

PUMPKIN (*Cucurbita pepo* 'Howden')
Powdery mildew; *Sphaerotheca fuliginea*
Downy mildew; *Pseudoperonospora cubensis*
Bacterial spot; *Xanthomonas campestris* pv. *cucurbitae*

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Evaluation of fungicides for control of pumpkin diseases, 2001.

A field experiment was conducted at the University of Illinois Vegetable Research Farm near Champaign, IL. Soil was deep-tilled in the fall of 2000 after soybeans were harvested. Fertilizers, 69 lb nitrogen, 46 lb phosphorous, and 60 lb potassium, per acre were broadcast and incorporated into the soil on 4 Apr. Furadan insecticide (2 pt/A) was broadcast and incorporated into the soil on 13 Jun. Also, Curbit (2.5 pt/A) and Command (1.5 pt/A) herbicides, in 20 gal of water/A, were applied over entire field then incorporated into the soil on 13 Jun. Jack-o-lantern pumpkin cultivar Howden was planted on 13 June. Seeds were sown 18 in. apart in single-row plots, 20 ft long. The plots were spaced 35 ft apart in a completely randomized block design with three replications. During the season, weeds were controlled by cultivation and hand weeding. Cucumber beetles and other insects were managed by applying Ambush at the rate of 13 oz./A on 25 Jun and 9 Jul, and 8 oz./A on 16 and 25 of Jul, in 20 gal of water per acre. Application of fungicides began on 11 Jul and continued (at 7-day intervals) until 26 Sep. Fungicides were applied with a backpack sprayer using 50 gal of water per acre. Average monthly high and low temperatures (F) were 81/59 in Jun, 86/67 in Jul, 86/64 in Aug, and 77/53 in Sep. Precipitation was 7 days (3.35 in.) in Jun, 6 days (3.60 in.) in Jul, 6 days (5.05 in.) in Aug, and 7 days (3.30 in.) in Sep. Disease severity (percentage of total area of vines, leaves, or fruit infected) of powdery mildew, downy mildew, and bacterial spot, were evaluated on 30 Jul, 5 Aug, 14 Aug, 21 Aug, 4 Sep, 14 Sep, and 30 Sep. Fruit rot incidence (percentage of fruit infected) was determined on 30 Sep. The incidence and severity of the diseases were assessed at four locations (44 sq. ft each) in each plot, and at the same locations, throughout the season. Weight of fruit was measured during 4-6 Oct.

Powdery mildew was observed on 30 Jul and its severity increased as the season progressed. Severity of the disease was significantly higher in unsprayed plots than the sprayed plots. Best control of powdery mildew was achieved by application of Flint + Folicur, Flint + Bravo Ultrex, TD-2435-01, Quadris + Procure, Quadris + Nova, and Nova + Zoxium. Downy mildew was observed in the plots on 14 Sep. The disease developed rapidly and caused leaf chlorosis and necrosis. Severity of this disease was significantly lower in the plots sprayed with Cuprofix + TD-2435-01, Nova + Zoxium, F-500 + Bravo Ultrex, and Acrobat + Kocide 2000. Bacterial spot developed on leaves and fruit in all of the plots in early Sep. Cuprofix and Bravo Weather Stik appeared to provide some control against this disease. The rates of fruit rot ranged from 5 to 25%. Fruit rot occurred mainly on the fruit infected with *X. campestris* pv. *cucurbitae*. In addition, *Fusarium* species were observed in most of the rotting fruit. The plots that did not receive spray during late Aug and in Sep had higher rates of fruit rot. Relatively lower rate of fruit rot in unsprayed plots may have been due to drier conditions within the plots, which resulted from the loss of foliage caused by severe powdery mildew infection. Average number of fruit per acre ranged from 780 (unsprayed plots) to 1,543 (plots sprayed with Cuprofix + TD-2435-01). The plots sprayed with Cuprofix + TD-2435-01, Quadris + Nova, and TD-2435-01 (3.8 lb/A) produced 98, 84, and 82%, respectively, more fruit than unsprayed plots. Fruit yield per acre ranged from 13,848 lb (unsprayed plots) to 27,407 lb (plots sprayed with Cuprofix + TD-2435-01). The yield from plots sprayed with Cuprofix + TD-2435-01, Nova + Zoxium, and Quadris + Nova were 98, 95, and 93%, respectively, higher than the yield from unsprayed plots.

