

Budworm Tracker: A Citizen Science Program



Start-up Package 2017

Authors: Emily Owens and Dr. Rob Johns



Table of Contents

<i>Start-up Instructions</i>	3
<i>Kit Checklist</i>	5
<i>Trap Assembly</i>	6
<i>Record of Samples</i>	8
<i>Contact Information</i>	11
<i>Introductory Letter</i>	12
<i>Survey</i>	13

We thank you for your time and for choosing to be a part of the program. Welcome to the 2017 Budworm Tracker team and happy tracking!



Start-up Instructions

PART 1 - GETTING YOUR TRAP READY

1. **Program duration:** June 12th to August 31st, 2017. Please set up your trap on or before June 12.
2. **Equipment:** Ensure all items are in your Budworm Tracker Kit (see checklist pg. 5).
3. **Participant information:** Fill out the 'Contact Information' sheet (pg. 12).
4. **Assembly:** Prepare your trap (see assembly instructions pg. 6 & 7).
5. **Hanging your trap:** Choose a location that is convenient for you to visit. Ideally, this would be near your home, yard, or woodlot and on an accessible lower branch of a spruce or fir tree (see assembly instructions for more details).
6. **Registering your trap (optional):** You may register on our website or download the Budworm Tracker App on your Android or Apple device. If you would like to check in as you visit your trap, the QR code on your trap will take you directly to your account on the website.
 - *Note:* If you participated last year and were registered online, you can use your same login information. If you are new to the program you will be prompted to enter your trap information (name, location of trap, trap ID). After the initial set-up, you will only need your username and password to login.

PART 2 - CHECKING YOUR TRAP

1. **Checking traps:** To get the most value from your trap, please do your best to adhere to your chosen trap-checking schedule and keep it consistent. At least once per week is the minimum; however, the more frequently you check, the more interesting your data will be!
2. **Collections:** If there are moths in your trap, please clearly fill in the label on one of the paper bags provided and place all the trap contents inside. Place the bag into a freezer as soon as you can to preserve them (their DNA breaks down if they are left in warm conditions).
3. **Reporting:** Once you finish checking your trap, fill in the data sheets provided (pg. 9-12). If you feel so inclined, we encourage you to count your moths, or you can just put a check mark to confirm you checked the trap on a given day. It's important that we know when you checked and whether or not you found moths. Zeros count!
4. **Remember:** ZEROS COUNT and are extremely valuable data! For us, knowing when there are no moths in your trap is just as important as knowing when they are there.
 - *Note:* If you are reporting via Website and Smartphone App, please still write your information on the provided data sheets, just to be sure the information doesn't get lost.



Start-up Instructions

PART 3 - SENDING YOUR SAMPLES BACK TO US

1. In the pre-labelled mailing envelope add
 - a. Your 'Contact Information' sheet
 - b. Your 'Record of Samples' data sheets
 - c. Your "Survey" answers
 - d. The sealed zipper bag with all of your collected samples

PART 4 – STORING YOUR TRAP

1. If you are participating again next year:
 - a. Throw your pheromone lure and insecticidal strip in the garbage.
 - b. Wash your trap with warm soapy water and store in a cool and dry place until next year (we will send new lures, data sheets, etc.).

If you decide that you will not participate again: We will cover the return mailing costs for your kit. All you have to do is put everything (including trap, data sheets, and samples) into the original box and put the return address sticker on the outside. Drop this off at the nearest Canada Post and use a Cash On Delivery (COD) method, which will be refunded to you by Canada Post once we receive the samples.

Important Notes:

*****Every trap counts, whether it is full of moths or completely empty throughout the season!**

- We will never provide your Contact Information to any outside agency. It will be used only to help us pinpoint where your trap was placed and to contact you about the project.
- If, for any reason, you cannot put your trap up this season but have received it, please let us know as soon as possible.
- If for any reason, you cannot check your trap during a particular week, see if a neighbour, family member or friend can check it for you. The data is important!
- If you caught zero moths all season, we still want your paperwork (especially when and how often you sampled).
- We will post on our website's blog and Facebook throughout the season to update you on what's happening throughout the tracking season and to give you lots of valuable information.
- Your trap ID number is unique and is found on the inside lid of your kit and below the QR code on the trap itself (see image below). This number identifies your trap's data, so always make sure to completely fill in your information on the paper bags with the correct trap number.



