

STRAWBERRY (*Fragaria x ananassa* 'Florida 127')  
Botrytis fruit rot; *Botrytis cinerea*  
Pestalotia fruit rot; *Neopestalotiopsis* spp.

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### **Evaluation of biorational products to control Botrytis and Pestalotia fruit rot on annual strawberry, 2020-21.**

Biorational products alone or in combination with conventional fungicide treatments were evaluated for Botrytis fruit rot (BFR) and Pestalotia fruit rot management at a commercial farm in Plant City, FL. Bare-root transplants from a nursery in Canada were planted into raised beds covered with black plastic mulch on 10 Oct 2020. Beds were previously fumigated with Pic-Clor 80 (200 lb/A) and measured 28 in. wide on 4-ft centers. Twelve plants per plot were spaced 16 in. apart within and between rows, and each plot measured 10-ft long separated by a 4-ft gap. Plants were established using overhead irrigation for ten days, and water and fertilizers were delivered by drip tape throughout the entire season. Twenty-three biorational and conventional fungicide treatments and a non-treated control were arranged in a randomized complete block design with four blocks as replications. Treatments were applied with a CO<sub>2</sub> back-pack sprayer calibrated to deliver 100 gal/A at 60 psi through two hollow-cone T-Jet 8002 nozzles spaced 12-in. apart on the wand. Ten treatments consisted of weekly applications of biorational products that were made 14 times from 24 Nov 2020 to 23 Feb 2021. Treatment programs with the conventional fungicide Switch 62.5WG were applied during weeks of conducive weather for infection (17 to 25°C and ≥ 12 h leaf wetness), following risk assessments by the Strawberry Advisory System (StAS, <http://sas.agroclimate.org>). Captan Gold 80WDG, BFun1, BFun2, SA 0650004, Exp 14, or BW165E were applied in alternation with Switch 62.5WG during weeks with low disease risk. Some treatments consisted of biorational products BFun1, BFun2, Exp 14, or ProBlad Verde applied in alternation with Captan Gold 80WDG when disease risk was low. In total, five StAS-based applications were made on 15 Dec 2020, 5 Jan, 26 Jan, 9 Feb, and 16 Feb 2021. Twenty-one harvests were made from 1 Dec 2020 to 26 Feb 2021. Fruit were usually harvested twice a week to determine yield and fruit rot incidences caused naturally by *Botrytis cinerea* and *Neopestalotiopsis* spp. Marketable fruit were counted and weighed to determine yield, and disease incidences were expressed as a percentage of the total number of marketable and non-marketable fruit. All data were analyzed by fitting a generalized linear mixed model using the statistical software SAS and means were separated using Fisher's Protected LSD test ( $\alpha = 0.05$ ).

During the trial, StAS identified 14 and 6 days that were moderately and highly conducive for disease development, respectively. The disease alerts occurred during early (1 Dec 2020 to 14 Jan 2021) and late (15 Jan 2021 to 26 Feb 2021) season indicating conditions were suitable for infection throughout the 2020-21 strawberry season. Thus, average disease incidence for the entire season is reported. In the non-treated control (NTC), BFR incidence averaged 15.8%. The treatments including SA 0650004 at 28 and 42 fl oz, Serenade Opti, PREV-AM, Exp 14 at 7.14 oz applied weekly, and BFun2 and ProBlad Verde alternated with Captan Gold 80WDG or Serenade Opti failed to reduce BFR incidence compared to the NTC. The most effective treatments all included Switch 62.5WG alternated with BFun1, BFun2, SA 0650004, Captan Gold 80WDG, Exp 14, or BW165E. During the season, Pestalotia fruit rot was observed in the trial with an average of 19.8% in the non-treated control. Treatments including Switch 62.5WG alternated with Captan Gold 80WDG, BW165E, Exp 14, BFun1, or SA 0650004, as well as Exp 14 at 10.72 oz and BFun1 and BFun2 alternated with Captan Gold 80WDG significantly reduced disease incidence. For the overall season, Switch 62.5WG alternated with Captan Gold 80WDG, Exp 14, BW165E, BFun1, Bfun2, or SA 0650004, as well as Exp 14 and BFun1 alternated with Captan Gold 80WDG, and Exp 14 7.14 oz applied weekly significantly increased yield compared to the non-treated control. No phytotoxicity was observed in this trial.

