Gypsy Moth (*Lymantria dispar* L.) Program Updates – Surveys & Treatments

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2018 UMISC – NAISMA Joint Conference
Gypsy Moth - Introduction

• Gypsy Moth (GM) Biology
• GM on National Level
• GM in Minnesota
  • GM Surveys
  • GM Treatments
Gypsy Moth – Preferred Hosts

Willow

Oak

Aspen

Birch
Gypsy Moth - Life Cycle

- **Egg Mass**
- **Larva (caterpillar)**
- **Pupa**
- **Adult**

*Female*

*Male*
Gypsy Moth – Life Stages

Distinctive comma markings are on the wings of both the female and male adult moths.

Buff colored egg mass can vary in size and shape.

Feathered Antennae

Difficult to see here, but the pupae have golden hairs coming out of various places on the surface of the casing. Casing can be light to dark brown, sometimes with a purple hue. Males are smaller.
NOT Gypsy Moth

Cecropia moth

Forest Tent Caterpillars - spring

Eastern Tent Caterpillars - spring

Fall Webworm – late summer
Gypsy Moth – Introduced to the U.S.

• European insect species

• Introduced in 1869 in Medford, Massachusetts

• One of the most destructive tree pests in the U.S.
Gypsy Moth – Limited Natural Spread Rate

• 1¼ miles per year due to larval dispersal.

• Female moths do not fly.

Female GM laying egg mass.

“Ballooning” of larvae.
• Egg masses or other life stages are transported

• 13-16 miles per year (1960-1990)
• Three strategies of gypsy moth management
  
  • Suppression - population established / reproducing
    • Treatments conducted to suppress population / decrease defoliation
  
  • Slow the Spread – population building
    • Treat localized populations to decrease the general population spread to < 5mi per year
  
  • Eradication – pre-infestation
    • Eliminate start up populations
National GM Slow the Spread (STS) Program

- Federal Program through US Forest Service

![Diagram of STS Program](image)

- Barrier Zone Concept
- Goal is to limit spread to <6km per year
- [www.gmsts.org](http://www.gmsts.org) – DA (Decisions Algorithm)
Minnesota Cooperative Gypsy Moth Program

• **State Partners**
  • MN Department of Agriculture
  • MN Department of Natural Resources
    • University of Minnesota

• **Federal Partners**
  • USDA APHIS Plant Protection & Quarantine
  • USDA Forest Service
  • Gypsy Moth Slow the Spread Foundation
Gypsy Moth Pheromone Traps
• Minnesota’s survey program began in 1973.
  • First male moth captured in 1976
  • First eradication treatment was in St. Paul in 1980.
  • 121 successful treatments conducted within MN since then!
  • Averaging ~20,000 traps/year since 2000.

• MDA follows STS Trapping and Treatment Protocols.
  • Trapping on a set, standard grid
  • High Risk sites are targeted with traps on site.
  • Delimit areas are trapped at higher densities
Gypsy Moth – Fall Alternate Life Stage (ALS) Surveys

• Conducted in the Fall
• Used to determine if reproducing population exists
Gypsy Moth Treatments - BTK

Biological Insecticide (larval stage): Bacillus thuringiensis var. kurstaki (Btk)

• Applied when caterpillars are in the first or second instar of development.

• Sensitive to sunlight/heat will only persist of foliage for 3-7 days.

• Crystalline proteins formed by naturally occurring bacteria.

• Commonly used in organic gardening

• Applied aerially with a low flying fixed-wing aircraft
Gypsy Moth Treatments – Mating Disruption

• Specific to gypsy moth

• Dispensed by small plastic “flakes” (Disrupt II) or droplets of wax-based substance (SPLAT).

• Flakes or wax is embedded with the female pheromone (same as the lure placed in traps).

• Applied aerially by fixed wing aircraft.

• Two – three flakes/wax droplets per square foot.

• Applied before moths begin to fly and look for mates.

• Interrupts mating, moths die before mating occurs.
Gypsy Moth – 2017 Treatments

Aerial Application sites:

• Richfield (Hennepin Co.) – 329 acres, two applications of Btk
• Hinckley (Pine Co.) – 791 acres, two apps of Btk
• Pine Creek (Winona Co.) – 1,765 acres of mating disruption
Gypsy Moth – 2017 Trapping Survey Results

- 20,612 Early Detection Traps
- 4,648 moths statewide
- 3,237 moths - Lowry Hill, Minneapolis

www.mda.state.mn.us/gmresults2017
Gypsy Moth – 2018 Treatments

Aerial Application Sites:

• Lowry Hill, Minneapolis - 307 acres, three application of Btk

• Lakeside Neighborhood, Duluth - 352 acres, two apps of Btk

• Two Harbors (Lake Co.) - 526 acres, two apps of Btk

• White Iron Lake (Lake Co.) - 77 acres, two apps of Btk

• Split Rock, Beaver Bay (Lake Co.) - 72,720 acres of mating disruption (SPLAT)
• 4 Lead Workers, 33 Trapping Routes
• ~20,315 traps set in MN
  • MDA staff set 20,028 traps
  • USDA, APHIS, PPQ set 112 traps
  • County Ag Inspectors set ~175 traps
• Three Rivers Parks District set 40 traps
2018 Survey Results & 2019 Proposed Treatments

- 437 gypsy moth trapped as of 10/8

- Potential Btk treatment sites for 2019 (all in the State eradication area):
  - Stillwater (Washington Co.)
  - Lakeville (Dakota Co.)
  - Chisholm (W. St. Louis Co.)

www.mda.state.mn.us/gmresults2018
Thank you!

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