

Pictorial Progress Report:

Aerial Spraying for Hardwood Control and Pine Release

In July, 1956, some 2200 acres of Union Bag-Camp woodlands in Georgia and South Carolina were sprayed by helicopter with a solution of 2,4,5-T in diesel oil, to control hardwood brush and thus release existing young pines or else prepare the sites for pine regeneration. The Stull Chemical Company, of Tulsa, Oklahoma, did the actual spraying under the terms of a contract that called for application of 1 1/2 pounds of 2,4,5-T concentrate in 2 1/2 gallons of diesel oil carrier per acre.

Aerial application of 2,4,5-T is not a proved technique in hardwood brush control. In order to check the results of this experiment with some degree of certainty, therefore, the Woodlands Research Department established a series of sample plots just before the spraying was done on two of the areas that were to be treated, inventorying all trees and shrubs on the plots and taking photographs of the original condition of each plot. All plots have been examined periodically since the spraying was done, with the most recent inspection in April, 1957, well after the start of the 1957 growing season.

The April, 1957, inspection showed that the spraying had been quite effective; 60 percent of all hardwood stems on the plots were dead, with an additional 35 percent badly damaged as a result of the treatment. While most of the pines were originally damaged to some extent, only 5 percent were dead. The others appeared to be recovering completely and rapidly from the damage done them. Sweet gum proved most susceptible to the spray, followed by black gum, hickory, and myrtle. Maple and the oaks were most resistant, although both species groups suffered considerable mortality and heavy damage among the ones still alive.

As interesting and important as these figures are, the general appearance of the treated areas is even more impressive. A re-take in June, 1957, of the original plot photographs, and a comparison of these with the earlier photos, points up the effectiveness of the 2,4,5-T spray and, also, some of its limitations.

Facing each other on the following pages of this pictorial progress report are "before" and "after" photographs of certain of the sample plots, showing the differences that exist 11 months following treatment with 2,4,5-T spray. This report supplements the written and tabular Progress Report entitled "Aerial Spraying for Hardwood Control and Pine Release" prepared by Barry F. Malac and submitted in May, 1957.

June, 1957.

John W. Johnson
Barry F. Malac



July, 1956

Sheffield tract, Ogeechee Forest

Plot #4

Fig. 1A. Where pine regeneration does not come immediately after cutting, a rank growth of lesser woody vegetation takes over. When this happens, only drastic hardwood control measures will make pine establishment possible.



June, 1957

Sheffield tract, Ogeechee Forest

Plot #4

Fig. 1B. After spraying with 2,4,5-T in diesel oil, the hardwood ground cover is almost gone, and there is room for pine seed to germinate and grow.



July, 1956

Sheffield tract, Ogeechee Forest

Plot #2

Fig. 2A. There are pine seed trees aplenty here, and several pine saplings engulfed by a dense undergrowth of wax myrtle. A man is in the picture, but only his hard hat can be seen.



June, 1957

Sheffield tract, Ogeechee Forest

Plot #2

Fig. 2B. The killing effect of the spray on hardwoods in this particular area is fairly complete. Practically all of the hardwood undergrowth was killed, but the pine saplings survived. Note how much easier the stems of the large pines can be seen.



July, 1956

Edwards tract, Combahee Forest

Plot # 7

Fig. 3A. The dense stand of sweet gum, predominantly, almost completely hides the forester in the center of the plot. Note particularly the young loblolly pine (only the top is visible at left center).



June, 1957

Edwards tract, Combahee Forest

Plot #7

Fig. 3B. About one year after spraying, the man is now easily seen through the dead hardwood brush. The loblolly pine has lost some of its needles, but is now recovering rapidly and is free to grow. Sweet gum proved very easily controlled by 2,4,5-T spray.



July, 1956

Sheffield tract, Ogeechee Forest

Plot #3

Fig. 4A. Where hardwood brush is fairly well advanced, such as on this plot, relatively little light reaches the forest floor for young pine seedlings.



June, 1957

Sheffield tract, Ogeechee Forest

Plot #3

Fig. 4B. Some of the hardwoods are still living, but the main canopy has been opened up considerably. Approximately 60 percent of all hardwoods were killed with the rest severely damaged.



July, 1956

Sheffield tract, Ogeechee Forest

Plot #8

Fig. 5A. This close-up picture shows the tangled mass of vegetation typical of certain pine-productive areas. There exists a fierce competition for light and moisture which all but eliminates sun-loving pine.



June, 1957

Sheffield tract, Ogeechee Forest

Plot #8

Fig. 5B. A year later. Most of the hardwood stems on this plot are dead, and are not competing with the pine for light and moisture. Note how much thinner the leafy vegetation is.



July, 1956

Sheffield tract, Ogeechee Forest

Plot #7

Fig. 6A. A typical scrub oak ridge area. Although there is enough sunlight on the relatively clean forest floor, root competition for moisture is critical for young pine.



June, 1957

Sheffield tract, Ogeechee Forest

Plot #7

Fig. 6B. Quite a reduction in foliage surface is apparent. The rugged oaks are still alive, though badly weakened. Note the epicormic branching up and down the stems of the two small oak saplings in left foreground.



July, 1956

Sheffield tract, Ogeechee Forest

Plot #1

Fig. 7A. Under a somewhat open canopy of mature pine, there is a luxuriant growth of hardwoods which creates a regeneration problem. In this picture the understory is mostly scrub oak.



June, 1957

Sheffield tract, Ogeechee Forest

Plot #1

Fig. 7B. Although oaks were the first ones to show signs of injury, they proved to be the most resistant species to the spray. A good many of them leafed out the following spring and sprouted new shoots. The pine overstory was relatively unaffected.



July, 1956

Sheffield tract, Ogeechee Forest

Plot #1

Fig. 8A. This stand canopy picture is taken on the same plots as Fig. 7A. It was sprayed to control a hardwood understory that prevented pine regeneration.



June, 1957

Sheffield tract, Ogeechee Forest

Plot #1

Fig. 8B. There was some defoliation of pines by the spray, but it was not serious. Careful comparison between individual limbs in this picture and Fig. 8A shows the foliage to be a little thinner here. The dead stub at the bottom of the picture was dead before spraying.



July, 1956

Edwards tract, Combahee Forest

Plot #3

Fig. 9A. This good stand of 65-70 foot loblolly could never be regenerated unless the dense hardwood understory was controlled. Thick hardwood foliage makes the picture look fuzzy.



June, 1957

Edwards Tract, Combahee Forest

Plot #3

Fig. 9B. From the same camera point a year after 2,4,5-T spraying, a clear picture of the stand is possible. Most of the hardwoods were killed, but maple -- one of the tougher species -- still persists to a degree (note maple leaves at upper left).



July, 1956

Edwards tract, Combahee Forest

Plot #5

Fig. 10A. This area had been logged shortly before spraying. Most of the vegetation is annuals with a scattering of small hardwoods, mainly hickories. Note the larger hickory on the left.



June, 1957

Edwards tract, Combahee Forest

Plot #5

Fig. 10B. The growth of annuals has not been materially affected by spray. While most of the hickories were only partially controlled and resprouted rather freely, the larger specimen on the left has been killed outright.