

Great Lakes Fruit, Vegetable & Farm Market EXPO

December 5-7, 2006

DeVos Place Convention Center, Grand Rapids, MI



Celery

Wednesday afternoon 2:00 pm

Where: Gallery Overlook (upper level) Room C

Recertification credits: 1 (1A, 1B, Comm CORE, Priv CORE)

CCA Credits: NM(0.5) PM(0.5) CM(0.5)

Moderator: Bruce Schreur, Schreur Farms, Hudsonville, MI

- 2:00 p.m. Aster Yellows & Insect Management in Celery
Beth Bishop, Entomology Dept., MSU
- 2:20 p.m. Basics of Transplant Production
Matt Kleinhenz, The Ohio State University
- 2:45 p.m. Disease Management Begins in the Greenhouse
Mary Hausbeck, Plant Pathology Dept., MSU
- 3:05 p.m. Can Slow Release N Carriers Increase Celery Profit?
Darryl Warncke, Crop & Soil Sciences Dept., MSU
- 3:25 p.m. Brassica Biofumigants for Celery Production
Mathieu Ngouajio, Horticulture Dept., MSU
- 3:45 p.m. Black Streaking in Celery: Is This a New Problem?
Mathieu Ngouajio, Horticulture Dept., MSU
- 4:00 p.m. Celery Research Inc. Annual Meeting

Disease Management Begins in the Greenhouse

Dr. Mary K. Hausbeck (517-355-4534)
Michigan State University, Department of Plant Pathology

Damping-off (caused by *Pythium* spp., *Phytophthora* spp. and *Rhizoctonia* sp.) affects all vegetable seedlings and is also common among flowering bedding plants. Damping-off results in collapse of the plant at the soil surface. To prevent damping-off, avoid over-watering because some fungi that cause damping-off prefer wet conditions.

Good sanitation is the key and ensures that root rot problems from one crop are not carried over to another crop. Root rot pathogens survive in the greenhouse in soil particles or plant parts clinging to containers, benches, walkways, and equipment. If root rot occurs, remove and destroy the diseased plants. Also, remove healthy-appearing plants that are immediately adjacent to the dead plants because the disease may have already spread to them although they are not yet showing symptoms. Plug sheets containing diseased transplants should not be reused.

Greenhouse Fungicide Trial – *Rhizoctonia*

A greenhouse trial was conducted using registered and nonregistered products (Table 1). Inoculum was prepared by growing *R. solani* on potato dextrose agar for four weeks. Flasks filled with two parts millet and one part water were sterilized. Four 1.5-in. plugs of the infested agar were then placed into the flasks. The infested millet was allowed to grow for three weeks before being mixed (8 oz/1 ft³) into a soilless media (Baccto Professional Planting Mix, Michigan Peat Company, Houston TX). Three weeks after seeding into a 288-cell tray, healthy celery 'Dutchess' seedlings were planted into 3-in. pots containing the infested soilless media. Plants were watered as needed and fertilized twice weekly with 200 ppm of Peter's 20-20-20 water soluble fertilizer (The Scotts Company, Marysville, OH). Eight plants per treatment were placed into a completely randomized design. Immediately after transplanting the seedling into the infested soil, fungicides were applied as a drench in sufficient volume to displace 10% of the water in the pots on 1 and 15 of February. A plant health rating (1 to 5; 1=healthy, 2=chlorosis/minor wilting, 3=moderate wilting, 4=severe wilting, 5=plant death) and death (%) were assessed on 7, 14 and 23 February.

Disease pressure was severe in this trial with 100% of the untreated inoculated plants dead just 7 days after inoculation (Table 2). All treatments had significantly better plant health ratings and lower plant death (%) than the untreated control throughout the trial. Terraclor 75WP, Moncut 70DF, and Scholar 50WP were the only treatments that completely prevented plant death in this trial. Kocide 2000 54DF, although statistically better than the untreated, did not offer acceptable disease control. No phytotoxicity was noted on any of the treated plants in this trial.

