Project Stink-be-Gone "2" Virtual Training

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Project website:
https://shrewsburylab.weebly.com/project-stink-be-gone-2.html

Agenda

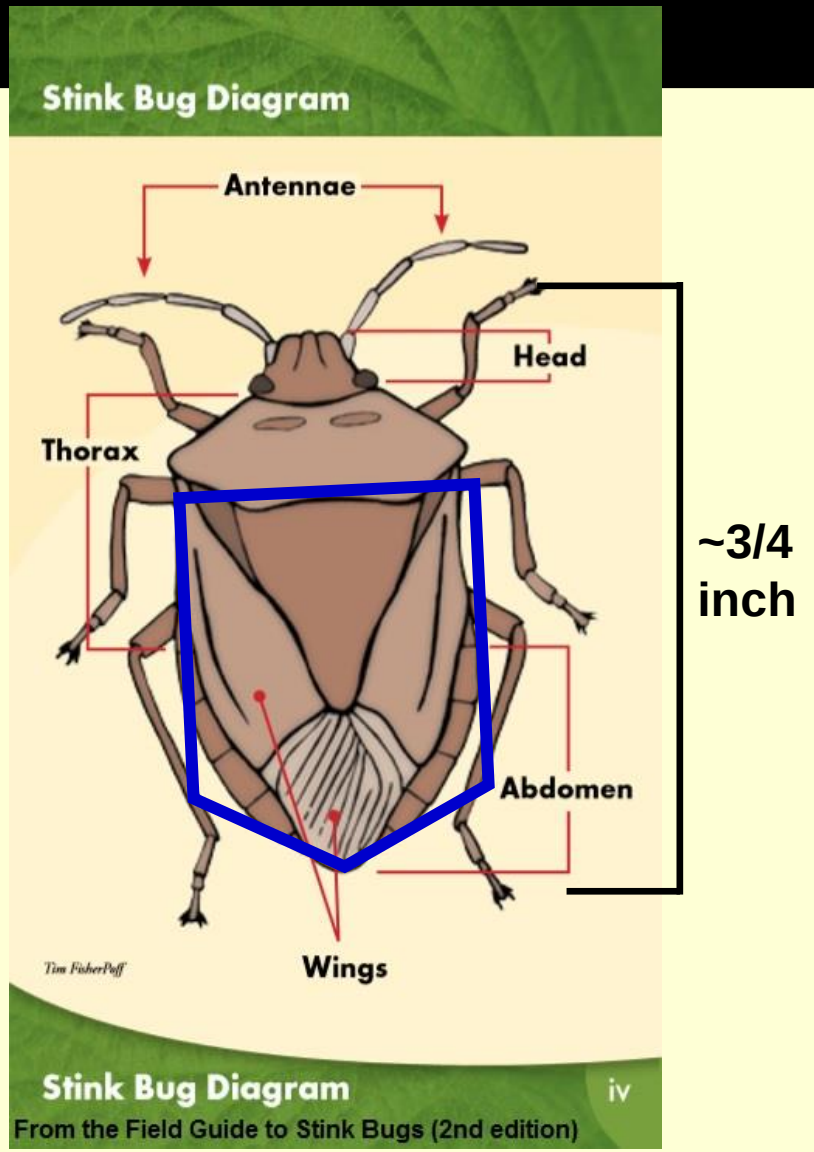
- **Pre-Quiz**
- **Background**
  - -Stink bugs
  - -Parasitic wasps
  - -Insect egg ID
  - -Invasive pest alert
- **Post-Quiz**
- **Insect Egg Collection**
  - -Where/how to search
  - -Egg removal
- **Recording Data**
  - -GPS coordinates
  - -Host plant ID
- **Shipping Materials**
  - -Fedex Express
- **Communication**
  - -Project webpage
  - -Email
  - -YouTube
  - -Instagram

