Cabbage maggot life cycle, monitoring, and identification

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Cabbage maggot and the root fly complex

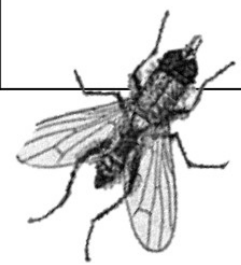
- Synonyms for cabbage maggot
  - Cabbage root maggot
  - Cabbage root fly
  - *Delia radicum*
- Cabbage maggots are one of several species in the genus *Delia* that are crop pests
- The different species look very similar and have similar life cycles and control methods

Root fly / maggot life cycle

- Cabbage root flies overwinter as brown pupae in soil and crop residue and emerge as adults in Spring
- Adults lay eggs on lower stems of host plants or in soil cracks
- After 4-10 days, eggs hatch into larvae (maggots)
- Larvae move down into the soil to feed on roots for around 3 weeks
- Larvae pupate underground, remaining as pupae for at least two weeks
- Multiple overlapping generations occur each summer

Species	Crops attacked[1]	Lifecycle	Egg location	Egg Number/ Oviposition	Main damage	Occasional Damage	Damage Threshold
D. radicum CABBAGE MAGGOT	Radish Turnip Cabbage Misc. crucifers	Apr- Oct, 3-5 generations	On stem at soil level or just below	10-100+ per female	Mine and burrow into roots and stem	heads, cause browning and rotting	early: 5-10% later: 100% if sufficient water
D. floralis TURNIP MAGGOT	Turnip Cabbage Cauliflower	July-Sept 1 generation	On stem at soil level or just below	'in clumps', similar to D. radicum	mine and burrow, but not as deep as D. radicum	petioles of lower leaves	Not as severe due to timing, if well established, >80 per root
D. planipalpus RADISH MAGGOT	Radish Cabbage Cauliflower Turnip	Apr-Oct many generations	On exposed root or inner surface of lower petiole	laid singly	tunneling in the root	not observed	not larval density per se, rather secondary problems caused by root damage (lodging, unmarketable roots, etc.)
D. platura SEEDCORN MAGGOT	Crucifers infested with other Delia species, other vegetable hosts (corn, bean, etc.)	late June-early Sept	Higher on stems	in clumps, sometimes interlaid with eggs from other species	roots	unknown	unknown

J.Green based on Brooks (1951) and other references.

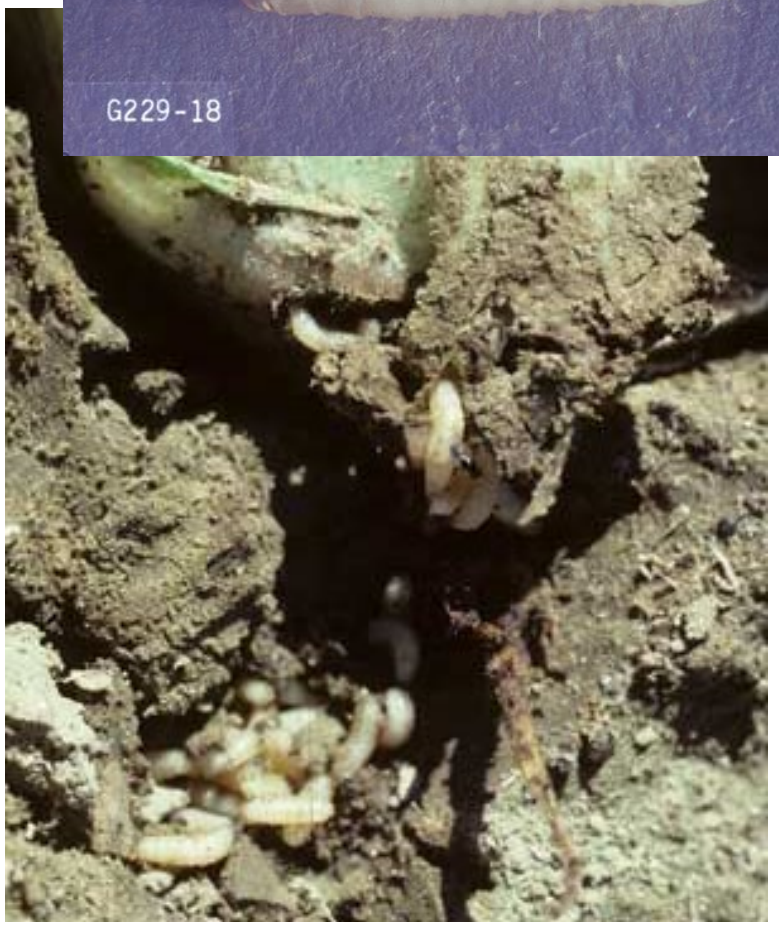


Identifying root fly eggs

- Eggs
  - Approximately 1/8” long
  - Shaped like grains of rice
  - Visible from soil surface
  - May be in clumps

Identifying root fly larvae

- Larvae are legless, white and about 1/3” long
- Live belowground – pull plants to survey
- Empty tunnels in roots are feeding damage from larvae that have left to pupate



