

Gypsy moth in High Park in 2013

History

There is an increase of the Gypsy moth population in High Park this year. The number of egg masses deposited on trees last fall are significantly higher than in any of the past 11 years. Urban Forestry yearly monitors Oak Decline at two permanent sample plots, with 100 oak trees respectively, over the last 11 years. The presence of the Gypsy moth has been also recorded as part of the monitoring. The Gypsy moth egg mass numbers have never been higher than this year. In most years it was nonexistent or at negligible level. The Gypsy moth population in certain areas can reach an outbreak level this spring and cause partial and full defoliation of over 300 host trees. Oak species, as the most susceptible, are particularly under risk.

Survey

The Forest Health Care section of the Urban Forestry observed the higher than usual Gypsy moth presence last summer and also has received a number of calls from the public and the High Park staff.

The Urban Forestry has conducted a systematic survey right after the Gypsy moth egg laying cycle has been finished. The survey crews identified around 600 trees within the limits of the High Park that have egg mass deposits. The number of egg masses varies from 5 to up to several hundred per tree. There are over 300 trees identified with high number of egg masses (>15) and are almost exclusively located in the manicured areas. These trees are traditionally under constant environmental stress, mainly caused by a heavy human traffic and the maintenance work around them.

Egg parasitism and test on Nucleopolyhedrosis virus (NPV)

Egg parasitism is an important factor in Gypsy moth natural control. It has been also observed and analyzed at the last Gypsy moth outbreak in Toronto in 2008. A parasitic wasp *Ooencyrtus kuvanae* can reduce egg viability by 30-40%. The egg samples collected at High Park this winter show 30-40% of reduction of viable eggs. An average egg mass from that sample pool contains 200-300 eggs.

Samples of egg masses collected in High Park have been sent to Canadian Forest Service (CFS) for lab testing of the NPV. If present in a sufficient level, NPV can play a significant role in the Gypsy moth population control in High Park. Unfortunately, the samples were mishandled by CFS lab staff accidentally and were not analyzed in time.

Proposed control options

The *population control* of the Gypsy moth, at the manicured areas, can be achieved in the most practical way, by two applications of Foray 48B (a.i. *Bacillus thuringiensis var. kurstaki*) in the spring. There is an argument that the aerial spray of the Btk. will impact other non-target Lepidoptera species.

Given this consideration, other control options were reviewed and recommended to reduce the damage to the over 300 selected trees. This will not be a Gypsy moth population control, but rather a gypsy moth *control within individual trees* that are under high risk of the defoliation. If the natural control factors, like the NPV and the *Entomophaga mammaiga*, cannot control the remnant population this year, there is a risk of an outbreak over the wider area next year.

1. Egg mass removal

a. Ground level removal.

The egg mass deposits on about 250 trees have been removed by the Urban Forestry staff in the month of January. This control method was applied to the trees where egg masses were deposited within the reach of the removal equipment (portable vacuum with an extension pipe of 6-7m).

b. By aerial tower .

There are 35 mature oak trees where the egg mass deposits are located higher in the crown. These trees are accessible by an aerial tower. The egg mass removal was completed in the month of February and March.

2. Ground application of Foray 48B (Btk.) of selected trees.

33 oak trees have an extremely high number of egg masses and egg mass removal is not a feasible control option on them. The trees are accessible by ground spray equipment. A two ground applications of Btk is recommended to protect these trees from complete or partial defoliation.

The trees selected for the Btk. ground spray are marked with a green aluminum tag "HP-S#" The first Btk application is expected to be done between May 20th and 27th. The second 3-7 days later.

3. TreeAzin injection of selected trees.

10 oak trees with a high number of egg masses that are not accessible by ground spray equipment are recommended for a TreeAzin stem injection. One treatment in the spring, when the caterpillars begin to hatch, should prevent the defoliation of these trees. Information on the TreeAzin is available upon request. The trees selected for TreeAzin treatment are marked with green aluminum tag "HP-TI#" The treatment should start between May 7th and 15th.