

GYPSY MOTH IMPACTS ON OAK ACORN PRODUCTION

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ABSTRACT

Gypsy moth outbreaks can have drastic effects on many forest resources and uses. Because gypsy moth prefers oak foliage, oak stands are the most susceptible to defoliation and resultant damage. The value of oak mast for many wildlife species is high. The high carbohydrate content of acorns provides the energy necessary for winter survival. Loss of mast crops due to direct and indirect effects of gypsy moth defoliation may result in large-scale reductions in wildlife habitat and food sources.

Direct defoliation effects during years of moderate and heavy defoliation can come from three sources: direct consumption of flowers, abortion of immature acorns due to low carbohydrate supply, and lack of flower bud initiation. These effects are generally short-lived, having residual effects for only 1 or 2 years after defoliation ends. Information available to date suggests that abortion of immature acorns is the most significant of these three effects. It is possible to go for 2 to 5 years in succession with complete failures of acorn production.

Longer term indirect effects of outbreaks result from: crown dieback and poor vigor, mortality of oaks and hickories, and shifts in species composition of current and regenerated stands. These effects can reduce viable seed for regeneration and wildlife food. Crown dieback can turn productive acorn producers into nonproducers. Trees may take as long as 10 years to recover their full vigor. Mortality of mast producers in stands is distributed across a wide range from low to moderate to heavy. Estimates of the impact of mortality on stand-level acorn production show that considerable mortality (>60 percent of the basal area) must occur before significant reductions in acorn production occur. This result is due to mortality occurring primarily in intermediate and suppressed trees that are not heavy producers. This thinning from below may even stimulate production by residual trees. Many stands that were predominantly oak before defoliation and mortality occurred have regenerated to red maple and black birch. This shift in composition results in a long-term reduction in mast production in these areas.