USDA Forest Service Research Note SE- 132 July 1970

FRONT AND BACK FACE GUM YIELDS FROM 2,4-D AND H_2SO_4 TREATMENTS ON SLASH PINE

Abstract. --A Z-percent water soluble solution of 2,4-D was as effective as 50-percent H_2SO_4 for stimulating gum flow from slash pine in stands of natural reproduction. In the 4-year study reported here, there was no appreciable difference in gum yields for any one year of work, for either front or back faces, and for the entire 4 years of production.

The hcrbicidai treatment is noncorrosive, provides safer working conditions, gives longer life for galvanized iron cups and gutters, and will produce higher grades of gum.

Data from a previous study indicated that 2,4-D was just as productive as H_2SO_4 on planted slash pine that were selectively cupped and worked on the front face only. The study also demonstrated conclusively that the weak solution of 2,4-D was a gum yield stimulant for slash pine exclusively, because repeated treatments proved lethal to longleaf pine.[1]

OBJECTIVES

The cl-year study reported here was established in the spring of 1965 to obtain additional information on the behavior of a 2,4-D water solution as a gum yield stimulant for slash pine in average commercial naval stores operations. Specific objectives of the study were to record and compare gum yields by year of work, rate of insect attack, incidence of dry face, and commercial acceptability of rosins and turpentine from 2,4-D and H_2SO_4 (sulfuric acid) treatments.

Of special interest was the possibility that herbicidal treatment on the front face might create some systemic effect or physiological changes in the tree which would impair gum yield from the back face.

[1] Clements, Ralph W. Noncorrosive chemical produces good gum yields in slash pine AT-F.4 J. 27(2): 14-17. Also in Nav. Stores Rev. 74(8): 4-5, i. 1964.

Southeastern Forest Experiment Station-Asheville, North Carolina

U.S. Department of Agriculture- Forest Service

PROCEDURE

Sample areas of pure slash pine from natural reproduction were located with reliable producers near Palatka, Florida, and Stockton, Georgia. In the Florida stand, all trees 9 inches d.b. h. and over were cupped; in the Georgia stand, all trees 10 inches and over were cupped.

The control was a standard 50-percent solution of H_2SO_4, and each treatment was tested on 800 single-faced trees. Faces were chipped and treated at regular 14-day intervals with a total of 16 streaks for each of the 4 years. All trees were back-faced at the beginning of the third year (1967) and worked for 2 years (fig. 1). New cups, gutters, and nails were installed the first year and each set of hardware remained with the tree throughout the 4-year study. Gum was collected at regular 28-day intervals and weighed to the nearest pound by Olustee personnel. All work related to gum production was accomplished by commercial laborers.

Figure 1. --A major concern of this study was the measurement of gum yields from 2 years of 2,4-D treatments on the front face (right) and 2 years on the back face (left).

RESULTS

Yields by the herbicidal treatment were equivalent to, or slightly greater than, the yields from acid treatment for any one year of work, for either front or back faces, and for the entire 4 years of production (table 1).

Table 1. --Average annual yields for 4 years of production

Year of work	2,4-D treatment	H_2SO_4 treatment
	Bbl. per 10,000 faces	
First, 1965	322	322
Second, 1966	328	324
Third, 1 967[1]	287	283
Fourth, 1968	283	274
Cumulative	1,220	1,203

[1] Back faces beginning with 1967.

There was no evidence that front face treatment with 2,4-D created any systemic effects or physiological changes which reduced gum yield from the back face.

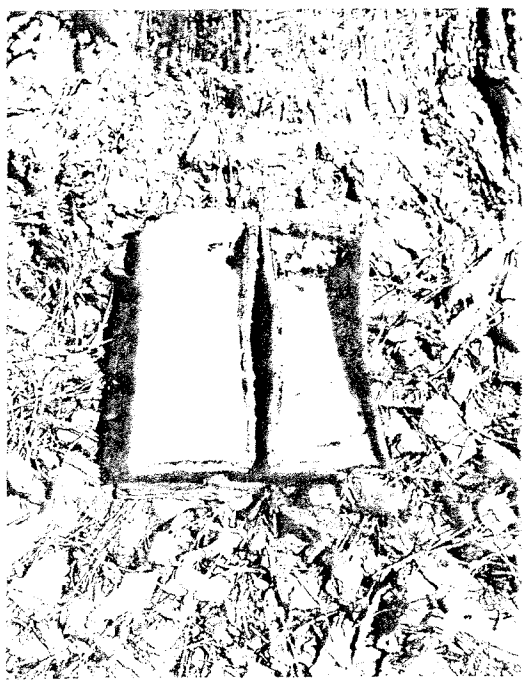

Figure 2. --After 4 years' exposure tc 2,4-C and H_2SO_4, iron cups and gutters imparted distinct color grade differences. The 2,4-D gum (left) graded WG (window glass) and the acid gum M (Mary). Both cups are the same age.

Herbicidal treatment, per se, did not contribute to the rate of mortality, incidence of dry face, or occurrence of bark beetle attack in this 4-year study in slash pine.

Gas chromatographic analyses of gum samples from both treatments revealed that gum stimulated by 2,4-D will produce rosin and turpentine which are completely acceptable for commercial consumer usage. Furthermore, because the 2,4-D solution does not corrode iron cups and gutters, the absence of iron contaminants influenced the color grade of gum collected from the herbicidal treatment (fig. 2). In this study, a l-grade difference was apparent by the third year. During the fourth year of work with the original cups and gutters, the 2,4-D gum revealed a 2- to 3-grade superiority over gum collected from acid treatments.

DISCUSSION

A %-percent water solution of 2,4-D will not prolong gum flow for longer than 2 weeks, so its potential as a gum yield stimulant depends upon the supply of labor available to the producer and his ability to chip at regular 14-day intervals. The commercial producer now using H_2SO_4 treatments at 14-day intervals in either planted slash pine stands or natural reproduction can change hi= treatment to 2,4-D and realize the advantages of a noncorrosive stimulant.

When the supply of labor permits the return to biweekly chipping, 2,4-D has excellent possibilities as a noncorrosive treatment for use with paper gum cups.

Ralph W. Clements, Naval Stores Research Specialist
Naval Stores and Timber Production Laboratory
Olustee, Florida