

STRAWBERRY (*Fragaria x ananassa* 'Florida Sensation')
Powdery mildew; *Podosphaera aphanis*

J. Mertely, T. Seijo, and N.A. Peres
University of Florida
Gulf Coast Research and Education Center
Wimauma, FL 33598

Evaluation of products for the control of powdery mildew in annual strawberry, 2015-2016.

On 10 Oct 2015, bare-root, green-top plants from Canada were transplanted into plastic-mulched, raised beds in a high plastic tunnel. Transplants were irrigated by overhead sprinkler for 10 days to facilitate establishment, then irrigated and fertilized through drip tape. The beds were 28-in. wide on 4-ft centers and were fumigated with Telone C-35 (300 lb/A) at bed formation. Each bed contained two rows of plants 12-in. apart with 15-in. in-row plant spacing. Selected plants were removed on 26 Nov to form 14-plant plots that were 9.4 ft long, separated by 3- to 4-ft of empty bed. Treatments were arranged in a randomized complete block design with four blocks on adjacent beds. Treatments were applied five times at 2-wk intervals from 27 Nov to 22 Jan with a CO₂ backpack sprayer delivering 100 gal/A at 60 psi through two TeeJet disc-core hollow-cone nozzles soaced 12 in apart on the boom. Forti-Phite Max was applied on a weekly schedule (9 times). Foliar colonization by *P. aphanis* was evaluated by removing a center leaflet from each of 10 plants/plot on 3 Feb and evaluating 10 microscopic fields/leaflet at 25X for the presence or absence of mycelial growth. Leaflets were taken from leaves tagged during the petiole elongation stage on 21 Jan and were similar in age. The number of positive fields/leaflet was averaged for all 10 leaflets/plot and expressed as a percentage representing mycelial coverage of the foliage. Fruit were harvested twice weekly from 14 Dec to 16 Feb (15 harvests). Marketable fruit were counted and weighed to determine yield. Unmarketable fruit were also counted. Fruit with visible powdery mildew growth on more than 25% of the achenes were categorized as diseased, and not considered marketable. Fruit disease incidence was expressed as a percentage of all marketable and unmarketable fruit. Data were analyzed by two-way ANOVA in SAS (SAS Institute, Cary, NC).

Powdery mildew development in the high tunnel was delayed due to unusually warm weather in Nov and Dec 2015, but developed quickly in Jan, 2016. Young leaves were tagged on 21 Jan, after four bi-weekly applications had been made, and just before the final application on 22 Jan. Tagged leaves were removed for assessment 13 d later, when microscopic observation of leaves from control plots indicated good mycelial coverage. Foliar coverage ranged from 16.4 to 82.8% across all treatments verses 76% in the control. Many treatments reduced foliar colonization, although a surprising number including the QoI fungicide Cabrio and the SDHI fungicides Endura and Kenja, did not. Pristine, a premix containing QoI and SDHI components, also performed poorly. The DMI fungicide Top Guard significantly reduced foliar colonization at the 5 and 16 fl oz rates, but not at 8 fl oz. Consecutive applications of Merivon and Top Guard 16 fl oz, and alternations of two or more products ranked among the more effective treatments for the reduction of foliar and fruit colonization in this trial. Marketable yields were low, ranging from 2706 lb/A in the control to 3911 lb/A in the Top Guard 5 fl oz treatment. These unusually low yields contributed to a non-significant ANOVA, as did patchy distribution of fruit disease in the experimental area. Phytotoxicity was not observed in this trial.

Treatment (product and rate/A)	Week of application ^z	Marketable yield (lb/A)	Diseased fruit (%) ^y	Foliar coverage (%) ^x
Quintec 6 fl oz	1,5,9			
Torino 3.4 fl oz	3,7	3726	10.2 ab	16.4 a ^w
Merivon 5.5 fl oz	1,3,5,7,9	3808	8.0 a	19.6 ab
Quintec 6 fl oz	1,5,9			
Prolivo 4 fl oz	3,7	3692	13.7 a - d	23.1 abc
Procure 480SC 8 fl oz	1,5			
Quintec 6 fl oz	3,7			
Merivon 5.5 fl oz	9	3310	14.6 a - e	34.7 bcd
Top Guard 16 fl oz	1,3,5,7,9	3257	12.2 a - c	36.0 bcd
Merivon 5.5 fl oz	1,5,9			
Vivando 15.4 fl oz	3,7	3315	13.2 a - d	37.5 cd
Mettle 5 fl oz	1,5,9			
Torino 3.4 fl oz	3,7	3122	17.0 a - f	39.5 cde
Vivando 15.4 fl oz	1,3,5,7,9	3499	17.1 a - f	43.0 def
Top Guard 5 fl oz	1,3,5,7,9	3911	13.3 a - d	52.0 defg
Equation SC 15.5 fl oz	1,3,5,7,9	3857	15.0 a - e	55.2 efg
PhD 6.2 oz	1,3,5,7,9	2836	23.0 d - f	56.0 efg
Top Guard 8 fl oz	1,3,5,7,9	3185	21.6 c - f	60.0 fgh
Pristine 22 oz	1,3,5,7,9	3849	15.3 a - e	61.0 gh
Cabrio 14 oz	1,3,5,7,9	3225	24.6 ef	62.2 gh
Kenja 13.5 fl oz	1,3,5,7,9	3491	19.7 b - f	64.4 gh
Forti-Phite Max 0-30-20 (3.0 qt)	1			
Forti-Phite Max 0-30-20 (1.5 qt)	2,3,4,5,6,7,8,9	2673	23.5 d - f	75.4 hi
Endura 8 oz	1,3,5,7,9	3288	23.5 d - f	77.3 hi
Synergy 2 (1.04 qt)	1,3,5,7,9	3202	13.1 a - d	82.8 i
Control	n.a.	2706 ns	26.1 f	76.0 hi

^z Week of application in a series of 9 weekly applications made from 27 Nov 2015 to 22 Jan 2016.

^y Percent of fruit with conspicuous powdery mildew (PM) growth on more than 25% of the achenes.

^x Percent of leaf area covered with powdery mildew based on microscopic observations at 25x.

^w Means in a column followed by the same letter are not significantly different by Fisher's Protected LSD test ($\alpha = 0.05$).

Statistics are provided if the Pr > F term for treatment sums of squares was significant at $p \leq 0.05$. NS = non significant.