

# Weed Control: Alternatives to Herbicides

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Abstract. In 1984 Federal use of herbicides was banned in Oregon and Washington. The purpose of this presentation is to outline the impact and response to the loss of herbicide usage at one USDA nursery, and to provide a brief look at the arsenal of tools and equipment used to keep unwanted vegetation at bay.

## INTRODUCTION & BACKGROUND OF THE HERBICIDE BAN

On March 1, 1984, U.S. District Court Judge James Burns issued an injunction to the Forest Service in Washington and to both the Bureau of Land Management and the Forest Service in Oregon, enjoining them from applying herbicides in any of their vegetation management programs including nurseries, research projects, noxious weeds and individual tree treatments until the agencies could develop adequate NEPA documents, including worst case analysis.

Federal nurseries in the region were directed to defer the use of all herbicides by the end of March 84. Due to the wording of our pesticide use proposal which identified the herbicidal properties of soil fumigation as a positive tool in the control of unwanted vegetation, it was felt that the court could have interpreted the use of Methyl Bromide to be an application of an herbicide. Therefore, the decision was made by the nursery superintendent to discontinue the use of fumigation at Wind River Nursery.

At Wind River two consecutive bareroot crops totaling roughly 32 million seedlings were sown on unfumigated ground. In 1985 a resubmission of our use proposal identifying the fumigation targets of most significance as soil borne diseases, insects and other pests resulted in the approval to resume the use of soil fumigation. In 1985 we were able to fumigate approximately 1 acre of bedhouse area, and in the spring of 1986 we fumigated roughly 40 acres for spring bareroot sowing. We are still unable to apply any herbicides

at Wind River.

At this time the herbicide ban on Federal lands in Oregon and Washington is still in effect. A herbicide Risk Assessment has been prepared by the Washington Office and it will be used in the preparation of several Environmental Impact Statements. As we understand the situation, Federal Nurseries and possibly the noxious weed programs are to be covered under separate EIS's that are being prepared by the Washington Office. At this time it appears that there will be a formal legal request for relief made in the fall of 1987. Much work remains to be done and it could be several years before we know the outcome of the litigation.

## THE PREVIOUS STANDARD HERBICIDE PROGRAM AT WIND RIVER NURSERY

Prior to the injunction, herbicide usage at Wind River had been kept to moderate levels. Our annual program on the 1-0 crop consisted of one application of Stoddard's Solvent just prior to seedling germination (@25 gallon/acre), followed by one or two summertime applications of Dymid or Dacthal (@ 8 lbs/acre and 12 lbs/acre respectively). The 2-0 crop received only one shot of Dacthal or Dymid in the spring. Roundup had been used along the fences and in areas where the use of equipment was difficult. Fumigation had been done on areas for bareroot sowing, having a positive impact on subsequent weed populations. All other weed control was done either by manual or mechanical methods except that in 1981 we began using Chinese Weeder Geese. The philosophy of the weeding program at the time was to keep the seedling beds as clean as possible in order to eliminate competition for light, moisture and nutrients, and to keep weed seed contamination from adjacent areas to a minimum.

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## THE POST INJUNCTION WEED CONTROL PROGRAM

The herbicide injunction arrived at a time when Federal nurseries were experiencing personnel and budget limitations. We could see that we needed new tricks to keep from being inundated with weeds. One of our first attempts in 1984 was to enter into personal services contracts with individuals willing to submit an hourly wage bid for their own personal labor. We simply took the lowest bidders until we had a crew of sufficient size. This worked well except that we received pressure from the National Federation of Federal Employees and the Washington Office of the Forest Service to discontinue the use of this type of labor force after only one year.

In 1985 and again this year we have had a program in cooperation with the Washington State Parks and Recreation Commission called the Youth Development and Conservation Corps. This program employs youths 14 thru 21 years of age at below minimum wage levels. In addition to their salary the enrollees receive work experience and conservation education. This program has been very successful so far, but, even with 40 enrollees we are unable to maintain the nursery fields as inexpensively and as cleanly as they had been prior to the ban. Nowadays, we must often be satisfied to weed only those weeds that are starting to bloom or are developing seed and move on to other priority areas.

Over the years we have developed or purchased a wide variety of hand tools. Some of the more common ones are shown in these slides. A variety of mechanical equipment including the Turner Rear Mounted Flail Mower, the Fobro Brush Hoe, the Rotary Cultivator, the Roter, Rototillers, various Weed Eaters, Troy Built tillers, the Bush Hog and even a Flame Thrower have been used for weed control.

We have had limited success with Biological Control. Of the various agents tried, we have had the most success with the weeder geese which was a presentation given at a previous meeting. Also, the county has released Cynabar larva in the general area in an attempt to combat the tansy ragwort. These larva also feed on groundsel, one of our biggest problem species. Although there are now large populations of Cynabar at Wind River, their impact on the groundsel has been minimal. Finally, manipulation of irrigation water is sometimes used during periods of peak seed dispersal to reduce their germination. We would be interested in hearing

from anyone who has experimented with other forms of biological control.

## COSTS

The injunction in early 1984 caught us by surprise. Our cost data from the years when there were few restrictions on herbicides was not detailed enough for a highly accurate breakdown of the weed control aspect of our program. However, we began keeping track of the situation on a more detailed basis early that spring and were able to compare the total cost of the previous program with the cost of operating under the injunction. It was determined that the total additional cost to our nursery was roughly \$106,000 in 1984. Based on a production of around 20MM at that time, this raised our production costs by about \$5.30 per thousand. This figure included the cost to our clients of the additional seed required to offset the expected (and experienced) increase in cull %, but did not include the cost to them of replenishing their seed inventory. Also, the competition for light, nutrients, water and space may have resulted in some less vigorous seedlings being shipped. In theory, if only 5% of the total production (or @ 1MM seedlings) failed to survive after outplanting as a result of the injunction, the additional cost of replanting could be as high as \$700,000, based on a planting cost of \$350 per acre @ 500 trees per acre. The increased production costs combined with the additional reforestation costs could result in a total additional cost of up to \$20 per acre to our clients.

## IN SUMMARY

We sincerely hope that the legal effort to gain relief from the current herbicide injunction will bring us back to a more realistic program of weed control by the spring of 1988. However, weed seed buildup in areas that we had had under control in the past will provide us with difficulties for years to come. In the meantime we are trying to stay ahead of the blooming weeds.

## LITERATURE CITED

- Owston, P.W., and L.P. Abrahamson, 1984 Weed Management in Forest Nurseries FOREST NURSERY MANUAL: Production of Bareroot Seedlings. USDA Forest Service and Oregon State University, Nursery TechCooperative. Duryea and Landis.
- Dutton, David W. 1982. Chinese Weeder Geese Proceedings of the 1982 Western Nurserymen's Conference. (Medford, OR, August 10-12)