

Phytophthora in Peppers and Cucurbits

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Phytophthora Blight

(*Phytophthora capsici*)

Importance:

- Worldwide occurrence
- Affects >50 species in 15 plant families
- The most important disease of peppers and cucurbits in the US
- Causes up to 100% crop losses



Phytophthora blight of bell pepper

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Phytophthora crown infection of peppers *Babadoost*

Phytophthora blight of, 100% crop losses





Phytophthora blight of pepper

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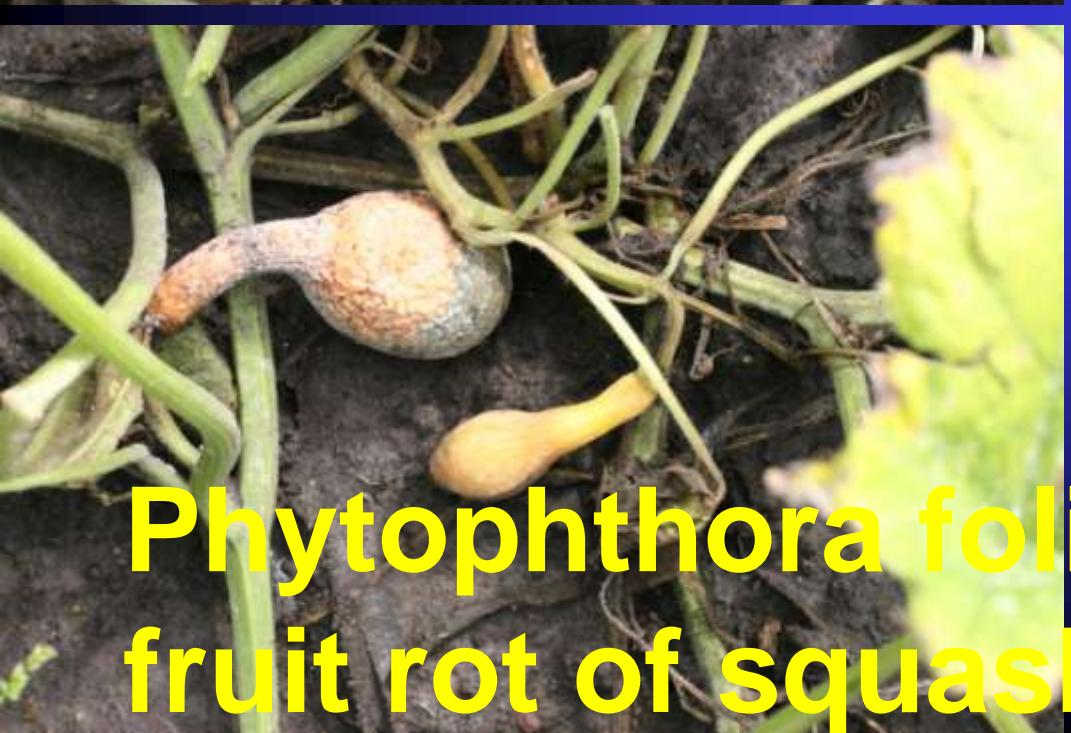


Plant death of pumpkin (*Phytophthora capsici*)
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**Phytophthora crown
infection of a squash plant**

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**Phytophthora foliar blight and
fruit rot of squash**