Pre-Quiz

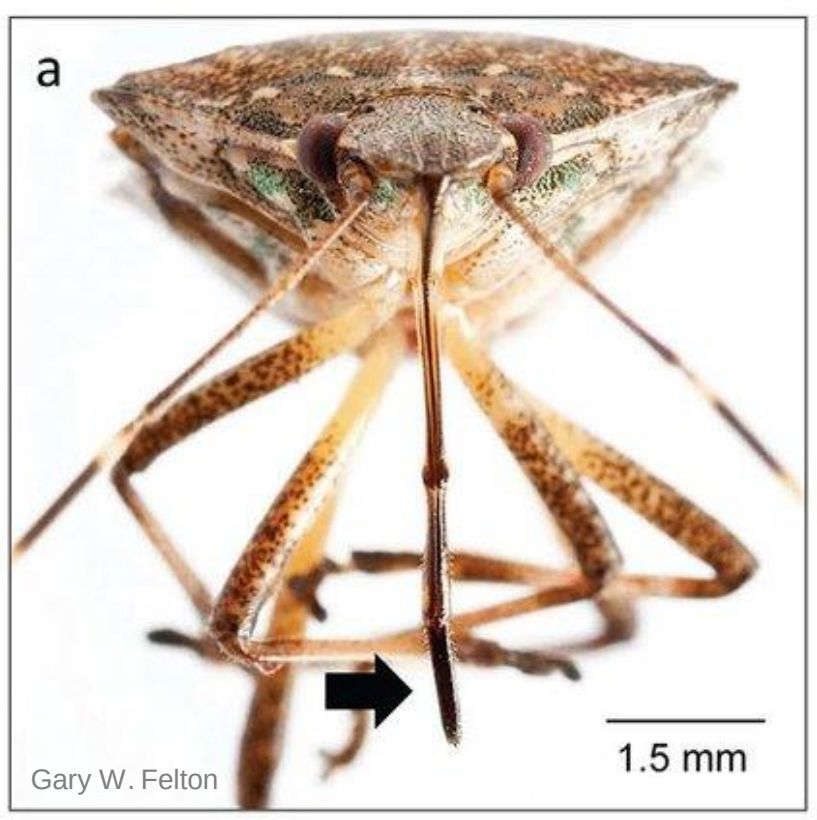
What are stink bugs?

Order: Hemiptera
Family: Pentatomidae

- **Shield-shaped body**
- **Produce an odor when threatened**
- **Possess piercing-sucking mouthparts**
- **Herbivorous & predatory species**



Piercing-Sucking Mouthparts



Brown Marmorated Stink Bug (BMSB)

- *Halyomorpha halys*
- **Invasive pest from North East Asia**
- **First detected in U.S. in PA in the mid-1990's**
- **Now in 46 States**
- **Over 200 host plants**
- **2 generations/year in MD (one in June, one in late July)**

Managing Stink Bugs- Biological Control

- **Natural enemies- Predators and <u>Parasitic wasps</u>**

- **Stink Bug parasitic wasps:**
  - **Insert their eggs inside stink bug eggs**
  - **Specialist and generalist species**

  →Increasing parasitic wasp populations
  →Increases biological control of BMSB
  →Decreases BMSB populations

***Anstatus reduvii* on a BMSB eggs.**

Parasitic Wasps- Unsung Heroes

- A very important source of biological control
- They do not sting humans!
- Endo- and Ectoparasitoids
- Parasitic wasp for almost every pest insect
- Very sensitive to insecticides
- They love nectar!

Parasitic Wasp on Stink Bug Eggs

Parasitic wasp: *Trissolcus* sp.

Supporting Parasitic Wasps

- **Reproduction- <u>host insect eggs</u>**
- **Generalist parasitic wasps- More than one type of insect host**

- ***Anastatus reduvii***
- **Specifics of host breadth unknown**

Female *Anastatus reduvii*

Project Stink-be-Gone “2”

What types of insect eggs do BMSB parasitic wasps use to <u>reproduce</u>?

Collect	**Collect any and all insect eggs.**
Rear	**Place insect eggs in growth chambers to rear out nymphs, larvae, and/or parasitic wasps.**
Identify	**Identify eggs and what emerges.**

Types of Insect Eggs- Starting in March

ASSASSIN BUGS (Bark & Leaves)

Wheel Bug Eggs

***Zelus* sp. Eggs**

LEAF-FOOTED BUGS (Leaves)

PREYING MANTIDS (Bark)

Carolina Mantis Egg Sack (Ootheca)

Chinese Mantis Egg Sack (Ootheca)

INVASIVE

ALERT!

Spotted Lanternfly- (Eggs) Sept.-April

PEST

Wisconsin Horticulture Extension

Virginia Cooperative Extension

Do NOT collect spotted lanternfly eggs

If eggs, nymphs, or adults found contact:

MD Department of Agriculture at

DontBug.MD@maryland.gov

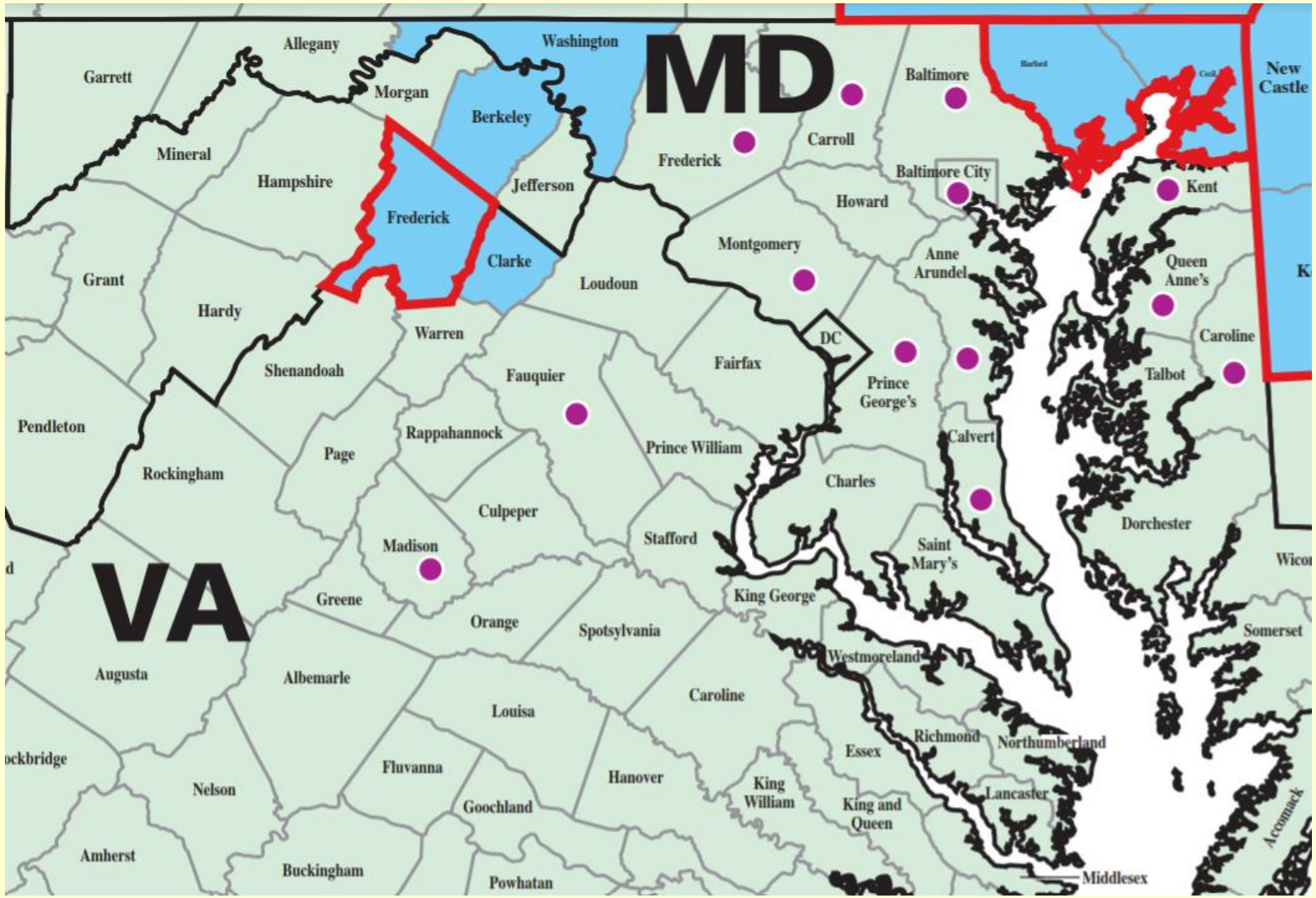
or

(410) 841-5920

Bartlett Tree Experts

Pennsylvania Department of Agriculture

Spotted Lanternfly in MD



- **Washington Co.**
- **Montgomery Co.**

Individual finds of Spotted Lanternfly. No infestation present.

Spotted Lanternfly infestation present.

Internal state quarantine areas.

https://nysipm.cornell.edu/environment/invasive-species-exotic-pests/spotted-lanternfly/spotted-lanternfly-ipm/introduction-native-range-and-current-range-us/

Types of Insect Eggs- Starting in May

BEETLES (Leaves)

Ladybird Beetle (Ladybug) Eggs

Elm Leaf Beetle Eggs

BUTTERFLIES (Leaves)

Orange Striped Oakworm Eggs

Yellow-Necked Caterpillar Eggs

Green Striped Mapleworm

Types of Insect Eggs- Starting in June

MOTHS (Bark & Leaves)

