

TWO-YEAR ROTATION USED ALONE OR COMBINED WITH A FUNGICIDE PROGRAM FOR MANAGING PHYTOPHTHORA FRUIT ROT IN PUMPKIN, 1995: The experiment was conducted at the Long Island Horticultural Research Laboratory in Riverhead, NY, in a field (Haven loam soil) where *Phytophthora* fruit rot of pumpkin occurred in 1991 and 1992. This field was fallow in 1993 and 1994. On 30 Jun 1995, 1000 lb/A of 10-10-10 fertilizer was broadcast and incorporated. Pumpkin seed were planted at 24-in. within row plant spacing and 68-in. between row spacing on 5 Jul. Plots were four 45-ft rows. Weeds were controlled by mechanically cultivating and hand-weeding. Cucumber beetles and aphids were managed by applying the following insecticides: Lannate LV (3 pt/A) on 28 Jul, Metasystox R (1 qt/A) on 12 Jul and 8 Aug, and Asana (9.6 oz/A) on 21 Jul and 22 Aug. To suppress powdery mildew, Bravo Ultrex was applied at 1.4 lb/A on 29 Jul and 2 lb/A on 8 and 22 Aug, Benlate 50WP (4 oz/A) was applied on 8 and 22 Aug, and Bayleton 50DF (4 oz/A) was applied on 22 Aug. Average monthly high and low temperatures (F) and total rainfall (in.) were 86, 65, and 1.52 in Jul; 86, 62, and 0.7 in Aug, and 76, 56, and 4.43 in Sep, respectively. The field was irrigated (approx. 1.0 in.) 11 times on 12-14, 24-25, and 31 Jul; 10-11, 15+17, 24-25 Aug; 1, 8, 15, and 21 Sep; and 30 Sep-1 Oct (several days sometimes were required to move pipe across the field). Irrigation during Sep was to provide favorable conditions for *Phytophthora*. There were 5 replications in a randomized block design. Incidence of *Phytophthora* fruit rot in plots in 1992 and previous observations on soil drainage after rain were used to position the 5 replications such that variation within a replication was minimized. Plots in replications 1, 2 and 3 were separated by a 22-ft wide fallow area. Replications 1 and 2, 2 and 3, and 4 and 5 were separated by a 55-ft long area planted with oats. Soil drainage was improved by subsoiling between rows on 21 Jul and rototilling driveways. Treatments were applied with a tractor-mounted boom sprayer equipped with no. 3 hollow cone nozzles that delivered 40 gal/A at 68 psi. The fungicide program consisted of a post-plant, pre-emergence broadcast application of Ridomil 2E (2 qt/A) on 12 Jul and weekly foliar applications (Ridomil/Copper 70WP at 2.5 lb/A on 2, 16 and 30 Aug; Aliette 80WG at 3 lb/A + Potassium carbonate 100WG at 1.8 lb/A + Maneb 75DF at 2 lb/A on 8 Aug, 23 Aug and 7 Sep; and Kocide 50DF at 2 lb/A on 12 and 20 Sep). Kocide applications were initiated after the leaves had started to senesce thereby exposing the fruit. Apparently healthy (asymptomatic) and rotting fruit were counted in each plot on 25 and 29 Sep; 3, 10, 16, and 25 Oct; and 1 Nov. Fruit that did not turn orange during the experiment were not included in calculations. Most fruit rot was due to *Phytophthora*.

The hot, dry conditions during most of the growing season were unfavorable for *Phytophthora*. Symptoms of *Phytophthora* fruit rot were observed first on 29 Sep after a total of 1.78 in. of rain on 23, 25, 26, and 27 Sep. Surprisingly, symptoms were not observed after 2.42 in. of rain on 17 Sep. *Phytophthora* fruit rot usually started where fruit touched soil. Occasionally symptoms first appeared around the stem. Most fruit had sporangia when symptoms were seen first. Fruit with typical symptoms but no sporangia visible to the unaided eye were classified as having *Phytophthora* fruit rot; sporangia often were observed at the next assessment. Disease development was suppressed by fungicide treatment. On 3 Oct, symptoms were found in 4 of 5 non-fungicide-treated plots but not in any fungicide-treated plots. On 10 Oct, one fungicide-treated plot did not have any affected fruit. The proportion of affected fruit increased rapidly to more than 45% in 4 of 5 non-fungicide-treated plots and 3 of 5 fungicide-treated plots on 16 Oct. Conditions were favorable for disease development during Oct because 3.02 in. of rain fell on 5-6 Oct, 1.74 in. on 21-22 Oct, and 0.9 in. on 28 Oct. On 1 Nov, there were 48 apparently healthy fruit in the five fungicide-treated plots and only 4 healthy fruit in the non-treated plots. The proportion of affected fruit was lower in the treated plots on all assessment dates.

Treatment	Cumulative proportion of fruit with <i>Phytophthora</i> fruit rot				Healthy fruit (%)
	10 Oct	16 Oct	25 Oct	1 Nov	1 Nov
Two-year rotation	19.9	70.4	90.1	98.6	1.4
Two-year rotation+ fungicides *	2.1	43.2	62.5	88.8	11.2
P-value	.0571	.1339	.0671	.0772	.0772

* The fungicide program consisted of a post-plant, pre-emergence broadcast application of Ridomil 2E (2 qt/A) on 12 Jul and weekly foliar applications (Ridomil/Copper 70WP at 2.5 lb/A on 2, 16 and 30 Aug; Aliette 80WG at 3 lb/A + Potassium carbonate 100WG at 1.8 lb/A + Maneb 75DF at 2 lb/A on 8 Aug, 23 Aug and 7 Sep; and Kocide 50DF at 2 lb/A on 12 and 20 Sep). Kocide applications were initiated after the leaves had started to senesce thereby exposing the fruit.