

EVALUATION OF COCOA SHELL, OAT STRAW AND BLACK PLASTIC MULCH FOR MANAGING PHYTOPHTHORA 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 occurred in 1994 and 1996. Treatments were conventional tillage, oat straw mulch, cocoa shell mulch and black plastic mulch. A randomized complete block design with five replications was used. Fertilizer (1000 lb/A of 10-10-10) was broadcast over the entire field and incorporated on 8 Apr. Oat straw was obtained by hand-cutting oats in an adjacent field that had been killed by applying Round-up herbicide when they were flowering on 18 Jun. To reduce plot-to-plot interference, test plots (18- x 6- ft) were alternated with plots planted to sorghum (22- x 6-ft) in a checkerboard pattern. On 11 Jul cocoa shell mulch and oat straw were laid at a thickness of 3/4 inch (7 ft³/plot) and black plastic mulch was used in a manner typical for commercial production; control treatments received no mulch. After mulching, 3-wk-old bush-type pumpkin plants ('HMX 2692') were transplanted eight per plot with 68-in. between row spacing. 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. Fruit were examined weekly from 8 Sep through 20 Oct for symptoms of *Phytophthora* fruit rot and other diseases.

Phytophthora fruit rot was first observed on 20 Aug in plastic mulch treatments. It developed in all treatments, although severity varied substantially within treatments. Plastic mulch plots had, on average, more disease than other treatments. Oat straw- and cocoa shell-mulched plots had less disease than plastic mulch plots (significant at P=0.07 for 14 Oct data) based on planned comparisons. Total yield (which remained much the same after 7 Oct) did not differ significantly among treatments.

Treatments	Mean diseased fruit/plant			Mean yield (fruit/plant)
	7 Oct	14 Oct	20 Oct	14 Oct
Control (rototilled)	9.4	10.4	10.6	34.6
Oat straw mulch	4.8	4.8*	6.4**	33.0
Cocoa shell mulch	1.6	4.4*	8.8**	36.8
Black plastic mulch.....	19.0	22.3	24.7	41.0
P-value	0.30	0.21	0.24	0.39

* Oat straw and cocoa shell mulch treatments differed from plastic mulch treatment at P=0.07 and 0.06, respectively, based on planned comparisons.

** Oat straw and cocoa shell mulch treatments differed from plastic mulch treatment at P=0.06 and 0.10, respectively, based on planned comparisons.