STRAWBERRY (*Fragaria* x *ananassa*, 'Florida Beauty')
Anthracnose fruit rot; *Colletotrichum acutatum*

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Evaluation of fungicide products to control anthracnose fruit rot in annual strawberry, 2021-22.

Efficacy of fungicide products against anthracnose fruit rot (AFR), caused by *Colletotrichum acutatum*, was evaluated in an experiment conducted with 'Florida Beauty' bare-root green-top transplants obtained from a California nursery. On 5 Oct 21, the trial was set up where transplants were planted into raised beds covered with black plastic mulch previously fumigated with Telone C-35 (300lb/A). Each bed, measuring 32 in. wide on 4-ft centers, contained two staggered rows of plants placed 15 in. apart within rows and 15 in. between rows. Right after, plants received overhead irrigation during the day for 10 consecutive days to promote plant establishment. Irrigation and fertilization were applied throughout the season through a central drip tape placed under the plastic in each bed. Four plots of fourteen plants were distributed in a randomized complete block design within four beds where each bed represented one replication. Flowers were removed prior to inoculation on 01 Nov and ten days later plants were spray inoculated with a suspension mixture of two *C. acutatum* isolates (one sensitive and one resistant to QoI fungicides) at 5 x 10^4 spores/ml. Isolates were grown on 50% potato-dextrose-agar (PDA) for 7 days under constant light at room temperature (24°C). In total, 10 fungicide applications were made weekly from 16 Nov 21 to 21 Jan 22. A CO_2 back-pack sprayer was calibrated to deliver 100 gal/A at 60 psi using a sprayer wand. Two T-Jet 8002 hollow-cone nozzles spaced 12 in apart were used to deliver the treatments to their correspondent plots. A non-treated inoculated control (NTC) treatment did not receive fungicide application. One treatment consisting of weekly applications of Captan Gold 80WDG throughout the experiment was included as standard control. All other treatments were applied when conducive weather favored disease development as indicated by the Strawberry Advisory System (StAS) (http://agroclimate.org/tools/sas/) and Captan Gold 80WDG was applied otherwise. StAS applications were made twice, on 16 Nov and 23 Dec 21, corresponding to weeks 1 and 6. Ripe and diseased fruit were harvested from 29 Nov 21 to 25 Jan 22 (15 harvests). Marketable fruit (> 10g) weight was used to determine yield. Marketable and cull fruit (< 10g or diseased) were also counted. AFR incidence was expressed as the percentage of diseased fruit compared to total number of fruit. Data was analyzed by fitting a generalized linear mixed model using the GLIMMIX procedure in SAS and means were separated by Fisher's Protected LSD test ($\alpha = 0.05$).

Anthracnose fruit rot symptoms were observed within 2 weeks of pathogen inoculation with a peak of symptoms and signs observed in the first two weeks of December. Average AFR incidence reached 33.5% in the NTC over the duration of the experiment. All treatments reduced disease incidence compared to the NTC treatment, except Howler + Theia + Induce alternated with Switch 62.5WG 14 oz during StAS alert week. The previously mentioned treatment and Exp 14 10.72 oz alternated with Switch 62.5WG during alert weeks did not increase marketable yield compared to the NTC treatment. The most effective treatments in reducing AFR incidence and increasing marketable yield included StAS alert application of Switch 62.5WG and XDE-659 alternated with Captan Gold 80WDG. Weekly applications of Captan 80WDG 2.5 lb were also highly effective in reducing disease and increasing marketable yield. Results indicate that Captan applications seem to play a major role in controlling AFR and increasing yield on strawberry. Phytotoxicity was not observed in any of the treatments in this experiment.

Treatments (rates/A)	Application timing[a]	Yield (lb/A)[b]		AFR incidence (%)[c]	
Switch 62.5WG 14 oz Captan Gold 80WDG 1.9 lb	1 and 6 2-5 and 7-10	8699.4	a[d]	3.6	d
Captan Gold 80WDG 2.5 lb	1-10	8106.7	ab	5.6	cd
XDE-659 20 fl oz Captan Gold 80WDG 1.9 lb	1 and 6 2-5 and 7-10	8640.4	a	9.0	c
Switch 62.5WG 14 oz Oxidate 5.0 0.39% PerCarb 3lbs	1 and 6 2, 4, 7, 9 3, 5, 8, 10	5067.2	cd	18.0	b
Switch 62.5WG 14 oz Theia 3 lb + Induce 2 pt	1 and 6 2-5 and 7-10	4944.0	cd	18.0	b
Switch 62.5WG 14 oz	1 and 6	6585.8	bc	18.3	b
Switch 62.5WG 14 oz Howler 5 lb + Induce 2 pt	1 and 6 2-5 and 7-10	4971.6	cd	18.7	b
Switch 62.5WG 14 oz Exp 14 7.14 oz	1 and 6 2-5 and 7-10	6263.7	cd	19.7	b
Switch 62.5WG 14 oz Exp 14 10.72 oz	1 and 6 2-5 and 7-10	4689.4	de	21.5	b
Switch 62.5WG 14 oz Howler 2.5 lb + Theia 1.5 lb + Induce 2 pt	1 and 6 2-5 and 7-10	4615.0	de	26.5	ab
Non-treated control	-	3208.0	e	33.5	a
Probability of a greater F value		<0.0001		<0.0001	

[a] Fungicide applications were made for 10 consecutive weeks from 16 Nov 21 to 21 Jan 22.

[b] Marketable yield based on 15 harvests from 29 Nov 21 to 25 Jan 22.

[c] Anthracnose fruit rot (AFR) incidence as percent of total harvest fruit.

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