STRAWBERRY (*Fragaria* x *ananassa* 'Camarosa')
Anthracnose fruit rot; *Colletotrichum acutatum*

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Evaluation of products for anthracnose fruit rot control in annual strawberry, 2017-2018.

On 18 Oct 2017, bare-root strawberry plants from Canada were transplanted into plastic-mulched raised beds fumigated with Telone C-35 (300 lb/A). The beds were 28 in. wide on 4-ft centers and contained two rows of plants spaced 15 in. apart within rows and 12 in. between rows. Transplants were irrigated by overhead sprinklers for 10 days to aid establishment, then irrigated and fertilized through a central drip tape. Treatments were arranged in a randomized complete block design with four blocks in adjacent beds. Plots consisting of 14 plants in 9.3 ft of bed were aligned in a staggered arrangement. Treatment applications were made at weekly intervals from 29 Dec 2017 to 3 Mar 2018 using a CO_2 backpack sprayer calibrated to deliver 100 gal/A at 60 psi through two TeeJet disc-core hollow cone nozzles spaced 12 in. apart on the boom. Captan, Omega, Thiram, EXP11, and EXP22 were applied each week during that interval. Other test products were applied when weather conditions favored disease development as indicated by the Strawberry Advisory System StAS (http://agroclimate.org/tools/sas/). These applications were made 29 Dec, 12 Jan, and 26 Jan corresponding to weeks 1, 3, and 5 of the 10-wk spray period. During other weeks, Captan Gold 80WDG was applied as a maintenance treatment at 3.0 lb/A. Ripe and diseased fruit were harvested twice weekly from 16 Jan to 8 Mar (15 harvests). Healthy fruit weighing more than 10 g were counted and weighed to determine marketable yield. Fruit weighing less than 10 g, diseased fruit, and other unmarketable fruit were also enumerated. Anthracnose fruit rot incidence was expressed as a percentage of the total number of marketable and unmarketable fruit. Data were analyzed by ANOVA using the proc GLM procedure in SAS. Multiple means comparisons were made by the Fisher Protected LSD test ($\alpha = 0.05$).

Anthracnose fruit rot (AFR) developed early in the season and spread rapidly. The early onset of disease was promoted by natural inoculum occurring on the plants and periods of favorable weather for disease development. Those products applied in response to Dec and Jan StAS alerts are best compared using early season data from the first eight harvests. With two exceptions (Mettle 5 fl oz/captan and Luna Sensation/captan), nearly all treatments suppressed early season development of anthracnose fruit rot (AFR). However, only Abound/captan and Rhyme/captan increased marketable yield during this period. During the whole season consisting of 15 harvests, all treatments reduced AFR incidence, and all treatments except Mettle 5 fl oz/captan significantly increased yield. It should be noted that weekly applications of multi-site fungicides captan and thiram, as well as Omega reduced disease and increased whole season yield as well as hybrid programs combining captan with other fungicides. Weekly applications of biorational products EXP11 and EXP22 also performed as well as most conventional fungicides in these respects. Phytotoxicity symptoms were not observed in this trial.

Products and rates/A	Application timing (wk)[z]	Yield (lb/A)[y] Early season	Yield (lb/A)[y] Whole season	AFR incidence (%)[y] Early season	AFR incidence (%)[y] Whole season
Omega 20 fl oz	all 10 weeks	5110 a-d	12284 abc	13.0 a	15.0 a[x]
Aprovia 10.5 fl oz Captan Gold 80WDG 3 lb	1,3,5 2,4,6,7,8,9,10	5050 a-d	12890 ab	13.3 ab	14.0 a
Captan Gold 80WDG 3 lb	all 10 weeks	4206 a-d	11175 abc	13.4 ab	14.6 a
Thiram SC 2.5 qt	all 10 weeks	5203 a-d	12621 abc	14.0 ab	15.6 ab
Abound 2.08F 15.5 fl oz Captan Gold 80WDG 3 lb	1,3,5 2,4,6,7,8,9,10	5639 ab	13157 a	14.3 ab	14.7 a
Rhyme 7 fl oz Captan Gold 80WDG 3 lb	1,3,5 2,4,6,7,8,9,10	6419 a	12865 ab	14.3 ab	16.1 ab
EXP22 3 fl oz + Cohere 8 fl oz	all 10 weeks	5407 abc	11574 abc	14.9 ab	15.1 a
EXP11 10 fl oz + Cohere 8 fl oz	all 10 weeks	5098 a-d	13351 a	15.0 ab	14.4 a
EXP22 5 fl oz + Cohere 8 fl oz	all 10 weeks	4858 a-d	12065 abc	18.0 abc	18.6 ab
Aprovia Top 13.4 fl oz Captan Gold 80WDG 3 lb	1,3,5 2,4,6,7,8,9,10	4726 a-d	11765 abc	18.2 abc	15.4 a
Mettle 125ME 8.0 fl oz Captan Gold 80WDG 3 lb	1,3,5 2,4,6,7,8,9,10	4797 a-d	10688 bcd	19.1 abc	20.9 ab
Captan Gold 4L 2.4 qt	all 10 weeks	3884 a-d	11359 abc	19.8 abc	15.3 a
Kenja 15.5 fl oz Captan Gold 80WDG 3 lb	1,3,5 2,4,6,7,8,9,10	4512 a-d	11321 abc	20.7 abcd	19.7 ab
EXP11 5 fl oz + Cohere 8 fl oz	1,3,5 2,4,6,7,8,9,10	5282 abc	12816 abc	23.1 bcd	17.1 ab
Mettle 125ME 5.0 fl oz Captan Gold 80WDG 3 lb	1,3,5 2,4,6,7,8,9,10	3500 de	10612 cd	27.4 cde	20.9 ab
Luna Sensation 7 fl oz Captan Gold 80WDG 3 lb	1,3,5 2,4,6,7,8,9,10	2870 e	10830 bcd	30.2 de	22.6 b
Control	n.a.	3695 cde	8745 d	35.8 e	32.8 c
P > F (treatment sums of squares)		0.0365	0.0140	< 0.0001	0.0215
MSE		1,545,140	2,442,858	50.117	24.295

[z] Applications were made weekly for 10 consecutive weeks beginning 29 Dec. Application week is indicated by the numbers 1 – 10.
[y] Anthracnose fruit rot (AFR) incidence and yield of marketable fruit are provided for the first 8 harvests from 16 Jan to 12 Feb (early season) and all 15 harvests from 16 Jan to 8 Mar (whole season).
[x] Means in a column followed by the same letter are not significantly different by Fisher's protected LSD test ($\alpha = 0.05$).