

# Insect and Disease Protocol

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## Insect and Disease Protocol (1996)

The following describe a standardised survey protocol for assessing the incidence of insect pests and diseases in SRC trials of Poplar and Willow, and for estimating the amount of damage to leaves and stems.

The same survey protocol is used for all plots, at all sites. A separate recording form should be used for each plot, on each date. The numbers in square brackets refer to the fields on the form.

### For each plot:

- Complete the site, Variety, plot information at the top of the recording sheet for the plot, including the weather condition (sunny, dull, calm, windy, dry, wet).
  - Select three central rows from the 6 x 6 assessment trees in the centre of the plot.
  - Record insect damage, infestation and disease incidence on one branch from each tree (stool) by walking up one row, down the next, and back up the third row. This gives a total of 18 branches from 18 trees sampled.
  - On each branch select 3 leaves from the length of stem that is carrying leaves, including side shoots and this year's extension growth. Select one leaf from the top third of the section with leaves (or as high as can be reached), one from the middle region, and one from the bottom third. Try to do this as randomly as possible, i.e. without selecting particular leaves.
  - Examine each leaf and allocate it to one of the incidence scores or % leaf area lost classes for **each** of the insect and disease categories [1.1 – 1.13]. Note: this means that leaves damaged by multiple causes will be entered for each type of damage). It may be easier to remove leaves from the stem to examine them, especially on small shoots at the beginning of the season, but be careful not to dislodge aphids.
  - Record on the form the number of leaves falling into each incidence score or damage class. Each row of the form should add up to 54 at the end of the plot, i.e. the total number of leaves examined per plot should be  $3 \times 18 = 54$ .
  - Examine the terminal shoot of the branch and record any aphid or caterpillar infestation in the terminal leaves, or presence of terminal shoot galls (e.g. rosette galls on Willow) [2.1 – 2.3]. If the branch is too tall to reach the top, examine the terminal shoot on one of the larger side branches.
  - Allocate each branch to one of the incidence scores for these types of injury and record on the form the total number of branches in each class. Each row should add up to 18 at the end of the plot
  - Examine the length of the branch from top to base and record
    - aphid infestation on the stem [3.1, 3.2],
    - number of froghopper spittle masses [3.3],
    - presence of shoot borers [3.4],
    - fungal lesions on the stem [3.5],
    - shoot dieback [3.6]
    - and frost damage [3.7].
- Give the branch a score for each of these categories and enter the number of branches in each infestation / damage class onto the form. Total across rows should add up to 18.
- For the main stem axis, estimate the percentage of the length of the current stem section which has lost its leaves (usually from the base), to the nearest 10%, and allocate the branch to the appropriate % Leaf Fall class on the form.
  - Estimate to the nearest 10% the proportion of the sampled stool which appears to be dead, i.e. has not produced any living shoots. Allocate the stool to one of the % Stool Death classes on the form.
  - Finally, assess for the stool as a whole the overall incidence of rust infection on a 0 – 3 scale (0 = no visible sign of rust; 1 = low incidence; 2 = moderate infection; 3 = severe infection).

**Handling material**

Samples of material for identification and confirmation of insect or disease symptoms may be sent to:  
Entomology Branch, Alice Holt Lodge, Wrecclesham, Farnham, Surrey GU10 4LH.

Label the material carefully (e.g. use the top of one of the recording forms). Post first class at the beginning of the week so there is no delay over a weekend. (Samples collected on Thursday or Friday should be stored in a fridge and posted the following Monday).

**Form for collecting insect and disease data**

SITE: _____		DATE: _____								
VARIETY: _____		STOOL AGE: _____								
PLOT: _____		ROTATION YEAR: _____								
RECORDER: _____		STAND HEIGHT: _____								
WEATHER: _____										
<b>1. Leaves</b>										
<b>Incidence score</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Comments</b>			
1.1 aphids on leaves										
1.2 leafhopper damage										
1.3 rust (leaves)										
1.4 insect leaf and petiole										
1.5 mechanical damage										
1.6 leaf distortion										
1.7 discolouration										
<b>% leaf area lost</b>	<b>0-5</b>	<b>5-10</b>	<b>10-20</b>	<b>20-40</b>	<b>40-65</b>	<b>65+</b>				
1.8 leaf chewers										
1.9 skeletonising										
1.10 linear leaf mines										
1.11 blotch leaf mines										
1.12 diseases spots / blotches										
1.13 Taphrina leaf galls										
<b>2. Shoot tip</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>				
2.1 aphids in terminal shoots										
2.2 caterpillars in shoots										
2.3 terminal bud galls / death										
<b>3. Stem</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>				
3.1 aphids - current / green										
3.2 aphids - 2 year stem										
3.3 spittle buds										
3.4 stem borers / woody galls										
3.5 stem lesions										
3.6 shoot dieback										
3.7 frost damage										
<b>4. Rust (stools)</b>										
	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90+
<b>5. % Leaf Fall</b>										
<b>6. % Stool Death</b>										