

Diagnosis and Control of Cutworm Damage on Conifer Seedlings in Nursery Seedbeds

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The article describes cutworm outbreak, damage, identification, and control in conifer nurserybeds of a Lake States nursery. How to diagnose cutworm damage is discussed.

Seedling damage at a northern Lake States nursery was first observed in the mid-1960's. The damage, from an unknown cause, was of minor importance until it became epidemic in 1976. The nursery manager estimates losing approximately 1 million seedlings a year from 1976 to 1978, the total loss valued between \$150,000 and \$200,000.

All conifer species were affected. Symptoms included cut or chewed cotyledons, primary needles, or stems of 1-year-old seedlings. Many times, only part of the stem was left standing in the ground. This damage was tentatively labeled "bird peck" because the seedlings appeared as if a bird had nipped off the foliage or stem. But repellants and screening failed to reduce the problem. The damage was similar to that caused by damping-off fungi, so fungicides were tried as a control, but without success. Losses were sometimes attributed to poor seed germination. Our objective was to determine the cause of seedling losses.

Methods and Results

To determine the cause of the damage, we studied affected seedbeds at the nursery, beginning

in the early spring of 1979. On May 24, 1979, the sites of the most severe damage were marked, and damaged 1-0 red pine seedlings were collected. Parts of these seedlings were surface-sterilized and incubated in petri dishes on various mycological media to see if a fungal pathogen could be recovered. Most of these isolations were sterile and no pathogens were recovered.

One week later, in late afternoon, another close inspection of damaged seedlings revealed one or two cutworms feeding on the foliage. Because cutworms are normally active only at night, the seedlings were again closely observed that evening. Many cutworms were observed devouring seedling foliage and were determined to be the cause of the damage.

Cutworms were collected and reared to the adult stage in the laboratory for positive species identification. The cutworm was identified as dingy cutworm (*Feltia ducens* Lepidoptera:Noctuidae). Using the same techniques, we examined emerging red pine seedlings at other Lake States nurseries. Only a few cutworms and minor cutworm damage were observed.

Diazinon AG-500, at 4 quarts of product per 96 gallons of water, was applied on June 1 and June 6, 1979. Before control measures were begun, small plots were established to determine the effectiveness of the spray.

Seven bedrows of 1-0 red pine were designated as spray areas. The remaining two bedrows were the

control (unsprayed). In each of the sprayed and unsprayed areas, four 0.6-meter-long plots (each consisting of one row of trees) were established. The number of undamaged seedlings were counted in each plot, and each damaged seedling was tallied and marked with a toothpick.

On June 12, 1979, we examined the plots and found that the spray was effective in controlling the cutworms (table 1).

Also on June 12, sprayed and unsprayed plots were observed after dark during the period when cutworms are active. No cutworms were observed feeding on seedlings in the sprayed plots, but 18 cutworms were found on unsprayed seedlings during a count period of 45 minutes for each plot. These observations confirmed the effectiveness of the chemical control.

Table 1.—Effectiveness of a chemical spray for control of cutworms on 1-0 red pine seedlings

Treatment ¹	Number of trees in sample ²	Number of seedlings damaged	
		Before spray	After spray
Sprayed ³	186	35	0
Unsprayed	148	64	27

¹Chemical used was Diazinon AG-500 at a rate of 4 quarts of product per 96 gallons of water.

²Total number of trees from 0.6-meter-long plots replicated four times per treatment.

³Sprayed June 1 and June 6, 1979.

Discussion

Cutworm damage has been reported infrequently from Lake States nurseries. Although conifer seedlings are usually the reported host, cutworms have also been observed feeding on young, deciduous trees such as hybrid poplars. Cutworm outbreaks occur when favorable environmental conditions allow populations to build up quickly to damaging economic levels.

Cutworms generally feed at night and go underground during the daylight hours, hindering identification of the cause of damage. Heavy seedling losses can occur before damage is noticed, especially if the seedlings are under protective screens. During 1979, 1 million trees, valued at \$58,000, were saved at the nursery we studied by the proper identification of the cause and quick chemical control.

Early spring is the time to watch for cutworm damage on young seedlings (1). To make a positive identification, growers should look for cutworms feeding on the seedlings at night where damage was noticed during the day (fig. 1). If a chemical control is used, it should be applied as soon as the cutworm damage is observed. Early detection is necessary if control is to be effective in reducing losses. Because cutworms also feed on weeds, their populations can be reduced through weed control.

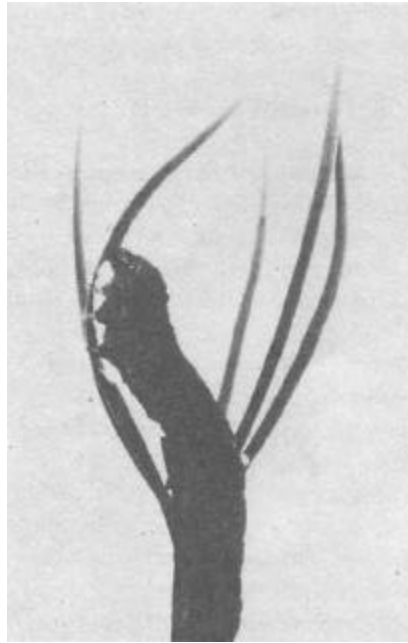


Figure 1.—Cutworm feeding on red pine seedling.

Literature Cited

1. Palmer, Marguerita; Nicholls, Thomas. How to identify and control cutworm damage on conifer seedlings. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; 1981. S p.