

## **Refining and Validating a Fungicide Timing Model for Controlling Flyspeck on Apples in the Hudson Valley**

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### **Introduction**

Flyspeck is caused by the fungus *Zygothiala jamaicensis* and appears during late summer as superficial blemishes on apple fruit. Development of flyspeck is favored by the hot and humid summer climate in the Hudson Valley, but this disease causes commercial losses throughout the Northeast in wet years. In a recent three-year trial with Liberty apples in the Hudson Valley, flyspeck and sooty blotch in unsprayed trees caused losses averaging nearly \$2,400 per acre per year (Rosenberger et al., 1996a). In the same study, losses to flyspeck still averaged \$427/acre/year where IPM fungicide strategies were employed.

Inoculum for flyspeck infections on apples probably originates with host plants outside of the orchard. More than 100 plant species are hosts for this fungus (Sutton et al., 1988). Disease incidence in unsprayed orchards in Massachusetts was significantly higher in trees located within 90 meters of external inoculum sources (Cooley, unpublished data). Disease incidence is also greater in orchards with poor air drainage because trees dry more slowly following rains and dews.

Apple fruit can become infected by the flyspeck fungus soon after petal fall (Brown & Sutton, 1993; Hickey, 1960). However, symptoms of flyspeck rarely appear on apple fruit before late-August in southeastern New York. The incubation period between infection and appearance of symptoms varies from a minimum of 14 days to more than 70 days under field conditions. Long incubation periods occur when environmental conditions are less favorable for fungal growth, as during the cooler weather of September and October or during hot dry weather in mid-summer. The incubation period in commercial orchards is also extended by postinfection applications of fungicides that suppress but do not eradicate pre-existing infections.

Devising low-spray strategies for flyspeck has been complicated by the long incubation period between infection and symptom development. The ability of the flyspeck fungus to infect fruit in late May, survive repeated fungicide applications, and then cause symptoms in September frequently leaves apple growers mystified as to why their summer fungicide programs failed. As a result, most growers still apply fungicides at 3-4 week intervals throughout summer even during dry periods when fungicides may not be needed.

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