

Where Do Your Tree Fund Donations GO?

Dan Quiring

Protecting St. John's, NL, from the elm spanworm

Native to North America, the elm spanworm, *Ennomos subsignaria* (Lepidoptera: Geometridae), hereafter referred to as ES, is a serious defoliator (i.e., eats the leaves) of hardwood trees. During the past five years, the ES has reached outbreak densities in St. John's, Newfoundland. This is the first recorded outbreak of the ES in the province. Large numbers of trees have been completely defoliated for multiple years. It is not known how long the trees can tolerate this level of defoliation before experiencing significant growth losses or mortality. The ES is also problematic because the masses of larvae, their silk strands and frass, cover houses, sidewalks, driveways, lawn furniture and cars. This constitutes a significant nuisance

and safety hazard for citizens living or working in areas of high ES density, and it ultimately interferes with the quality of life for local residents during the summer period. In addition, due to the extent of the ES problem, some citizens resort to cutting down their 100+ year old trees which are a major part of the landscape in St. John's. Finally, this outbreak may negatively impact the tourism industry as many historic city parks are infested with this insect at the peak of the summer season.

Progress

The generous assistance from the Canadian Tree Fund allowed us to efficiently and successfully achieve our goal of developing an integrated pest management plan for the ES in St. John's. Densities of

ES remained high during the 2006 field season. Large numbers of trees were completely stripped of their leaves while many more trees had their crowns partially eaten. Larvae consumed leaves at an alarming rate as they moved from tree to tree by hanging from their silk strands.

The first objective of this study was to develop a predictive relationship between ES egg density and the subsequent amount of defoliation caused by ES larvae. Two methods were developed for assessing ES egg density: 1) Sampling a branch from the lower or mid crown level of a tree and counting the number of egg masses on the branch; and 2) counting the number of egg masses in a band around the trunk that is 0.5 metres high, beginning 1.4 m above the ground. New ES eggs can easily be

differentiated from old eggs by the presence of an operculum. Old eggs do not have an operculum but instead have a hole where the larvae emerged from the egg in a previous year.

Fortunately, we determined that ES egg density is strongly related to subsequent defoliation. Thus, pest managers can now sample eggs from trees to determine where defoliation will be the highest. This will help ensure that suppression tactics (such as using trunk-implanted insecticides or insecticides sprayed from the ground up into the crowns of trees) are used only when absolutely needed. Thus, by developing this predictive relationship, the amount of insecticides used against the ES can be minimized.

Trunk implanted pesticides can be used to protect individual trees of high value. Systemic trunk implantation is considered to pose substantially less risk to both human and environmental health, principally because the products are delivered directly to the target tree, thus limiting potential

exposure only to those directly applying the material or to other organisms feeding on tree tissues. AceCap 97 is a trunk-implanted systemic insecticide. Acephate is the active ingredient, and has been recently re-approved by the Pest Management Regulatory Agency for use against insect pests, although not specifically against ES.

The second objective of this study was to determine: 1) the efficacy of AceCap 97 against the ES at the currently recommended dosage; and 2) the lowest effective concentration of AceCap 97 against the ES. AceCap 97 is the most environmentally friendly method of chemical insecticide application because the chemical is present only in the tissues of the treated tree (i.e. non-target plants and the environment around the tree are not affected). In this study, it was determined that both the recommended concentration of AceCap 97 and two-thirds of the recommended concentration of AceCap 97 were effective in significantly reducing the amount of ES

defoliation when compared to trees that were not treated with AceCap 97. This method of control is particularly advantageous for managing the ES in St. John's because ground spray application of insecticides is usually impractical as the majority of trees are old, making full crown coverage difficult and the risk of contaminating the surrounding environment high.

In conclusion, the implementation of this research would not have been possible without assistance from the Canadian Tree Fund. Mature hardwood trees in St. John's are a major part of the city's landscape and protecting these trees from ES defoliation is of utmost importance to citizens, local businesses and the tourism industry. This research was featured on Memorial University of Newfoundland and Labrador's website as well as presented to a class of MUN Education students while on a field trip to a city park. ♦

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