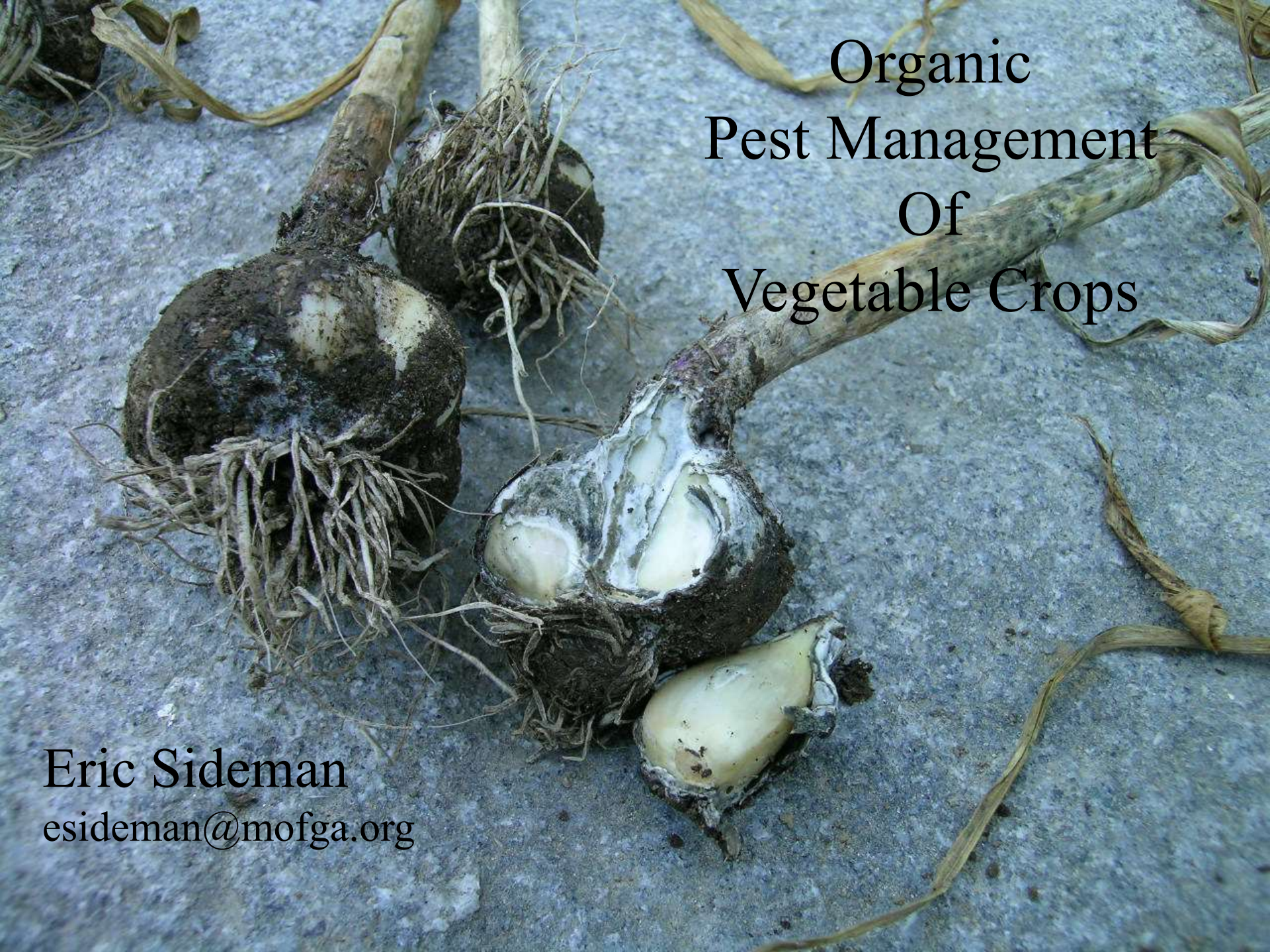


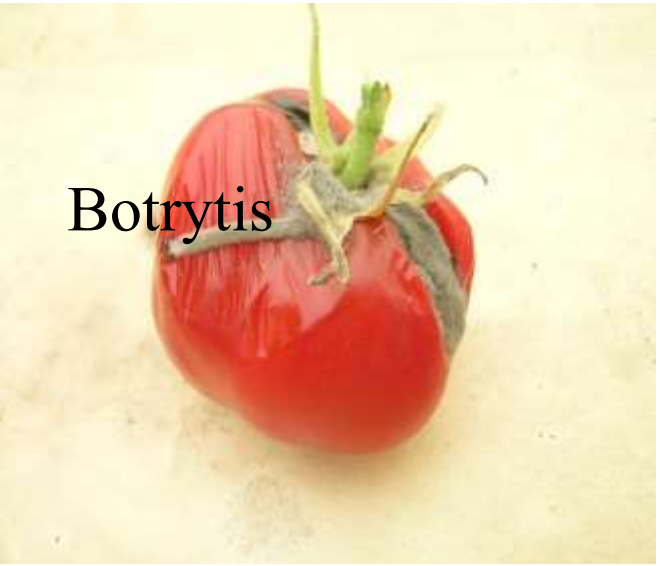
Organic Pest Management Of Vegetable Crops

Eric Sideman
esideman@mofga.org

Organic Pest and Disease Management

- Healthy Crops
- Good Weed Control
- Sanitation
- Barriers - Row covers
- Microbial Pesticides -Bt, Spinosad
- Biological Control
- Botanicals -Pyrethrum, Neem
- Synthetic Chemicals -Copper, Sulfur, Soap
- Crop Rotation

