PINE SAWFLY INFESTATION RELATED TO CULTURAL TREATMENTS

CLAYTON E. POSEY and REX B. MCCULLOUGH 1

During the second week of October 1967, many 2-year-old loblolly pine seedlings, established for grafting rootstock in a clone bank near Idabel, Okla., were defoliated by the red-headed pine sawfly *(Neodiprion lecontei* Fitch).

The infestation was first observed when the defoliation was in an advanced stage; control measures were not taken so that the test reported here could be conducted.

Procedures

The seedlings had been planted in heavy native sod, consisting mainly of species of *Andropogon.* Cultural treatments had been applied to help determine a suitable procedure for growing healthy rootstock for field grafting without extensive site preparation. The treatments were applied to trees planted at a spacing of 12 ft. by 12 ft., in eight tree row plots. The treatments, replicated six times, were as follows:

1. Control (trees planted in grass).
2. Fertilizer (ammonium nitrate applied at the rate of 160 pounds of N per acre plus potash applied at the rate. of 60 pounds of K_2O per acre).
3. Sawdust mulch (pine sawdust several years old applied 3 inches deep around each tree).
4. Fertilizer and sawdust mulch.
5. Scalped spots (removal of sod).
6. Scalped and fertilized.
7. Scalped and mulched.
8. Scalped, fertilized, and mulched.

The sawflies continued defoliating until stopped by freezing weather, when counts were made of attacked and nonattacked seedlings. Trees were considered attacked if any feeding by sawflies was evident. Total height of trees was also recorded.

1 Asst. Prof., Forest Genetics, and Tree Improvement Asst., respectively, Okla. Agr. Exp. Sta., Stillwater, Okla.

Results

Of all trees in the study, 31 percent was attacked by sawflies. Cultural treatments were definitely related to the percent attacked. Seventeen percent of the trees planted in scalped spots only, or in combination with other treatments, was attacked, compared with 38 percent on nonscalped spots. The percentage of trees attacked ranged from 11 percent for scalped spots only to 45 percent for trees planted in grass with mulch applied. In the control plot, trees planted in grass, 38 percent was attacked. All treaments except the mulched treatment had fewer trees attacked than the control plots. The defoliation by sawflles is related to cultural treatments (fig. 1). Within treatments, attack occurred on the taller trees. The average height of attacked trees was 3 ft. 7 in. as compared to 3 to 4 in. for nonattacked trees.

Conclusions

The female sawfly lays eggs in slits cut in needles. Ordinarily pupation takes place in the soil. More seedlings planted under any cultural treatment that enhances the environment for pupation will be attacked than those planted under treatments that would limit survival. Scalping removed the litter where the cocoons normally overwinter, thus trees in scalped spots were not subjected to attack as much as in plots where litter or mulch was added.

The larvae started at the tree tops and worked down. Many trees, even though 3 ft. plus in height, were still overtopped by grass. Taller trees were attacked more frequently, probably because the larvae preferred sunlight rather than shade.

In areas where defoliation by sawflies is a continuing problem, perhaps more intensive planting practices provide partial biological control. Scalping before planting provided significantly higher survival, taller trees, and less defoliation than other treatments.

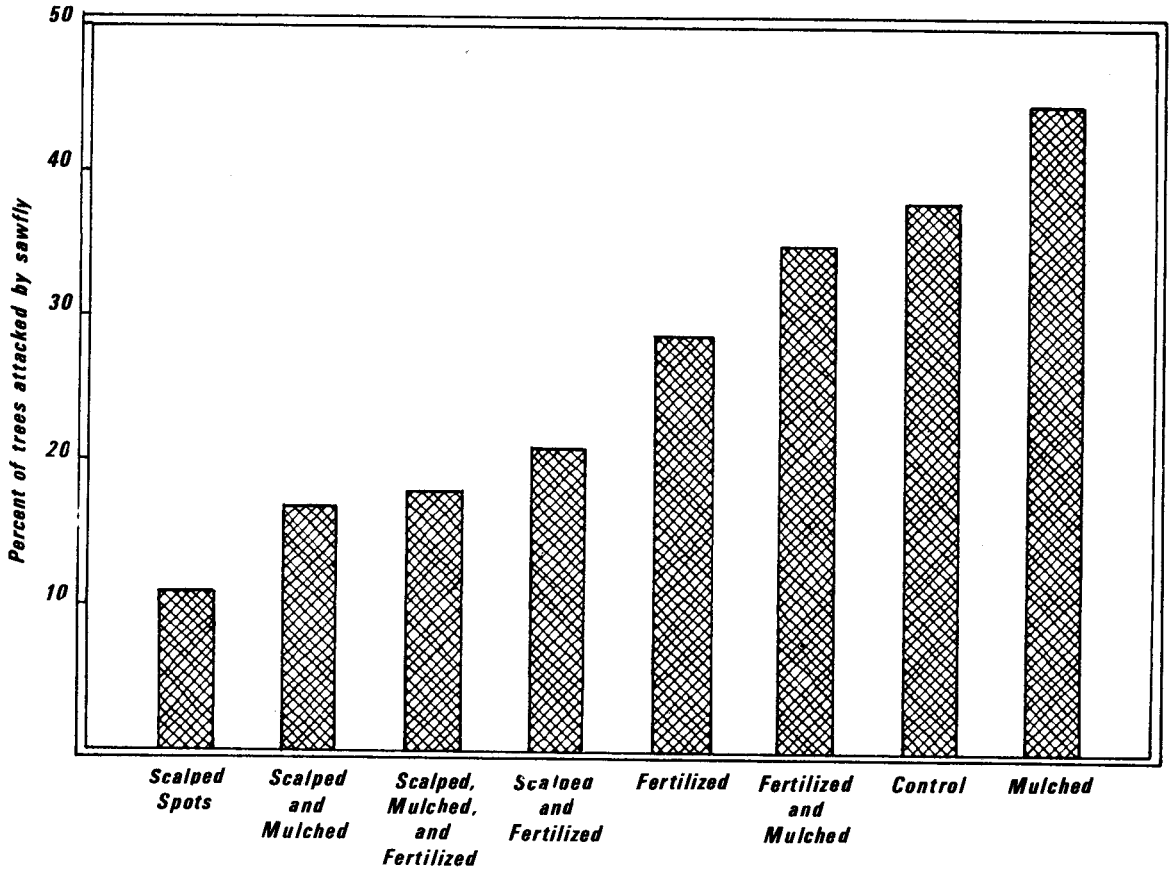

Figure 1.—Relationship between defoliation by sawfly and cultural treatments.