Table 1. Products used in trials.

Product	Active ingredient	Labeled
Aliette 80WDG	fosetyl-al	no
Banol EC	propamocarb	no
Endorse 11.3DF	polyoxin D zinc salt	no
Heritage 50WG	azoxystrobin	yes*
Kocide 2000 54DF	copper hydroxide	yes**
Moncut 70DF	flutolanil	no
Scholar 50WP	fludioxonil	no
Subdue MAXX EC	mefenoxam	no
Terraclor 75WP	PCNB	no
ZeroTol	hydrogen dioxide	no

*Labeled for celery nurseries, applications in greenhouse not prohibited.

**Labeled for field and greenhouse use.

Table 2. Control of Rhizoctonia root rot of celery seedlings with fungicide drenches.

Treatment and rate/100 gal	Plant health* 23 Feb	Plant death (%) 23 Feb
Untreated inoculated	5.0 d**	100 c
Terraclor 75WP 8 oz.....	1.4 ab	0.0 a
Moncut 70DF 1.1 lb.....	1.0 a	0.0 a
Endorse 11.3DF 8 oz.....	2.0 bc	12.5 ab
Scholar 50WP 4 oz.....	1.3 ab	0.0 a
Heritage 50WG 8 oz	2.0 bc	12.5 ab
Kocide 2000 54DF 1 lb.....	2.7 c	25.0 b

*Plant health rated on a 1 to 5 scale; 1=healthy, 2=chlorosis/minor wilting, 3=moderate wilting, 4=severe wilting, 5=plant death.

**Column means with a letter in common are not significantly different (Fisher's LSD; $P=0.05$).

Greenhouse Fungicide Trial – *Pythium*

A fungicide trial was conducted to test various products against *Pythium* damping-off in the greenhouse (Table 1). Inoculum was prepared by growing several *Pythium* spp. on dilute V8 agar for 2 weeks. Flasks filled with two parts millet and one part water were sterilized. Six 4-cm plugs of the infested agar were then placed into the flasks. The infested millet was allowed to grow for four weeks before being mixed (8 oz/1 ft³) into a sterilized soilless media. Several 288-cell flats were cut into sections of 48 cells and filled with the infested soil. Celery 'Dutchess' seeds were planted into each cell on 29 Sep. Six 48-cell flat sections were used per treatment and placed into a completely randomized design. Fungicides were applied as a drench. The percentage of emerging celery seedlings was noted on 20 Sep and 5 Oct.

Table 3. Control of *Pythium* root rot of celery seedlings with fungicide drenches.

Treatment and rate/100 gal, applied at 14-day intervals	Germinated seedlings (ave.)	
	20 Sep	5 Oct
Untreated healthy control.....	40.8 a*	64.8 a
Untreated inoculated	20.8 b	18.8 d
Kocide 2000 54DF 1.5 lb.....	21.5 b	21.0 d
ZeroTol 10 fl oz	20.3 b	16.3 d
Banrot 40WP 12 oz.....	38.3 a	32.0 c
Aliette 80WDG 4 lb.....	37.5 a	45.5 b
Subdue MAXX EC 1 fl oz.....	21.5 b	18.3 d
Banol EC 3 fl oz.....	14.8 b	13.5 d

*Column means with a letter in common are not significantly different (Fisher's LSD; $P=0.05$).

Disease pressure was severe in this trial with the untreated inoculated flats averaging just 18.8 emerged seedlings compared to the untreated healthy control with 64.8 on 5 Oct (Table 3). On the final rating date, Aliette WDG and Banrot WP were the only treatments that had statistically more emerged seedlings than the untreated inoculated control according to our statistical tests. Due to the resistance of the *Pythium* spp., Subdue MAXX was statistically similar to the untreated inoculated control and did not limit disease. No phytotoxicity was observed on any of the treated plant in this trial.