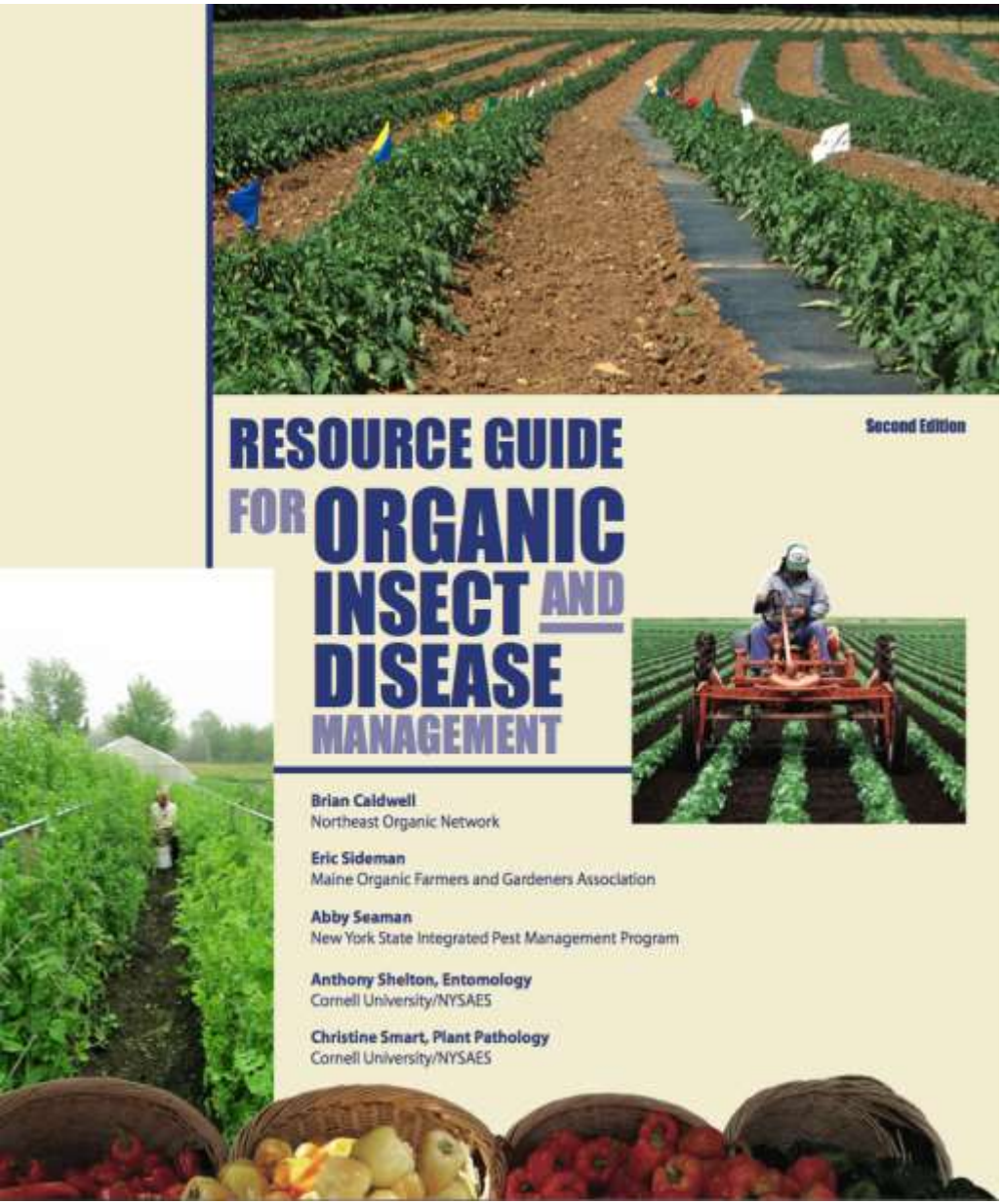
Pest, Pathogen or what?



