Potato Insects

Frank G. Zalom, Department of Entomology, UC Davis

Whiteflies

Bemisia spp.

Greenhouse whitefly (GWF)

Adults- tiny, 1.5 mm long

• *Bemisia* spp. hold wings at an angle, rooflike over body, space between wings at rest

• GWF hold wings flat over body, no space between wings at rest

Fourth-instar nymphs-

• GWF nymphs have long waxy filaments around the edge of their bodies

• *Bemisia* spp. nymphs do not

Whiteflies colonize the underside of leaves

Whiteflies

Damage

- Whiteflies suck sap and excrete honeydew, a substrate for sooty mold
- Heavy infestations can weaken plants
- Greatest concern is in Fall planted potatoes with infested hosts nearby that are declining in quality

Control

- When possible, plant potatoes at least 0.8 km upwind from key whitefly hosts
- If populations are higher at the field margins than field centers, treat only the field margins. This reduces treatment costs and preserves beneficials.

Aphids

- Cluster on the underside of growing leaves
- Vector virus diseases; some aphid species transmit viruses more readily than others
- Malva is an important overwintering host. Mustards (*Brassica* spp.) are early season host plants

Aphids

Damage

- Heavy feeding may weaken plants
- Potato leafroll infected potatoes (certain varieties) express phloem net necrosis virus, a brown discoloration inside the potato that reduces quality

Aphids

Control

- Control nightshades and volunteer potatoes - these plants are reservoirs for potato leafroll virus
- Plant disease-free seed to reduce the incidence of potato leafroll virus
- In seed fields - destroy virus infected potato plants, and plants in close proximity of infected plants, to reduce spread viruses within a field
- Preserve habitat for beneficials around the field

Colorado Potato Beetle

- Adults overwinter in soil and soil litter, becoming active in Spring
- Eggs are laid in clumps on the under side of leaves, hatch in 4 to 15 days
- Larvae are hump-backed, with 6 legs, reddish-tan to brick-red, and have 2 rows of black spots on each side; pupate in soil

Colorado Potato Beetle

Hosts range includes solanaceous plants including tomato, eggplant, and pepper

Damage

- Larvae and adults feed on foliage; high populations can cause extensive damage
- Heavy feeding within two weeks of peak flowering will have a pronounced effect on yield

Colorado Potato Beetle

Control

- Plants can lose up to 30% of their foliage without yield loss
- An average of more than one beetle or larva per plant may warrant treatment
- *Bt* strains, *san diego* and *tenebrionis,* are effective on small larvae (less than 0.63 cm); apply every 5 to 7 days until all the eggs have hatched
- Thorough coverage of the plant is vital as the larvae must ingest some of the bacterium to have effect

Colorado Potato Beetle

Control

Colorado potato beetle has become very resistant to chemical insecticides

- Insecticides should only be used when needed
- Rotate the class of insecticide used
- Beneficial insects such as birds, predatory stink bugs, and parasitic flies will help to reduce Colorado potato beetle numbers somewhat

Potato Tuberworm

Adult - small moth, 1 cm long, gray with darker gray-brown or black markings; narrow appearance at rest.

Larva - whitish to pink caterpillars - greenish when feeding on stems or leaves; 1 cm long when full grown, brown head and dark prothoracic shield

Potato Tuberworm

Damage

- High numbers of worms on very young plants may result in stand reduction or stunted plants from leaf and stem mining
- Typical damage results from larvae mining in the tubers; larvae don’t move from stem to tuber

Potato Tuberworm

Damage

- Tubers exposed to the surface from shallow setting or cracks in the soil are most frequently infested
- Frass and webbing around the eye where larva has entered. Tunnels are filled with frass compared to clean tunnels made by wireworms or other soil-inhabiting insects.

Potato Tuberworm

Control

- Monitor moths with pheromone traps to aid treatment timing
- Destroy cull piles and volunteer potatoes
- Prevent cracking in beds- Soil cracking is less severe under sprinkler irrigation than with furrow irrigation

Potato Tuberworm

Control

- Shallow setting varieties are more susceptible than varieties that set tubers deep
- Prompt harvest - the longer the tubers remain in the ground after vine kill, the more damage that can be expected
- Insecticides applied at vine kill do not reduce tuberworm damage

Wireworms

Diabrotica spp.

Adults - Slender, reddish brown to black click beetles, 1.3-2.5 cm long (do not cause damage)

Larvae - Hard, cylindrical bodies yellowish to brown, about 1.9 cm long full grown

- Common species require 3 to 4 years to complete life cycle
- Most of the time is spent in the larval stage

Wireworms

Damage

- Shallow to deep holes in the tubers. Worms can bore to depths up to 1.3 cm, but do not tunnel all the way through the tuber
- May cause early season damage to roots

Monitoring

- Before planting, check for wireworms in soil during plowing or disking, or by baiting with a carrot; if seen, monitor by taking soil samples to determine the need to treat
- Threshold is 1 worm in 30, 15 cm deep samples

Wireworms

Control

- All stages may be present at once during the growing season
- Avoid planting potatoes in fields immediately following clover, grass, pasture, or weedy alfalfa
- Summer fallow will reduce wireworm numbers by drying the soil
- If necessary, treat with soil application of neonicotinoid insecticide in irrigation water immediately after transplanting