Insect Pests of Black locust

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Insect Pests of Black locust

- 30 insects reported feeding on Black locust in Johnson & Lyon 1994
- 14 are foliage feeders
- 8 feed on bark, wood, and twigs
- 9 are sucking insects
- Most are native insects – only 4 non-native
- 10 only feed on Black locust, all sucking insects are polyphagous
- 4 identified as potential problems

Foliage feeders

- *Apion nigrum* (Black locust weevil) native, mono
- *Cyrtepistomus castaneus* (Asiatic oak weevil) nn, poly
- *Epargyreus clarus* (Silverspotted skipper) native, sort of poly
- *Lophocampa caryae* (Hickory tussock moth) native, poly
- *Nematus tibialis* native, mono
- *Obolodiplosis robiniae* (Locust midge) native, mono
- *Odontota dorsalis* (Locust leafminer) native, mono
- *Parectopa robiniella* (Locust digitate leafminer) native, mono
- *Nematus tibialis* (Locust sawfly) native, mono
- *Schizura concinna* (Redhumped catrerpillar) native, poly
- *Sumitrosis rosea* (Locust leafminer) native, mono
- *Thyridoptreix ephemeraeformis* (Bagworm) native, poly
- *Panonychus ulmi* (European red mite) nn, poly
- *Tetranychus urticae* (Twospotted spider mite) native?, poly

Foliage feeders

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Bark, wood, twigs

- *Acanalonia conica* native, poly
- *Agrilus egenus* native, mono
- *Ectydolopha insiticiana* (Locust twig borer) native, mono
- *Enchenopa binotata* (Two marked treehopper) native, poly
- *Magicicada septendecim* (Periodocal cicada) native, poly
- *Megacyllene robiniae* (Locust borer) native, mono
- *Neoclytus acuminatus* (red-headed ash borer) native, poly
- *Prionoxystus robiniae* (Carpenterworm) native, poly

Bark, wood, twigs

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Sucking insects

- *Acanalonia conica* native, poly
- *Enchenopa binotata* (Two-marked treehopper) native, poly
- *Micrutalis calva* native, poly
- *Pulvinaria innumerabilis* (Cottony maple scale) native, poly
- *Quadraspidiotus juglansregiae* (Walnut scale) native, poly
- *Saissetia oleae* (Black scale) nn, poly
- *Stictocephela bisonia* (Buffalo treehopper) native, poly
- *Tetraleurodes stanfordi* (Stanford whitefly) native, poly
- *Trialeurodes vaporariorum* (Greenhouse whitefly) nn, poly

Factors affecting susceptibility to insects

- Stand density
- Site quality
- Shallow rooting

Stand density

- Can impact insect behavior
  - Light & temperature
- Impacts on tree vigor

Site quality

- Impacts on tree vigor
  - Locust grows well on poor sites, like mine reclamation, but insect outbreaks can be more frequent and have more severe impact

Shallow rooting

- Black locust are shallow rooted and this can impact their susceptibility to insect attack.
  - Drought-weakened trees are especially susceptible to Locust borer attack.
  - Grazing of livestock has been found to contribute to Locust borer damage. In addition to weakening the tree by feeding on young succulent growth and bark, cattle reduce tree vigor by damaging shallow roots and compacting the soil.

