



NOTES



PHOTO: L. ST-ANTOINE

THE OVIPOSITION TRAP

A NEW TECHNIQUE FOR SAMPLING EGGS OF THE BRUCE SPANWORM AND SIMILAR SPECIES

Christian Hébert and Luc St-Antoine

Figure 1
Defoliation caused by Bruce spanworm in a
maple stand.

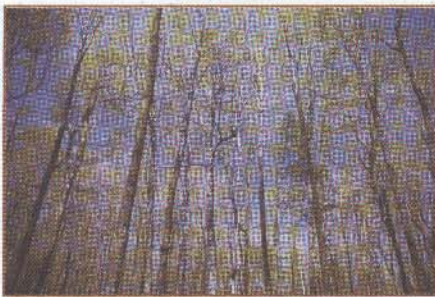


PHOTO: C. MONNIER

Figure 2
Late-instar Bruce spanworm larva.



PHOTO: T. ARCAND

THE BRUCE SPANWORM (*Operophtera bruceata* HULST. [LEPIDOPTERA: GEOMETRIDAE]) IS A MAJOR FOREST DEFOLIATOR IN CANADA. IT ATTACKS MANY DECIDUOUS SPECIES, WITH OUTBREAKS COMMONLY OCCURRING IN MAPLE STANDS IN EASTERN CANADA (*Figures 1 and 2*) AND IN TREMBLING ASPEN STANDS IN BOTH EASTERN AND WESTERN CANADA. THE FEMALES ARE WINGLESS AND DEPOSIT THEIR EGGS SINGLY ON THE TRUNKS OF HOST TREES (*Figure 3*). UNTIL NOW, THERE WAS NO WAY TO SAMPLE THIS INSECT'S EGGS. OVER THE PAST 50 YEARS, POPULATION MONITORING FOR THIS PEST HAS BEEN DONE BY USING STICKY BANDS PLACED AROUND THE TRUNKS OF HOST TREES (*Figure 4*) TO CAPTURE AND COUNT THE FEMALES CLIMBING UPWARDS TO LAY THEIR EGGS. THE LATTER METHOD HAS BEEN USED FOR SEVERAL SIMILAR SPECIES AS WELL, SUCH AS THE LINDEN LOOPER (*Erannis tiliaria* HARR.), THE FALL CANKERWORM (*Alsophila pometaria* HARR.) AND THE WINTER MOTH (*Operophtera brumata* L.), WHICH IS A SPECIES CLOSELY RELATED TO THE BRUCE SPANWORM. IN ADDITION TO BEING TIME-CONSUMING, HOWEVER, THAT APPROACH CAN UNDERESTIMATE HIGH SPANWORM POPULATION LEVELS.

FOLLOWING SEVERAL YEARS OF RESEARCH, AN EGG SAMPLING METHOD HAS BEEN DEVELOPED FOR THE BRUCE SPANWORM. IT INVOLVES USING AN OVIPOSITION TRAP, AND REPRESENTS A NEW WAY TO SAMPLE EGGS OF FOREST INSECT PESTS. PRIVATE WOODLOT OWNERS, FORESTRY COMPANIES AND OTHER ORGANIZATIONS CONCERNED WITH MONITORING POPULATIONS OF BRUCE SPANWORM AND SIMILAR SPECIES CAN BENEFIT FROM THE TECHNIQUE.



Figure 3
Female Bruce spanworm depositing her eggs in a crack in the bark.



PHOTO: T. ARCAND

Figure 4
Sticky band used to capture female moths of Bruce spanworm.



PHOTO: L. ST-ANTOINE

Figure 5
Materials used to construct an oviposition trap.

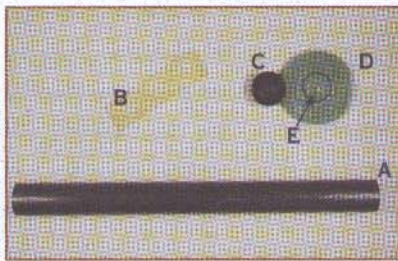


PHOTO: C. MOFFET

Figure 6
Marking the ABS pipe 30 cm from one end.

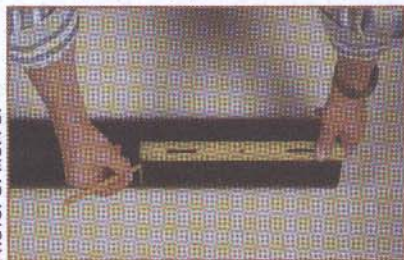


PHOTO: C. MOFFET

MATERIAL

- A PIECE OF BLACK ABS PIPE 10 CM IN DIAMETER AND 1.2 M LONG (*Figure 5a*).
- A 6-MM-THICK BAND OF WHITE STYROFOAM MEASURING 10 X 36 CM (*Figure 5b*).
- A FLEXIBLE BLACK COVER WITH A HOLE MADE IN THE CENTRE FOR THE ABS PIPE. THE COVER MUST HAVE A SLIGHTLY THICKER LOWER EDGE TO KEEP THE STYROFOAM BAND FROM SLIPPING (*Figure 5c*).
- A MULTI-PHER® TRAP LID (JOBIN AND COULOMBE, 1988) WITH A HOLE MADE IN THE CENTRE, OR A SIMILAR LID (26.5 CM IN DIAMETER WITH A SLIGHTLY DOWNWARD SLOPING EDGE) (*Figure 5d*).
- A BOLT AND A BUTTERFLY NUT (*Figure 5e*).

