

# Growing Healthy Crops and Healthy Profits

December 6-8, 2005  
Grand Rapids, Michigan



## Asparagus

Tuesday morning 9:00 am

**Moderator:** Gene Kokx Jr., Michigan Vegetable Council Board of Directors

9:00 a.m. Asparagus Virus Survey

Norm Myers, Oceana Co. MSU Extension

9:15 a.m. Asparagus Disease Update

Mary Hausbeck, Plant Pathology Dept., MSU

9:45 a.m. Asparagus Irrigation: Is It Really Needed?

Dan Drost, Plants, Soils & Biometeorology Dept., Utah State Univ.

10:45 a.m. Michigan Asparagus Advisory Board Update

John Bakker, Michigan Asparagus Advisory Board

## Asparagus Disease Update

Dr. Mary K. Hausbeck (517-355-4534), Dr. Catarina Saude, and James Counts, Jr.  
Michigan State University, Department of Plant Pathology

### **Effect of irrigation and drip-applied chemical and biological treatments on *Fusarium* crown and root rot and *Phytophthora* crown and spear rot of asparagus.**

This study was conducted on a cooperator's farm in Oceana County, MI, in a fallow field that had been planted to an asparagus seedbed in 2002. Asparagus 'Jersey Giant' crowns were planted on 13 May 2003 at a spacing of 7.5 in. with a row spacing of 5 ft. Treatment blocks consisted of five rows. Two rows were irrigated every 7 days, two rows were irrigated every 30 days, and one row served as an untreated control with a 9-ft. buffer between treatment blocks. Five treatments were replicated 4 times in a completely randomized block design with the 7- and 30-day irrigation intervals also being randomized. Inoculum was prepared using sterile asparagus broth that was inoculated with nonpathogenic *Fusarium* strains F-21 and D-1, and incubated for one week. Crown treatments of Topsin 70WSB (0.5 lb/A), Scholar 50WP (8 oz/100 gal), or nonpathogenic *Fusarium* broth (2.6 gal/1000 row ft) were applied as a drench at planting and then reapplied every 30 days as an irrigation injection. Mefenoxam (4 pt/A) was applied to the outside rows every 21 days in 2004 and 2005. A stand count was taken on 2 September 2003, 3 August 2004 and 24 August 2005. Plants with shepherd's crook and *Phytophthora* symptoms were counted on 14 September 2004 and 24 August 2005.

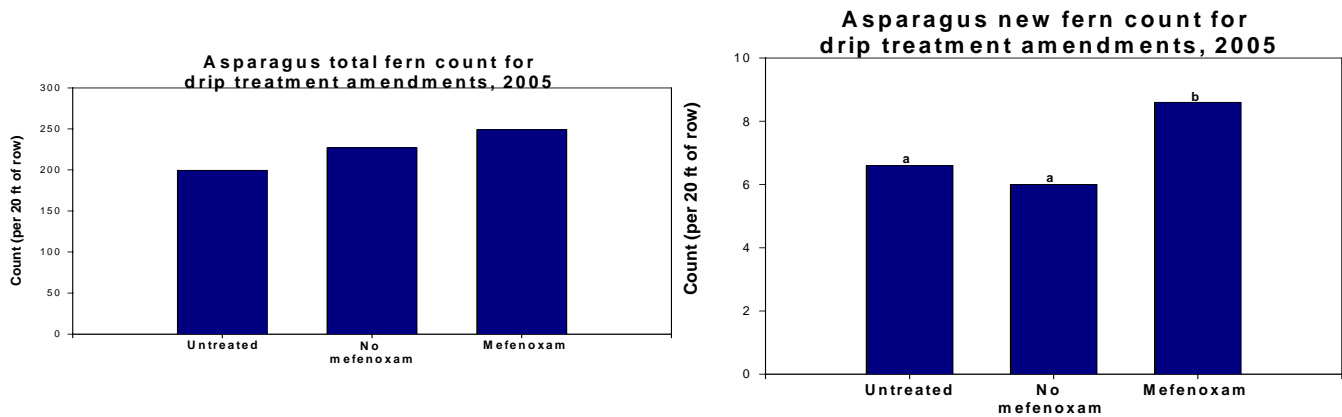
The plot was established in 2003 under dry conditions, which favored *Fusarium* development. In 2004, *Phytophthora megasperma* symptoms, including water-soaking and shriveling of spears, were noticed during harvest, possibly enhanced by heavy rains during May. Weather conditions were dry and cool during Jul and Aug 2004. In 2005, hot dry conditions were normal for the growing season.

