CHERRY (*Prunus avium* 'Bing') Powdery Mildew; *Podosphaera clandestina* Leaf Spot; *Blumeriella jaapii* Brown Rot; *Monilinia sp.*  J. W. Pscheidt and John P. Bassinette Dept. of Botany and Plant Pathology Oregon State University Corvallis, OR 97331-2903

## Comparison of fungicides for control of cherry powdery mildew and leaf spot, 2010.

Treatments were arranged in a randomized complete block design in a 'Bing' sweet cherry orchard on Mazzard F12-1 rootstock planted in 1995 on 20 x 20 ft spacing and grafted in 1998. Each treatment consisted of 4 single tree replicates. Fungicides were applied approximately every 14 days using a hydraulic handgun sprayer at 110 psi, such that 5 to 6 gal of a spray suspension were applied per 4 trees (136 to 163 gal water/A) depending on the time of year. Fungicide treatments were applied on 16 Apr (start of petal fall), 29 Apr (shuck-split), 13 May (1<sup>st</sup> cover), 3 Jun (2<sup>nd</sup> cover), 17 Jun (3rd cover) and 29 Jun (pre-harvest). A tank mix of Rovral (16 fl oz/A) plus Endura (4.5 oz/A) plus Topsin (8 oz/A) was applied on 12 Apr (full bloom) to protect against brown rot blossom blight (disease pressure was heavy in adjacent blocks). A dormant oil spray of Omni supreme-oil (5 gal/A) was applied on 17 Feb for aphid control. Acramite 50WS (1 lb/A) and Pravado 1.6F (8 fl oz/A) was applied on 8 Jun for aphid and cherry fruit fly control. Rejexit (1.5 gal/A) was applied on 11 Jun as a bird repellant. Insecticides and bird repellants were applied using a Rear's air blast speed sprayer. The entire block of trees was irrigated using low angle sprinkler heads for 8 hours on 2 Aug. No herbicides were applied, in season, for weed control. No fertilizer was applied to trees in the trial. Fungal infection periods were monitored using an Adcon A730 weather station equipped with standard sensors. A total of 10 cherry leaf spot infection periods were detected from Apr through early Jun: 1 high infection period (1 Jun) and 9 light infection periods (19, 26 and 27 Apr, 3, 25 and 30 May, 3, 6 and 8 Jun). Incidence of powdery mildew was evaluated on 6 Jul by examining the last (distal) five (5) fully expanded leaves on each of 10 shoots from around each tree. To compensate for variations in tree vigor only shoots showing high vigor and strong growth were selected for disease evaluation. Powdery Mildew on fruit was not assessed. Incidence of cherry leaf spot was also evaluated on 29 Jun by examining all leaves on each of 10 vigorous shoots from around each tree (average of 162 leaves per 10 shoots). On 2 Jul, 100, arbitrarily selected, healthy appearing fruit were harvested from each tree. An additional 12 fruit were destructively harvested for soluble solids (Brix) using a hand held refractometer. A subset of 50 harvested fruit were placed side to side and then end to end in a plastic gutter to evaluate fruit width and length. All 100 cherries were then placed on wire racks within moist chambers located in Cordley Hall. Cherries were incubated at ambient room temperature (69 to 77°F) for 14 days. The number of cherries with symptoms of brown rot were evaluated and removed each day. Fruit rotting from other causes were noted and also removed from the moist chambers daily.

Spring weather conditions were cold and wet during bloom and early shoot growth. Overall disease pressure for brown rot was unusually high, medium for cherry leaf spot and low for powdery mildew before harvest. Only a few blossoms with brown rot were found on 12 Apr while nearby orchards had anywhere from 50 to 80% blossom blight (thus the reason we treated for blossom blight). Symptoms of cherry leaf spot were first observed 24 May. Powdery mildew was confirmed on 28 May with the observation of colonies with conidia. All treatments had significantly less cherry leaf spot when compared to nontreated trees. No leaf spot was observed on trees treated with TopGuard at 14 oz/A but it was not significantly different from leaf spot that developed on other fungicide treated trees except the two lowest rates of TopGuard. All treatments had significantly lower incidence of powdery mildew was on trees treated with Pristine or highest rates of TopGuard. There was no significantly different from powdery mildew on trees treated with Pristine or highest rates of TopGuard. There was no significant separation among any treatments with respect to powdery mildew severity.

