off sunlight to weeds
Thermal

Flaming equipment delivers propane fired flame heads over the selected weeds. The heat destroys the green tissue. Flaming is an effective tool for controlling Yellow Starthistle by killing small plants and stopping seed production.

Hard Scape

Hard Scapes is a term designers use to describe the placement of stone, concrete or other inorganic materials used to pave areas in landscape plantings or at the road edge to eliminate bare soil.

Control Burns

The heat from the fire destroys unwanted weeds. (Yellow Starthistle)

Extra Paving

Pave under guardrail, around signs and in narrow bare soil areas to eliminate weed growth.

New Highway Mower Development

The standard highway mowers that are available today do a good job where the terrain is not too steep and where it is permissible to leave the cuttings in place. New mowers are needed that can mow closer to highway obstacles, follow a variety of uneven terrain and move or pickup the cuttings.

University of California, Davis – Hopland Research Center – Steve Young

Caltrans has contracted with the university to conduct research to fine viable alternatives to synthetic herbicides for controlling vegetation. The research project will be conducted over a three year period and will includes the evaluation of the following:

- Bioherbicides (fatty acids – Scythe, acetic acid – vinegar & lemon juice)
- Barriers/mats (polypropylene fibers block out weeds, water, air and nutrients pass through)
- Steam
- Cultivation
- Mechanical and chemical combined (brush mower that applies herbicide as it mows)
- Natural plant products (glucosinolates – compounds in plants that have biological activity)
- Ultra violet light (removing weeds with uv light)