In 2005, rows that were treated with mefenoxam had a greater set of new growth and more total growth than rows that did not receive mefenoxam. The treatments of Topsin 70WSB and irrigation produced more new growth than nonpathogenic *Fusarium* or the untreated (Tables 1,2; Fig. 1).

**Table 1.** Average total fern when asparagus was treated with mefenoxam or with drip treatments.

Treatment and rate	Total fern		
	2003	2004	2005
<b>Drip treatment amendment</b>			
Untreated.....	-	163.8*	199.6 a
No mefenoxam.....	-	172.5	226.9 a
Mefenoxam 4 pt/A.....	-	171.8	249.0 b
<b>Drip applied treatments</b>			
Untreated.....	217.5 ab	164.4	224.8
Irrigated.....	225.9 a	184.7	242.3
Nonpathogenic <i>Fusarium</i> 2.6 gal/1000 row ft.....	207.9 ab	171.1	234.2
Topsin 70WSB 0.5 lb/A.....	200.4 b	167.8	233.1
Scholar 50WP 8 oz/100 gal.....	198.7 b	165.2	233.6

\*Treatments with a letter in common or with no letter are not significantly different ( $P>0.05$ , Tukey-Kramer).



**Fig. 1.** Total fern count (left) and new fern count (right) for asparagus treated with drip amendments in 2005.

**Table 2.** Average new shoot growth when asparagus was treated with mefenoxam.

Treatments	New fern		
	2003	2004	2005
Untreated.....	-	5.7*	6.6 a
No mefenoxam.....	-	6.7	6.0 a
Mefenoxam 4 pt/A.....	-	4.9	8.6 b

\*Treatments with a letter in common or with no letter are not significantly different ( $P>0.05$ , Tukey-Kramer).

**Pathogenicity of *Phytophthora* sp. on asparagus cultivars.**

Two experiments were conducted in a growth chamber to evaluate the response of 19 asparagus cultivars to *Phytophthora* sp. isolated from asparagus in 2004. Results from both trials show that cultivars Mary Washington, Thelim, Dulce Verde and Jersey Giant are especially susceptible to *Phytophthora* sp. with disease severity ratings between 4.5 and 5.3. Grolim and UC 157 showed resistance or tolerance with disease severity between 1.5 and 2.2 (Table 3). This screening was useful in differentiating asparagus cultivars and these results will facilitate further screening both in greenhouse and field.

Table 3: Pathogenicity of *Phytophthora* sp. isolated from asparagus on several asparagus cultivars.

Cultivar	Disease severity <sup>y</sup>	Cultivar	Disease severity
Grolim	1.6 a <sup>z</sup>	Jersey Supreme	3.3 abc
UC 157	2.2 a	Jersey Gem	3.3 abc
Tiessen	2.5 ab	Millenium	3.4 abc
Gignlim	2.6 abc	Apollo	3.6 abc
Grande	2.8 abc	Greenwich	3.8 abc
Jersey King	2.8 abc	Mary Washington	4.5 bc
Atlas	2.8 abc	Thelim	4.6 bc
Jersey Giant	3.0 abc	Dulce Verde	4.9 bc
Jersey Knight	3.0 abc	Jersey General	5.3 c

<sup>y</sup> Disease severity rating is 1 to 6 where 1= no symptoms and 6= plant death.

