

A close-up photograph of two vibrant green metallic wood-boring beetles (Agrilus) on a rough, textured tree bark. The beetles are positioned vertically, one slightly above the other, both facing downwards. The bark is light brown with deep, irregular cracks and crevices.

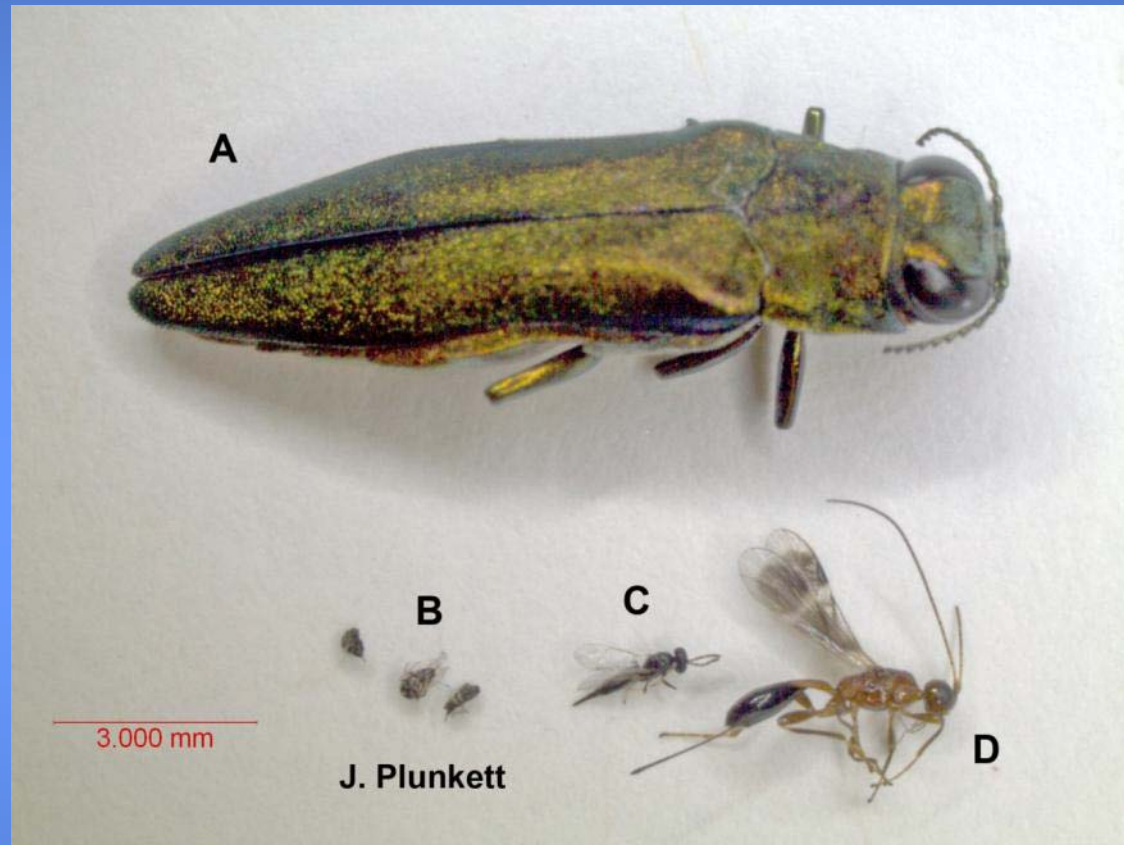
Minnesota Department of Agriculture's New and Established Biological Control Programs

Monika Chandler, Minnesota Department of Agriculture

When to use biocontrol?

- Large infestation
- Environmentally sensitive area
- Other single control methods are ineffective or too costly
- Integrate with other control methods
- Long-term, sustainable management

EAB Biological Control



Adult emerald ash borer beetle, *Agrilus planipennis* (A) and the parasitoids that control it in China including the egg parasitoid, *Oobius agrili* (B), and two larval parasitoids, *Tetrastichus planipennisi* (C) and *Spathius agrili* (D).