Harvested fruit rotted from a large variety of fungi including but not limited to *Monilinia sp, Rhizopus sp. Botrytis sp., Penicillium sp., Alternaria sp.* and fungi with sterile mycelia. Highest number of fruit with brown rot developed on fruit from trees treated with the lowest rate of TopGuard. The number of fruit with brown rot from nontreated trees was not significantly different from the number of fruit from trees treated with Pristine alternate Quintec or the three lowest rates of TopGuard. Fruit from trees treated with Orbit did not develop brown rot but the number of fruit with brown rot from trees treated with Luna Sensation or the high rate of TopGuard were not significantly different. The number of fruit that rotted from *Rhizopus* was not significantly different among any of the treatments (data not shown). The total number of fruit that rotted from any cause from nontreated trees was not significantly different from that from fungicide treated trees except those treated with Orbit or Luna Sensation alone. Orbit treated trees had smaller leaves, more open canopy, less color development in fruit and significantly smaller fruit (both length and width) than either nontreated trees or trees treated with any other fungicide. The leaf and canopy effect appeared to last throughout the growing season. Although there was less color development in fruit treated with Orbit there was no significant difference in Brix readings among the various treatments (data not shown). Overall, fruit from Orbit treated trees had the lowest length to width ratio. No other phytotoxicity was observed in trees treated with any of the various materials used.

Treatment and Rate/A**	Cherry Leaf Spot (%)*	% Powdery Mildew*		% Fruti Rot*		Fruit Length
		Incidence	Severity	Brown Rot	All Fruit Rots	to Width ratio*
Nontreated	11.9 a	44.0 a	0.9	5.8 a	35.8 ab	0.91 a
Pristine 38 WDG at 14.5 oz plus						
Break-Thru at 4 fl oz/100gal						
alternate with						
Quintec at 7 fl oz	0.5 c	7.5 d	0.1	4.8 ab	24.8 bc	0.89 a
Luna Sensation 500 SC at 5 fl oz						
alternate with						
Quintec at 7 fl oz	0.9 bc	3.0 d	0.1	1.0 bc	20.5 bc	0.90 a
Luna Sensation 500 SC at 5 fl oz .	0.8 bc	2.0 d	1.5	0.8 c	12.0 c	0.91 a
Orbit EC at 4 fl oz	0.8 bc	39.0 ab	0.5	0.0 c	9.8 c	0.85 b
TopGuard SC at 3.5 fl oz	2.4 b	26.0 bc	0.6	6.5 a	34.8 ab	0.90 a
TopGuard SC at 7 fl oz	2.2 b	11.0 cd	0.1	5.0 a	42.0 a	0.90 a
TopGuard SC at 14 fl oz	0.0 c	7.0 d	0.1	3.0 abc	24.5 bc	0.90 a
TopGuard SC at 28 fl oz	1.6 bc	4.0 d	0.1	0.3 c	22.3 bc	0.90 a

\* Means followed by the same letter do not differ significantly based on Fisher's protected LSD (P=0.05). Means without letters do not differ significantly.

\*\* A tank mix of Rovral (16 fl oz/A) plus Endura (4.5 oz/A) plus Topsin (8 oz/A) was applied on 12 Apr (full bloom) to protect against brown rot blossom blight (disease pressure was heavy in adjacent blocks).

Acknowledgements

We wish to thank Stephanie Heckert and Steve Cluskey for helping with data collection and harvest.