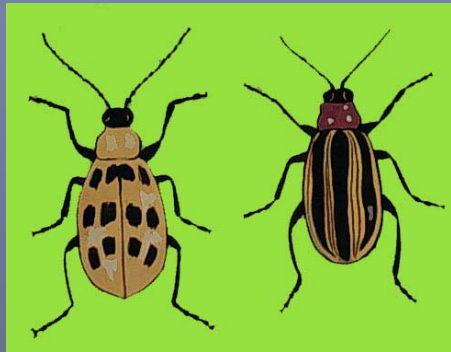


Cucumber Beetle Biology and Control in Melons



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Cucumber Beetles

Chrysomelidae - Leaf Beetles

- Western Striped CB (*Acalymma trivittatum*)
- Spotted CB (*Diabrotica undecipunctata*)
- Pests of cucurbits
 - × Feed on leaves, stems, roots, & fruits
 - × Transmit bacterial wilt & squash mosaic virus



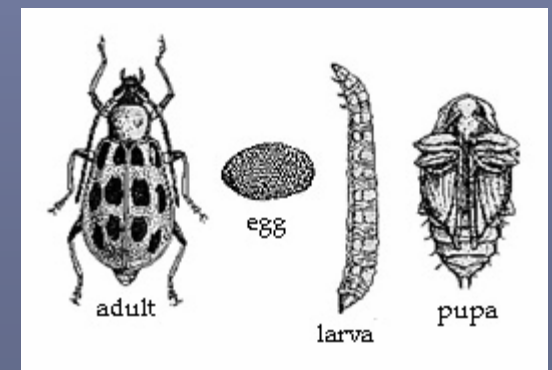
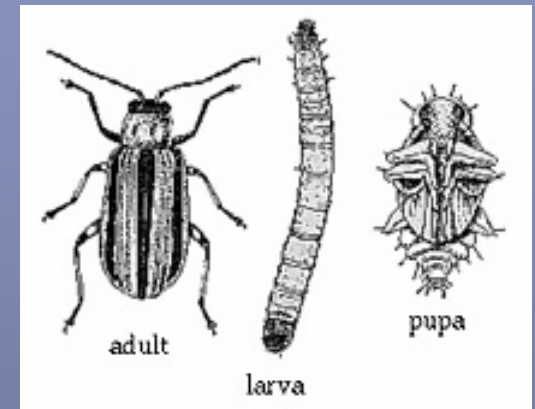
CB Biology

- Adults overwinter in protected sites near agricultural fields
 - × Under plant debris, in crevices of buildings, fence posts, etc.
 - × Spring - active when temperatures $>50^{\circ}\text{F}$
 - × Feed on pollen & nectar
 - × Can fly long distances
 - × Feed on seedling cucurbit plants
 - Cucumber, cantaloupe, winter squash, pumpkin, gourds, summer squash, watermelon, many others



CB Life Cycle

- Adults mate in spring
- Females lay 200-1,200 eggs
 - × Prefer to lay eggs in moist soil at base of host plants
- Larvae hatch in 7-10 days
- Larvae feed on roots for 3-6 wk
- Pupate in soil
- Summer adults emerge (1 or 2 gens.)



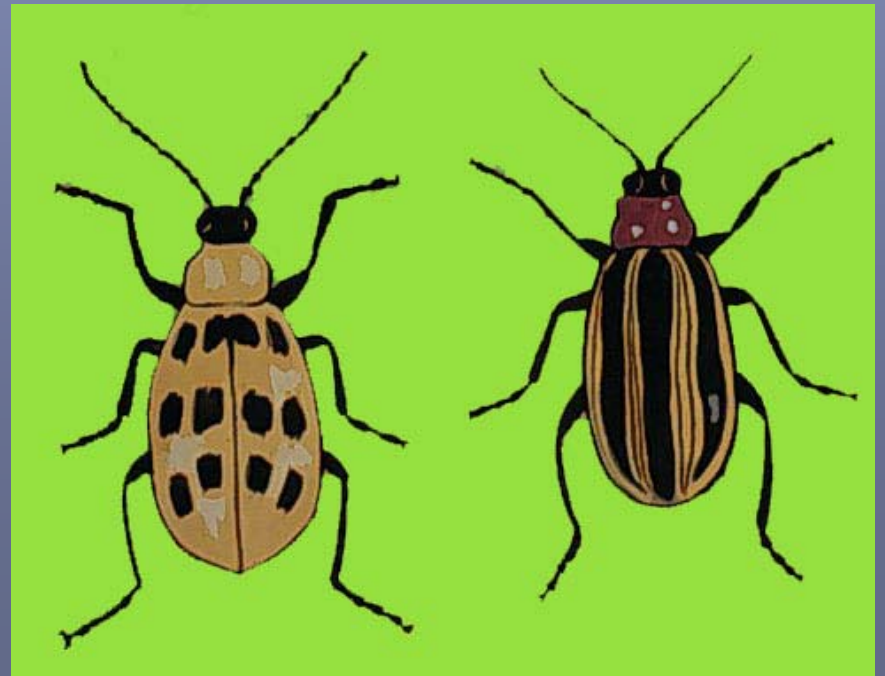
Injury to Melons

- **Spring Adults**
 - × Feed on stems, cotyledons – stunt or kill young plants
 - × Spread bacterial wilt
- **1st generation Larvae**
 - × Feed primarily on roots – stunt plants
 - × Ample moisture reduces injury
- **Summer Adults**
 - × Feed on leaves, flowers, stems, fruit
- **Summer Larvae**
 - × Feed on roots & fruit