Emerald Ash Borer (EAB)





USDA

Oobius agrili



H. Liu, USDA



J. Lelito



Spathius agrili

J. Lelito



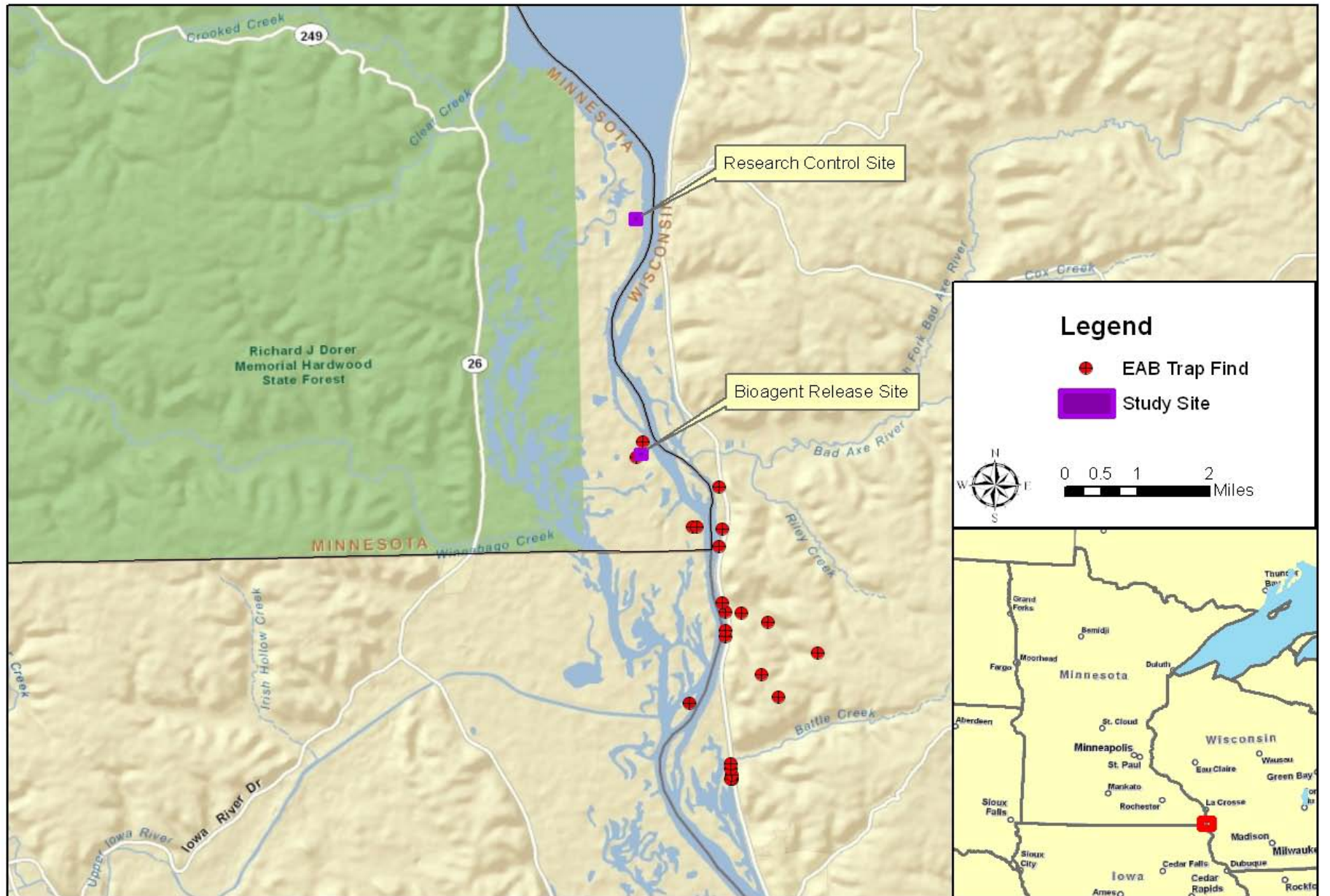
J. Plunkett



J. Lelito

Tetrastichus planipennisi

Emerald Ash Borer Biocontrol in Minnesota



Data Collection and Monitoring



Bioagent Release

Release totals:

Spathius agrili: 1,172

Tetrastichus planipennisi: 2,154



EAB Management



**BURN IT
WHERE YOU
BUY IT**

Stop the Emerald Ash Borer
Don't Move Firewood > StopTheBeetle.info



Wikimedia Commons

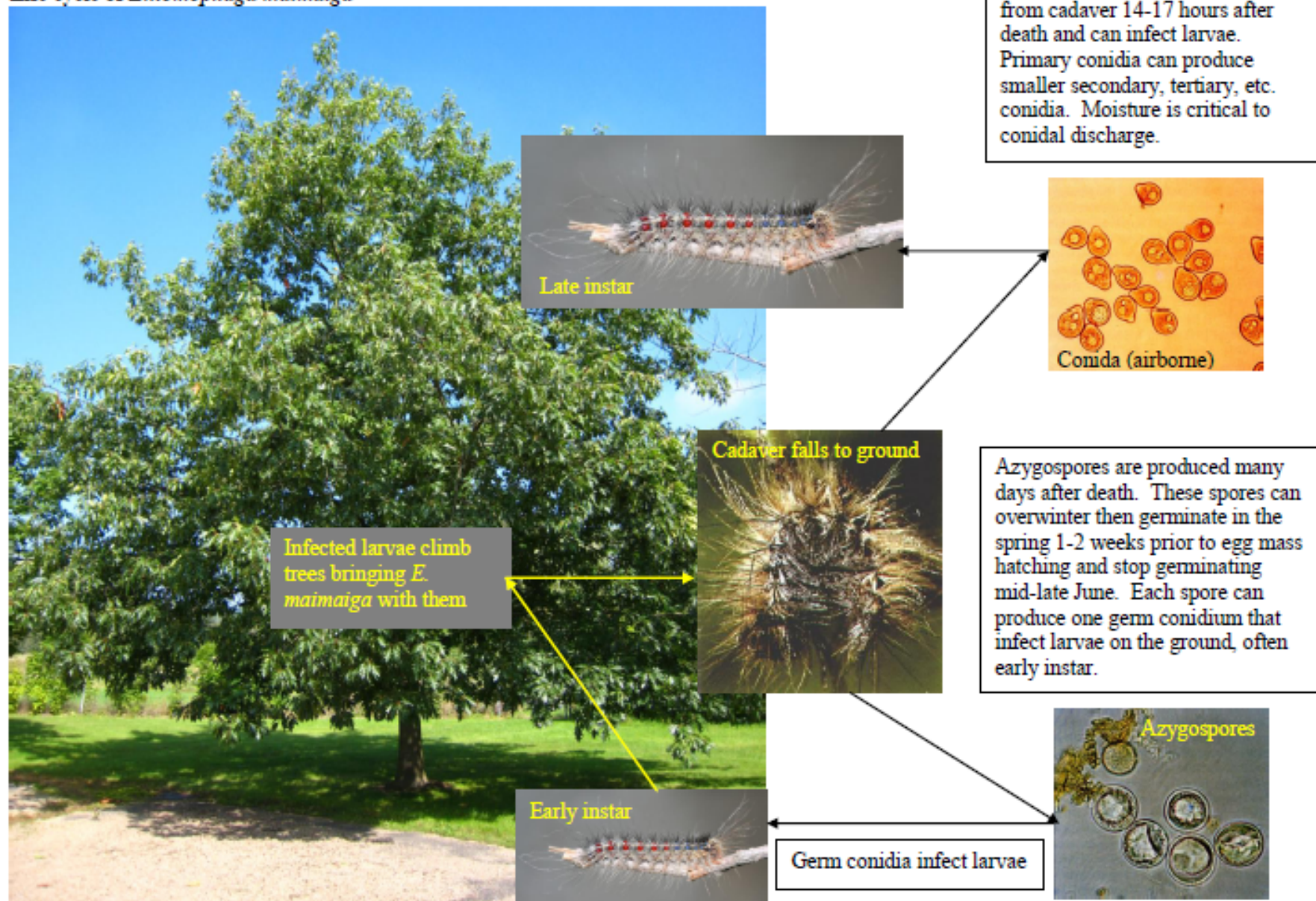


J. Lelito

Gypsy Moth Biocontrol

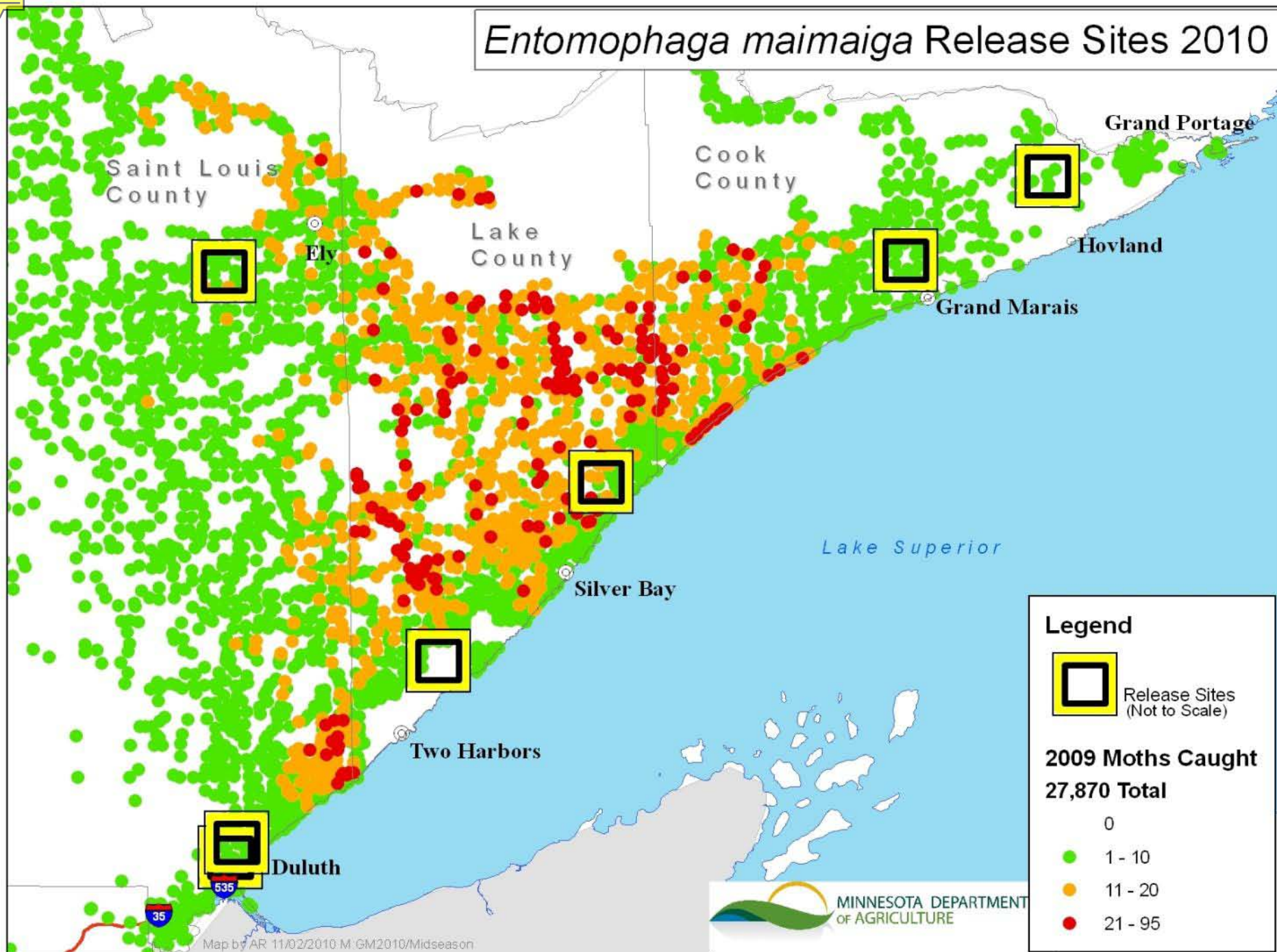


Life cycle of *Entomophaga maimaiga*