Polyphemus Moth Eggs

Imperial Moth Eggs

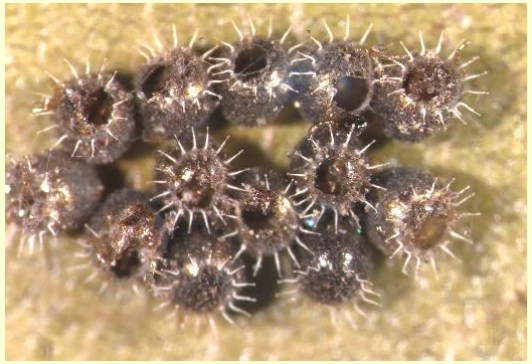
Large Yellow Underwing Moth Eggs

STINK BUGS (Leaves)

Brown Marmorated Stink Bug Eggs

***Holcostethus limbolarius* Eggs**

Spined Soldier Bug Eggs



Harlequin Bug Eggs

Post-Quiz

Quiz Answers

7.) **Are all species of stink bugs pests (“bad”)?**

Answer: **No**

8.) **What type of mouthparts do stink bugs have?**

Answer: **Piercing-sucking**

9.) **How do stink bug parasitic wasps parasitize?**

Answer: **Wasp parasitizes stink bug eggs.**

10.) **Where can insect eggs be found on a plant?**

Answer: **All of the above (underside and topside of leaves, and trunk and branch bark)**

Quiz Answers

1.) Assassin bug (Wheel bug)

4.) Spotted lanternfly

2.) Stink bug (BMSB)

5.) Mantis (Carolina mantis)

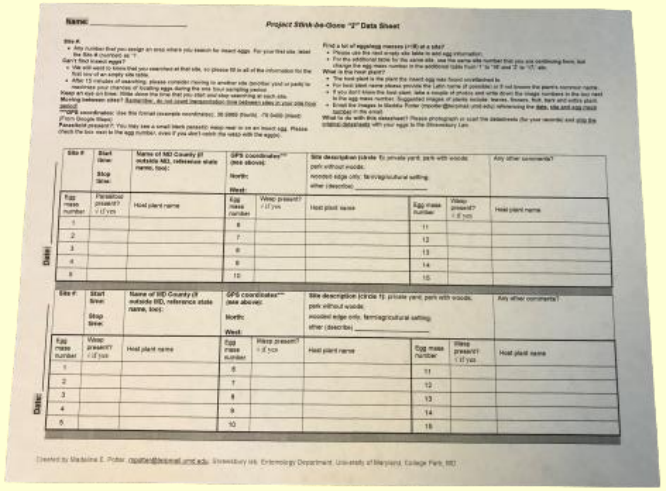
3.) Beetle (Ladybird beetle)

6.) Butterfly (Green striped mapleworm)

Collecting Insect Egg Masses

Materials Needed and Provided:

- **Soft cooler**
- **Ice pack**
- **Petri dishes**
- **Rubber bands**
- **Data sheet**



*Writing tool

*Scissors

*Smart phone or camera

*Paint scraper/scraping tool

Where to Search for Eggs

Locations:

- Backyard/ front-yard
- Neighborhood
- Parks
- Woods

Plant Parts:

- Bark- trunk and branches
- Leaves- top and bottom

Plants:

- Trees
- Shrubs
- Flowers
- Grass

How to Search for Eggs

- Crouch/kneel to look up
- Look for shadows/ discolorations on leaves
- Flip leaves over
- Scan bark

