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FRONTLINE EXPRESS
Canadian Forest Service – Great Lakes Forestry Centre

Insect Production Services

INTRODUCTION

Insect Production Services (IPS) at Great Lakes Forestry Centre (GLFC) is the only facility in North America that raises many species of forest insects and the only one in the world that mass-produces eastern spruce budworm, the most destructive pest of fir and spruce forests. Most of the insects produced are in support of pest management related research at GLFC and other Canadian Forest Service (CFS) establishments. The primary research of about two dozen CFS scientists is dependent upon the services provided by the insectarium. We also provide insects to researchers and pest managers at provincial/state agencies, about 20 universities throughout North America and a range of establishments for public education.

WHY PRODUCE INSECTS?

Through the production of insects, the CFS can facilitate research that develops socially acceptable forest protection tools to control insect outbreaks. Most importantly, the production of insects will help researchers understand the role of insect outbreaks as a natural disturbance to the forest. While insect outbreaks may play a role in maintaining the diversity and health of Canada's forests, an average of 20% of the damaged trees will not be suitable for harvesting.

INSECT REARING

The types of insects that are reared depend upon changing research needs of scientists. The majority of the resources in the insectarium are dedicated to producing spruce budworm. Other species that are reared include: western spruce budworm, fir coneworm, rusty tussock moth, whitemarked tussock moth and the cabbage looper.

While most strains of spruce budworm require an over-wintering dormant phase called diapause, researchers have also been successful in creating a strain that does not require it. A great benefit from this development is the speed with which the strain cycles through its generations. A shorter time span means that researchers do not have to wait more than a few months to determine long-term effects of different experimental treatments. We produce an average of 3.5 million spruce budworm larvae annually.

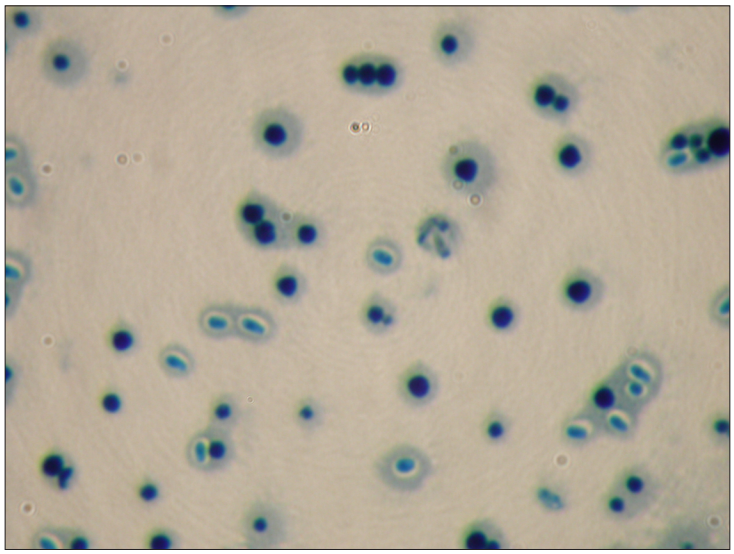
Each species is fed special food that is created in the lab and is specific to its needs. The diet is put in tiny cups and the small insect larvae are placed on top of it. As the larvae become larger, they are transferred to fresh diet at a lower rearing density to prevent overcrowding and to ensure there is an adequate supply of diet.

Climate controlled rearing rooms house insects that are feeding, mating or in diapause. Rooms are programmed to meet the specific environmental needs of each species, and stage of development.

Rearing room for eastern spruce budworm with diet cups lined on shelves.

QUALITY CONTROL

The quality control facility is an analytical lab, separate from the insectarium, where production and process control are monitored. The quality control unit ensures the health of the insect colonies before they are distributed, to maintain customer satisfaction. We use quality control methods to manage the consistency, reliability and timeliness of insect production. These methods also allow us to ensure that production processes are consistent, eliminating unacceptable deviations in product quality.



Example of insect pathogens found in spruce budworm during quality control monitoring.

METHODS DEVELOPMENT RESEARCH

The Methods Development Research facility, also separate from the insectarium, is where new methods are created to mass produce insects, initiate new colonies and develop or modify techniques to detect pathogens.

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