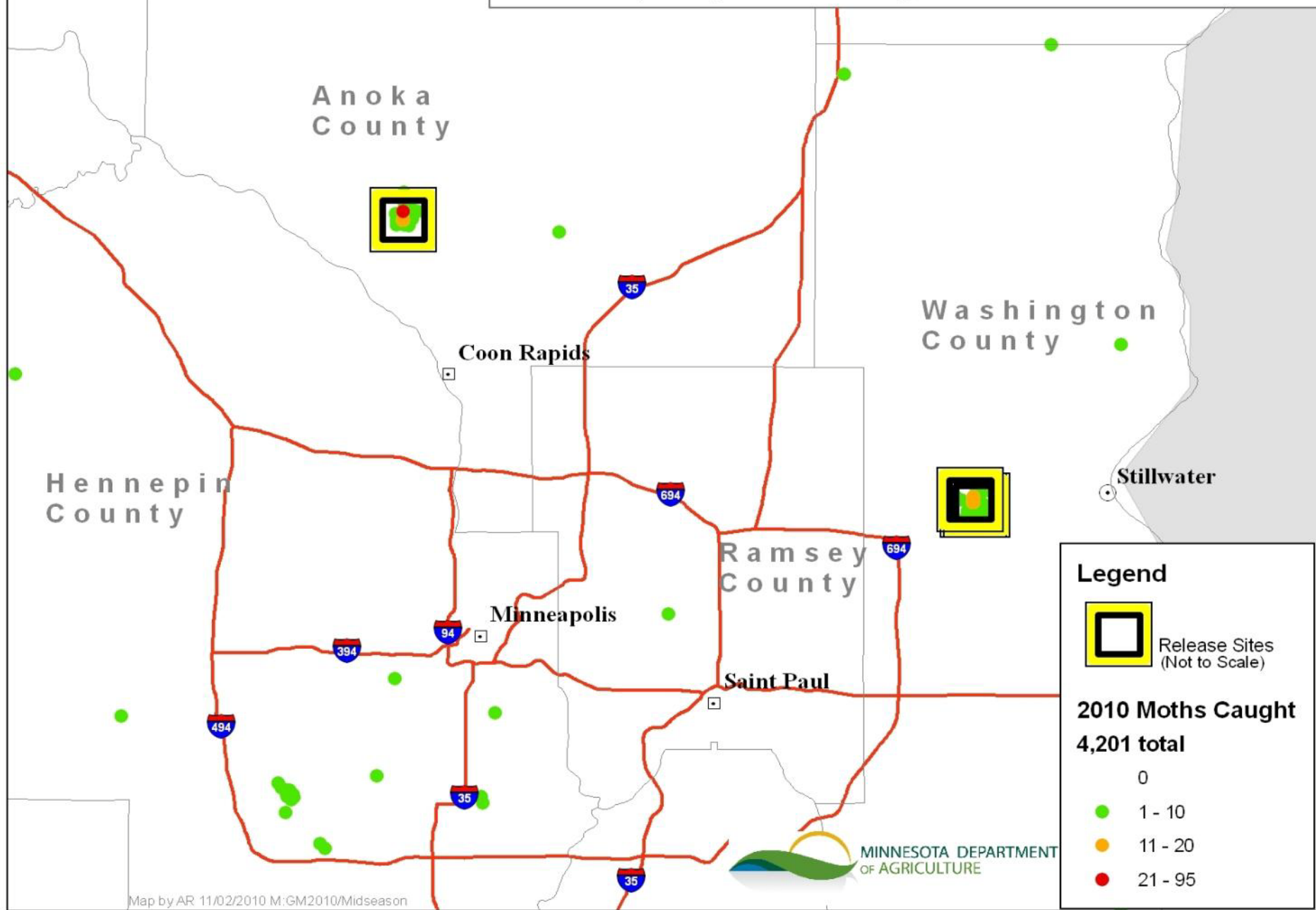


Images from Wikimedia Commons (http://commons.wikimedia.org/wiki/Main_Page) and the US Forest Service Gypsy Moth In North America (www.fs.fed.us/ne/morgantown/4557/gmoth/natenem/fungus.html) websites

Entomophaga maimaiga Release Sites 2010



Entomophaga maimaiga Release Sites 2010