Management Program

- ▣ Population monitoring
- ▣ Cultural practices
- ▣ Trap crops, trap baits, sticky traps
- ▣ Natural Enemies
- ▣ Insecticides



Spring Population Monitoring

- Determine when spring adult invasion begins
- Scout field 2X per wk when plants <5 leaves
 - × Look on undersides of leaves & stems
- Cucumbers & cantaloupe - susceptible to bacterial wilt
 - × 1 beetle per plant
- Watermelon - not susceptible to wilt
 - × 5 beetles per plant
- Place yellow sticky traps on edges of field



Cultural Practices

- Delayed planting
 - × Post egg-laying (June?)
- Row covers
- Mulching
 - × Aluminum-coated plastic mulch
 - × Deter egg-laying near stems
 - × Hinder larvae migrating to fruits
- Limit irrigation when fruit nears ripening
- Cultivation & residue removal after harvest
- Insect vacuuming



Trap Crops

- High concentrations of cucurbitacin &/or floral volatiles
- Plant on field perimeters as border strips
- Plant 2 wk before crop
- Treat trap crop with insecticides to kill migrating adults
- 2-5% of land
- Highly attractive summer & winter squash



Trap Baits

- Bait + insecticide
- Cucurbitacin - feeding attractant
- Eugenol - pheromone
- Cucurbit floral volatiles - host finding attractant
- Commercial attractants
 - × Developed for *Diabrotica* spp.
 - × Cidetrack - feeding stimulant
 - × Adios & Slam - cucurbitacin + carbaryl



Sticky Traps

- Yellow sticky traps
 - × Pherocon AM trap
 - × Add kairomone lure
- Pherocon CRW Kairomone trap (for *Diabrotica*)
- Place on borders



Natural Enemies



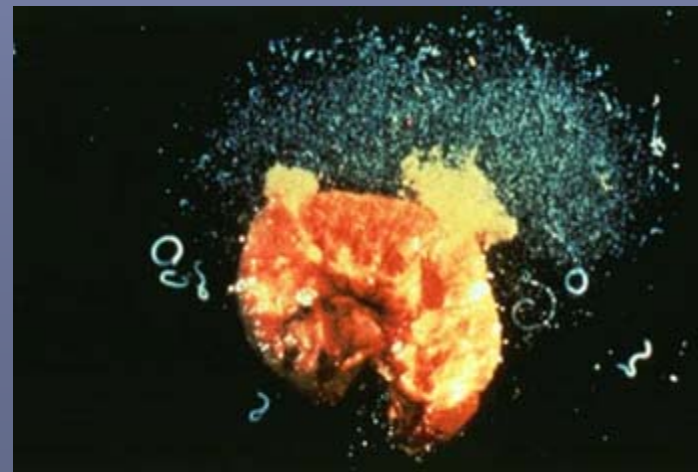
Soldier beetle



Parasitic wasps



Ground beetles



Entomopathogenic nematodes

Insecticides Registered for Cucumber Beetle in Utah

■ Nicotinoids

- × Imidacloprid (Admire) - systemic

■ Pyrethroids

- × Cypermethrin (Ammo, Mustang)
- × Permethrin (Pounce, Ambush) - not watermelon
- × Bifenthrin (Capture, Brigade)
- × Esfenvalerate (Asana)
- × Cyfluthrin (Tempo)
- × Lambda-cyhalothrin (Warrior)

■ Carbamates

- × Carbaryl (Sevin)
- × Methomyl (Lannate)

■ Organophosphates

- × Azinphosmethyl (Guthion)
- × Chlorpyrifos (Lorsban)
- × Methyl parathion (Penncap-M)
- × Oxydemeton-methyl (Metsystox-R)
- × Diazinon
- × Malathion

■ Organochlorines

- × Endosulfan (Thiodan)
- × Methoxychlor (Marlate)

■ Inorganics

- × Cryolite (Kryocide)
- × Kaolin clay (Surround)

Insecticide Application

- **Coverage**
 - × Cover undersides of leaves, stems, drench soil surface
- **Timing**
 - × Start before severe adult damage in spring
 - × Summer treatment if populations are high
 - × Target adults (Nicotinoid, Pyrethroid, Carbamate)
 - × Target eggs & larvae (Organophosphate, Organochlorine or Others)
- **Use full label rate**
- **Rotate insecticide classes - prevent resistance**



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