THE EFFECT OF PETROLEUM OIL HERBICIDES ON THE GROWTH OF GUAYULE AND WEED SEEDLINGS

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PRIOR to 1943, the weeds in guayule nursery seedbeds planted by the Emergency Rubber Project at Salinas, Calif., were controlled by handweeding at an approximate cost of $135.00 per acre. Following a lead from the use of petroleum oil sprays to control weeds among carrot seedlings (4), Bernard J. Abrahams, of the Emergency Rubber Project, U. S. Forest Service, developed a method whereby weeds among guayule seedlings could be controlled by the use of these sprays with very little or no loss of guayule. This method, after several modifications, consisted of applying a mixture composed of 1 gallon of Diesel oil, 3 gallons of stove oil, and 16 gallons of water at the rate of 6 gallons per nursery bed (4x400 feet), or 162 gallons per acre. This is equivalent to 1.2 gallons of the oils per bed or 32.4 gallons per acre. This mixture was applied 2 weeks after seeding and as often thereafter as necessary. The cost of each oiling, including the oil tractor and driver and spray equipment, was about $5.00 per acre.

The use of oil sprays to control weeds raised several questions as to the effect of these oils on the growth of the guayule plants and the weeds. It is the purpose of this paper to present the results of various experiments designed to study the responses of guayule and weed seedlings of different ages and under various climatic conditions to the oil sprays. The experiments described herein were conducted in the Alisal Nursery or in the greenhouses of the Emergency Rubber Project at Salinas, Calif.

MATERIALS AND METHODS

As a result of studies carried out by Clifford (3) and unpublished data of the

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2Physiologist and Principal Scientific Aide, respectively. The latter is now located with the Soil Conservation Service, Huron, S. D.

3Figures in parenthesis refer to “Literature Cited”, p. 895.


5Stove oil meets the specifications for grade No. 1 of Commercial Standard CS 12-40 for fuel oils. According to Raynor (4), the approximate limits of variation in physical characteristics of stove oil are:

- Specific gravity (A.P.I.) .................. 37.6° to 38.7° Be.
- Viscosity (Saybolt universal) at 100° F .................. 31 to 33 secs.
- Flash point (Pensky-Martens closed cup) .................. 134° to 140° F
- Distillation temperatures:
  - Initial boiling point .................. 335° to 380° F
  - 10% point .......................... 380° to 390° F
  - 90% point .......................... 480° to 515° F
  - End point .......................... 535° to 570° F
- Water and sediment .......................... 0 to trace
- Sulfur content .......................... 0.13% to 0.68%
- Unsulfonatable residue .......................... 76%