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Fruit rot of cucurbits (*Phytophthora capsici*)
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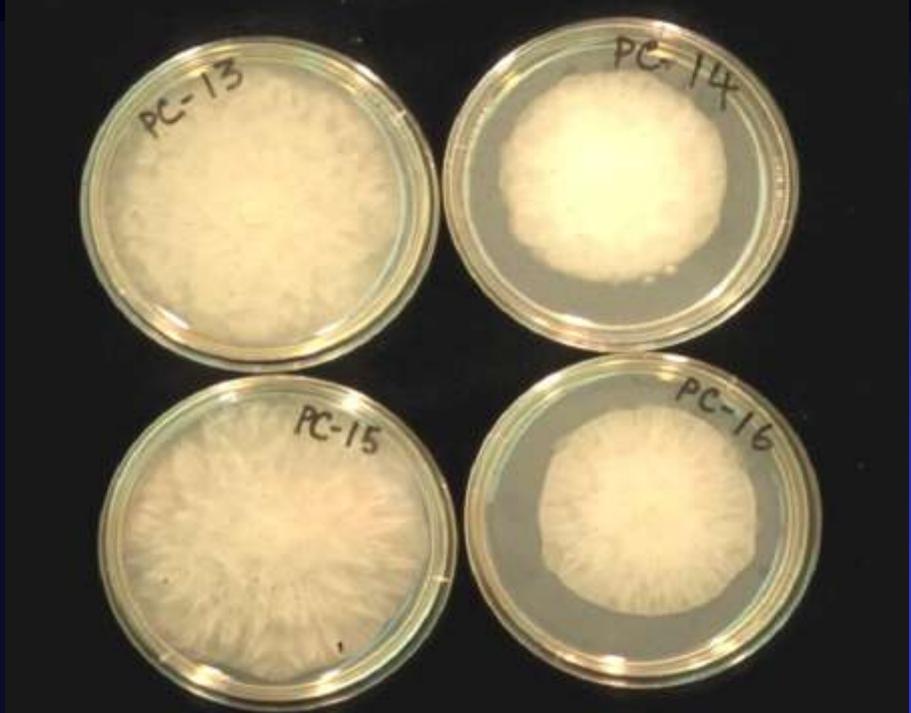
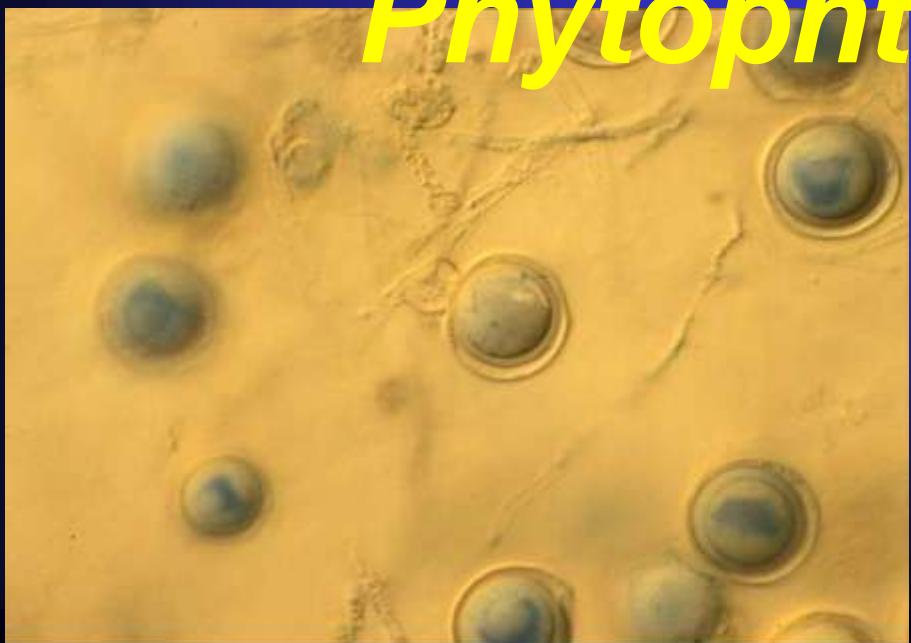
Fruit rot of pumpkins (*Phytophthora capsici*)

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Phytophthora Blight

*(*Phytophthora capsici*)*

- An oomycete pathogen
- Genetic and pathogenic variations
- Multi-cycle pathogen
- Survival: oospores and mycelium
- Favorable conditions: **moist** &



Phytophthora capsici



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Management of Phytophthora Blight of Peppers and Cucurbits