Crouch/kneel

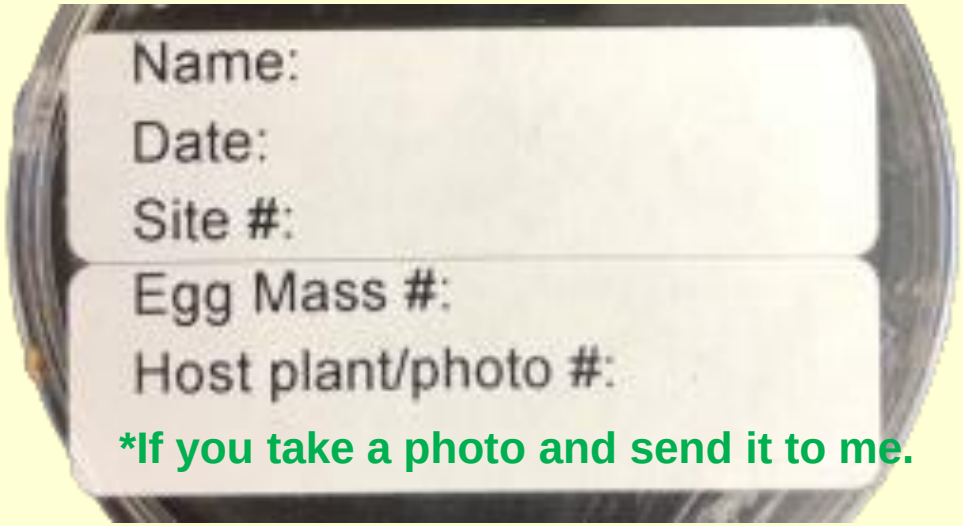
Avoid craning neck & back

How to Search, Find, and Collect Insect Eggs

Processing Found Eggs

Small vs. large sized petri dishes

Fill out **ALL** the information on each petri dish label

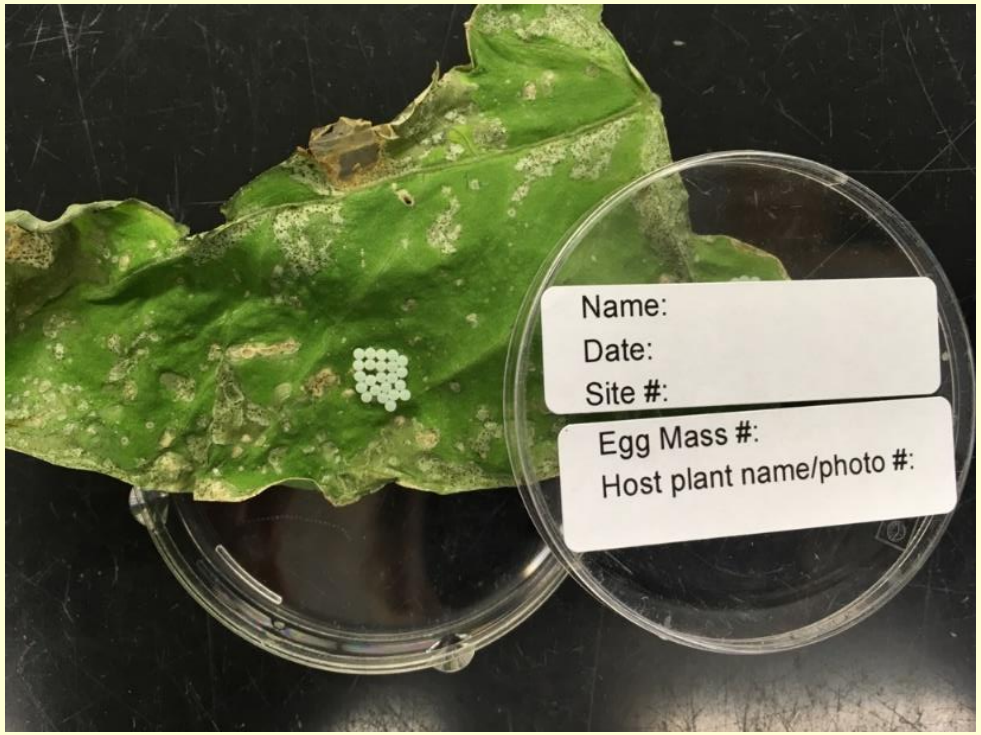


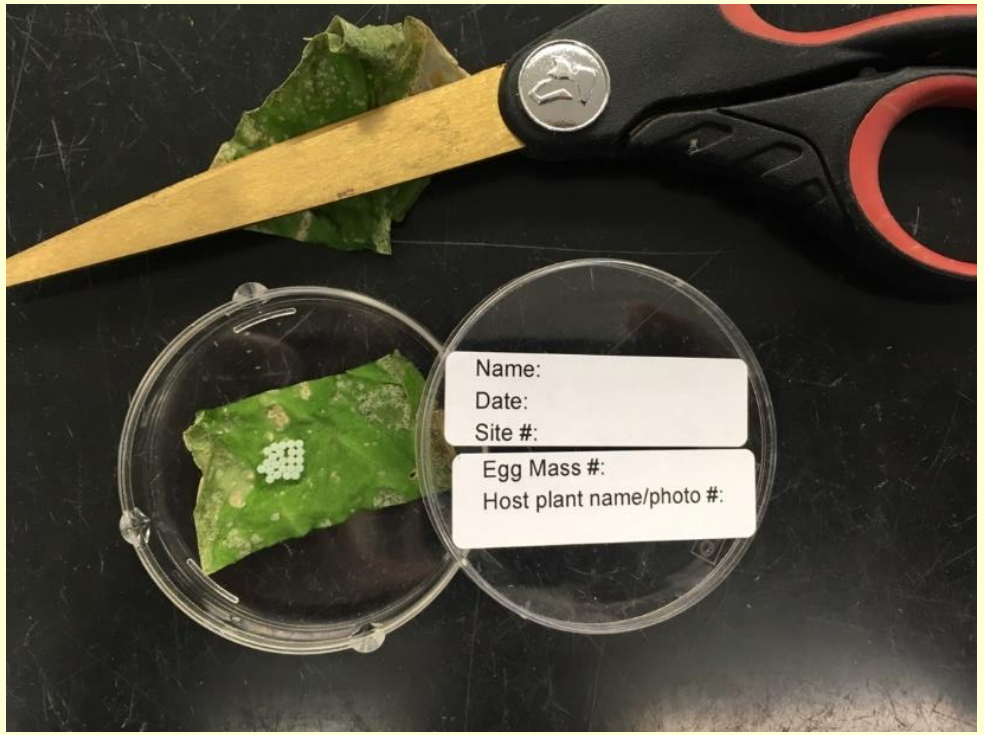
*If you take a photo and send it to me.

