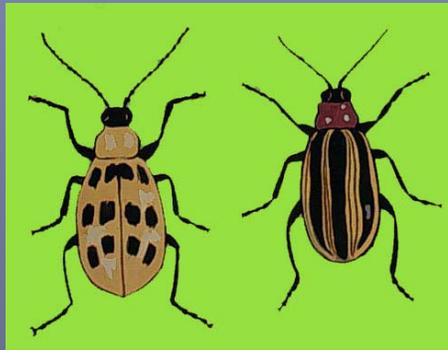


# Cucumber Beetle Biology and Control in Melons



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Green River, UT  
January 31, 2006

# 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



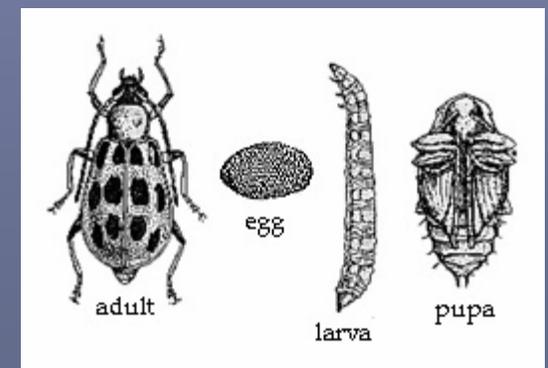
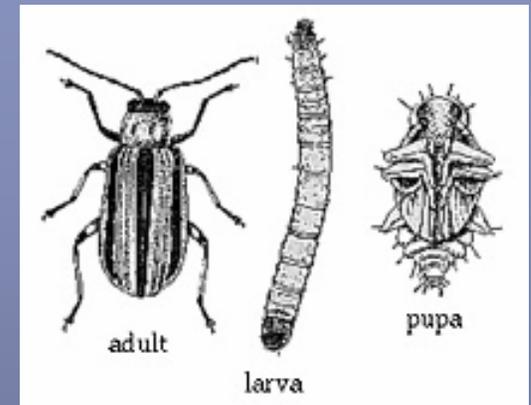
# CB Biology

- 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.)



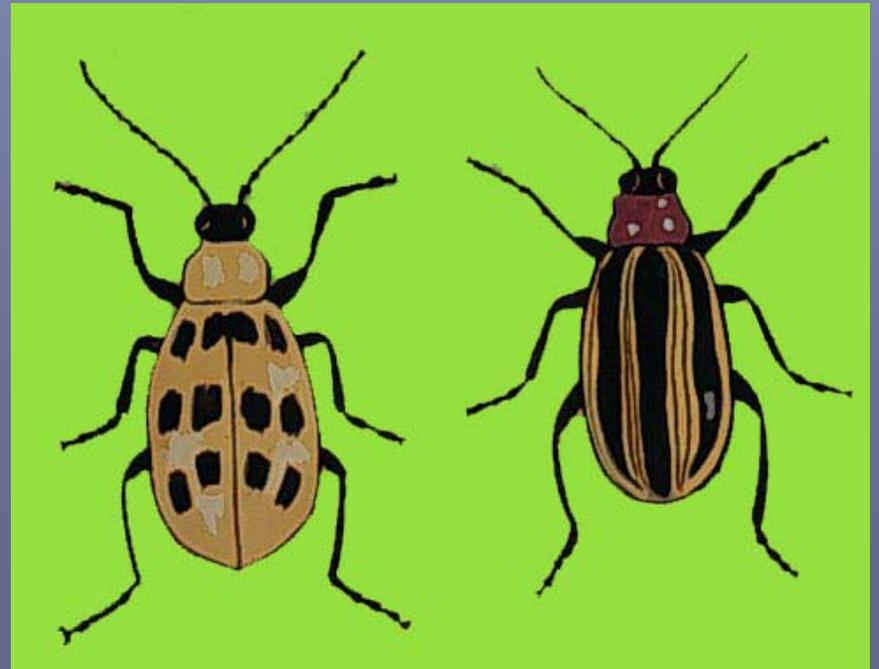
# Injury to Melons

- **Spring Adults**
  - × Feed on stems, cotyledons – stunt or kill young plants
  - × Spread bacterial wilt
- **1<sup>st</sup> 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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