

**Evaluation of fungicide products to control Botrytis fruit rot in annual strawberry, 2018-19.**

The efficacy of fungicide treatments on the management of Botrytis fruit rot (BFR) was evaluated in a replicated field experiment on a commercial farm located in Plant City, FL. Bare-root strawberry transplants from a California nursery were transplanted into raised beds on 8 Oct 2018. Beds measured 28 in. wide on 4-ft centers and were treated with Pic-Clor 60 (200 lb/A) before covering with a black plastic mulch. Plants were 15 in. apart within and between two staggered rows on each bed. Immediately after planting, overhead irrigation was applied during the day for 10 consecutive days to aid plant establishment. Afterwards, irrigation and fertilization were delivered via a drip system for the remainder of the season. Twenty-one treatments and a non-treated control were arranged in a randomized complete block design with four replications. Plots were 9.5-ft long with 12 plants each and were separated by a 4-ft long gap without plants. Fungicides were applied with a CO<sub>2</sub> back-pack sprayer calibrated to deliver 100 gal/A at 60 psi through a boom fitted with two hollow-cone T-Jet 8002 nozzles. Applications were done weekly from 30 Nov 2018 to 12 Feb 2019 (12 applications). However, site-specific fungicides were applied based on the weather favorability to disease (17 to 25°C and ≥ 12 h leaf wetness) as indicated by the Strawberry Advisory System (StAS, <http://agroclimate.org/tools/sas/>). Four StAS-triggered applications were made on 19 Dec 2018, 4 Jan, 1 Feb, and 11 Feb 2019. To evaluate BFR incidence and yield, fruit were harvested twice weekly from 4 Dec 2018 to 19 Feb 2019 (22 harvests). After each harvest, healthy ripe fruit weighing more than 1/3 oz were weighed to determine marketable yield. Botrytis fruit rot (BFR) incidence was expressed as the percentage of infected fruit compared to total number of fruit harvested. Yield and incidence data were analyzed by two-way ANOVA in SAS using the proc GLM procedure. Means were separated by Fisher's Protected LSD test ( $\alpha = 0.05$ ).

According to the StAS, weather conditions were very conducive for BFR development during the winter 2018-19 growing season. Throughout the harvest period, StAS indicated nine days highly favorable to infection, and 11 days moderately favorable. Consequently, BFR incidence in the non-treated control (NTC) reached 26.9% over the entire season. During this period, all treatments reduced BFR incidence except a program involving the low rate of SAU 20. Treatment programs with EXP 22, Kenja, Merivon, Miravis Prime, or Switch, and weekly applications of Thiram SC at 2.6 pt/A were the most effective. During the late-season period (harvests made after 15 Jan), all treatments reduced disease incidence except the low rate of SAU 20. No significant differences were observed during the early season (harvests made before 15 Jan) when BFR incidence in the non-treated control was low (6.2%). All treatments increased yield compared to the non-treated control. Programs with Abound, Intuity, Kenja, Miravis Prime, Switch, or the high rate of SAU, and weekly applications of Thiram SC at 2.6 pt/A were associated with the highest yields of marketable fruit.

Products and rates/A	Application timing <sup>z</sup>	Yield (lb/A) <sup>y</sup>	BFR (%) <sup>x</sup>		
			Early Season	Late Season	Whole Season
Miravis Prime 3.33SC 11.4 fl oz	4, 6, 10, 11	18119 a-d	2.7	12.2 a	10.1 a <sup>w</sup>
Captan 80WDG 1.9 lb	1, 2, 3, 5, 7, 8, 9, 12				
Miravis Prime 3.33SC 13.4 fl oz	4, 6, 10, 11	17099 a-e	3	12.7 a	11.1 a
Captan 80WDG 1.9 lb	1, 2, 3, 5, 7, 8, 9, 12				
Kenja 400SC 13.5 oz + Thiram SC 2.0 qt	4, 6, 10, 11	19988 a	6.6	14.0 ab	12.3 ab
Captan 80WDG 1.9 lb	1, 2, 3, 5, 7, 8, 9, 12				
Switch 62.5WG 14 oz	4, 6, 10, 11	19288 ab	2.1	14.9 abc	12.4 ab
Captan 80WDG 1.9 lb	1, 2, 3, 5, 7, 8, 9, 12				
Kenja 400SC 15 oz	4, 6, 10, 11	17621 a-e	2.9	14.9 abc	12.5 ab
Captan 80WDG 1.9 lb	1, 2, 3, 5, 7, 8, 9, 12				
Thiram SC 2.6 qt	weekly	18439 a-d	2.6	15.0 abc	12.6 ab