Place petri dishes in your soft cooler with the frozen ice pack.

Plant Material Too Large?

Cut, do not rip the leaf because the egg mass is less likely to pop off when using scissors.





Photos by Rebeccah Waterworth

Data Sheet

Name: _____

Project Stink-be-Gone "2" Data Sheet

Site #:
- Any number that you assign an area where you search for insect eggs. For your first site, label the Site # (number) as '1'.

Can't find insect eggs?
- We still want to know that you searched at that site, so please fill in all of the information for the first row of an empty site table.
- After 15 minutes of searching, please consider moving to another site (another yard or park) to maximize your chances of locating eggs during the one hour sampling period.

Keep an eye on time: Write down the time that you start and stop searching at each site.

Moving between sites? Remember, do not count transportation time between sites in your one hour period!

***GPS coordinates:** Use this format (example coordinates), 38.9889 (North), -76.9409 (West) (From Google Maps)

Parasitoid present?: You may see a small black parasitic wasp near or on an insect egg. Please check the box next to the egg number, even if you don't catch the wasp with the egg(s).

Find a lot of eggs/egg masses (>15) at a site?
- Please use the next empty site table to add egg information.
- For the additional table for the same site, use the same site number that you are continuing from, but change the egg mass number in the additional table from '1' to '16' and '2' to '17,' etc.

What is the host plant?
- The host plant is the plant the insect egg was found on/attached to.
- For host plant name please provide the Latin name (if possible) or if not known the plant's common name.
- If you don't know the host plant, take a couple of photos and write down the image numbers in the box next to the egg mass number. Suggested images of plants include: leaves, flowers, fruit, bark and entire plant.
- Email the images to Maddie Potter (mpotter@terpmail.umd.edu) referencing the date, site and egg mass number in the email.

What to do with this datasheet? Please photograph or scan the datasheets (for your records) and ship the original datasheets with your eggs to the Shrewsbury Lab.

Date: _____

Site #:	**Start time:** **Stop time:**	**Name of MD County (if outside MD, reference state name, too):**	**GPS coordinates*** (see above):** **North:** **West:**		**Site description (circle 1):** private yard; park with woods; park without woods; wooded edge only; farm/agricultural setting; other (describe) _____			Any other comments?
Egg mass number	Wasp present? √ if yes	Host plant name	Egg mass number	Wasp present? √ if yes	Host plant name	Egg mass number	Wasp present? √ if yes	Host plant name
1			6			11		
2			7			12		
3			8			13		
4			9			14		
5			10			15		

Recording Data

Any number you assign an area where you search. First site # label as '1'.

Date: _____

Site #:	Start time: Stop time:	Name of MD County (if outside MD, reference state name, too):	GPS coordinates*** (see above): North: West:		Site description (circle 1): private yard; park with woods; park without woods; wooded edge only; farm/agricultural setting; other (describe) _____			Any other comments?
Egg mass number	Parasitoid present? √ if yes	Host plant name	Egg mass number	Wasp present? √ if yes	Host plant name	Egg mass number	Wasp present? √ if yes	Host plant name
1			6		*Acer rubrum*	11		
2			7		Red maple	12		
3			8			13		
4			9			14		
5			10			15		

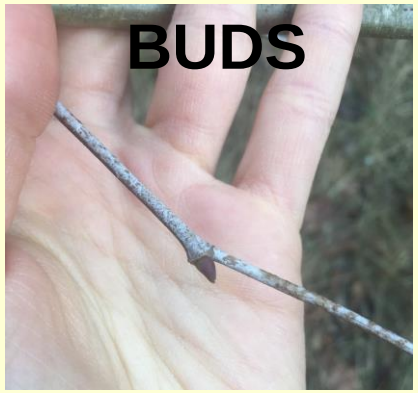
Scientific/Latin name preferred, but you may put common name. If plant ID unknown, take photos of the plant.

