

EVALUATION OF OAT STRAW MULCH AND RYEGRASS LIVING MULCH FOR MANAGING PHYTOPHTHORA CROWN ROT AND FRUIT ROT IN PUMPKIN, 1997: 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 had developed in 1994 and 1996. Treatments were conventional tillage, oat straw mulch, and ryegrass living mulch. A randomized complete block design with four replications was used. Fertilizer (300 lb/A of 10-10-10) was broadcast over the entire field and incorporated on 8 Apr. Oats were planted on 11 Apr. The ryegrass and tilled plots were rototilled. Oats were killed by applying Round-up herbicide when they were flowering on 18 Jun. Pumpkin 'Harvest Moon' was direct-seeded on 27 Jun at 24-in. within row plant spacing and 68-in. between row spacing. Plots consisted of four 25-ft rows. There was 12 ft between plots. All plots were subsoiled on 29 Jul between the rows to improve drainage for *Phytophthora* management. Ryegrass (95 lb/A) was planted on 30 Jul by broadcasting seed around the pumpkin plants, then raking the seed in. Weeds were controlled by hand-weeding. Cucumber beetles were managed by applying Metasystox R (1 qt/A) on 18 Jul and Asana XL (9.6 oz/A) on 31 Jul and 25 Aug. Plants were sidedressed with ammonium nitrate at a rate of 30 lb N/A on 6 Aug. Powdery mildew was controlled by applying Bayleton 50DF (4 oz/A) on 25 Aug and Bravo Ultrex (2.7 lb/A) on 25 Aug, and 5 and 16 Sep. The field was irrigated (approx. 1.0 in.) when soil was dry due to inadequate rainfall on 30 Jun - 2 Jul, 8-11 Jul, 14-17 Jul, 1 Aug, 11-13 Aug, 3-4 Sep, and 8-9 Sep (7 times total). The field was irrigated frequently and often excessively (0.5-2.7 in.) during late Sep and Oct to create conditions favorable for *Phytophthora* fruit rot development by saturating the soil and providing opportunity for splash dispersal from infected fruit. Irrigation dates were 17, 19, 23, 24, 25 Sep; and 2, 7, 9, 14, 15, 16, and 17 Oct. Average monthly high and low temperatures (F) were 87/65 in Jul, 82/64 in Aug, 76/58 in Sep, and 66/48 in Oct. Rainfall (in.) was 2.53, 3.97, 1.20, and 1.81 for these months, respectively. To minimize the chance of interplot interference due to movement of soil on boots while working, boots were dipped in PT2000 Green-Shield (Whitmire) between plots. Fruit were examined weekly from 8 Sep through 5 Nov for symptoms of *Phytophthora* fruit rot and other diseases.

The ryegrass formed a thick mulch between the rows of pumpkin, but it did not grow within the rows. There were a lot of fibrous roots underneath the fruit in the ryegrass plots. The ryegrass was sufficiently tall (12-16 inches) in Oct that these medium-small fruit (6 lb) were partially covered. There were fewer orange fruit in the ryegrass plots than in the others; however, this difference was not statistically significant. Most of the oat straw remained standing throughout the growing season. Some oat reseeded occurred. Pumpkin plants in the oat straw plots grew more slowly and the fruit turned orange later than in the other plots. There were significantly more green fruit in the oat straw plots than in the others on 8 Sep. *Phytophthora* was first observed on 20 Aug in 2 of the 4 ryegrass mulch plots. *Phytophthora* developed in all treatments. This disease developed more slowly than expected under frequent irrigation. Almost all fruit rot due to *Phytophthora* started where fruit touched soil; very few symptoms resulting from splash dispersal were seen. There were no significant differences among the treatments at any time.

Treatments	Fruit with <i>Phytophthora</i> (%) *					Green fruit (%)		Orange fruit (%)
	8 Sep	22 Sep	13 Oct	28 Oct	15 Nov	8 Sep	30 Sep	13 Oct
Control (rototilled)	10	18	28	32	35	9 b **	10	83
Oat straw mulch	9	13	22	33	36	47 a	17	79
Ryegrass living mulch	16	20	32	36	39	7 b	5	64
P-value	0.68	0.87	0.79	0.97	0.95	0.0126	0.13	0.15

* Cumulative counts.

** Numbers in a column with a letter in common are not significantly different according to Fisher's Protected LSD (P=0.05).