PREPARATION

- WITH A YELLOW CRAYON, DRAW A LINE 30 CM FROM ONE END OF THE BLACK ABS PIPE (*Figure 6*). THIS LINE IS INTENDED TO ENSURE THAT THE PIPE HAS BEEN DRIVEN 30 CM INTO THE GROUND AND THAT ALL THE POSTS ARE 90 CM TALL.
- WRITE THE SITE LOCATION AND THE TRAP PLACEMENT NUMBER ON THE STYROFOAM BAND AND THEN, MAKING SURE THIS INFORMATION IS POSITIONED ON THE INSIDE OF THE BAND, JOIN THE ENDS ON BOTH FACES USING 5-CM-WIDE MASKING TAPE (*Figure 7*). TO ENSURE MAXIMUM ADHESION OF THE MASKING TAPE, IT IS BEST TO PREPARE THE BANDS IN THE LABORATORY AT LEAST 1 WEEK IN ADVANCE. WE STRONGLY ADVISE AGAINST ASSEMBLING THE BANDS IN THE FIELD IN COLD WEATHER.

Figure 7

Joining the ends of the styrofoam band, outside (*left*) and inside (*right*), using masking tape. Although the tape shown here is 2.5 cm wide, the use of 5-cm-wide tape is strongly recommended to ensure better adhesion and standardize the method.



PHOTOS: C. MOFFET



Figure 8
Assembling the lid of the Multi-Pher® trap
on the cover of the ABS pipe.



PHOTO: C. MOFFET

Figure 9
Installing the styrofoam band
on the cover.



PHOTO: L. ST-ANTOINE

Figure 10
Installing the styrofoam band on the
ABS pipe.



PHOTO: L. ST-ANTOINE

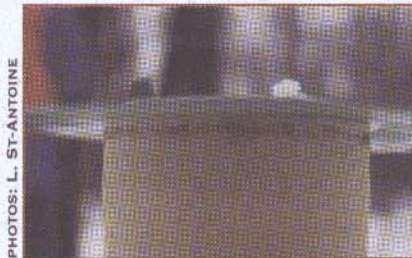
- THE MULTI-PHER® LID AND THE BLACK COVER FOR THE ABS PIPE MUST BE ASSEMBLED WITH A BOLT AND A BUTTERFLY NUT (*Figure 8*). THE MULTI-PHER® LID PROVIDES A SHELTER FOR FEMALE INSECTS AND PROTECTS THE STYROFOAM BAND FROM BAD WEATHER. IT HELPS TO PREVENT ICE ACCRETION WHICH WOULD HINDER EGG RECOVERY.

INSTALLATION

- USING A WOODEN Mallet, DRIVE THE PIPE INTO THE GROUND UP TO THE LINE. THE HEIGHT OF THE PIPE SHOULD BE EXACTLY 90 CM; IT WILL BE KEPT AT THE SAME SPOT FOR A NUMBER OF YEARS AND SO CAN BE ASSIGNED A PERMANENT NUMBER.
- INSTALL THE STYROFOAM BAND, PREVIOUSLY PREPARED IN THE LABORATORY, ON THE MOUNTED ABS PIPE COVER (*Figure 9*).
- INSTALL THIS ENTIRE ASSEMBLY ON THE POST (*Figure 10*), MAKING SURE THAT THE STYROFOAM BAND IS SUPPORTED ALONG THE ENTIRE PERIPHERY OF THE LID (*Figure 11*), IN ORDER TO PREVENT EGG-LAYING ON THE UPPER VERTICAL RIDGE. THIS WILL FACILITATE EGG COUNTING IN THE LABORATORY. TO STANDARDIZE THE METHOD, BE SURE TO POSITION THE JOINED PART OF THE BAND SO THAT IT IS FACING IN A NORTHERLY DIRECTION (*Figure 12*).

Figure 11

*Styrofoam band that is properly (left) and improperly (right) supported over the periphery of the lid. The eggs on the styrofoam bands were laid by fall cankerworms, *Alsophila pometaria*.*



PHOTOS: L. ST-ANTOINE

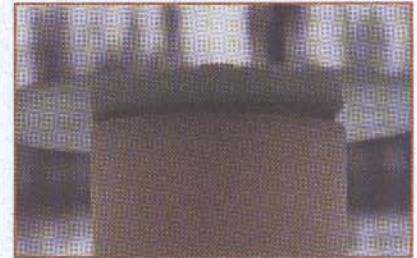


Figure 12

Joined part of the styrofoam band positioned so that it faces in a northerly direction.



PHOTO: L. ST-ANTOINE

Figure 13
Counting insect eggs on a light table.

