PUMPKIN (*Cucurbita pepo* 'HMX 6687')
Phytophthora blight; *Phytophthora capsici*

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Evaluation of brewery-waste compost for managing Phytophthora blight of pumpkin, 2001.

Compost effectively suppresses several soilborne plant diseases. Yard-waste compost, however, was not sufficiently effective for management of Phytophthora blight of cucurbits in previous experiments conducted at the Long Island Horticultural Research and Extension Center (B&C 10:143 and 11:115). This may have been due to low microbial activity of this compost, based on FDA measurements. Brewery-waste compost has higher microbial activity, and thus was expected to be more suppressive to soil-borne pathogens. The current experiment was conducted at LIHREC in a field (Haven loam soil) where Phytophthora blight developed in 1991 to 1993 and 1995 to 1999. On 21 May, 333 lb/A of 15-15-15 fertilizer (50 lb/A of N) was broadcast over the entire field and incorporated. Additional fertilizer was applied to the plots and incorporated on 27 Jun. Nontreated plots received an additional 333 lb/A of 15-15-15 fertilizer and the compost plots received 54 lb/A of 46-0-0 (25 lb/A of N). A randomized complete block design with eight replications was used. Phytophthora blight data from a previous experiment (F&N 48:172) was used to determine plot location. The low area running diagonally through the center of the field was not used. Blight was more severe previously in this area than elsewhere in the field. Because adjacent plots with similar previous severity values were selected to be a replication, the plots in some replications were oriented side-by-side and in others they were end-to-end. Plots were 28.3 ft wide and 51 ft long with 20 ft space between plots. Composted brewery waste (NutriBrew) was obtained from Commodity Specialists in Syracuse, NY. It was spread on 11-12 Jun at a rate of approximately 45 wet tons/A (20 dry tons/A) with a Millcreek compost spreader, then hand-raked as needed to obtain even distribution. The compost was incorporated by disking to a maximum of 6 in. deep on 16 Jun. An experimental pumpkin hybrid with a high level of powdery mildew resistance was selected to minimize the need for pesticide applications because tractor traffic through the field could move *Phytophthora* and compact the soil, creating favorable conditions for blight. Pumpkin seed were planted in the plots on 28 Jun at approximately 24-in. within row plant spacing. Each plot contained three rows spaced 68 in. apart. Weeds and insects were controlled by applying Curbit EC (2 pt/treated A), Command 4EC (1.3 pt/treated A), and Admire 2F (16 fl. oz./ treated A) in a 10-inch band over the planted rows on 29 Jun; these were incorporated lightly by irrigating (approx. 0.25 in.). Hand weeding was also done. No additional pesticides were applied. Oats were planted on 24 Jul in the low area of the field and between plots to minimize the potential for movement of *Phytophthora* between plots in rain runoff. Soil drainage was improved by subsoiling on 25 Jul between rows before vines grew over. Plots were examined weekly for symptoms of foliar blight and fruit rot due to *Phytophthora* beginning 18 Jul. Average monthly high and low temperatures (F) were 80/63 in Jun, 80/63 in Jul, 84/68 in Aug, 75/59 in Sep, and 66/50 in Oct. Rainfall (in.) was 6.08, 3.43, 4.86, 2.98 and 1.97 occurring on 8, 9, 8, 5, and 4 days for these months, respectively. The field was irrigated (approx. 1.0 in.) on 20 Jul, 10 Aug and 7 Sep when soil was dry due to inadequate rainfall. Analysis of variance was conducted using Fisher's Protected LSD to compare treatment means.

Phytophthora blight was observed first on 1 Aug in a nontreated plot (15% of foliage affected) and the compost-treated plot (3%) in that replication. This treated plot was 1 of 3 that had visible evidence that some compost washed out of it during a severe rain storm on 17 Jun (4.25 in). Rain on 26 Jul (1.1 in) most likely provided favorable conditions for disease onset. Soil in these two plots looked wetter than other plots following rain earlier in the summer when plants were small and soil was readily visible. Symptoms were observed in two more plots on 14 Aug and all plots except one treated plot on 24 Aug. More than 0.75 in. rain fell on 10, 20, and 24 Aug. First symptom observed in many plots was collapse of some of the longest vines that extended out of the plots. Many fruit were affected by Phytophthora fruit rot. Additionally, many plants died before producing fruit. Numerous affected fruit with abundant sporulation and new symptoms of vine collapse were observed on 7 Sep despite dry conditions. The only rainfall since 24 Aug was 0.1 in. on 28 Aug. Evidently, heavy dews occurring during that time provided favorable conditions for disease development. No significant differences were detected in proportion of the canopy wilting or dead from Phytophthora blight or in the number of asymptomatic fruit. Variation was high among plots for both treatments. In conclusion, compost with high microbial activity applied about two weeks before seeding pumpkin did not suppress Phytophthora blight.

	Proportion of canopy wilting or dead from Phytophthora blight *				Healthy fruit (#)
Treatment	24 Aug	31 Aug	7 Sep	17 Sep	20 Sep
Nontreated Control ……..	8.4	35.3 (6-97)	51.7 (9-99)	70.1 (13-99)	20.5 (4-41)
Compost ……...	17.8	51.6 (1-100)	66.7 (2-100)	80.8 (4-100)	11.5 (0-48)
P-value	0.138	0.415	0.408	0.570	0.290

* Average (range).