Black Oak Gall Wasp

Pest: *Zapatella davisae*

Order: Hymenoptera

Family: Cynipidae

Host: Black Oak (*Quercus velutina*)

Description: *Zapatella davisae* is a small cynipid wasp (Fig. 1) that forms galls on the shoots and twigs of black oak (*Quercus velutina*). Galls form anywhere along the current season shoot but are often concentrated at the beginning of the shoot near the bud scale scars. Inside the galls are cavities in which the insect develops (Fig. 2). When cavities are numerous the vascular system in the shoot is severely disrupted resulting in flagging. Other symptoms associated with infested trees include twig dieback, thinning crowns and epicormic growth (shoot development from dormant buds on larger branches and trunk) (Fig. 3 & 4). Exit holes may often be seen on older galled twigs.

Figure 1: Zapatella davisae *adult cynipid wasp*

Trees suffering several years of infestation or severe infestation typically exhibit dramatic crown loss, decline, and mortality. The fungal organism Botryosphaeria is often associated with trees with *Z. davisae* infestations.

Z. davisae is a parthenogenetic cynipid wasp with a single generation per year. *Z. davisae* overwinters as an adult or pupa within the cavities of the gall. The emergence of adults occurs in May. Adults are believed to oviposit eggs in developing new shoots and/or buds shortly after emergence. By July, cavities can often be found in swollen shoots. Larvae develop in the cavities and eventually become pupae in the fall.

Figure 2: Black oak twig with galls and cavities showing larvae and pupae of Z. davisae

Z. davisae damage resulted in widespread decline and mortality of black oak on Cape Cod and the islands from 2012 – 2016. In the early 1990s a similar outbreak occurred on Long Island, NY. Research conducted during the most recent outbreak found several parasitoids that eventually led to population declines of *Z. davisae* both on Long Island and Cape Cod. Management options for controlling gall wasps are limited. Trunk injections with emamectin benzoate and imidacloprid have shown some success at controlling *Z. davisae*. Tree health is also important, trees that grew faster prior to infestation survived better than slower growing trees. Tree health can be improved by reducing stresses from drought, pests, or site conditions such as compaction.

Figure 3: Black oak with severe crown dieback and epicormic growth as a result of Z. davisae

Figure 4: Black oak exhibiting flagging as a result of Z. davisae.