NATIONAL PARKS BOARD
RESEARCH TECHNICAL NOTE 01/2008

DEFOLIATION OF *SAMANEA SAMAN* DUE TO SEVERE WATER STRESS, TWIG DIEBACK DISEASE AND CATERPILLAR INFESTATION

BACKGROUND: Defoliation of *S. saman* (Rain tree) is a commonly observed phenomenon among Rain trees in Singapore. Defoliation can be caused by one of the following 3 factors: severe water stress, caterpillar infestation, twig dieback disease, or a combination of more than one factor. While defoliation rarely kills a Rain tree directly, trees subjected to periodic severe defoliation can be expected to be weakened, and hence more susceptible to a variety of biotic and abiotic factors.

PURPOSE: This technical note aims to guide staff on how to differentiate defoliation of Rain Trees arising from different factors, and disseminate information on control strategy to adopt for affected trees.

Twig Dieback Disease Symptoms

- crown defoliation **non-uniform**
- crown remains non-uniformly green at the end of a rainy period
- a fungal pathogen is involved, and research on causal agent and chemical control are still in progress

Caterpillar Infestation Symptoms

- crown defoliation is either **uniform / non-uniform**, no dieback twigs
- caterpillars only attacked **young flushes**
- crown recovers when caterpillar population is controlled

Severe Water Stress Symptoms

- crown defoliation **uniform**, no dieback twigs
- crown recovers at end of rainy period

INTEGRATED CONROL STRATEGY

1. Staff to identify Rain trees suffering from twig dieback disease. Trees that have >80% twig dieback on crowns should be removed upon identification.

2. All affected branches of lightly infected trees to be pruned back to healthy tissues (crown cleaning), no dead and discoloured tissues should be left on branches after pruning.

3. All branches of severely infected trees (>50% twig dieback) to be cut back to healthy main stems (crown cleaning), followed by: watering during severe drought seasons, applying and maintaining thick mulch materials below crowns (3-4 inches) and fertilizing at regular intervals. All the infected trees that do not respond to above treatments after 6 – 12 months should be removed.

4. High population of caterpillars attacking Rain trees need to be reduced by spraying infested crowns with BtK (*Bacteria thuringiensis* Kurstaki – an environmental friendly insecticide) at 7 days intervals using Control Droplet Application sprayers. This method is currently used by Streetscape staffs to control severe caterpillar defoliation of Rain trees along East Coast Parkway and is found to be effective. Spraying of BtK should only stop when caterpillar infested Rain trees have recovered.

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