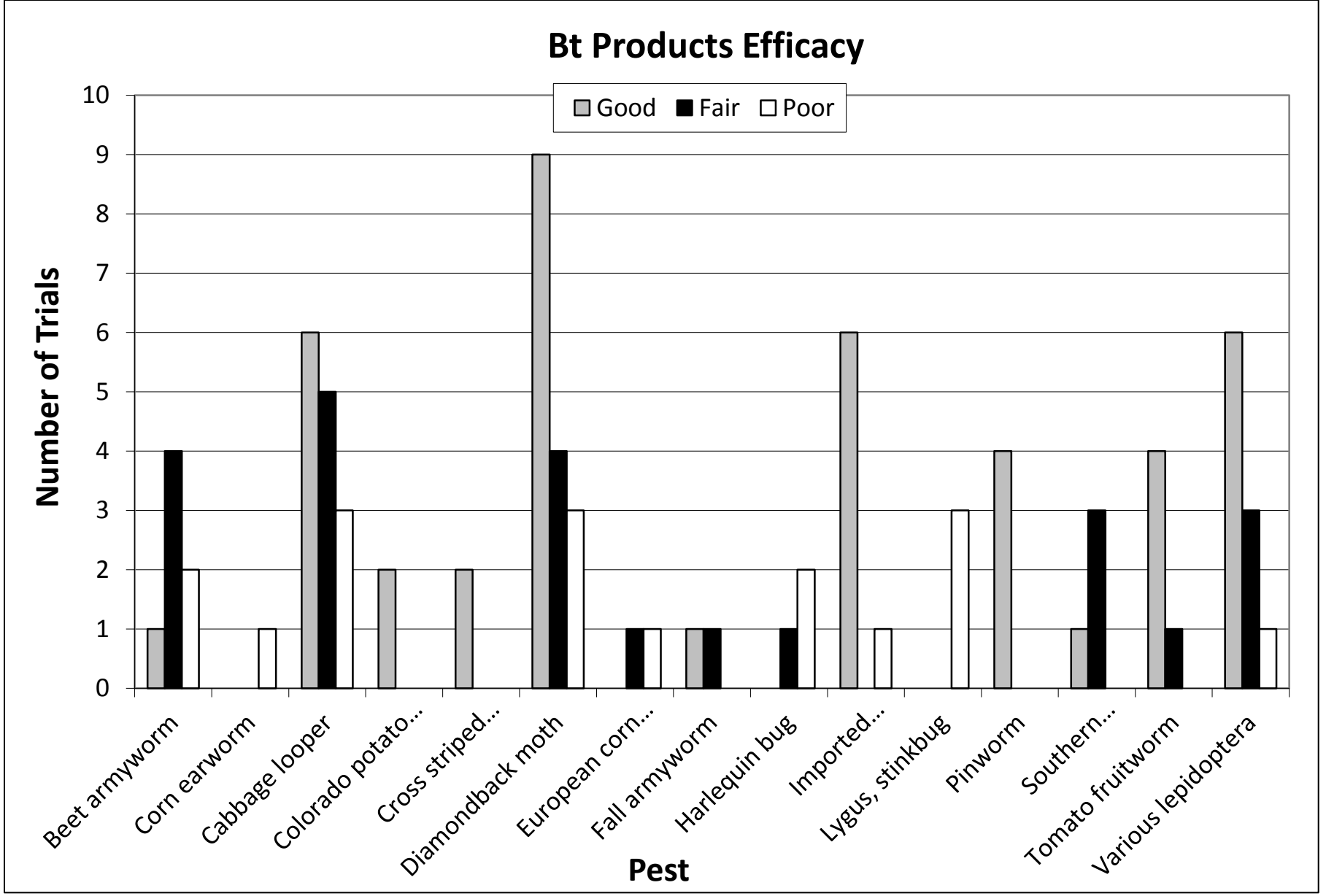
* IPM for organic growers

* Cultural management emphasized

* Pesticides as rescue treatment



http://web.pppmb.cals.cornell.edu/resourceguide/



Good = >75% Fair = 50%-74% Poor = <50%

Reductions Compared to Control

Wireworm

Spends a few years as larvae

- Prepare ground a year in advance
- Nematodes?
- Trap with carrots or potatoes?

Black rot

Didymella bryoniae

Black Rot / Gummy Stem Blight

* Survives on crop debris

* Peak spore production after rain

* Fruit invaded through wounds

Black Rot

Management:

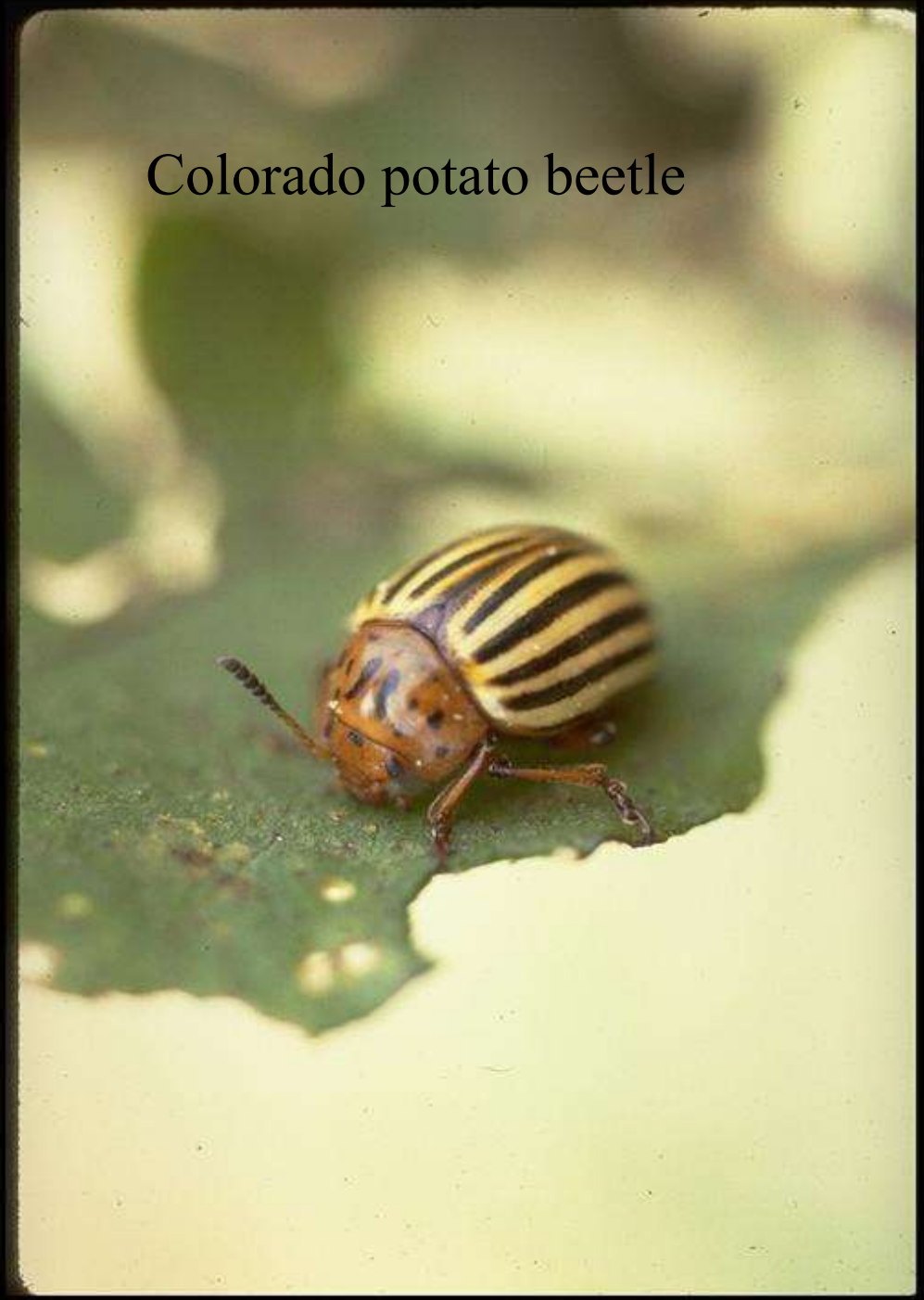
*Disease free Seed

*Minimize moisture

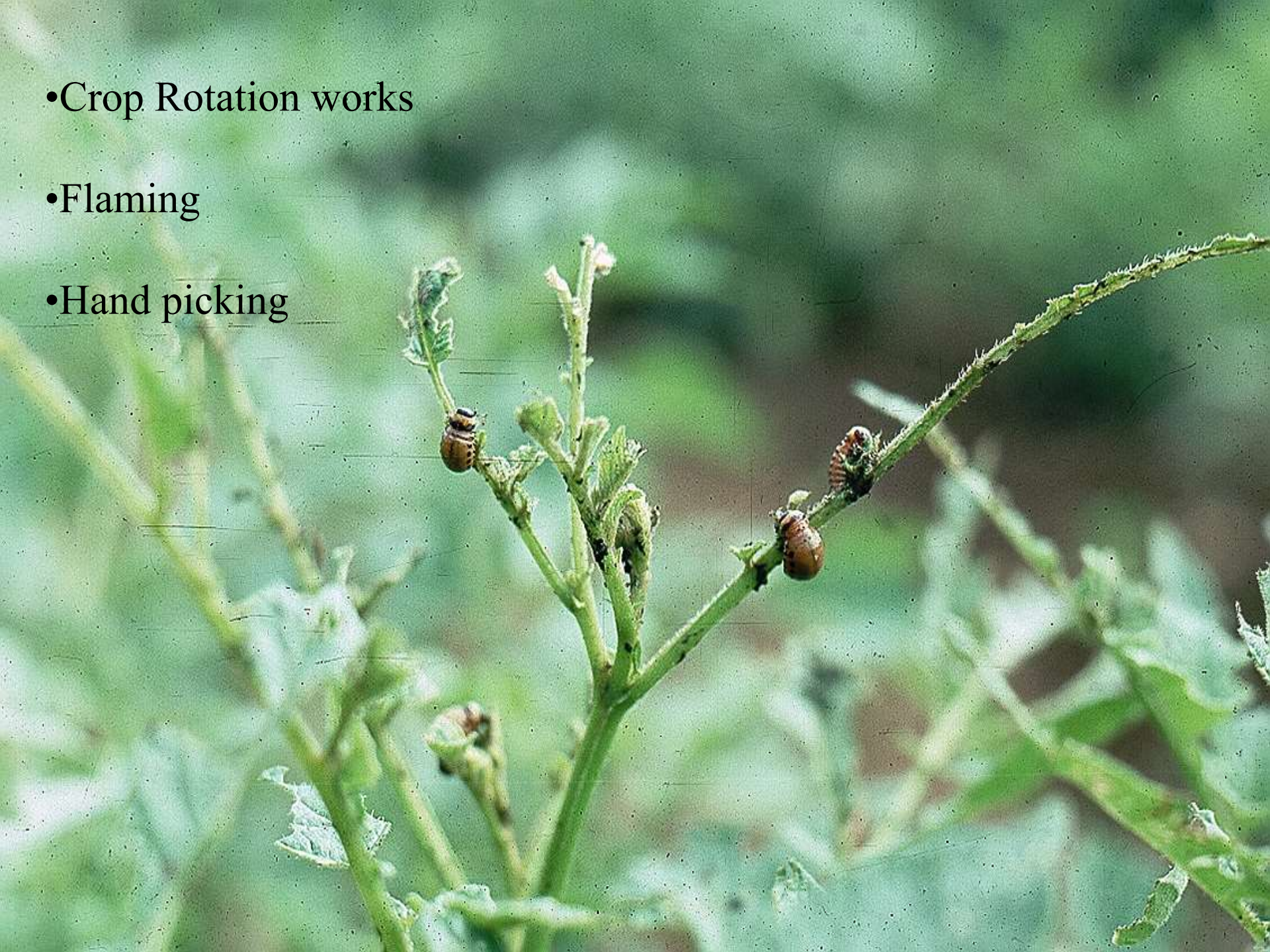
*Crop Rotation

*Care During Cultivation

*Plow under debris after harvest


Colorado potato beetle


CPB egg hatch


•Crop Rotation works
•Flaming
•Hand picking


ENTRUST
or
Monterey Garden Spray


Diamondback moth larva
LIBERTY
1989

Diamondback moth

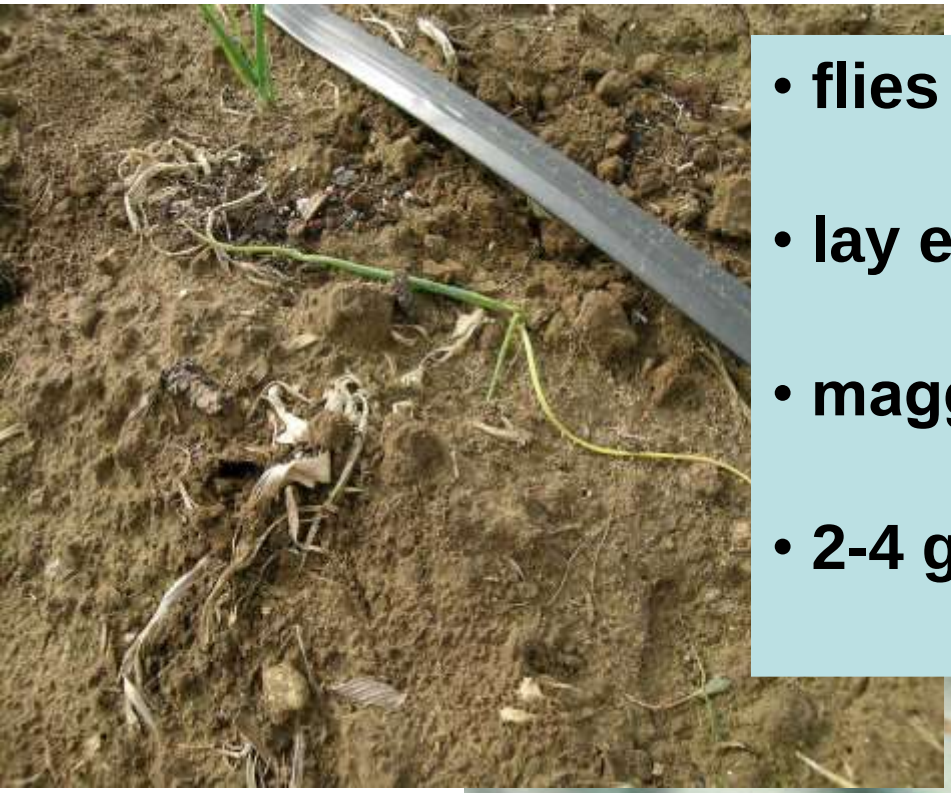
- Use clean transplants
- Control related brassica weeds
- Till in residues after harvest
- Trap crops

Diamondback Moth

- Spinosad can provide very good control (alternate with Bt)

- Bt gives very good control
  (alternate with spinosad)

Onion Maggot



- flies emerge in early spring
- lay eggs at base of plants
- maggots hatch, feed, pupate…
- 2-4 generations per year