Treatment (products and rates/A)	Application timing <sup>z</sup>	Yield (lb/A) <sup>y</sup>	Disease incidence (%) <sup>x</sup>	
			Pestalotia fruit rot	Botrytis fruit rot
Switch 62.5WG 14 oz BFun1 1% + Induce 1 pt	4, 7, 10, 12, 13 1, 2, 3, 5, 6, 8, 9, 11, 14	23576 abcd	8.2 efg	3.0 j
Switch 62.5WG 14 oz SA 0650004 28 fl oz + Induce 1 pt	4, 7, 10, 12, 13 1, 2, 3, 5, 6, 8, 9, 11, 14	21714 bcde	8.6 efg	3.5 j
Switch 62.5WG 14 oz BFun2 2% + Induce 1 pt	4, 7, 10, 12, 13 1, 2, 3, 5, 6, 8, 9, 11, 14	22438 abcde	13.4 bcde	3.7 j
Switch 62.5WG 14 oz Exp 14 7.14 oz	4, 7, 10, 12, 13 1, 2, 3, 5, 6, 8, 9, 11, 14	25698 ab	8.1 efg	4.2 ij
Switch 62.5WG 14 oz Captan Gold 80WDG 1.9 lb	4, 7, 10, 12, 13 1, 2, 3, 5, 6, 8, 9, 11, 14	26439 a	5.1 g	4.2 hij
Switch 62.5WG 14 oz Exp 14 10.72 oz	4, 7, 10, 12, 13 1, 2, 3, 5, 6, 8, 9, 11, 14	25517 ab	10.6 cde	4.2 hij
Switch 62.5WG 14 oz BW165E WP 3 lb + Kinetic 0.1%	4, 7, 10, 12, 13 1, 2, 3, 5, 6, 8, 9, 11, 14	23729 abcd	5.9 fg	4.4 hij
Exp 14 7.14 oz Captan Gold 80WDG 1.9 lb	4, 7, 10, 12, 13 1, 2, 3, 5, 6, 8, 9, 11, 14	21464 bcde	12.5 bcde	6.4 ghi
Exp 14 10.72 oz Captan Gold 80WDG 1.9 lb	4, 7, 10, 12, 13 1, 2, 3, 5, 6, 8, 9, 11, 14	23802 abc	10.6 cdef	6.7 fgh
BW165E WP 3 lb + Kinetic 0.1%	weekly	16681 fghi	17.9 abc	6.8 fghi
BFun1 1% + Induce 1 pt Captan Gold 80WDG 1.9 lb	4, 7, 10, 12, 13 1, 2, 3, 5, 6, 8, 9, 11, 14	23268 abcde	9.1 efg	8.0 efg
BW900N 3 lb + Kinetic 0.1%	weekly	19223 defghi	19.3 ab	8.8 defg
Oso 5% SC 6.5 oz + Nu-Film P 4 fl oz	weekly	15990 ghi	24.1 a	9.7 defg
OR278 8 pt + OR159 1% 8 pt Exp 14 10.72 oz	weekly weekly	18888 efghi 16904 fghi	19.4 ab 16.6 abcd	10.1 cdef 10.9 cde
SA 0650004 42 fl oz + Induce 1 pt BFun2 2% + Induce 1 pt Captan Gold 80WDG 1.9 lb	weekly 4, 7, 10, 12, 13 1, 2, 3, 5, 6, 8, 9, 11, 14	14778 i 20496 cdefg	21.2 ab 10.2 def	10.9 bcde 11.1 bcde
Serenade Opti 1 lb ProBlad Verde 32 fl oz Serenade Opti 1 lb	weekly 4, 7, 10, 12, 13 1, 2, 3, 5, 6, 8, 9, 11, 14	19955 cdefgh 18910 efghi	19.5 ab 23.6 a	11.4 bcde 11.6 bcde
PREV-AM 3.2 pt Exp 14 7.14 oz	weekly weekly	15822 hi 20839 cdef	19.4 ab 13.2 bcde	12.1 abcde 13.2 abcd
SA 0650004 28 fl oz + Induce 1 pt	weekly	15307 i	18.2 ab	14.3 abc
Non-treated control	-	15973 ghi	19.8 ab	15.8 ab
ProBlad Verde 45.7 fl oz Serenade Opti 1 lb	4, 7, 10, 12, 13 1, 2, 3, 5, 6, 8, 9, 11, 14	16912 fghi	22.0 a	17.2 a
Probability of a greater F value		<0.0001	<0.0001	<0.0001

<sup>z</sup> Week of application over 14 weeks from 24 Nov 2020 to 23 Feb 2021.

<sup>y</sup> Yield based on harvest data from 1 Dec 2020 to 26 Mar 2021 (21 harvests total).

<sup>x</sup> Average of Pestalotia and Botrytis fruit rots incidence from 1 Dec 2020 to 26 Feb 2021 (whole season).

<sup>w</sup> Values in a column followed by the same letter are not significantly different by Fisher's Protected LSD test ( $\alpha = 0.05$ ).