Kit Checklist

FULL KIT

<input type="checkbox"/>	Start-up Package
<input type="checkbox"/>	Contact Information Sheet
<input type="checkbox"/>	Record of Samples
<input type="checkbox"/>	Freezer bag
<input type="checkbox"/>	Paper bags (40)
<input type="checkbox"/>	Vinyl Gloves
<input type="checkbox"/>	Pheromone Lure
<input type="checkbox"/>	Insecticidal Strip
<input type="checkbox"/>	Wooden Stick for moth removal
<input type="checkbox"/>	Trap (pre-assembled)
<input type="checkbox"/>	Return envelope
<input type="checkbox"/>	Pencil

REFILL KIT

<input type="checkbox"/>	Start-up Package
<input type="checkbox"/>	Contact Information Sheet
<input type="checkbox"/>	Record of Samples
<input type="checkbox"/>	Freezer bag
<input type="checkbox"/>	Paper bags (40)
<input type="checkbox"/>	Vinyl Gloves
<input type="checkbox"/>	Pheromone Lure
<input type="checkbox"/>	Insecticidal Strip
<input type="checkbox"/>	Wooden stick for moth removal
<input type="checkbox"/>	Return envelope

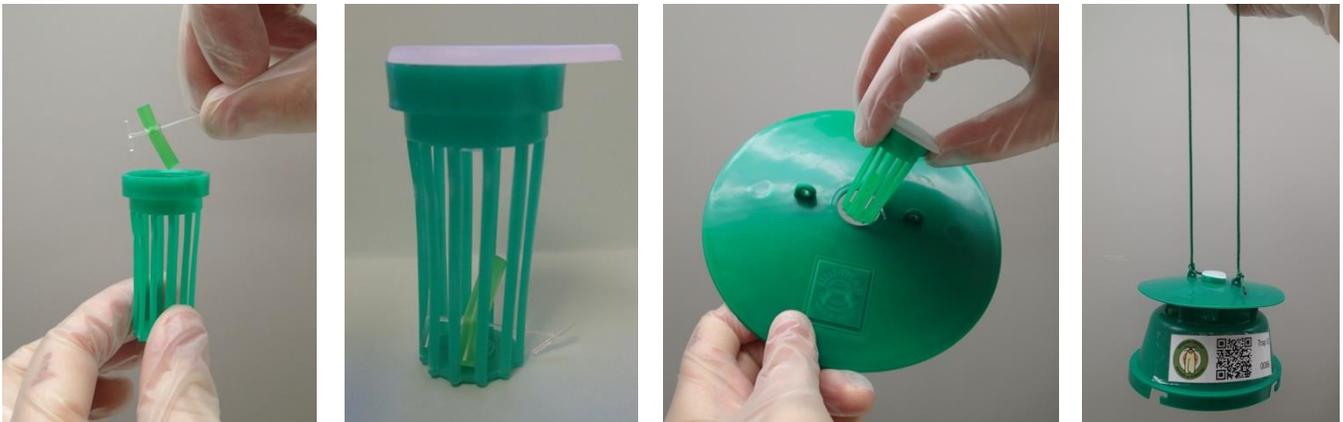


Trap Assembly

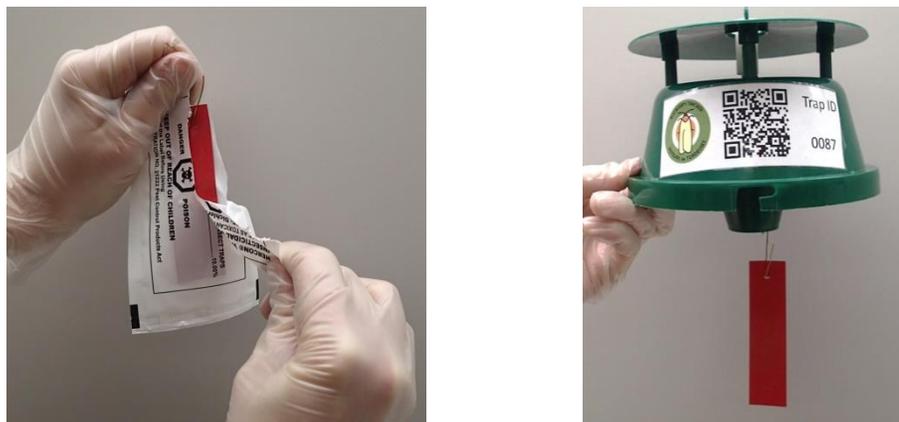
Trap Components

- Pre-assembled trap
- Pheromone lure
- Pre-installed wire
- Insecticidal strip

1. With vinyl gloves, place the pheromone lure in the lure basket. Carefully put the cap on, the basket is very fragile. Snap the lure basket onto the lid of the trap. Do not touch the pheromone with bare hands as it can decrease the lure's effectiveness.



2. Open the insecticidal strip and place the insecticidal strip in the wire at the base of the funnel.



Trap Assembly

3. Connect the funnel and the bucket together with a twist.



4. Trap set-up

- The trap needs to be in a wooded area
- It needs to be hung on a tree at eye level
- It should be placed somewhere you are willing to access for the tracking season
- It needs to be at least 5 meters into the tree line and,
- It needs to be away from any lights that are left on overnight.



Contact Information

Name	
Trap ID	
Telephone Number	
Email	
Mailing Address	
Trap Address (if different from above)	
Trap Collection Frequency	
Set-up Date	
Tear-down Date	
Do you wish to participate next year?	Yes No (Circle Answer)





The Budworm Tracker

A Citizen Science Program

budwormtracker.ca

Dear Budworm Tracker Participant:

Budworm Tracker has been extremely successful in monitoring and detecting spruce budworm moth movements in northeastern America and continues to play a pivotal role in revolutionizing how we collect data. We simply could not do it without you and the other hundreds of citizen scientists! With a new phase of data collection emerging, the use of citizen science projects has provided both researchers and members of the public the opportunity to work together to collect scientific information and better understating nature and its ecology.