- Timed Planting
- Rowcover
- Collars
- Sanitation

Carrot Rust Fly

Carrot Rust Fly

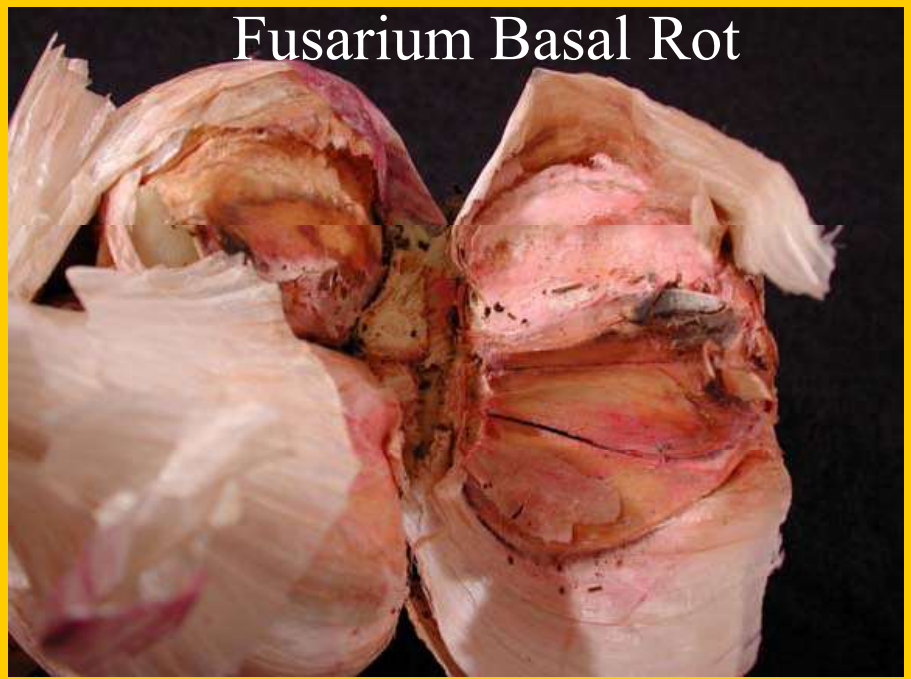
- Pupate in soil over winter
- Adults emerge in spring
- 2 generations per year

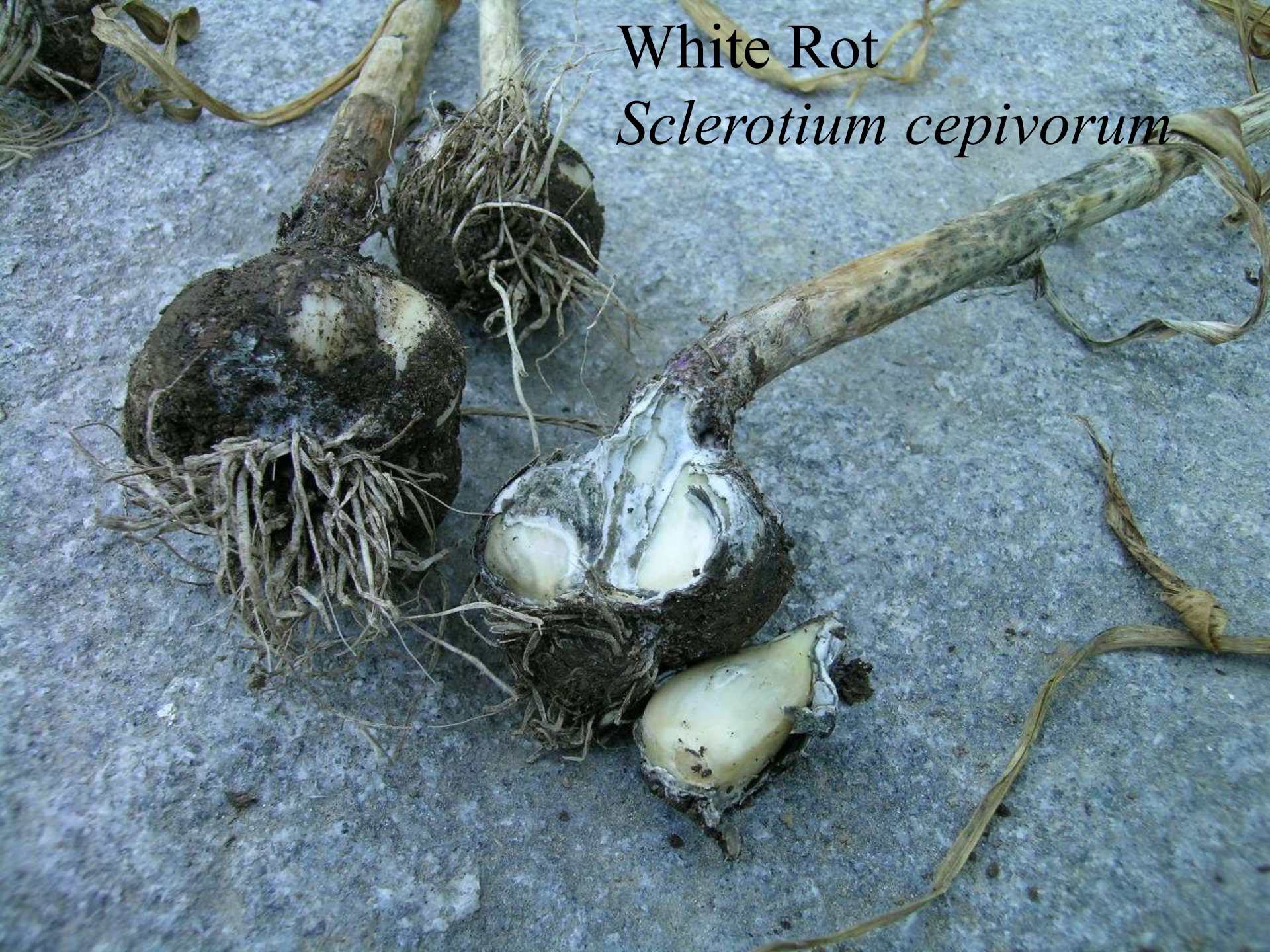
- Delay planting
- Row covers
- Crop rotation, BUT?
- Avoid field edges
- Avoid fields surrounded by shelter


Botrytis rot


White rot


Blue mold


Fusarium Basal Rot


White Rot
Sclerotium cepivorum

White rot
Sclerotium cepivorum

- Reproduce only by sclerotia
- Plants may yellow and die suddenly
- Sclerotia may lay dormant for many years (>15) until propyl and cysteine amino acids break down in the soil (unique to *Allium)*
- Disease does not spread in very dry stored bulbs
- Spread by infected seed or soil

Controls:

*Use clean seed

*Avoid transporting infected soil or manure

*Long rotations

?Biostimulation?

