

# **Assessment of HWA Sistens 2014-2015 Winter Mortality and Progreiens Recovery**

**Tom McAvoy, tmavoy@vt.edu**

**Virginia Tech**

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## **Purpose of this Assessment**

Determine mortality of HWA sistens during the winter of 2014/2015 in the eastern U.S. and subsequent recovery of the progreiens generation. This information will help those working with HWA to plan for the next year and develop a reliable model to predict the effect of cold on HWA.

## **When**

1. Mortality assessment will be done from 1 – 20 February 2015.
2. Progreiens recovery will be assessed by comparing the adult sistens density (mid-February to March 2015) to the progreiens density (late May to June 2015).

## **I. HWA mortality assessment, 1 to 20 February 2015**

1. If mortality assessment was done in late winter 2014 then use the same sites for this sample as were used previously.
2. New sites in addition to the sites assessed last year can be used.
3. Each collection site should be no more than 0.5 acres. Record site coordinates.
4. Do not collect HWA from insecticide treated trees.
5. Cut infested branches 1 – 2 ft. in length with ample new growth. Cuttings should come from several trees.
6. Collect enough branches to have well over 200 HWA to examine at each site.
7. Be careful not to crush branches. This may damage or kill HWA.
8. HWA should be examined within 48 h after field collection. Keep in a cool location.
9. Use a dissecting microscope to examine HWA for viability.
10. Examine HWA only on new growth.
11. Record all data on Form 1 and count a minimum of 200 live + dead HWA. The more you count the better the data is.

12. How to determine if HWA is alive or dead:

1. HWA nymphs are small, less than 0.4 mm in length; with wool only along lateral edge of nymph (Fig. 1). Every year 50 to 75% of HWA sistens die naturally in the summer or fall. These are the first instar nymphs seen in mid to late winter that did not break diapause:

**DON'T COUNT AS LIVE OR DEAD**



**OR**

2. HWA is longer than 0.4 mm, but somewhat smaller than other HWA. HWA is covered with wool but is not as full as the wool on larger HWA. When probed HWA is dry and does not exude fluid (Fig. 2):

**COUNT AS DEAD**

**OR**

3. HWA is longer than 0.4 mm and similar in size to other HWA. Wool appears fresh and full. When gently probed it exudes fluid. Fluid exudes from body at points other than where it was probed. Fluid is thin and more pink than red. Body does not retain its integrity but is flaccid and not firm. HWA in this condition died recently and has not dried up as in case #2 above. By placing ethyl alcohol on the HWA with a forcep the wax will dissolve and it is easier to see the nymph (Fig. 2):

**COUNT AS DEAD**

**OR**

4. HWA is longer than 0.4 mm and similar in size to other HWA. Wool appears fresh and full. When lightly probed it does not exude fluid. Requires firm probing to puncture cuticle. Fluid is fairly thick and dark red. Body retains its integrity when probed and expands back to its original shape. Legs may move when probed. By placing ethyl alcohol on the HWA with a forcep the wax will dissolve and it is easier to see the nymph (Fig. 2):