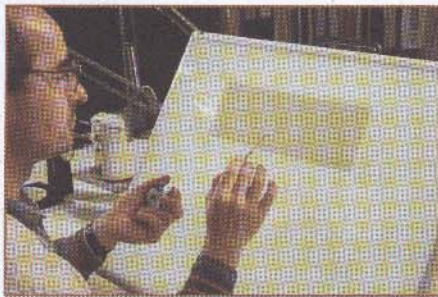


PHOTO: C. MOFFET

Figure 14
Bruce spanworm eggs trapped in the styrofoam (magnified 16X).

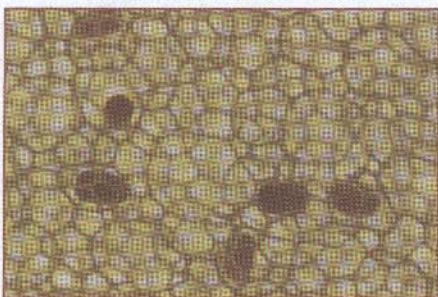


PHOTO: C. MOFFET

EGG RECOVERY AND OBSERVATIONS

- CUT THE STYROFOAM BANDS ALONG THE MASKING TAPE AND PLACE THEM IN A PRE-ADDRESSED ENVELOPE SO THAT THEY CAN BE SENT TO THE MONITORING AGENCY.
- IN THE LABORATORY, THE EGGS CAN BE COUNTED EASILY BY PLACING THE STYROFOAM BANDS ON A LIGHT TABLE (*Figure 13*). IF THERE ARE A LOT OF EGGS, A SUBSAMPLE SHOULD BE TAKEN, ENCOMPASSING ABOUT 10% OF THE SURFACE AREA OF THE STYROFOAM, THAT IS, THREE VERTICAL STRIPS MEASURING 1 X 10 CM; A SMALL GRID CAN BE USED FOR THIS PURPOSE. THIS MATERIAL HOLDS ALL THE EGGS THAT HAVE BEEN LAID, SINCE THEY ARE SOLIDLY ANCHORED INSIDE THE AIR CHAMBERS FORMED BY THE OVERLAPPING STYROFOAM FIBRES (*Figure 14*).

ALL THOSE WHO ARE INTERESTED CAN REQUEST A COPY OF A REPORT ON CHANGES IN THE LOCAL (e.g. A MAPLE STAND), REGIONAL (e.g. BEAUCÉ AREA) OR PROVINCIAL SITUATION. THIS INFORMATION MAY ENCOURAGE WOODLOT OWNERS, COMPANIES AND OTHER ORGANIZATIONS TO PARTICIPATE IN THE MONITORING PROGRAM BY INSTALLING BANDS OR AT LEAST COLLECTING EGGS AND MAILING IN THE STYROFOAM BANDS AT THE END OF THE SEASON. THIS OPERATION TAKES ONLY ABOUT 1 HOUR PER SITE. ANYONE WHO DECIDES TO HELP OUT IN THIS WAY CAN COMBINE THE WORK OF INSTALLING OR REMOVING THE STYROFOAM BANDS WITH OTHER FORESTRY ACTIVITIES. THIS COLLABORATION CAN REDUCE THE NUMBER OF SITE VISITS MONITORING TEAMS HAVE TO MAKE, ALLOWING THEM TO SPEND MORE TIME ON EGG COUNTS IN THE LABORATORY. IN ADDITION, A LARGER NUMBER OF SAMPLING SITES CAN BE COVERED, ENSURING MORE EFFECTIVE MONITORING. BY PARTICIPATING IN THIS EFFORT, COLLABORATORS CAN HELP TO RAISE PUBLIC AWARENESS OF ENTOMOLOGY ISSUES CONCERNING FORESTS IN THEIR REGIONS.

REFERENCE

JOBIN, L. J.; COULOMBE, C. 1988.
THE MULTI-PHER® INSECT TRAP. FOR. CAN.,
QUEBEC REGION, SAINTE-FOY, QUEBEC.
INF. LEAFL. LFC-24E. 8 P.

FOR MORE INFORMATION:

DR CHRISTIAN HÉBERT
CFS, LFC, 1055 du P.E.P.S., P.O. Box 3800
SAINTE-FOY, QUÉBEC G1V 4C7
Tel.: (418) 648-5896 Fax: (418) 648-5849
E-mail: chebert@cfl.forestry.ca

This publication is also available in electronic
format on the LFC Web site at:
<http://www.cfl.forestry.ca/4a.htm>.

CETTE PUBLICATION EST ÉGALEMENT DISPONIBLE EN
FRANÇAIS.

This publication is part of a new series that aims to distribute the results
of research conducted at the LFC in a concise and timely manner.

PLEASE send your comments and suggestions to:

PAMELA CHEERS, editor
LAURENTIAN FORESTRY CENTRE
1055 du P.E.P.S., P.O. Box 3800
SAINTE-FOY, QUÉBEC G1V 4C7
Tel.: (418) 648-5253 Fax: (418) 648-3354
e-mail: pcheers@cfl.forestry.ca