Garlic Bloat Nematode

* DOES NOT MOVE BY ITSELF

BUY CLEAN SEED

- Spread by infected seed
- Persists in seed, debris, and soil

Management:

-Rotation

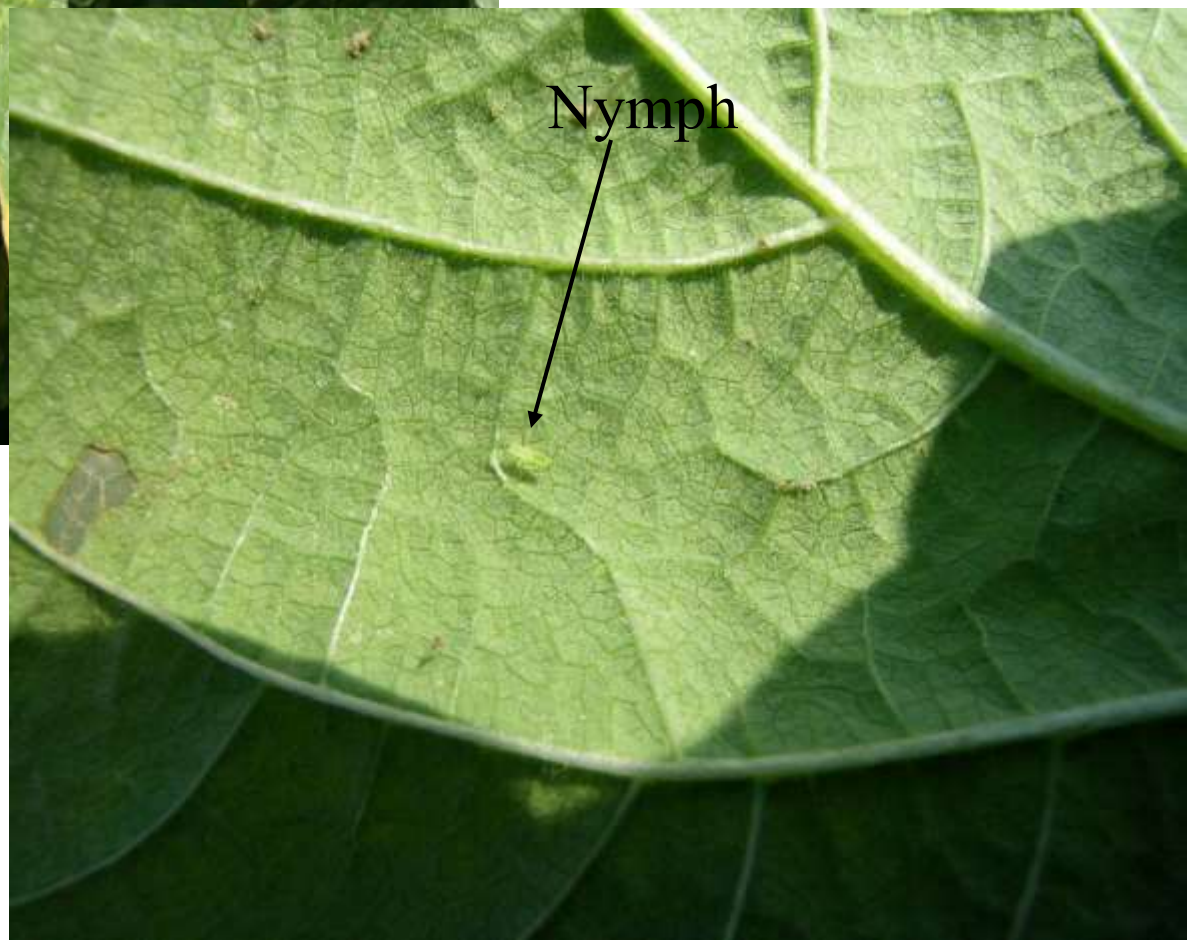
-Rotation with a mustard

-Clean seed

-Soil Guard ***(Trichoderma)***


Potato leafhopper

Potatoleafhopper



Favorites:

- potato
- bean
- strawberry

Hoppperburn Resistance

Really bad	Seems better
Purple Majesty	Satina
Carola	Banana
Norland	Russett
Yukon Gold	Kennebec
French fingerling	Butte

BUT…..