<sup>z</sup> Columns means with a letter in common are not significantly different, SNK ( $p=0.05$ )

### Host range trials in the greenhouse.

*Phytophthora* sp. isolated from asparagus in 2004 is a member of the *Phytophthora megasperma* group that has several hosts. Some species of this group have been renamed based on their specificity to certain crops. To evaluate the specificity of the *Phytophthora* sp. isolated from asparagus, greenhouse trials were conducted in March and May 2005. Plants of asparagus (Jersey Giant and Mary Washington), soybean, alfalfa and red clover were challenged with *Phytophthora* isolates from both asparagus and soybean.

Disease severity (1 to 4, 1 = no disease symptoms, 4= plant death) was evaluated weekly for 4 weeks. Results indicate the specificity of the isolate from soybean that caused disease and death of all soybean plants, but did not cause significant disease on asparagus, alfalfa, and red clover (Fig. 2). On the other hand, the *Phytophthora* isolate from asparagus induced high levels of disease and/or death on both asparagus cultivars but did not significantly affect soybean, alfalfa and red clover.

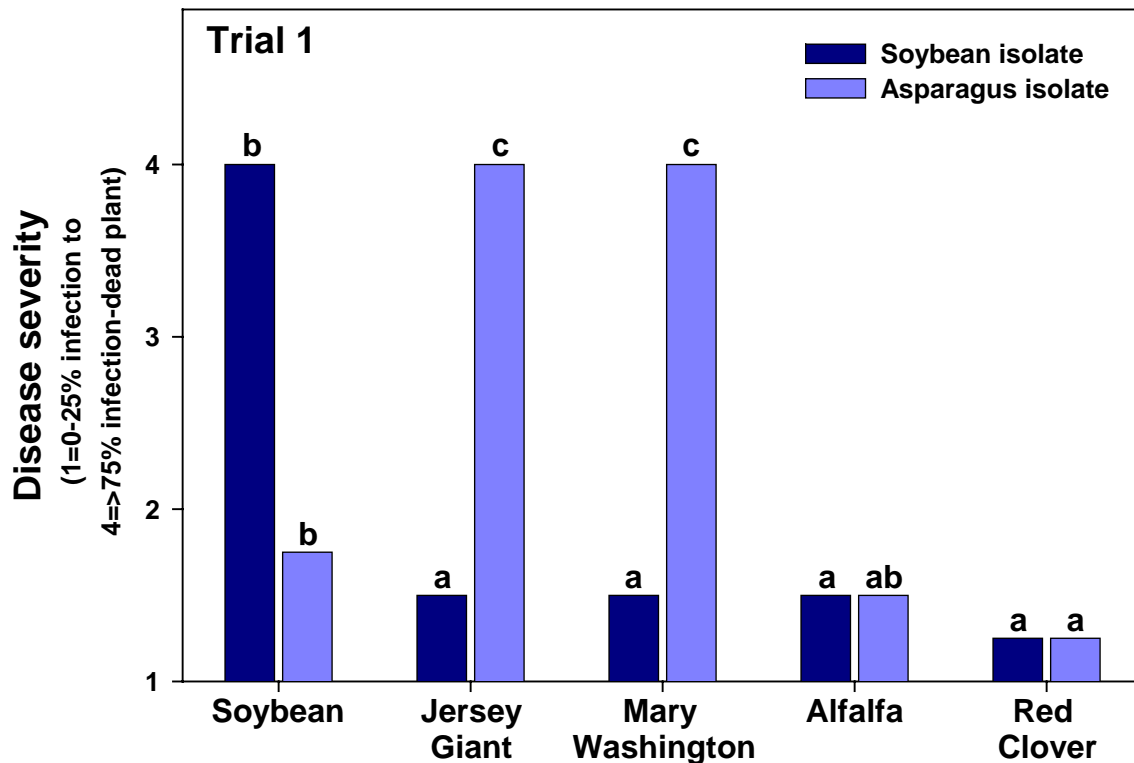


Fig. 2. Greenhouse host range screening for *Phytophthora* isolates from asparagus and soybean.