- Resistant cultivars
- Chemical control
- Cultural practices

Management of Phytophthora Blight of Peppers and Cucurbits

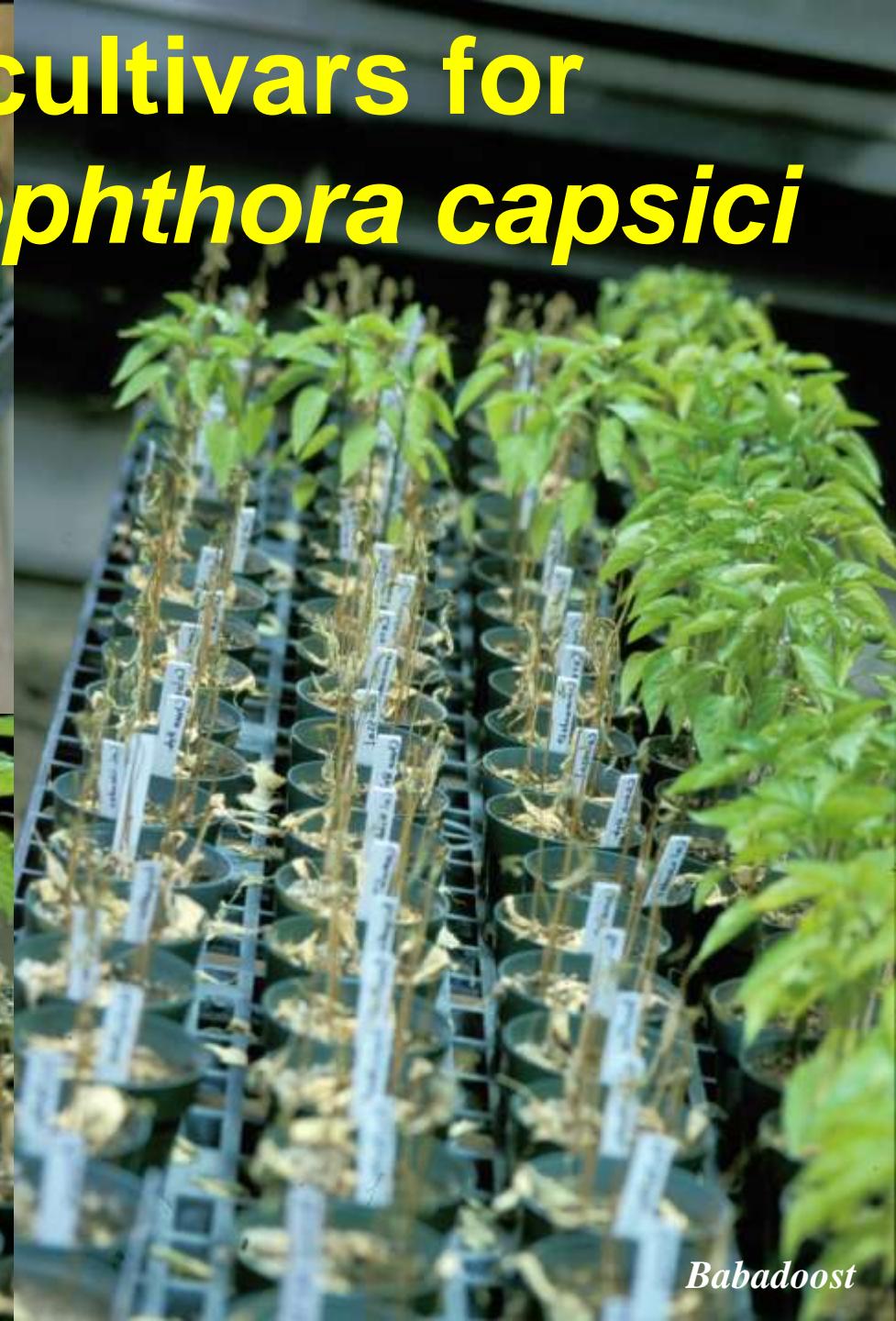
- **Resistant cultivars**
- **Chemical control**
- **Cultural practices**