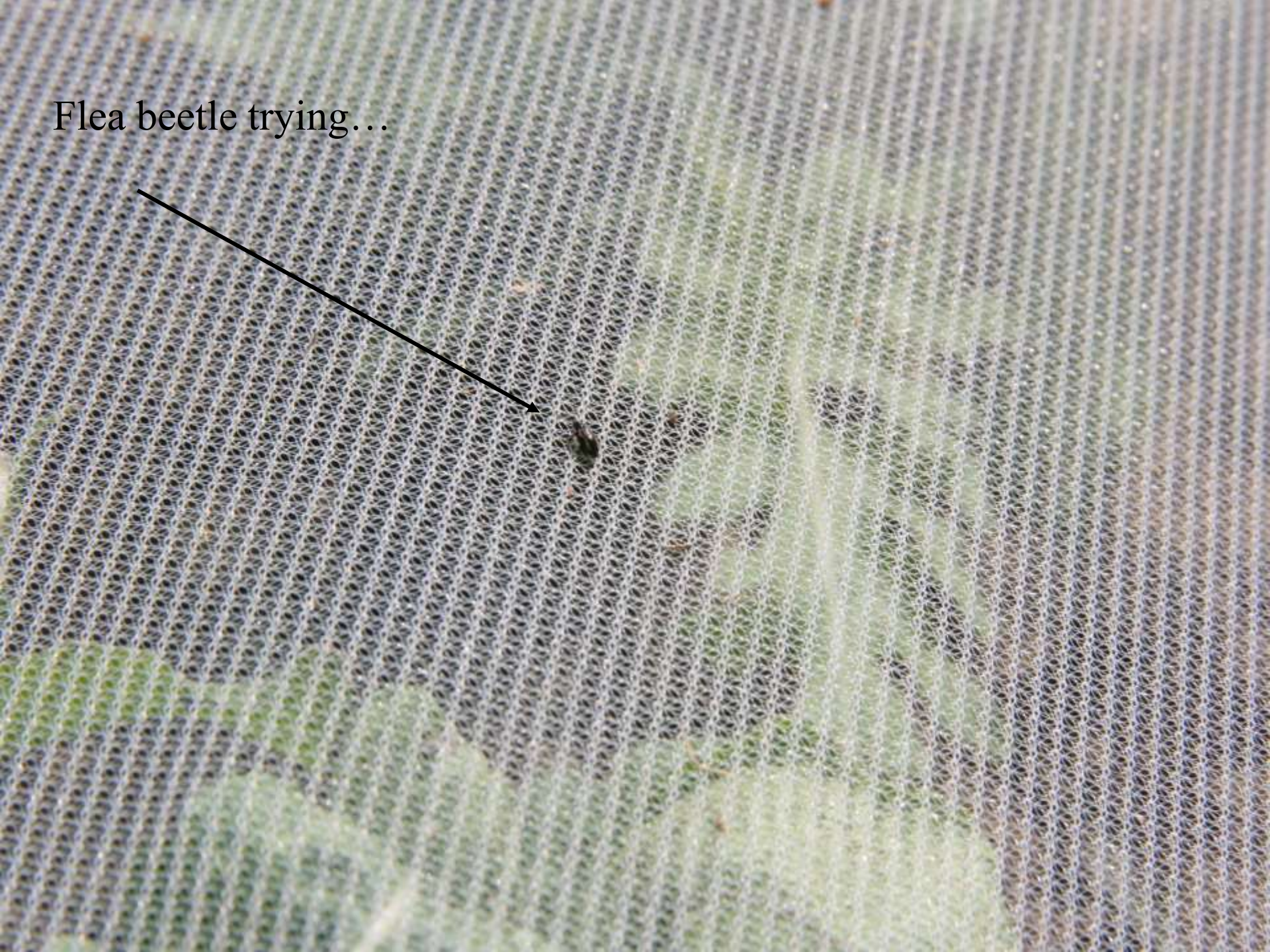

Tarnished Plant Bug


Tarnished Plant Bug
TPB damage

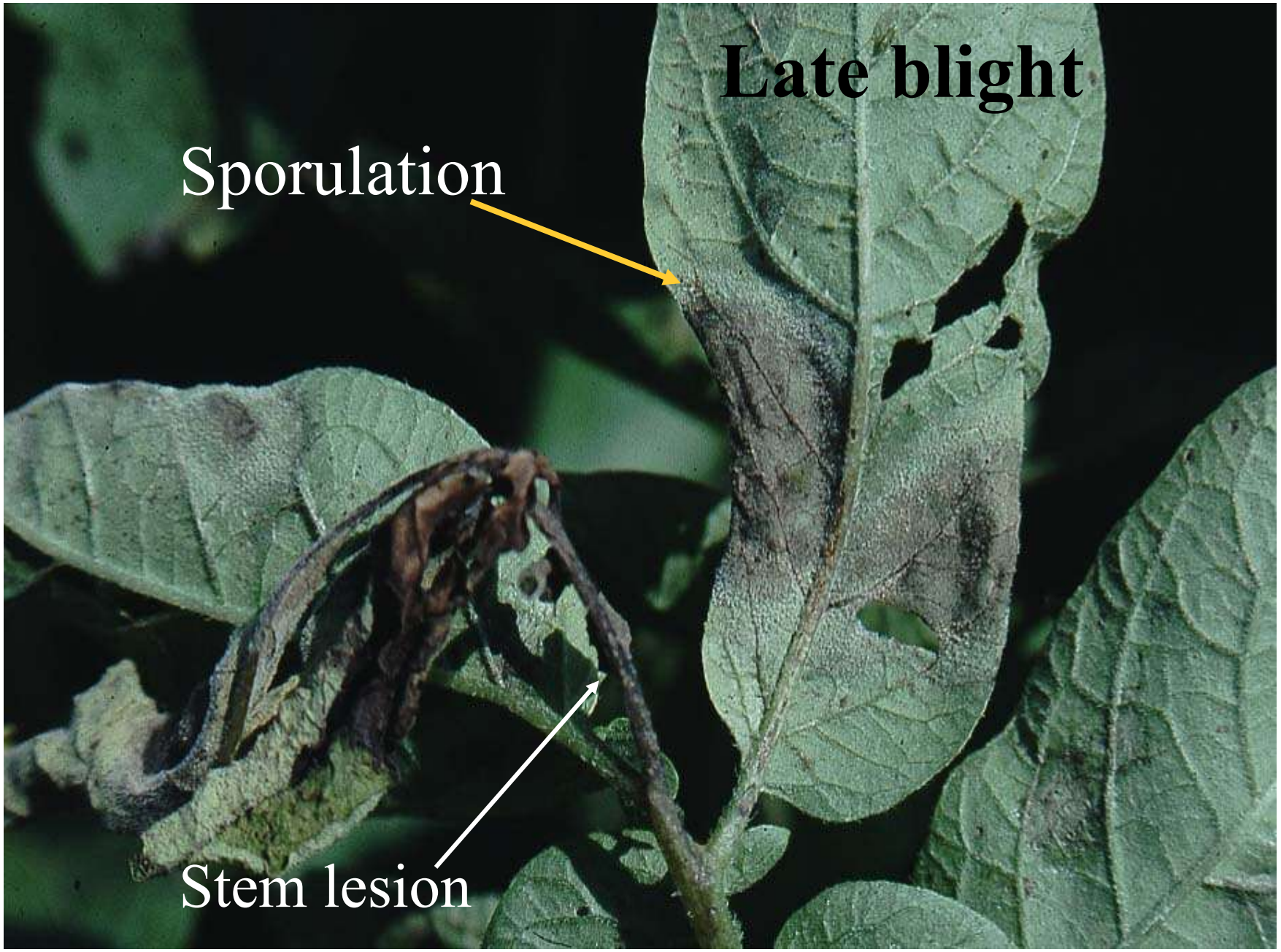

Flea beetle

[Insect netting]

Proteknet- Insects, hail

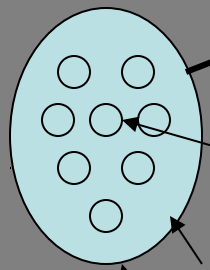

Flea beetle trying…


Flea beetle
Entrust?


