SOME EFFECTS OF LOW SPRING TEMPERATURES ON PINE CONELET DEVELOPMENT AND ABORTION

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ABSTRACT

Some effects of low spring temperatures on knobcone (Pinus attenuata Lemm.) conelet development were investigated during 1964-1965. An anatomical study of ovule and conelet development was made on approximately 200 developing cones in a breeding orchard following an unseasonal April frost. Night temperatures as low as 22° F were recorded for periods as long as 13 hours. Conelets covered by plastic pollination bags were most susceptible to low temperature damage. Approximately 45 percent of those conelets emerging from the bud scales and in pollination bags at the time of the frost were killed, as compared to 20 percent mortality for conelets at a similar stage of development but unbagged. Conelets whose scales were just opening were the next stage most vulnerable to low temperatures. Thirty percent of the bagged and partly opened conelets were killed as compared to 18 percent for similar but unbagged conelets. There was no mortality among conelets still completely covered by bud scales and among conelets whose cone scales were completely closed (post-pollination). Low temperature damage could be detected within 1 week in sectioned conelets, and in 2 to 3 weeks for unsectioned material. Definite signs of ovule abortion could be detected within 2 weeks of the frost. Dead conelets did not immediately abscisse, but remained attached to the tree for approximately 15 months. The low temperatures apparently did not affect final seed set of the surviving cones.

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