Cucurbit seedling death caused by *Phytophthora capsici*

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Evaluating pepper cultivars for resistance to *Phytophthora capsici*





Evaluating pepper cultivars for
resistance to *Phytophthora capsici*

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Management of Phytophthora Blight of Peppers and Cucurbits

- Resistant cultivars
 - ❖ No resistant cucurbit cultivar
 - ❖ Resistant pepper cultivars are available

Pepper Cultivars Resistant/Tolerant to Phytophthora Blight

Results of greenhouse and field trials

- Alliance
- Aristotle
- Emerald Isle
- Enza
- Paladin
- Reinger
- Revolution

Management of Phytophthora Blight of Peppers and Cucurbits

- Resistant cultivars
- Chemical control
- Cultural practices

Phytophthora Blight of Peppers and Cucurbits (Chemical Control)

- Since 2000, we have tested more than 40 fungicides for their efficacy for control of *Phytophthora capsici*

Phytophthora Blight Management (Chemical Control)

- 2000-2009: Spray application
- 2010: Drip-irrigation delivery



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Fungicides for Control of *Phytophthora capsici*

➤ Effective Fungicides

** Cyazofamid (Ranman 400SC)

** Captan (Maestro 80DF)

* Dimethomorph (Forum 4.16SC)

** Famoxadon + Cymoxanil (Tanos 50WDG)

* Fluopicolide (Presidio 4SC)

** Mandipropamid (Revus 2.09SC)

* Mefenoxam (Ridomil G. EC 4SC, R. G. Copper 65WP)

• Phosphorous acid (ProPhyt) – inconsistent results

• (Zampro 525SC) – further studies needed

No fungicide is effective with heavy rainfalls

Fungicides Control of *Phytophthora capsici* (Organic Production)

No effective fungicide is available
for control of *P. capsici* in
organic production

Management of Phytophthora Blight of Peppers and Cucurbits

- Resistant cultivars
- Chemical control
- Cultural practices

Management of Phytophthora Blight of Peppers and Cucurbits

- Cultural practices
 - ❖ Crop rotation
 - ✓ Host range of the pathogen
 - ✓ Survival of the pathogen in soil

Phytophthora Blight Management

(Host Range: 36 Crops and 9 Weed Species)

