RESEARCH NOTES

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Caltrans

EXPLORING ALTERNATIVE METHODS FOR VEGETATION CONTROL AND MAINTENANCE ALONG ROADSIDES

Yellow Star-thistle, J.S. Peterson @ USDA-NRCS PLANTS Database

Why was this Research undertaken?

California Department of Transportation needs to control plants growing on the state right of way because of safety concerns including visibility and fire control, as well as reducing the spread of noxious weeds and controlling erosion. The use of synthetic herbicides on state land has raised concerns over environmental quality, public health, and worker safety. In fact, Caltrans has committed to reduce roadside chemical use by 80% from 1992 levels. This work was undertaken to find alternatives to the conventional methods for roadside weed control such as registered synthetic herbicides and regular mowing.

What was done?

First, a literature search of alternative ways to control weeds was completed. Then greenhouse and field studies were conducted. Field test were performed to evaluate corn gluten meal's ability to prevent plants from sprouting compared to other pre-emergent treatments. Other field tests evaluated the effects of 7 alternative products on various weed plants, using untreated plots and plots treated with either the persistent chemical glufosinate or the potential amphibian toxin glyphosate as efficacy controls.

What can be concluded from the Research?

The list of identified alternatives covers a broad range of possibilities, including everything from grazing by goats to application of corn gluten

meal. Additional research would be needed to evaluate all of the alternatives.

- Using natural-based products proved to be an order of magnitude more costly than the reference synthetic compounds.
- Flaming wet plants is effective as steam carries the heat to the heart, but it is costly.
- Mowing yellow star thistle just before it blooms slows it down, but timing is difficult.
- Heavy applications of corn gluten meal were effective at preventing sprouting the first season, but after breaking down they encourage growth in later years.
- Pelargonic acid (Scythe) was the most effective natural product tested overall, but did not control jubata grass.
- Coconut oil (Bio-SAFE) proved to be effective on a variety of both woody and herbaceous plants.
- Plant essentials (Bioganic) were effective for controlling a wide variety of plants, but it does not control hare barley.
- Pine oil (Organic Interceptor) was nearly as effective on a variey of plants including common catsear and is effective against hare barley.
- Fatty acid (Greenscape) was fairly effective at controlling a wide variety of plants including jubata grass and woody plants, such as blackberries.
- Acetic acid (BurnOut) was effective in controlling medusahead and freshly sprouted grass.
- Citrus distillates were least effective in general, but exhibited moderate control of slender oat and medusahead with almost no effect on woody plants.
- Star thistle was controlled by plant essentials, pine oil and pelargonic acid. Both pelargonic acid and coconut oil were fairly effective at controlling trimmed French broom.

What do the Researchers recommend?

Until costs come down, the alternative products are only recommended for small areas with frequent visitors and not for large scale roadside maintenance. The product of choice depends on the type of plants that need to be killed and those that are desired to remain (selectivity). The timing of the season is also a factor in product selection.

Where bare earth is desired, the more effective products would be used, while in places where landscaping exists, products that are the least harmful to desired plants would be used. For example, the selectivity of acetic acid and citrus distillates suggests their use on grass sprouts in areas where most existing plants are desired.

Brother Alfred Brousseau @ USDA-NRCS PLANTS Database

Implementation Strategies

California has proceeded with follow-up research evaluating biological controls of yellow star thistle and using desirable species to suppress weeds. A maintenance toolbox will follow

List of Contacts.

For More Information about this and other landscape research

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