SQUASH (Cucurbita pepo 'Supersett')
Phytophthora crown rot and fruit rot; Phytophthora capsici

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EVALUATION OF DINITROANILINE HERBICIDES FOR MANAGING PHYTOPHTHORA IN SUMMER SQUASH, 1994: This project was undertaken because Surflan has been shown to be effective for controlling Phytophthora crown rot of cherry under greenhouse conditions. Two experiments were conducted in 1994. In the first experiment, plants were grown in an area treated with Treflan in a field (Riverhead sandy loam soil) at the Long Island Horticultural Research Laboratory in Riverhead, NY, where Phytophthora fruit rot of pumpkin developed in 1992 and 1993. The two treatments (two rates of Treflan: 0.75 lb a.i./A and 1.5 lb a.i./A) were not replicated because there was not enough space to have large separated plots that could adequately minimize inoculum moving from nontreated areas. Treflan was applied on 11 Jul with a CO_2 pressurized backpack sprayer equipped with 3 flat fan nozzles and incorporated two hours later with a rototiller. The area sprayed for each treatment was 12 ft by 35 ft. Two days later, 13 20-day-old seedlings of Supersett, a straightneck yellow squash, were transplanted into each of two rows in the two treated areas. Plants and fruit were examined routinely for symptoms. In the second experiment, trays (20 in. X 14 in. X 4 in.) containing infested soil were treated with a dinitroaniline herbicide, after which healthy summer squash fruit were placed on the soil. Trays were used because treatments were physically separated and the potential was small for inoculum movement between trays. Soil was collected on 31 Aug from a field at the LIHRL within an area of known high Phytophthora capsici density. Treatments were applied on 1 Sep with the sprayer used in the first experiment and immediately irrigated with 0.5 in. water. One day after treatment (DAT), five fruit per tray were surface-sterilized in 10% Clorox for 30 sec, rinsed in water, then placed on the soil surface. Trays were kept outside on gravel in an area receiving regular irrigation. Trays were arranged in a randomized block design with three replications. Fruit were evaluated at 11 and 13 DAT, then this first group of fruit was removed, the soil was saturated, and a second group of fruit were placed in each tray 1 day later, (14 DAT); these fruit were evaluated at 18 and 21 DAT. A nonparametric test (Friedman) was used because of the nonnormal distribution of the data, which was skewed to predominantly low or high values for some assessment dates.

Plants in the field appeared healthy until after 4 days of rain (total of 3.48 in. fell on 14, 15, 20, and 22 Aug), then disease development was extremely rapid. On 17 Aug, none of the plants were wilting, a symptom of Phytophthora crown rot, and none had symptoms of Phytophthora fruit rot. One fruit with symptoms was observed on 19 Aug. Most plants had fruit with symptoms on 23 Aug. Water was standing between rows, thus conditions were favorable for zoospore dispersal. When plants were evaluated on 24 Aug, symptoms of Phytophthora fruit rot were seen on 39% and 37% of the fruit on plants in the area treated with Treflan at 0.75 lb a.i./A and 1.5 lb a.i./A, respectively, and 11.5% and 16% of these plants were wilting. Only one plant had not collapsed by 31 Aug. Symptoms also developed rapidly on the fruit set on Phytophthora-infested, herbicide-treated soil in trays. By 11 DAT, 59 of 105 fruit had developed symptoms in group 1. Two days later, 99 fruit had symptoms. In group 2, 12 fruit developed symptoms in 4 days and 102 were symptomatic in 7 days. There were no significant differences among treatments. Similar p-values were obtained with standard ANOVA test procedures.

	Fruit with Phytophthora fruit rot (%) *			
	Group 1 (1 DAT) **		Group 2 (14 DAT) **	
Treatment and rate/A	11 DAT	13 DAT	18 DAT	21 DAT
Control (No Herbicide)	87	100	6	100
Treflan 4EC 1 qt	60	80	14	100
Balan 60DF 3.3 lb	33	100	20	93
Surflan 4EC 3 pt	40	100	14	93
Barricade 65DG 1.33 lb	67	93	6	100
Pendulum 60DG 2.5 lb	80	93	20	100
Prograss 1.5EC 2 qt	27	93	0	93
P-value (Friedman; adjusted for ties)	.260	.664	.722	.609

* Mean values for five fruit per tray; three replicate trays per treatment.
** Groups 1 and 2 were exposed to infested soil 1 and 14 days after treatment, respectively; subsequent timings of evaluation are given below.