Data Collection and Monitoring





Leafy Spurge, *Euphorbia esula*





Leafy Spurge Beetles, *Aphthona* spp.



A. B. Cortilet, MDA

Spurge Decrease From Beetle Damage





Spotted Knapweed, *Centaurea biebersteinii*



Seedhead Weevils, *Larinus* spp.



P. Samerdyke, WI DNR

Root Weevils, *Cyphocleonus achates*







Canada Thistle Biological Control Research Project

Stem weevil,
Ceutorhynchus litura





Common Tansy, *Tanacetum vulgare*



Biocontrol Candidates



Cassida stigmatica



Rhopalomyia tanaceticola



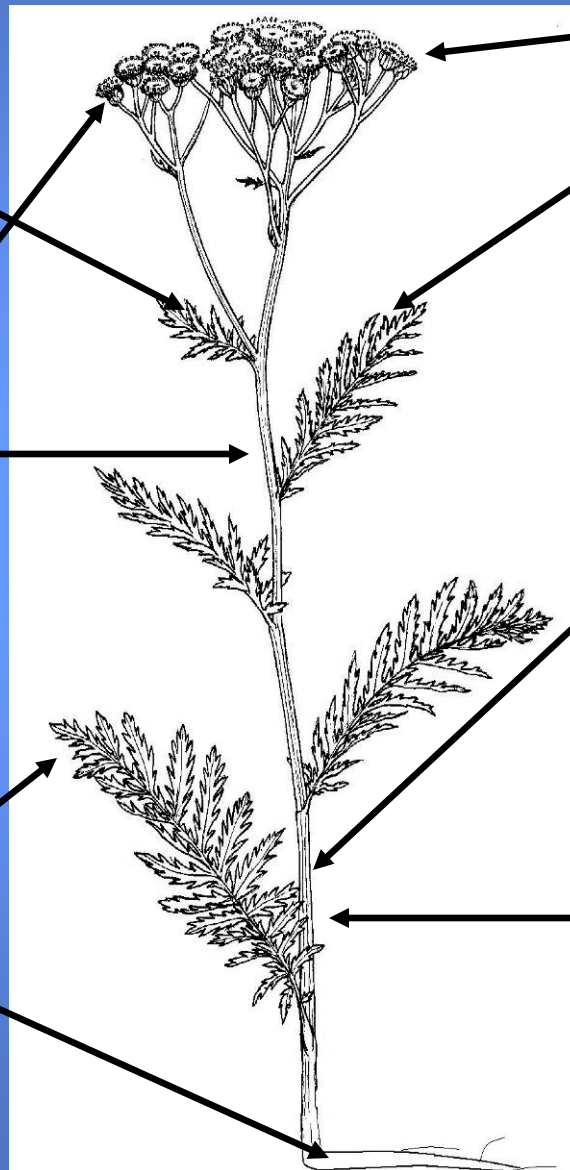
Isophrictis striatella



Phytoecia nigricornis



Longitarsus noricus



Microplontus millefollii



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