A tiny black parasitic wasp may be on or near an insect egg. Put a checkmark if you see one/capture one with the egg(s).

Host Plant Identification-

Host plant name

Email Maddie Photos



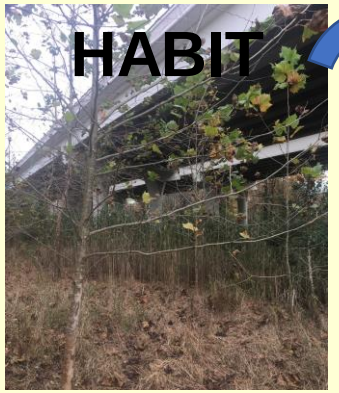


*Photo of entire plant

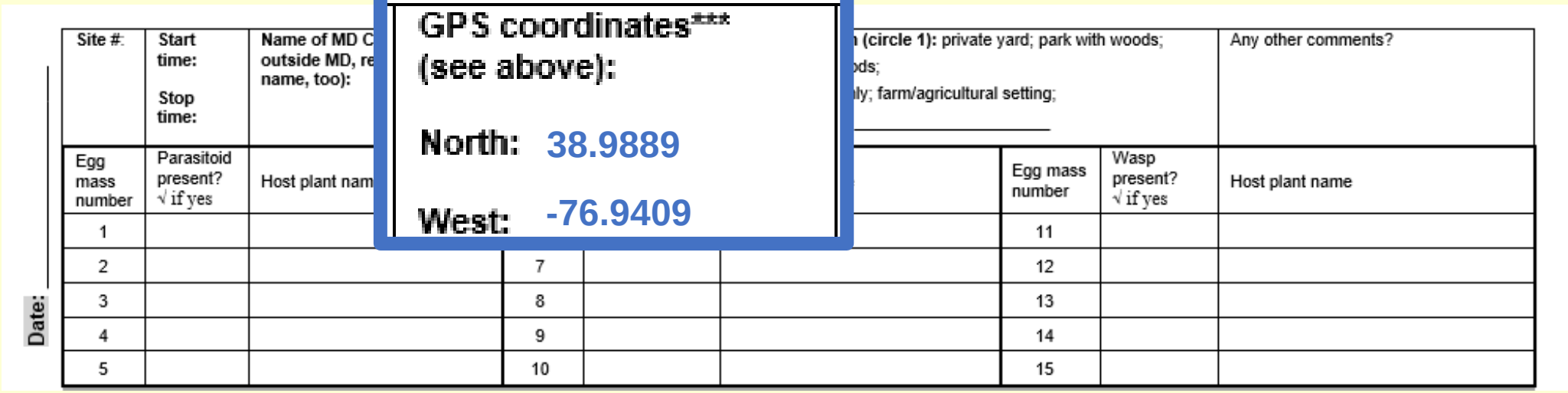
Google Photos

Using Google Lens with Google Photos App tutorial:
https://www.youtube.com/watch?v=ma-SVsnQepk

PlantNet

PlantNet App tutorial:
https://www.youtube.com/watch?v=Gn53wzpDxlQ

GPS Coordinates- App for Smartphones or Website to Use at Home



Date: _____

Site #:	Start time: Stop time:	Name of MD C… outside MD, re… name, too):				…(circle 1): private yard; park with woods; …ods; …ly; farm/agricultural setting;			Any other comments?
Egg mass number	Parasitoid present? √ if yes	Host plant nam…					Egg mass number	Wasp present? √ if yes	Host plant name
1							11		
2			7				12		
3			8				13		
4			9				14		
5			10				15		

GPS coordinates*** (see above):

North: 38.9889

West: -76.9409

Google Maps

>Google Maps App tutorial:
https://www.youtube.com/watch?v=_MT4_U1MzNA

>Google Maps Website tutorial:
https://www.youtube.com/watch?v=2yOX7soSPeQ

Shipping Eggs

Materials Needed and Provided:

