STRAWBERRY (*Fragaria × ananassa* 'Florida 127')
    Botrytis fruit rot; *Botrytis cinerea*

A. I. Zuniga, G. Alonzo, J. S. Baggio, and N. A. Peres
University of Florida, GCREC
14625 County Road 672
Wimauma, FL 33598

Evaluation of products to control Botrytis fruit rot on annual strawberry, 2021-22.

The efficacy of biorational products by themselves or in a program with a conventional fungicide was evaluated at a commercial strawberry field in Plant City, FL for management of Botrytis fruit rot (BFR). On 4 Oct 21, bare-root transplants from a nursery in Nova Scotia, Canada were transplanted on raised beds and established using overhead irrigation for 10 days. Drip irrigation was applied through a central tape in each bed to provide water and fertilizers. Beds measured 28 in. wide on 4-ft centers and were fumigated with Pic-Clor 80 (200 lb/A) before covering with black plastic mulch. On each bed, plants were arranged in two staggered rows spaced 16 in. apart. The trial consisted of twenty-three biorational and conventional fungicide treatments and a non-treated control arranged in a randomized complete block design with four plots as replications. Plots contained 12 plants each, measured 10-ft long and were separated by a 4-ft gap. Test products were applied with a CO_2 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. The multisite fungicide Thiram SC and ten treatments of biorational products were applied weekly from 23 Nov 21 to 22 Feb 22 for a total of 14 applications. For most treatment programs, timing of applications was determined according to the Strawberry Advisory System (StAS, http://sas.agroclimate.org) alerts, which follow risk assessments based on conducive weather for infection (17 to 25˚C and ≥ 12 h leaf wetness). For these programs, Captan Gold 80WDG, Sil-Matrix, Howler, Theia, BFun1, BRed, and/or BW165 WP were applied during weeks 2-9, 11, 13 and 14 when disease risk was low. Switch 62.5WG or biorational treatments BFun1or BRed were applied when disease risk was high, during weeks 1 (23 Nov 21), 10 (27 Jan 22), and 12 (9 Feb 22). For evaluation of yield and incidence of BFR caused by *Botrytis cinerea*, fruit were harvested twice a week from 10 Dec 21 to 1 Mar 22 (22 harvests). Marketable fruit (>10g) were counted and weighed to determine yield, and BFR incidences were expressed as a percentage of infected fruit relative to the total number of fruit harvested. 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 ($α = 0.05$).

According to StAS, moderate and high risk for disease development occurred during 11 and 6 days, respectively. The majority of the alerts were generated during early season; however, flower production was low during this period resulting in less than 3% disease incidence in the non-treated control (NTC) (data not shown). Average BFR incidence for the whole season (10 Dec 21 to 1 Mar 22) was 12.9% on the NTC. The most effective treatments in reducing BFR incidence included all treatments where Switch 62.5WG was applied in weeks of high disease risk, except alternations with BRed or Sil-Matrix. Weekly applications of Thiram, BW165 WP, and BW165 WP + ON-Gard were also effective. Interestingly, Thiram SC applied weekly had the highest yield in the trial and was the only treatment that significantly increased marketable yield compared to the non-treated control. No phytotoxicity was observed in this trial.

Treatment (products and rates/A)	Application timing[z]	Yield (lb/A)[y]	BFR (%)[x]
Thiram SC 2.5 qt	weekly	45126 a	6.3 gh[w]
BW165 WP 4lb + Kinetic 8 fl oz	weekly	34102 ef	6.3 h
Switch 62.5WG 14 oz	1, 10, 12	36281 bcdef	6.6 gh
BW165 WP 3 lb + Kinetic 8 fl oz	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
Switch 62.5WG 14 oz	1, 10, 12	36655 bcdef	7.7 fgh
Theia 3 lb + Induce 2 pt	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
BW165 WP 3 lb + Kinetic 8 fl oz + ON-Gard Ca 16 fl oz	weekly	36259 bcdef	7.8 fgh
Switch 62.5WG 14 oz	1, 10, 12	38185 bcdef	7.8 fgh
BFun1 1.7 lb + Induce 1 pt	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
Switch 62.5WG 14 oz	1, 10, 12	39112 bc	7.9 fgh
Howler 2.5 lb + Theia 1.5 lb + Induce 2 pt	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
Switch 62.5WG 14 oz	1, 10, 12	40281 b	7.9 fgh
Captan Gold 80WDG 1.9 lb	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
Switch 62.5WG 14 oz	1, 10, 12	34754 cdef	8.4 fgh
Howler 5 lb + Induce 2 pt	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
BW165 WP 3 lb + Kinetic 8 fl oz	weekly	36858 bcdef	8.7 efgh
BFun1 1.7 lb + Induce 1 pt	1, 10, 12	37695 bcdef	9.1 defg
Captan Gold 80WDG 1.9 lb	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
Switch 62.5WG 14 oz	1, 10, 12	38671 bcd	9.9 cdef
BRed 3 gal + Induce 1 pt	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
Switch 62.5WG 14 oz	1, 10, 12	38456 bcde	10.3 cdef
BFun1 0.85 lb + Induce 1 pt	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
BFun1 0.85 lb + Induce 1 pt	1, 10, 12	39079 bc	10.3 bcdef
Captan Gold 80WDG 1.9 lb	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
BRed 3 gal + Induce 1 pt	1, 10, 12	38766 bcd	11.9 abcde
Captan Gold 80WDG 1.9 lb	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
Trillium 128 fl oz	weekly	33877 f	12.4 abcd
Non-treated control	-	36939 bcdef	12.9 abc
NSTKI-014 5 lb	weekly	34335 def	13.3 abc
NSTKI-014 3 lb	weekly	36867 bcdef	13.3 abc
Switch 62.5WG 14 oz	1, 10, 12	37724 bcdef	13.3 abc
Sil-Matrix LC 8 pt	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
Trillium 64 fl oz	weekly	35356 cdef	14.0 ab
Sil-Matrix LC 8 pt	weekly	37537 bcdef	14.7 a
ON-Gard Ca 16 fl oz	weekly	35345 cdef	15.1 a
Kitogreen 150 g	weekly	38129 bcdef	15.5 a
Probability of a greater F value		0.0065	<0.0001

[z] Week of application over 14 weeks from 23 Nov 21 to 22 Feb 22.
[y] Total yield based on 22 harvests from 10 Dec 21 to 1 Mar 22.
[x] Average of Botrytis fruit rot (BFR) incidence from 10 Dec 21 to 1 Mar 22 (whole season).
[w] Means in a column followed by the same letter are not significantly different based on Fisher's Protected LSD test ($\alpha = 0.05$).