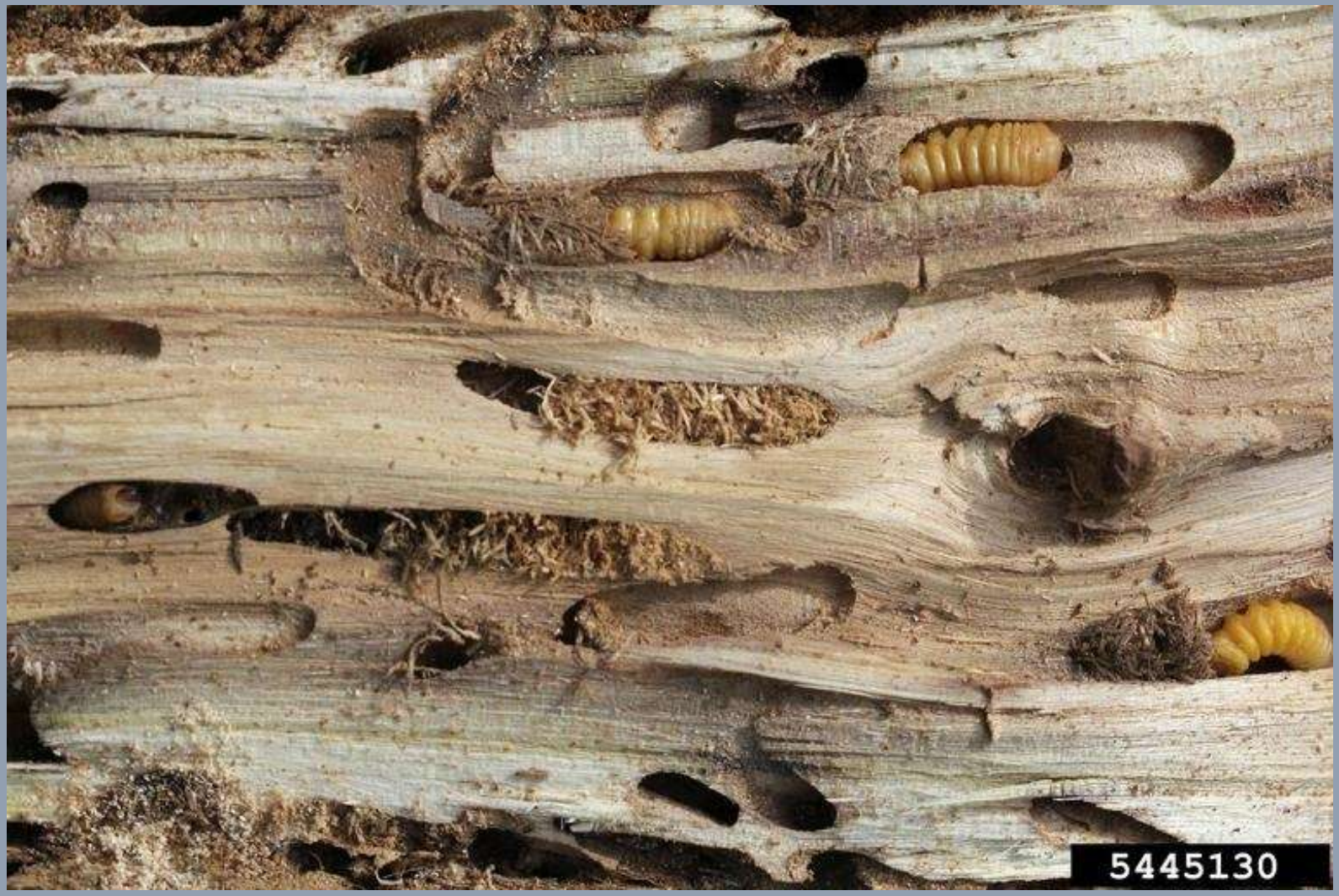
Locust borer *Megacyllene robiniae*

Susan Ellis, , Bugwood.org

Locust borer

- Coleoptera: Cerambycidae Native
- Most economically important pest of locust
- Only attacks living trees, preferring those under stress
- One generation per year (univoltine)
- Adults emerge in fall and feeds on goldenrod pollen
- Eggs laid in fall in cryptic spots on bark
- Larvae feed briefly in cambium in fall, overwinter, then resume feeding as tree growth commences in spring, then bore into xylem

Locust borer damage to wood



Whitney Cranshaw, Colorado State University, Bugwood.org

Locust borer damage to wood

James Solomon, USDA Forest Service, Bugwood.org

Locust borer pupal chamber

Lacy L. Hyche, Auburn University, Bugwood.org

Locust borer external signs

James Solomon, USDA Forest Service, Bugwood.org

Locust borer

external signs

Frass at base of tree

James Solomon, USDA Forest Service, Bugwood.org

Whitney Cranshaw, Colorado State University, Bugwood.org

Locust borer

- during severe epidemics, the branches and tops of older trees frequently become infested. Sometimes even dominant large trees are killed
- when the weather is cool during the egg-laying season, the beetles lay fewer eggs in densely shaded locust stands

Locust borer

- Pruning creates favorable conditions for egg laying: callus tissue around pruning wounds is ideal for oviposition
- studies using genetically identical cuttings of Black locust planted in different locations have shown that good growing conditions are more important than genetic resistance in reducing susceptibility to borer damage

Locust leafminer *Odontota dorsalis*

Whitney Cranshaw, Colorado State University, Bugwood.org

Locust leafminer *Odontota dorsalis*

- Coleoptera: Chrysomelidae
- Overwinters as adult in protected places on tree or in soil
- Adults emerge and feed on developing foliage in spring
- Eggs laid on underside of leaves
- Can have two generations in the southern part of its distribution, south of Pennsylvania
- Repeated defoliation can cause mortality

Adult Locust Leafminer

Lacy L. Hyche, Auburn University, Bugwood.org

Early instar larval leaf mining

Steven Katovich, USDA Forest Service, Bugwood.org

Later instar larval leaf mining damage

John A. Weidhass, Virginia Polytechnic Institute and State University, Bugwood.org

Locust twig borer *Ecdytolopha insiticiana*

Todd M. Gilligan and Marc E. Epstein, CSU, Bugwood.org

Locust twig borer *Ecdytolopha insiticiana*

- Lepidoptera: Tortricidae
- Attacks shoots, not twigs
- Causes shoots to swell, but seldom killed, just weakened and prone to breaking
- Larvae emerge from twigs to pupate between leaves in tree or on ground
- Can be two generations a year
- Larvae overwinter in their mine
- Native in east and reported on west coast

Locust twig borer damage

Robert L. Anderson, USDA Forest Service, Bugwood.org

Locust twig borer damage

James Solomon, USDA Forest Service, Bugwood.org

Locust twig borer larva

James Solomon, USDA Forest Service, Bugwood.org

Locust sawfly *Nematus tibialis*

Locust sawfly *Nematus tibialis*

- Hymenoptera: Tenthredinidae
- Univoltine (one generation per year)
- Adults appear in spring and lay eggs in leaf rachis
- Larvae feed through summer, do not eat the midrib
- Larvae overwinter in soil

Locust sawfly eggs

Lacy L. Hyche, Auburn University, Bugwood.org

Locust sawfly early instar larvae

Lacy L. Hyche, Auburn University, Bugwood.org

Locust sawfly late instar larvae *Nematus tibialis*

Lacy L. Hyche, Auburn University, Bugwood.org

Will we see invasive non-natives?

- Many trees in the pea family world wide
- Many of them are important economically
- Black locust is widely planted overseas
- Wood borers pose the greatest threat and the wood of trees in the pea family is valuable
- We will not reduce the amount of international commerce anytime soon
- Regulation of commerce is slow to implement and compliance difficult to verify

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