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

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

A trial was conducted in a commercial field located in Plant City, FL for the efficacy evaluation of conventional fungicide products for Botrytis fruit rot (BFR) management on strawberries. Bare-root strawberry transplants from a nursery in Canada were transplanted on 4 Oct 21 into raised beds previously treated with Pic-Clor 80 (200 lb/A) and covered with black plastic mulch. Plants were arranged in two staggered rows 16 in. apart within and between rows on beds measuring 28 in. wide on 4-ft centers. Plant establishment was facilitated with 10 days of overhead irrigation after planting and a single drip irrigation system was used to provide water and fertilizer for the remaining of the season. Plots consisted of 12 plants each and measured 10-ft long separated by a 4-ft gap without plants. Eighteen treatments including a non-treated control were arranged in a randomized complete block design with four plots in neighboring beds. Application of treatments was conducted using a CO_2 back-pack sprayer calibrated to deliver 100 gal/A at 60 psi through a boom fitted with two hollow-cone T-Jet 8002 nozzles. The exception to this was Minuet, which was applied through soil drench on 9 Nov 21, 5 weeks after planting. All treatments programs were applied weekly from 23 Nov 21 to 22 Feb 22 (15 applications), however, the test products were applied when weather conditions for *Botrytis cinerea* infection were favorable (17 to 25˚C and ≥ 12 h leaf wetness) according to the Strawberry Advisory System (StAS, http://sas.agroclimate.org). StAS- based applications were made on 23 Nov 21 (week 1), 27 Jan 22 (week 10) and 9 Feb 22 (week 12), when disease risk was high, and consisted of single-site fungicides Kenja 400SC, Miravis Prime, Luna Tranquility, Luna Flex, Inspire Super, or Mibelya. Other treatments were applied on the remainder of the weeks when disease risk was low. Twenty-two harvests were made from 10 Dec 21 to 1 Mar 22. After each harvest, fruit were counted and classified into marketable, unmarketable, and symptomatic to determine yield and disease incidence. Yield was expressed as pounds per acre based on the weight of marketable fruit and BFR incidence as the percentage of symptomatic fruit relative to all harvested fruit. Yield and incidence data were analyzed by fitting a generalized linear mixed model using the statistical software SAS and means were separated according to Fisher's Protected LSD test ($\alpha = 0.05$).

During the trial, StAS indicated that 11 and 6 days were moderately and highly favorable for *B. cinerea* infection, respectively, throughout the entire season. Four highly risk alerts were issued during early season from mid-Nov 21 to mid-Jan 22 in which only one StAS application was performed due to the proximity of the alerts and low number of flowers. The other two StAS-based applications of the test products were made during late season after mid-Jan 22. Thus, the averages of disease incidence for the whole season are reported. BFR incidence in the non-treated control (NTC) was 16.6%. All treatments reduced disease incidence compared to the NTC except for Switch 62.5WG alone or alternated with SA-0650004 and Captan Gold 80WDG. The most effective treatment programs included Miravis Prime, Kenja 400SC, Luna Flex alone or with Minuet alternated with Captan Gold 80WDG, and Switch 62.5WG alternated with either EXP 14, SA-0650004 or Captan Gold 80WDG. During the trial, none of the evaluated treatments significantly increased yield compared to the non-treated control probably because of the high incidence of powdery mildew in the experimental area. No phytotoxicity was observed in this trial.

Treatment (products and rates/A)	Application timing[z]	Yield (lb/A)[y]	BFR (%)[x]
Miravis Prime 13.4 fl oz	1, 10, 12	36899	7.7 d
Captan Gold 80WDG 1.9 lb	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
Kenja 400SC 15.5 fl oz	1, 10, 12	34867	8.5 cd[w]
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	36175	10.1 bcd
EXP 14 10.72 oz	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
Luna Flex 13.7 fl oz	1, 10, 12	39336	10.1 bcd
Captan Gold 80WDG 1.9 lb	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
Minuet 24 fl oz[v]	Drenched on 9 Nov 21	37053	10.2 bcd
Luna Flex 13.7 fl oz	1, 10, 12		
Captan Gold 80WDG 1.9 lb	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
Luna Flex 12 fl oz	1, 10, 12	38633	10.3 bcd
Captan Gold 80WDG 1.9 lb	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
Switch 62.5WG 11 oz	1, 10, 12	36549	10.5 bcd
SA-0650004 28 fl oz	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
Switch 62.5WG 14 oz	1, 10, 12	38726	10.9 bcd
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	34237	11.3 bc
Oxidate 5.0 0.39%	2, 4, 6, 8, 9, 11, 13, 14		
Guarda 1.5%	3, 5, 7		
Inspire Super 20 fl oz	1, 10, 12	38627	11.8 bc
Captan Gold 80WDG 1.9 lb	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
Mibelya 10 oz	1, 10, 12	38717	11.9 bc
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	37131	12.0 b
EXP 14 7.14 oz	2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14		
Luna Tranquility 27 fl oz	1, 10, 12	34424	12.1 b
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	36407	12.1 b
Captan Gold 80WDG 1.9 lb	2, 4, 6, 8, 11, 14		
SA-0650004 28 fl oz	3, 5, 7, 9, 13		
Switch 62.5WG 14 oz	1, 10, 12	34498	12.2 ab
Switch 62.5WG 14 oz	1, 10, 12	35315	12.6 ab
SA-0650004 28 fl oz	2, 4, 6, 8, 11, 14		
Captan Gold 80WDG 1.9 lb	3, 5, 7, 9, 13		
Non-treated control	-	31945	16.6 a
Probability of a greater F value		0.5715	0.0325

[z] Week of product application over 14 weeks (23 Nov 21 to 22 Feb 22).
[y] Sum of yield in pounds per acre evaluated for 22 harvests (10 Dec 21 to 1 Mar 22).
[x] Average incidence of Botrytis fruit rot (BFR) across harvests throughout the whole season (10 Dec 21 to 1 Mar 22).
[w] Values in a column with the same letter are not significantly different based on least significant difference (LSD) test ($\alpha = 0.05$).
[v] Minuet was applied through soil drench to each plant from the four replications 5 weeks after planting.