

MAPPING YOUR ROUTE TO THE FUTURE

Great Lakes Fruit, Vegetable & Farm Market EXPO

DeVos Place Convention Center
Grand Rapids, MI
December 7-9, 2004



Snap Beans

Wednesday afternoon 2:00 pm

Where: Gallery Overlook Room C-D (upper level)

Recertification credits: 1 (Private, 1B)

CCA Credits: IPM(2)

Moderator: Jim Breinling, Mason Co. MSU Extension

- 2:00 A New Phytophthora for Snap Beans
p.m. ● Mary Hausbeck, Plant Pathology Dept., MSU
- 2:20 White Mold Control Strategies in Snap Beans
p.m. ● Walter R. Stevenson, Plant Pathology Dept., Univ. of
- 2:50 Strategies to Suppress Root Rots in Snap Beans
p.m. ● Sieglinde Snapp, Horticulture Dept., MSU
- 3:05 Aphid Control and Viruses
p.m. ● Brian A. Nault, Entomology Dept., Cornell Univ.
- 3:35 Evaluating Snap Bean Cultivars for their Reaction to Aphid Transmitted Viruses
p.m. ● Walter R. Stevenson, Plant Pathology Dept., Univ. of

A New *Phytophthora* for Snap Beans

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Michigan State University

Phytophthora capsici on Vegetables

Phytophthora capsici causes foliar blighting and root, crown, and fruit rot on vegetables including cucumber, melon, pumpkin, squash, tomato, bell and hot pepper, and eggplant. Disease symptoms include browning of roots, water-soaking of the foliage, plant wilting and death. Fruit rot begins as dark water-soaked lesions with a white mold that resembles powdered sugar. Field symptoms first appear in poorly drained areas and along the surface water drainage pattern. Disease development is favored by warm temperatures and rain.

In many states, *Phytophthora capsici* is the limiting factor in vegetable production despite adherence to recommended control strategies, including crop rotation, surface water management, and fungicides. The fungicide mefenoxam (Ridomil Gold is an example) has been used to manage *Phytophthora capsici*, however, some strains of *Phytophthora capsici* have become resistant to the fungicide.

Disease on Snap Bean

In 2003, two snap bean fields in Michigan were diagnosed with disease caused by *Phytophthora capsici* (Fig. 1). A third diseased field was identified in another region of the state in 2004. All three fields showed symptoms, such as dark water-soaking of the leaves (Fig. 2), and disease patterns typical of *Phytophthora capsici* on other vegetable crops. *Phytophthora capsici* was isolated from all above-ground plant tissues including pods (Fig. 3). All *Phytophthora capsici* isolates from snap bean caused disease on cucumber fruit, and resulted in dark water-soaked lesions with white mold.

Each *Phytophthora capsici* strain recovered from beans was screened for sensitivity to the fungicide mefenoxam (available as Ridomil Gold, Ultra Flourish, Apron). In 2003, most of the *Phytophthora capsici* strains (74%) responded to this fungicide. However, field isolates from 2004 were only 40% sensitive to mefenoxam, with the greatest percentage of isolates falling into the intermediately sensitive category (42%). In this situation, the fungicides Ridomil Gold, Ultra Flourish, and Apron would not be very helpful in controlling disease.



Fig. 1. Michigan snap bean field exhibiting symptoms of *Phytophthora capsici* in August of 2003.



Fig. 2. Snap bean plant with *Phytophthora capsici* symptoms of water-soaking from a Michigan field in 2003.



Fig. 3. *Phytophthora capsici* symptoms on snap bean pod from a Michigan field in 2004.

Snap bean *Phytophthora capsici* strains caused disease on 12 bean species (Table 1). These results indicate that most bean species grown in rotation with cucurbit (cucumber, melon, pumpkin, squash) or solanaceous crops (tomato, pepper, eggplant) may be at risk.

Table 1. Bean species susceptible to *Phytophthora capsici*.

Genus species	Cultivar	Infected by <i>Phytophthora capsici</i> under lab conditions
<i>Phaseolus lunatus</i>	Bush Lima	yes
<i>Phaseolus vulgaris</i> var. <i>humilis</i>	Fordhook Standard	yes
	Bush Tenderpod	yes
	Bush Contender	yes
	HyStyle Snap	yes
<i>Phaseolus vulgaris</i> var. <i>vulgaris</i>	Pole Bean	yes
	Kentucky Wonder Pole	yes
<i>Phaseolus vulgaris</i>	Cranberry Soup Bean	yes
	Gold Mine Wax	yes
	Black Turtle	yes
	Blue Lake White Seed	yes
<i>Glycine max</i>	Soybean	yes

Table 2. Recommended control strategies for blight caused by *Phytophthora capsici*.

Preplant
<ul style="list-style-type: none"> • Use a seed treatment that is effective against <i>Phytophthora</i>. • Consider a pre-plant banded fungicide application for infested fields. • Plant susceptible hosts in well-drained fields. • Utilize raised beds (6-8 inches minimum) whenever possible. • Do not plant in low-lying areas of the field.
Production
<ul style="list-style-type: none"> • Monitor fields for disease, including damping off, plant stunting, root and crown rot. • Do not irrigate a field with water that contains runoff from fields with a history of <i>Phytophthora</i> disease. • Irrigate conservatively and, if possible, do not irrigate prior to harvest. • Plow under portions of the field with diseased plants, including healthy plants that border diseased areas. • Never dump culls or diseased fruit from other fields or farms into production fields. Once <i>Phytophthora capsici</i> is introduced, it may remain indefinitely.
Postharvest
<ul style="list-style-type: none"> • Plow under crop residue immediately.