As the spruce budworm outbreak spreads from Quebec into the neighboring provinces and states, we want to make sure the Budworm Tracker Program is best suited and designed to meet the needs of its citizen scientists as well as meeting our scientific objectives. As you know, you're one of the hundreds of citizen scientists across eastern Canada and Maine monitoring spruce budworm populations. As researchers, we're very curious to better understand what motivates you to participate and if there's more we could be doing as program coordinators to make this citizen science project more valuable to you.

To learn more about your interest and participation, we've included a survey with this year's information package. We would ask that you take 5 to 10 minutes to answer our survey. *All your personal information will remain confidential and in no way are you obligated to fill out this survey. It's completely optional and will have no bearing on whether you can participate in Budworm Tracker.* The survey has four sections: (1) demographics; (2) background; (3) knowledge; and (4) motivations.

With the information we receive from your surveys, we intend to make as many feasible changes and improvements to the program that we can in the near future. We will publish our findings in peer-reviewed journals so other citizen science programs and insect monitoring programs can have a better understanding of what the citizen scientists want. Thank-you for your help and we look forward to receiving your surveys! You can send your surveys back to us when you return your trap catches and data sheets in the fall.

Best regards and thank-you kindly,

Emily Owens
Project Manager

SECTION 1

1) What is your age?

2) What is your gender?

- a. male
- b. female
- c. prefer not to say

3) Where do you reside?

- a. rural area/community
- b. urban city

4) What is your highest level of education you have completed?

- a. no schooling completed
- b. some high school, no diploma
- c. currently enrolled in high school
- d. high school diploma or GED
- e. currently enrolled in college or university
- f. some college or university, no degree
- g. community college diploma or certificate
- h. bachelors degree (college degree in the USA)
- i. currently enrolled in graduate program
- j. some postgraduate study
- k. masters degree
- l. doctoral degree
- n. professional degree (i.e. M.D., D.D.)
- o. other: _____

5) Which of the following best describes your work situation?

- a. official or manager (i.e. departmental managers, executives, supervisors)
- b. professional (i.e. chemists, physicians, teachers, engineers)
- c. technician (i.e. surveyors, computer programmers, dental assistants)
- d. sales worker (i.e. cashiers, sales persons, real estate agents, brokers)
- e. office and clerical (i.e. bookkeepers, receptionist, legal assistants, typists)
- f. trades or craft worker (i.e. repairs, mechanics, stationary engineers)
- g. operation (i.e. apprentices, painters, truck drivers)
- h. laborer (i.e. groundskeepers, loading and pulling operations)
- i. service worker (i.e. firefighters, public transport, custodians)
- j. homemaker
- k. unemployed
- l. retired

SECTION 2

1) Is this the first citizen science program you've been involved with?