- **Shipping box**
- **Prepaid shipping label**

*Packing tape

*Writing tool

*Paper towels and/or
other packing materials

How to Pack your Shipping Box

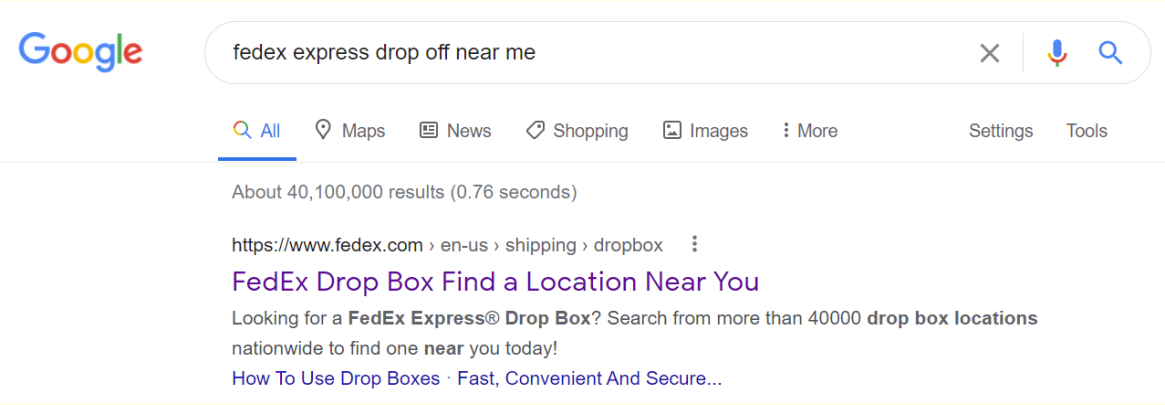
When to Fedex Express Ship

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Ship	✓	✓	✓	Not preferred (for shipping)	Not preferred (for shipping)	Not preferred (for shipping)	✓

***Do not wait longer than <u>1 week</u> from collecting eggs to shipping eggs.**

Where to Fedex Express Ship

Only use FedEx Express (orange) shipping times, NOT FedEx Ground (green).



Drop-Off Options:

1.) Fedex Building

2.) Orange Fedex Express Drop Box

***If the second layer of the shipping label (you stick onto the box) falls off, bring this label along with your shipping box to a Fedex store counter.**

Project Timeline

February/March	**Receive collection/shipping materials**
March – August	**Collect insect eggs (at least 1 hour/week)**

****Choose a day Sunday-Wednesday to ship found insect eggs each week.**

Project Info/Communication

Website

- **Project Materials:**
  1. Data sheet
  2. Training Powerpoint
  3. Common MD insect eggs guide
  4. Project infographic
  5. Recruitment Powerpoint
- **Contact form**
- **Supplemental Info**
  - BMSB resources
  - BMSB & parasitic wasp videos

Email

- **Maddie sends out monthly updates and tips**
- **Questions/reaching out to Maddie**
- **Communicating with fellow Project Stink-be-Gone “2” volunteers?**

Project Webpage

https://shrewsburylab.weebly.com/project-stink-be-gone-2.html

YouTube

Madeline Potter Loves Bugs

2 subscribers

CUSTOMIZE CHANNEL | MANAGE VIDEOS

HOME | VIDEOS | PLAYLISTS | CHANNELS | DISCUSSION | ABOUT

Uploads

▶ PLAY ALL

Parasitic Wasp on Stink Bug Egg Mass

6 views • 1 week ago

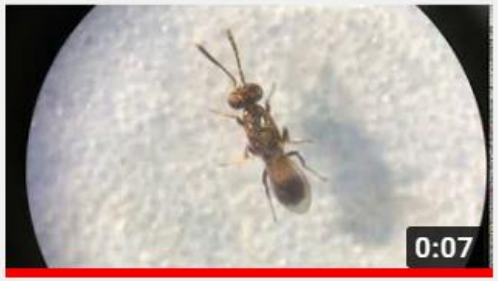
How to Search, Find, and Collect Insect Eggs

15 views • 2 weeks ago

CC

Anastatus reduvii on Halyomorpha halys egg mass

7 views • 2 weeks ago



Anastatus reduvii (female)

3 views • 2 weeks ago

Instagram

maddielovesbugs Follow •••

2 posts 14 followers 20 following

Madeline Potter

Graduate Student with Shrewsbury Lab, Entomology Department, University of Maryland <- parasitic wasp youtube.com/channel/UCszGDE8tP_wzm2jP19hhCug

- **Project Stink-be-Gone “2” updates**
- **Cool insect photos and videos**
- **Cool plant photos and videos**

Acknowledgements

Nancy Harding – Shrewsbury Lab Manager

Adelaide Figurskey - Shrewsbury Lab Technician

Cassie Herman – Shrewsbury Lab Technician

Dr. Michael Raupp - Emeritus Professor & Extension Specialist, Department of Entomology, University of Maryland,

Acknowledgements

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USDA-NIFA SCRI 2016-51181-25409

Questions?

Email contact:
mpotter@terpmail.umd.edu