

## Abstract

Anthracnose is a serious disease of highbush blueberry (*Vaccinium corymbosum* L.) incited by the fungal pathogen *Colletotrichum acutatum* Simmonds ex Simmonds. This species is a destructive pathogen on many fruit and nut crops. As a postharvest rot of ripe fruit, anthracnose drastically reduces shelf life. The objective of this research was to investigate the overwintering behavior of the pathogen and its migration from dormant plant tissue to green fruit.

Studies of naturally infected twigs from susceptible and resistant blueberry cultivars in 2002-2004 demonstrated that the *C. acutatum* overwinters on blueberry bushes in dormant buds as well as blighted wood, contrary to previously published work. Inflorescence buds consistently harbored the largest number of *C. acutatum* infections in both the susceptible cv. Bluecrop and the resistant cv. Elliott.

Blueberry inflorescence buds develop before dormancy from vegetative buds that form in leaf axils. Inoculated and naturally infected 'Bluecrop' buds appeared susceptible to *C. acutatum* infection at all stages of development. Comparison of seasonal patterns of infection in inoculated and naturally infected buds in 2003 and 2004 suggested that prevailing weather conditions may have influenced the establishment of bud infections after exposure to inoculum. *C. acutatum* infections penetrated dormant 'Bluecrop' buds and were concentrated in the outer bud scales covering the inflorescence bud in 2003 and 2004 samples. The overwintering propagule of *C. acutatum* was not identified by light microscopic examination of naturally infected bud scales.

*C. acutatum* migrates during budswell from the outer bud scales of dormant inflorescence buds to green fruit via inner bud scales associated with individual flower buds. Three cultivars with different ripening dates and susceptibilities to anthracnose were observed during fruit development in 2003 and 2004. The timing of senescence and abscission of inner bud scales from clusters relative to fruit development varied by cultivar. Early aging and Toss of inner bud scales could reduce the exposure of green fruit to inoculum from overwintering *C. acutatum* bud infections.

These findings will be useful in developing a phenology-based program for management of blueberry anthracnose, including approaches that reduce disease pressure in a field by preventing or eradicating new overwintering infections.