Piles of Apple Prunings as Sources of Conidia of Physalospora obtusa

P. M. Miller and S. L. Anagnostakis

Departments of Plant Pathology and Genetics, The Connecticut Agricultural Experiment Station, New Haven 06504.

ABSTRACT

Twigs in piles of apple prunings are an abundant source of conidia of *Physalospora obtusa*. Twigs 10-mm or less in diam each produce about the same number of conidia. No conidia could be obtained from piles of chipped apple prunings. A *Cytospora* sp. was often found as a secondary invader of the dead apple twigs. Phytopathology 63:1080.

Additional key words: Malus sylvestris, Cytospora sp.

Dead twigs (1) and fruit mummies (2) are important sources of conidia of the apple black rot fungus *Physalospora obtusa* (Schw.) Cooke. Pruned twigs and branches are usually heaped at the edge of the orchard and burned. This practice has been changed by recent air-pollution laws that restrict outdoor burning. Many orchardists now leave their prunings on the orchard floor and chip them in place. It is possible that brush piles and chipped prunings can serve as sources of spores for new infections in the orchard. Therefore, we investigated the production of *P. obtusa* conidia by apple twigs and chips collected from piles from orchards in which black rot occurs.

Twigs were collected in August from a brush pile of prunings cut during the previous winter and located about 100 m from a commercial apple orchard. The twigs were sorted into three different diam sizes: >3.3, 3.3–6.7, and 6.8–10.0 mm. Ten g of twigs from each size class were soaked in 50 ml of water for 48 hr. Then a 0.1 ml sample of the liquid from each container was placed on a microscope slide and covered with a 20 × 40 mm cover slip. Conidia in two 20-mm^2 areas per slide were counted on six slides for each twig size class.

Samples were collected from a pile of chipped apple prunings located about 15 m from an untended orchard. These prunings were chipped in April and the samples were collected 2 and 5 months later. Fifty g of chips were soaked 48 hr in 250 ml of water and the liquid examined for conidia as described previously.

Average counts of *P. obtusa* conidia per g of twig for the three different size classes were as follows: 1.6 mm, 42.4×10^4; 5.0 mm, 16.3×10^4; and 8.3 mm, 1.3×10^4. One g of the smallest twigs contained about 29 times as many twigs and produced 32 times as many conidia as 1 g of the largest twigs. One g of the smallest twigs contained about nine times as many twigs and produced 12.5 times as many conidia as 1 g of the intermediate twigs. One g of the intermediate twigs contained about 2.7 times as many twigs and produced 2.6 times as many conidia as 1 g of the largest twigs. It appears that infected apple twigs 10-mm or smaller in diam each produce approximately equal numbers of *P. obtusa* conidia.

These twigs showed primary infection by *P. obtusa* at the tips whereas *Cytospora* sp. was very often found as a secondary organism on the rest of the twig. A *Cytospora* sp. was also found in the lenticels occupied by *P. obtusa* on the bark of black rot trunk cankers. Whether this *Cytospora* sp. is pathogenic to apples is not known.

No conidia of *P. obtusa* were found in the liquid from the soaked chips, and it appears unlikely, therefore, that chips serve as a source of inoculum in the orchard.

Piles of diseased apple prunings can act as a source of *P. obtusa* conidia. Although the live pruned wood is probably not invaded when it is first cut, some prunings carry infected fruit mummies and infected dead twigs that release their spores during each rain and so inoculate the brush piles. As the pruned wood dies it becomes available as a substrate for a new crop of pycnidia.

It is not known how far the piles should be from an orchard to eliminate chances of causing new infections in the orchard. Since conidia of *P. obtusa* emerge in sticky tendrils and are removed only by wind-blown rain, it appears unlikely that they would spread very far from the prunings, unless the piles were on a hill upwind from the orchard.

LITERATURE CITED

1. GROVES, A. B. 1951. An apparent influence of naphthaleneacetic acid applications on subsequent fruit abscission and black rot development. Phytopathology 41:561 (Abstr.).
2. HOLMES, J. 1968. Overwintering of Physalospora obtusa on apple trees as influenced by variety, apple mummies, and dead fruit spurs. Phytopathology 58:1054 (Abstr.).