Host

Non-Host

Cantaloupe Cucumber Gourd Corn Pigweed Soybean

Eggplant pepper Beet Broccoli Kale Cabbage

Pumpkin Squash Radish Crabgrass Basil Chive

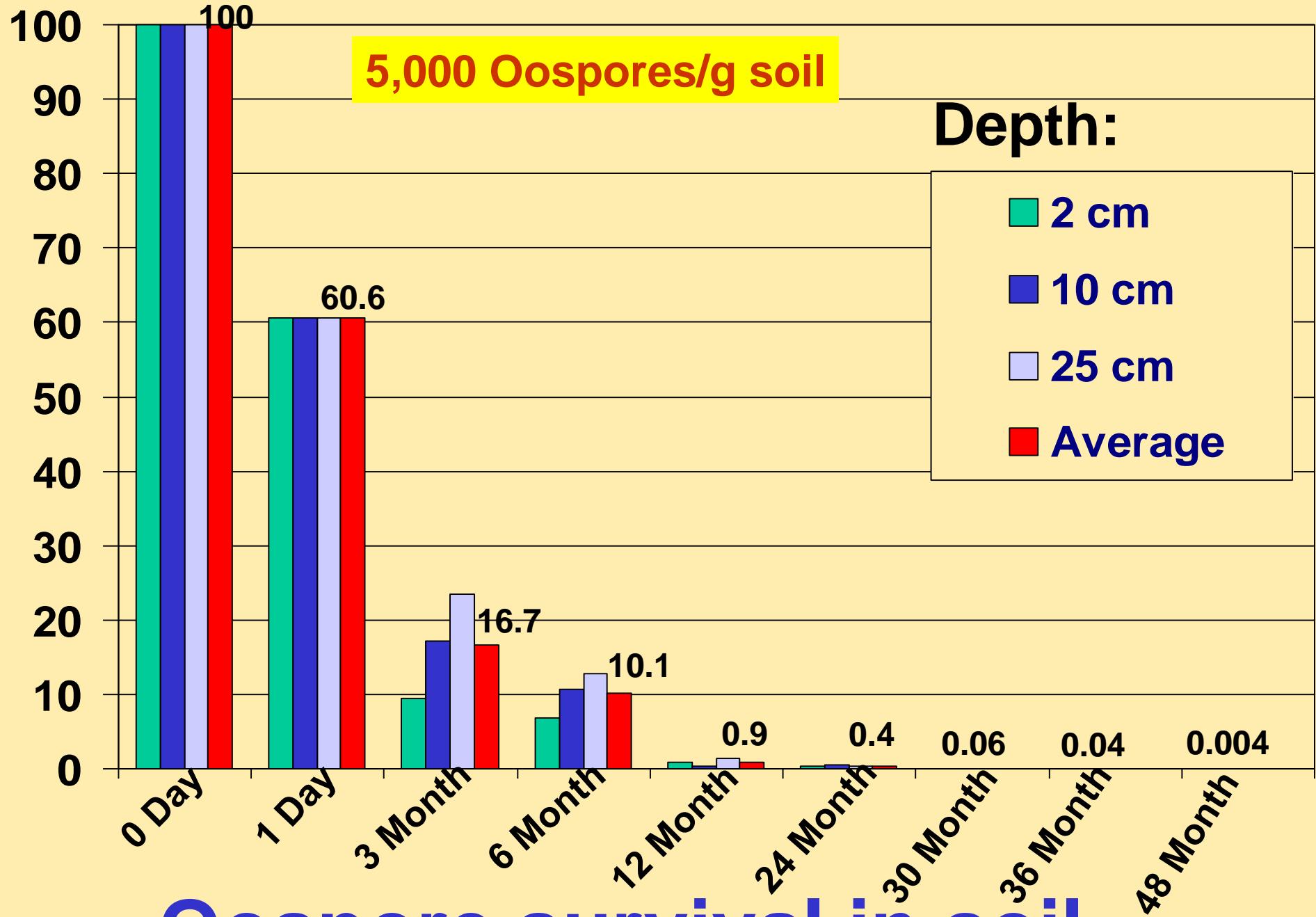
Zucchini Watermelon Turnip Sandbur Celery Dill