Late blight
Sporulation
Stem lesion

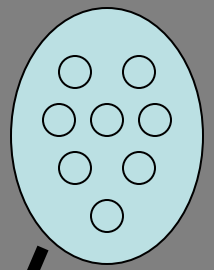

Sporulation

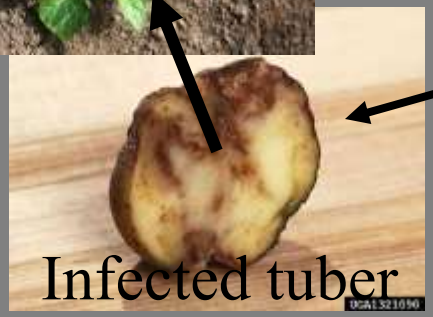
Typical Disease Cycle of Late Blight in NE



Spores

Sporangium





*Late blight overwinters here only in tubers
*Obligate parasite
*Sporangia and zoospores die quickly w/o host

Tuber management is Key

Efficacy of Materials

-Only Copper (ChampWG)consistent

Sonata ?

Serenade ?

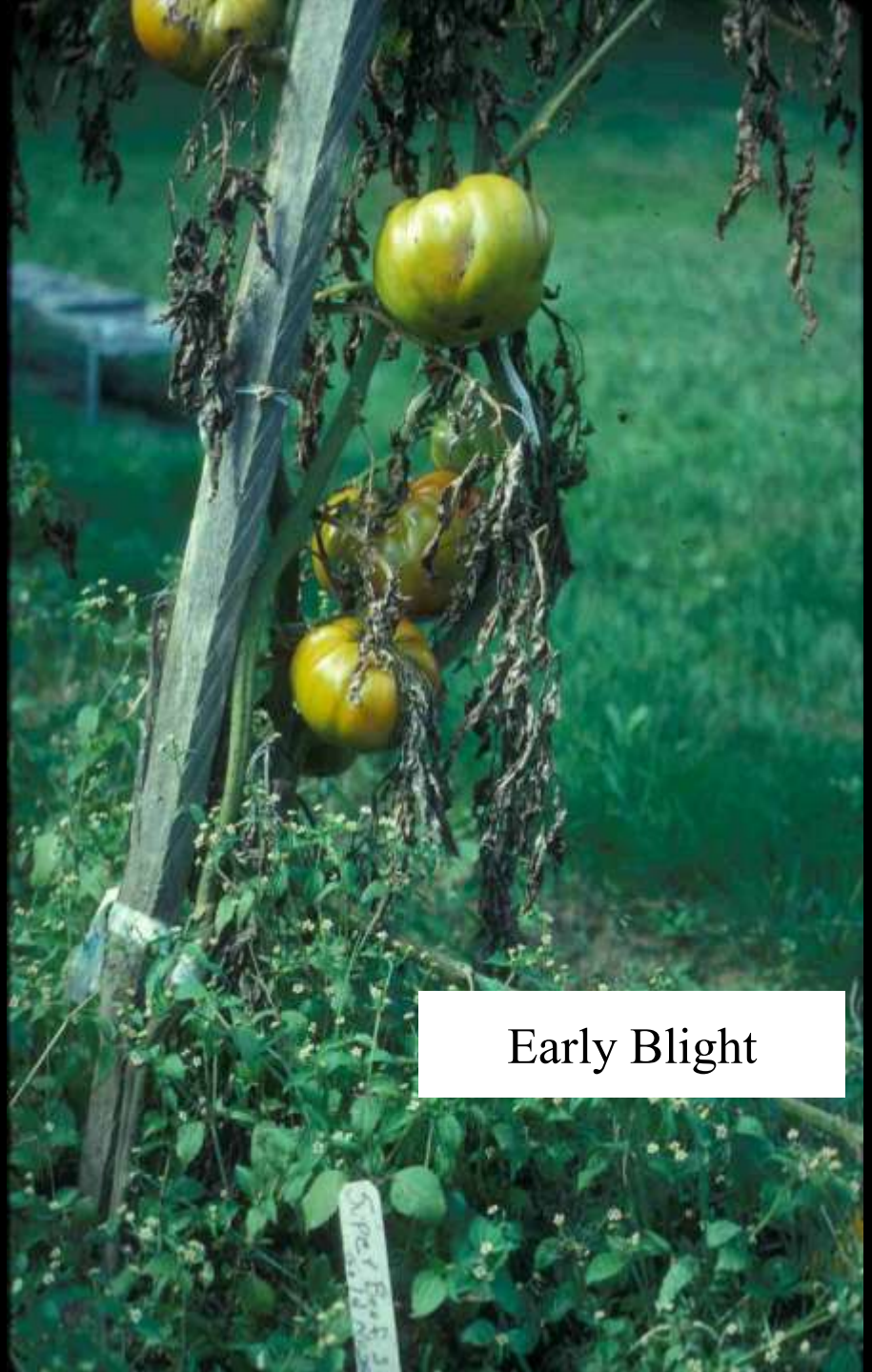
Actinovate ?

Oxidate ?

(http://ospud.org/materials_for_late_blight_management)

So ?

1. No cull piles
2. Don’t save questionable potato seed
3. Don’t compost diseased plants
4. Buy seed from good source
5. Scout for and pull volunteer potatoes
6. Clean tomato cages? Yes, but not for late blight
7. Tomato seed OK
8. Spray only if needed, and stick with it



Early Blight


Early Blight

Early Blight

Management:
*Crop Rotation

•Optimum growing conditions

•Stake Plants

•Drip irrigation

•Mulching

•Disinfect stakes

*Over winters on crop debris

*Spores splashed in Spring

*Summer spores windblown

*Needs leaf wetness to germ

Copper Efficacy

Put the crop undercover