**COUNT AS ALIVE**

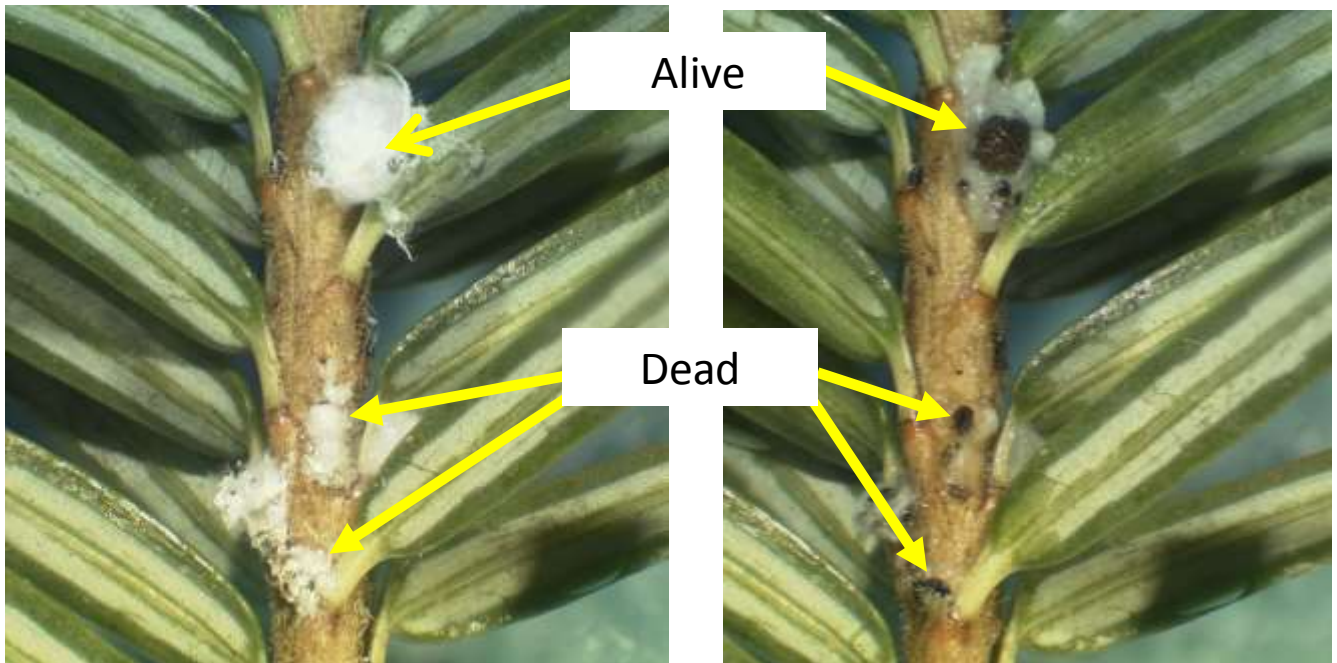


Fig. 2. The same live and dead HWA before and after alcohol applied.

## **II. Temperature data**

1. The temperatures generated from the BioSIM software will be used to calculate temperatures at each collection site. But if a temperature data logger is within a reasonable distance and at a similar elevation as the collection site then this data can be useful for comparison with the BioSIM generated data. Please send the data logger's daily minimum temperatures from 1 Nov. 2014 to the time of HWA mortality assessment to Tom McAvoy.

## **III. Progrediens recovery assessment**

1. Sistens density assessment will be done when they have reached the adult stage and are laying eggs (February to late March).
2. Trees used for this study can be the same trees used for the mortality assessment.
3. Flag 20 branches (1 – 2 ft. long) with a moderate to high density of HWA at each site.
4. In the field count the total number of woolly HWA (live or dead) from the point of attachment of the flag to the tip of the branch including all of the lateral branchlets (Form 2).
5. When the progrediens are mature and laying eggs (late May to June) count the total number of HWA progrediens on the same flagged branches used for the sistens assessment from the point of attachment of the flag to the tip of the branch, use Form 2.

**Record data on data sheets enclosed.**

**Send all data requested to Tom McAvoy [tmcavoy@vt.edu](mailto:tmcavoy@vt.edu) (540) 250-0617 at Virginia Tech**

**Your participation in this assessment is greatly valued and appreciated!**



## Form 2. Sistens and progrediens density assessment (progrediens recovery).

State \_\_\_\_\_

Recorder \_\_\_\_\_

Location/Site \_\_\_\_\_

Coordinates \_\_\_\_\_

Date recorded \_\_\_\_\_

Branch #	Total # HWA	Branch #	Total # HWA
1		11	
2		12	
3		13	
4		14	
5		15	
6		16	
7		17	
8		18	
9		19	
10		20	