Honeydew Swiss-chard Carrot Wheat Water hemp Barley

Spinach Nightshade Onion Cocklebur Lamb's-quarters

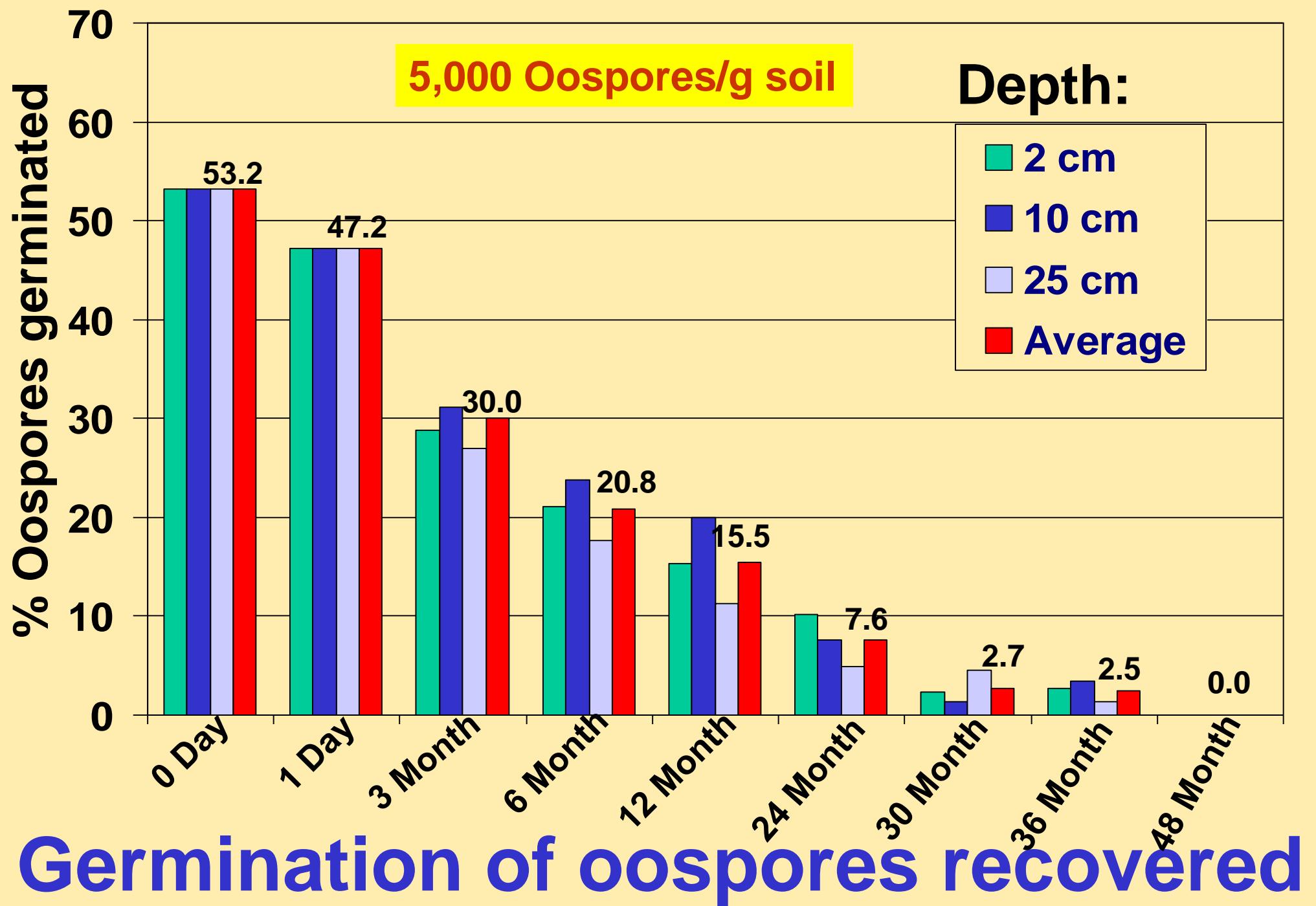
Green bean Lima bean Tomato Mustard Cauliflower Velvet-leaf Snow
pea Tobacco Parsley Puncture vine

% Oospores recovered



Oospore survival in soil

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Management of Phytophthora Blight of Peppers and Cucurbits

- Cultural practices
 - ❖ There are NONHOST crops of *Phytophthora capsici*
 - ❖ *Phytophthora capsici* may survive in soil for 4 years

Managing Phytophthora Blight in Organic Pepper Production

- Grow resistant cultivars
- ≥3 years effective crop rotations
- Grow in field with no Phytophthora history
- Grow on raised beds
- Use straw mulch between rows
- Sanitation practices
- Avoid using contaminated water
- Tolerant cultivars with cultural practices

Managing Phytophthora Blight in Organic Cucurbit Production

- No resistant cucurbit is available
- Grow in field with no Phytophthora history
- ≥3 years effective crop rotations
- Grow on well-drained field
- Grow on raised beds, if possible
- Disk localized infected areas
- Sanitation practices
- Avoid using contaminated water

**Disk localized area with
Phytophthora infection**



QUESTIONS