Cabbage root fly pupae

- Look similar to many other insects
- Inconspicuous
- Approx ½” long
- Often 1-5” underground
- Not a good life stage to survey

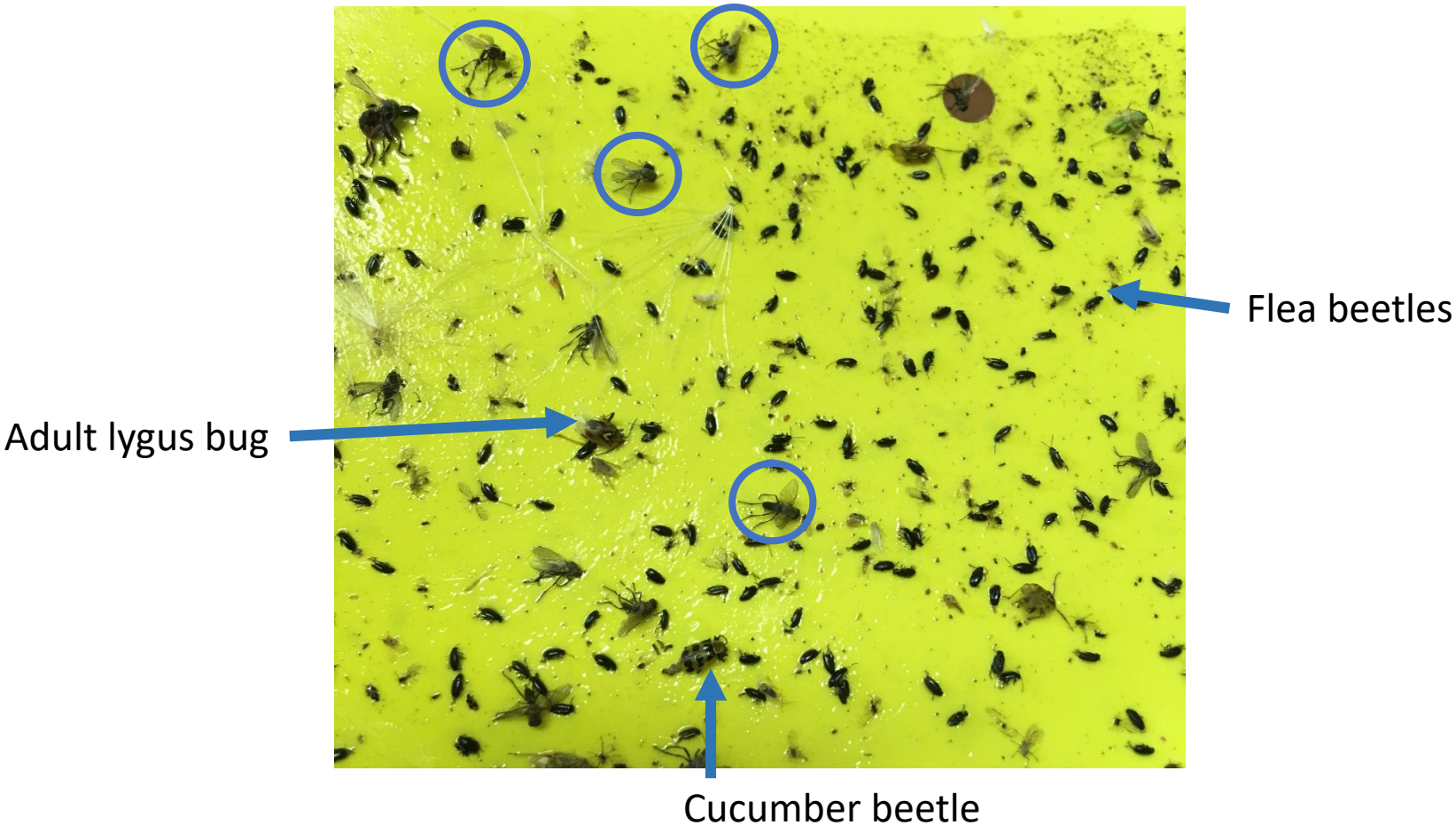
Identifying root fly adults

- Looks like a house fly – red eyes, hairy
- Appoximately ¼” long
- Eyes touch on males, do not touch on females

Trapping cabbage root flies

- Can use glucosinate lures to sample for flies before planting
- Sticky traps
  - Weekly maintenance
  - Can put in cling film or plastic bag to ID later
- Bucket traps
  - Daily maintenance
  - Use 2” strip of black tape or paint to minimize bee capture

Identifying adult rootflies on traps



Damage appearance at field scale

- Seedlings fail to thrive due to lack of roots
- Damage may be over wide area
- Foliage may have blue or purple hue, especially on lower leaves

Identifying maggot feeding damage

- Small entry holes on veg surface
- May tunnel along surface of root

Thanks

- VegNet: agsci-labs.oregonstate.edu/vegnet
  - Can subscribe for pest monitoring updates
- Thanks to Jessica Green for advice on trapping