PISTILLATE FLOWER ABORTION IN THREE SPECIES OF OAK

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Abstract: Pistillate flower survival was monitored at weekly intervals in three species of oak (*Quercus rubra* L., *Q. velutina* Lam., and *Q. alba* L.) during the 1989 and 1990 growing seasons in central Missouri. Pollen was shed between late April and early May in both years. However, in 1989 only *Q. velutina* flowers had emerged by the time of pollen shed; in 1990 flowers of all three species were receptive. Tree-tree variation was observed in morphological development of the flowers, especially in peduncle length in *Q. rubra* and *Q. alba*.

Flower abortion was pronounced during the early part of both growing seasons. By the end of May 1989, 95 percent of the *Q. rubra* flowers had aborted; by early July of that year 98 percent of the *Q. alba* flowers were dead. In 1990 those values were about 65 and 75 percent, respectively, with 98 percent mortality observed in *Q. alba* acorns by the end of the growing season. Forty to fifty percent of the *Q. velutina* flowers aborted by early July in both years, with little mortality thereafter.

Weevils destroy a large portion of an acorn crop. But, most oak flowers abort before reaching the acorn stage. If we look at the potential crop as a function of the number of pistillate flowers at the time of pollination, it is apparent that weevils are not the primary causal agent of variable acorn crops. What happens to the flowers?

We are currently exploring the hypothesis that pistillate flowers are destroyed by insects, primarily those in the family Membracidae, the treehoppers. Adults of these true bugs or sucking insects are active in the crowns of *Q. alba* just after the flowers emerge. Adults were observed with their stylets inserted into the stigmas. The flowers turned from green to brown within a week and aborted. The most abundant species observed on *Q. alba* was *Atymna querci* (Fitch.). The adult is present from early May to early June when most of the pistillate flower abortion occurs.

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