- a. yes
- b. no

2) Do you have any previous experience with scientific research?

- a. yes
- b. no

3) Had you ever heard about spruce budworm before joining the Budworm Tracker?

- a. yes
- b. no

4) Did you know about the threat of budworm prior to joining the Budworm Tracker?

- a. yes
- b. no

5) Do you have memories of the previous outbreak that occurred during in the 1970's and 1980's?

- a. yes
- b. no

SECTION 3

1) Spruce budworm is a native insect.

- a. yes
- b. no

2) Spruce budworm eats hardwood trees (i.e. maple trees)

- a. yes
- b. no

3) Spruce budworm has threatened the forest in the past

- a. yes
- b. no

4) Spruce budworm moths can defoliate trees

- a. yes
- b. no

5) Spruce budworm has the potential to kill balsam fir and spruce trees.

- a. yes
- b. no

SECTION 4

1) Why did you decide to trap spruce budworm?

2) Which of the following best describes your motivation to become a Budworm Tracker?

select all that apply

- a. to contribute (I am excited to contribute to original scientific research)
- b. learning (it helps me learn about insects and forestry)
- c. discovery (I can monitor budworm in ways that it has never been done before)
- d. community (I can meet other people with similar interests)
- e. teaching (I find it is a useful resource for teaching other people like my grandkids)
- f. beauty (I enjoy looking at beautiful forests and want to do my part in protecting it)
- g. fun (I have a lot of fun going to my trap and checking it)
- h. economic (I believe this program will be good for the economy)
- i. helping (I am happy to help)
- j. insects (I am interested in entomology, the study of insects)
- k. forestry (I am interested in forestry)
- l. science (I am interested in science)
- m. other: _____

3) Do you trap by yourself or do you do it with someone?

- a. by myself
- b. with my children
- c. with my grandchildren
- d. I do it for my employer
- e. I do it with my students
- f. I do it with my summer crew (i.e. summer camp or summer students)
- g. I do it with my partner (i.e. husband, wife, boyfriend, girlfriend)
- h. I work for a natural resources company and they've asked me to trap at work
- i. other: _____

4) Would you continue being a tracker if this program continued into future years?

- a. yes
- b. no

5) What is the one most important reason why you became a Budworm Tracker?

SECTION 4 CONTINUED...

I AM A BUDWORM TRACKER BECAUSE...

1) The forest is important to me

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

2) I am interested in helping preserve forests for future generations

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

3) I want to preserve forests for my enjoyment

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

4) I want to protect our forests from budworm outbreaks

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

5) I want to use it to engage my family and friends in the outdoors

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

6) I want to use this opportunity to spend more time outdoors

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

7) I want to learn more about insects

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

8) I want to learn more about spruce budworm

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

SECTION 4 CONTINUED...

I AM A BUDWORM TRACKER BECAUSE...

9) I want to learn more about forestry

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

10) I want to learn more about how budworm impacts our forests

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

11) I want to participate as a way of engaging with more researchers

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

12) I want to use this program as an opportunity to spend more time with my family

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

13) I want to use this program as a way to engage more with my students, colleagues, etc.

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

14) I feel that I am contributing to something that is important to me

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

15) I want to participate in research program that is important to my region

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

16) As a citizen, I feel there is value in participating in this program

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

SECTION 4 CONTINUED...

I AM A BUDWORM TRACKER BECAUSE...

17) I want to work in a field related to forestry or spruce budworm

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

18) I currently work in a field related to forestry or spruce budworm

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

19) I previously worked in a field related to forestry or spruce budworm

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

20) I have economic investments that might be affected by a spruce budworm outbreak

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

21) I don't have any investments, but am concerned about economic impact in my region

1	2	3	4	5	6	7	8
strongly agree	agree	somewhat agree	undecided	somewhat disagree	disagree	strongly disagree	not applicable

Do you have any comments or additional thoughts you'd like to add?