Kenja 400SC 13.5 oz + Captan 80WDG 1.9 lb	4, 6, 10, 11	16962 a-e	4.9	15.9 a-d	13.8 ab
Captan 80WDG 1.9 lb	1, 2, 3, 5, 7, 8, 9, 12				
EXP 22 (8 fl oz)	4, 6, 10, 11	15342 cde	2.7	17.6 a-e	14.1 ab
Thiram SC 2.0 qt	1, 2, 3, 5, 7, 8, 9, 12				
Merivon 11 fl oz	4, 6, 10, 11	16187 b-e	1.3	17.4 a-e	14.3 abc
Captan 80WDG 1.9 lb	1, 2, 3, 5, 7, 8, 9, 12				
Thiram SC 2.0 qt	weekly	16706 a-e	0	18.3 a-f	15.6 a-d
Velum Prime 6 fl oz <sup>v</sup>	1, 4				
Thiram SC 2.0 qt	weekly	15543 cde	4.7	19.3 b-f	16.8 bcd
EXP 22 (10 fl oz)	4, 6, 10, 11	15753 cde	0.4	20.7 c-f	17.0 bcd
Thiram SC 2.0 qt	1, 2, 3, 5, 7, 8, 9, 12				
Luna Tranquility 20 fl oz	6, 10	15237 de	2.1	19.8 c-f	17.1 bcd
Switch 62.5WG 14 oz	4, 11				
Captan 80WDG 1.9 lb	1, 2, 3, 5, 7, 8, 9, 12				
Kenja 400SC 13.5 oz	4, 6, 10, 11	18651 abc	2.6	19.3 b-f	17.2 bcd
Captan 80WDG 1.9 lb	1, 2, 3, 5, 7, 8, 9, 12				
Captan 80WDG 1.9 lb	weekly	14664 e	3.1	21.2 def	17.2 bcd
Abound 15.5 fl oz	4, 6, 10, 11	18555 a-d	1.7	20.4 c-f	17.4 bcd
Thiram SC 2.0 qt	1, 2, 3, 5, 7, 8, 9, 12				
SAU 20 8 oz	4, 6, 10, 11	16648 a-e	2	21.9 def	17.8 bcd
Captan 80WDG 1.9 lb	1, 2, 3, 5, 7, 8, 9, 12				
Intuity 6 fl oz	6, 10	17122 a-e	3.2	23.9 fg	19.8 cde
Captan 80WDG 1.9 lb	1,2,3,4,5,7,8,9,11,12				
Intuity 6 fl oz	4, 6	17369 a-e	6.1	22.8 efg	20.3 de
Captan 80WDG 1.9 lb	1,2,3,5,7,8,9,10,11,12				
Elevate 50WG 24 oz	4, 6, 10, 11	16140 b-e	2.3	23.9 fg	20.7 de
Captan 80WDG 1.9 lb	1, 2, 3, 5, 7, 8, 9, 12				
SAU 20 6 oz	4, 6, 10, 11	15241 de	0	28.4 gh	24.6 ef
Captan 80WDG 1.9 lb	1, 2, 3, 5, 7, 8, 9, 12				
Non-treated control	n.a.	10826 f	6.2	31.0 h	26.9 f
P > F (type III treatment sums of squares)		0.0031	0.3271	< 0.0001	< 0.0001

<sup>z</sup> Week of application of products from 30 Nov 2018 to 12 Feb 2019 (12 weeks).

<sup>y</sup> Yield from 22 harvests made from 4 Dec 2018 to 19 Feb 2019 (whole season).

<sup>x</sup> Average Botrytis fruit rot (BFR) incidence during three periods: early season (harvests conducted through 15 Jan), late season (harvests conducted after 15 Jan), and whole season (all harvests).

<sup>w</sup> Columns with the same letter are not significantly different based on least significant difference (LSD) test ( $\alpha = 0.05$ ).

<sup>v</sup> Velum Prime was applied by injecting the fungicide solution into the soil at two points about 2 in. from each plant.