ROSE (*Rosa* 'Tropicana')
Black spot; *Diplocarpon rosae*
Winter die-back, physiological disorder

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Evaluation of biorational fungicides for the control of black spot of rose and winter-dieback of canes, 2002-03.

This field trial was conducted at the University of Delaware Botanic Garden in Newark, DE. Bare root hybrid tea roses 'Tropicana' were planted in the spring of 2001 in a Matapeake silt loam soil, four ft apart on center. Each plot consisted of two plants, pairs were 8 ft apart on center and rows were spaced 10 ft apart. Experimental design was a randomized complete block with four replications. Weeds were controlled with glyphosate and Surflan as needed and the beds were mulched with composted woodchips for weed control and water conservation. Trickle irrigation provided water as needed during the season. The fungicides were applied to run-off with a CO_2 powered backpack sprayer equipped with a single hollow cone nozzle. Fungicide applications were initiated on 1 May and were applied weekly thereafter. Latron B-1956 spreader-sticker was added to Milsana and Eagle 40WP at each application at 0.026% v/v rate. The plots were rated on 15 Jul. In November the longest canes were pruned to reduce the length of the canes to aprox. 4 ft to prevent root and cane breakage during the winter. On March 31, 2003 the number of dead canes per plant was determined. A cane was considered dead if more than 50% of the cane showed dieback symptoms.

The season was hotter and drier than normal especially in June and July. Of the biorational materials tested only Sunspray UF oil provided control that might be acceptable in the home landscape. The best control was achieved with the conventional fungicide Eagle 40 WP (myclobutanil). Eagle 40WP sprayed roses were darker green and some stems had shortened internodes indicating plant growth regulator effects on 'Tropicana' at the rate and frequency of application used in this test. No other phytotoxicity was observed. The winter was the coldest in the past ten years with the average daily temperature for Dec, Jan, Feb, at 33.5, 27.1 and 29.5 °F, respectively. Seven nights in Jan and five in Feb were in the single digits with the lowest reading of the winter being 1° F. Apparently controlling black spot during the growing season confers some winter hardiness that prevents cane death.

Treatment and rate/100 gal	Black spot rating*	Avg. no. of winter-killed canes/treatment
Triact 70 EC 1.0 gal	5.9 cd**	4.8 b**
Sunspray UF oil 1.0 gal	3.3 b	1.8 a
FirstStep 85WP 3.0 lb	6.1 d	4.5 b
Milsana botanical extract 1.0 gal	5.3 c	5.8 b
Eagle 40WP 6.0 oz	1.0 a	0.3 a
Unsprayed control	6.3 d	4.8 b

*Black spot rating was based on the Horsfall-Barratt Rating System where 1=0%, 2=0-3%, 3=3-6%, 4=6-12%, 5=12-25%, 6=25-50%, 7=50-75%, 8=75-87%, 9=87-94%, 10=94-97%, 11=97-100%, 12=100% of leaves infected or defoliated.

** Means within a column followed by the same letter are not significantly different, Duncan-Waller *k*-ratio *t* test, *k*=100.