Treatment, rate/A (application) ²	Disease incidence and severity (%) ¹						
	14 Aug		30 Sep				
	Vine powdery mildew (sev.)	Leaf powdery mildew (sev.)	Leaf powdery mildew (sev.)	Leaf downy mildew (sev.)	Bacterial fruit spot (inc./sev.)	Fruit rot (inc.)	Yield (lb/A)
Untreated check	15.8	30.4	70.0	36.7	46/1.8	14	13,848
Flint 50WG 2.0 oz. + Folicur 3.6 FL 4.0 fl. oz. + Induce ³ 0.125% (1,4,7,10 + 3,6,9,12)	2.9	6.2	4.2	22.5	33/1.2	10	22,923
Flint 50WG 2.0 oz. + Bravo Ultrex 82.5WG 2.0 lb (1,4,7,10 + 3,6,9,12)	0.0	0.0	7.1	15.4	35/1.2	14	22,815
Cuprofix 30DG 3.0 lb + TD-2435-01 WG 1.9 lb (2-11 + 2,4,6,8,10)	1.7	4.6	25.0	6.9	17/0.6	7	27,407
Cuprofix 30DG 3.0 lb + Topsin M 70W 0.5 lb (2-11 + 2,4,6,8,10)	1.2	4.6	24.2	12.5	19/0.7	7	25,519
Topsin M 70W 0.25 lb + Bravo Weather Stik 6SC 720 2.0 pt (2,4,6,8,10 + 3,5,7,9,11)	0.4	3.3	35.0	11.7	17/0.8	13	21,290
Topsin M 70W 0.5 lb + Bravo Weather Stik 6SC 720 2.0 pt (2,4,6,8,10 + 3,5,7,9,11)	0.4	1.7	25.4	17.1	50/2.1	18	21,762
TD-2435-01 WG 1.9 lb (2-11)	0.8	2.1	21.7	16.7	35/1.4	12	20,891
TD-2435-01 WG 3.8 lb (2-11)	0.0	1.2	12.1	13.3	23/1.4	5	23,087
Quadris 2.08SC 12.3 fl. oz. + Bravo Ultrex 82.5WG 2.0 lb (1,4,7,10 + 3,6,9,12)	1.7	8.3	11.2	12.9	27/1.1	9	20,582
Quadris 2.08SC 12.3 fl. oz. + Procure 50WP 0.5 lb (1,4,7,10 + 3,6,9,12)	2.5	6.7	7.5	23.3	29/1.8	15	21,689
Quadris 2.08SC 12.3 fl. oz. + Nova 40W 0.25 lb (1,4,7,10 + 3,6,9,12)	2.9	9.2	5.0	18.3	21/1.0	5	26,753
Nova 40W 0.0625 lb + Zoxium 80W 0.3 lb (2-11)	0.0	0.0	7.5	6.7	27/1.2	9	24,593
Nova 40W 0.1 lb + Zoxium 80W 0.2 lb (2-11)	0.0	0.0	7.5	10.0	25/1.0	6	27,025
Nova 40W 0.1 lb + Zoxium 80W 0.3 lb (2-11)	0.0	0.0	10.8	8.3	19/0.6	12	23,032
F-500 EG 1 lb (2,4,6,8,10)	0.0	1.7	40.0	15.4	23/1.4	6	24,702
F-500 EG 1.0 lb + Bravo Ultrex 82.5WG 2.0 lb (1,4,7,10 + 3,6,9,12)	0.4	1.7	12.1	8.7	23/0.9	12	22,524
Acrobat 50WP 0.4 lb + Kocide 2000 1.5 lb (3-7)	5.8	12.1	68.7	9.9	31/1.7	25	14,956
LSD(P≤0.05)	2.7	4.1	7.2	5.4	21/1.1	4	3,788

¹ Inc=incidence of disease, percent fruit affected; sev=severity of disease, percent area of the foliage or fruit affected.

² Application time: 1=11 Jul, 2=18 Jul, 3=25 Jul, 4=1 Aug, 5=8 Aug, 6=15 Aug, 7=22 Aug, 8=29 Aug, 9=5 Sep, 10=12 Sep, 11=19 Sep, and 12=26 Sep.

³ Induce was mixed with Folicur only.