

STRAWBERRY (*Fragaria x ananassa* 'Camarosa')
Anthracnose fruit rot; *Colletotrichum acutatum*
Gnomonia leaf blotch; (*Gnomonia* spp.)

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Evaluation of products for anthracnose fruit rot and *Gnomonia* leaf blotch control in strawberry, 2016-2017.

On 12 Oct 2016, 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. On 13 Dec, plants were removed to create 14-plant plots separated by 2- to 4-ft spaces between plots in each bed. Each plot was 9.3 ft long. Treatments were arranged in a randomized complete block design with four blocks in adjacent beds. Applications were made with a CO₂ 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. Applications were made weekly from 16 Dec to 24 Feb (11 times). Ajifol Aminoguard, Bravo, Captan, Omega, Timorex Gold, and STK73 were applied 11 times at weekly intervals. Other test products were applied when disease pressure was high and/or weather conditions favored disease development, i.e., 16 Dec, 20 Jan, 23 Feb, and 2 Mar. During other weeks, Captan 80WDG was applied as a maintenance treatment at 2.5 lb/A. Ripe and diseased fruit were harvested twice weekly from 12 Jan to 2 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. Between 6 and 15 Mar, selected treatments were evaluated for *Gnomonia* by removing dead petioles from 10 plants/plot and examining them for distinctive perithecia and pycnidia at 12.5x. Disease incidence (DI) was expressed as the average number of *Gnomonia*-positive petioles per plant. 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 from naturally occurring inoculum, and was well distributed when applications began on 16 Dec. However, sparse rainfall restrained disease development until the end of the season, when an epidemic developed, and two consecutive applications of test products were made. Therefore, DI data from the last three harvests may best reflect efficacy of products applied solely during weeks conducive to AFR as indicated by the Strawberry Advisory System (<http://agroclimate.org/tools/sas/>). Within this group, AFR was best controlled by Aprovia and moderately controlled by Kenja 15.5 fl oz, both of which have SDHI active ingredients. Several products applied weekly such as Captan, Bravo, and Omega similarly reduced AFR. Two formulations of Captan were tested. While both reduced AFR, the liquid formulation (Captan Gold 4L) may have suppressed yield. This merits further testing, as Captan is the backbone of strawberry disease management in Florida. Over the entire harvest period, all above-mentioned products, as well as Abound and Fracture, reduced disease incidence markedly from 42.2% in the untreated control. Most of these products, including Omega, Aprovia, Captan 80WDG, Bravo Weather Stik, Kenja 15.5 fl oz, also increased yield. Captan 80WDG by itself did not significantly reduce *Gnomonia*, but treatment programs combining Captan 80WDG with Aprovia or Quilt Xcel + Actigard dramatically reduced the numbers of *Gnomonia* diseased leaves. These products, as well as Abound, Kenja 15.5 fl oz, and Omega, but not Bravo nor Captan 80WDG alone, also reduced overall leaf mortality (data not shown). Phytotoxicity symptoms were not observed in this trial.

Treatments (products and rates/A)	Week of application ^z	Yield (lb/A)	Leaf blotch ^y	Anthracnose fruit rot (%) ^x	
			Diseased leaves/plant	Whole season	Last 3 harvests
Omega 500F 1.25 pt	1 – 11	9918 a	3.4 bc	9.9 a	14.4 a ^w
Captan Gold 4L 2 qt	1 – 11	7640 abc	nd	12.6 ab	19.6 a
Aprovia 10.5 fl oz	1,6,10,11				
Captan 80WDG 2.5 lb	2-5, 7-9	9911 a	1.9 ab	13.1 ab	22.2 a
Captan 80WDG 2.5 lb	1 – 11	9717 a	5.8 de	15.9 ab	25.8 ab
Bravo Weather Stik 1.5 pt	1 – 11	8970 ab	6.2 de	16.9 ab	28.0 ab
Kenja 400SC 15.5 fl oz	1,6,10,11				
Captan 80WDG 2.5 lb	2-5, 7-9	8545 ab	6.2 de	16.7 ab	30.8 abc
About 2.08F 12.0 fl oz	1,6,10,11				
Captan 80WDG 2.5 lb	2-5, 7-9	8099 abc	4.5 cd	23.3 bc	38.9 bc
Quilt Xcel 14 fl oz + Actigard (0.375 oz)	1,6,10,11				
Captan 80WDG 2.5 lb	2-5, 7-9	7594 abc	0.9 a	21.4 abc	39.1 bc
Kenja 400SC 13.5 fl oz	1,6,10,11				
Captan 80WDG 2.5 lb	2-5, 7-9	6766 bcd	nd	22.7 bc	41.8 bcd
Fracture 36.6 fl oz	1,6,10,11				
Captan 80WDG 2.5 lb	2-5, 7-9	7450 a-d	6.4 de	23.5 bc	46.7 cd
Ajifol Aminoguard 0.2% v:v	1 – 11	6493 bcd	nd	32.3 cd	56.3 de
Timorex Gold 16 fl oz	1 – 11	6406 bcd	7.0 e	39.2 de	64.5 ef
STK73 24 fl oz	1 – 11	5655 cd	nd	45.1 e	73.9 f
Ajifol Aminoguard 0.4% v:v	1 – 11	5733 cd	nd	44.8 e	74.2 f
Control	n.a.	4890 d	7.4 e	42.2 de	75.8 f

^z Applications were made weekly for 11 consecutive weeks beginning 16 Dec. Application week is indicated by the numbers 1 – 11. Weeks 1, 6, 10, and 11 were especially conducive to disease development according to the Strawberry Advisory System

^y Leaf blotch severity = number of dead leaves/plant with *Gnomonia* spp. sporulating on the petioles. nd = not determined.

^x Anthracnose fruit rot incidence is presented for 15 harvests from 12 Jan to 2 Mar 17 (whole season) and the last 3 harvests on 23 and 27 Feb and 2 Mar.

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