Evaluation of tree trunk injection methods with Q-Pest-TI in controlling Erythrina gall wasp (刺桐癭蜂) Infestation in Erythrina variegate(刺桐)

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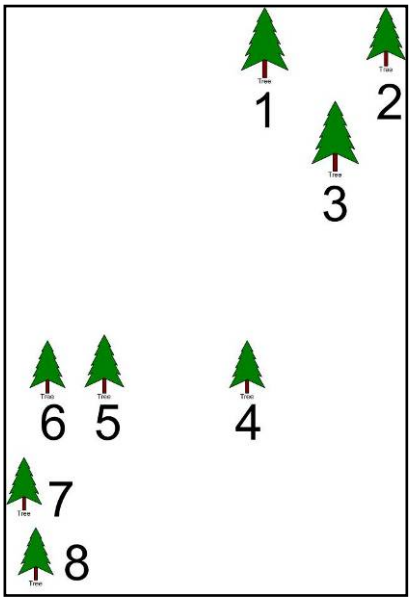
2006-11-27	2007-04-04	2007-06-21

Chemical method to control EGW problem had been studied in Tai Hang Tung Estate Playground 2. In our study, application of systemic insecticide -- Q-Pest (the active ingredient is imidacloprid) to infected trees. After application, observation had been carried out for 6 months period. The effect of imidacloprid with using the methods (soil drenches vs hole digging method) was not significantly successful. Most of the trees cannot recover from EGW infestation. For the tree shown above, it seem to be healed from EGW infestation, but small amount of galling were found. Detail is in our previous study report “Evaluation of different application methods of Q-Pest in controlling Erythrina gall wasp (刺桐癭蜂) Infestation in Erythrina variegate(刺桐)” on 2 June, 2007.

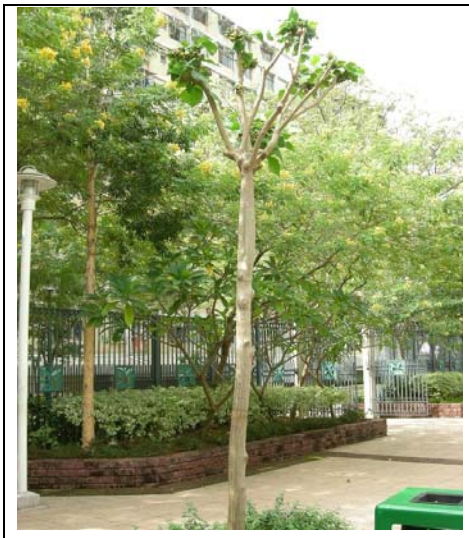
In the tree trunk injection with “Q-Pest TI” trial performed in Manlai Court, several treated trees showed a very successful result with a month. We believe that tree trunk injection with “Q-Pest TI” should be the best method to save the trees. Since the age of the trees in Tai Hang Tung Playground 2 are much younger (about 5-8 years old) than those trees in Manlai Court (about 20 Years old). Same dosage of “Q-Pest-TI” may causing stress and damage the tree growth. In this trial the dosage will be lower to about 1ml of “Q-Pest TI” for every 1cm DBH. To maintain the protection to against EGW by imidacloprid, 2 pack of Q-Pest will be apply every trees by hole applied method. Again, fertilizer (Fairturf T (10-10-10+2MgO)) will be also applied to every trees to promote their growth.

Tree number 9 is outside the accessible area of Tai Hang Tung Estate Playground 2 where a construction site is. Therefore, Tree number 9 is considering as a control that compare with other treated trees

Testing Site: Tai Hang Tung Estate Playground 2



Trees location inside the playground and numbered as above diagram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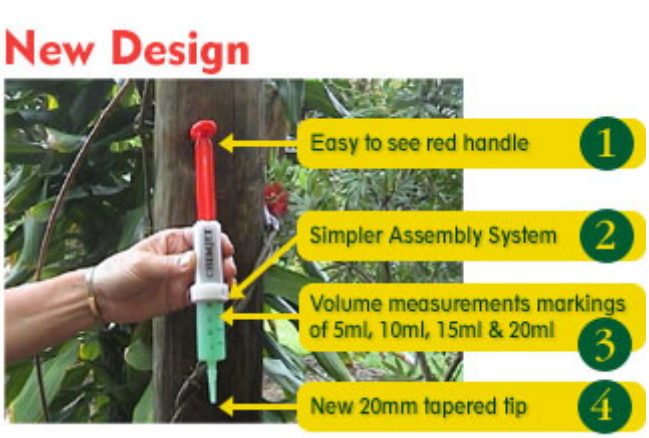
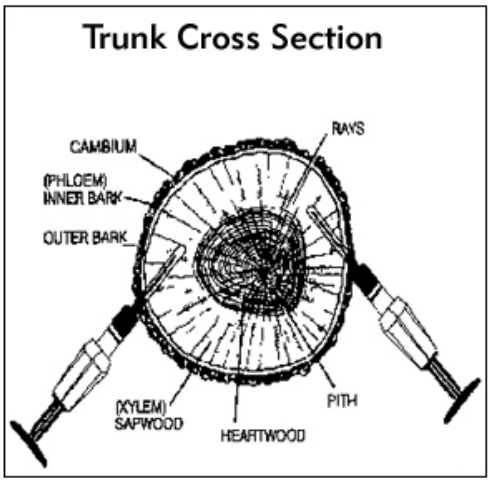
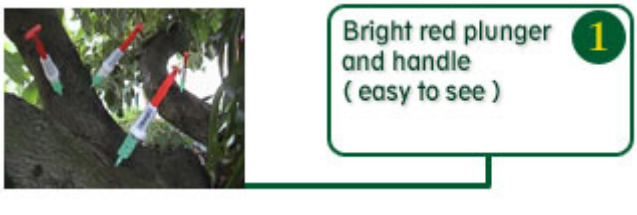
The infected branches of trees were trimmed away, and insecticide was sprayed directly to the remained branches and trunk one month before November 2006. Soil drenching and hole application with Q-Pest were used.

Application method

1. Use a tape and place at the level of your chest to measure the tree circumference.
2. For every 1cm of diameter or 3cm of circumference around the tree at chest level, apply 1 ml of Q-Pest TI.
3. In a single injection, maximum injected volume of Q-Pest TI is 10ml
4. Drill appropriate number of holes into tree. (4.2mm drill bit) 30 & 50mm deep.
5. Draw chemical into injector by pulling the handle to the required dosage
6. Insert injector nozzle into pre-drilled hole. Release handle.
7. Note: Where the injector nozzle needs to be screwed into the tree, a 1/4" or 6.4mm hole 30-50mm deep is required. It is not necessary to screw injector fully into the tree. To obtain a complete seal, screw in until firm pressure is felt. A further half turn might be required if weeping occurs.
8. Completed injection time approximately 2 hours, varying in weather conditions and sap viscosity. When injection is slowing down, leave the injector to the following day.







Hole Digging method

Application method

- Apply 2 pack of 10 gram of Q-Pest for every tree
- For every bag of Q-Pest 10gram water soluble pack, dig a hole 30cm from the base of the tree and 15cm in depth.
- Apply 1kg of Fairturf T (10-10-10+2MgO) in the holes of the soil around the tree
- Place the Q-pest in each hole, then cover it with soil
- Pour water on the base of the tree where it flows down over the root flare and directly around the base of the tree.

Equipments and apparatus

	Qty
1. Q-Pest-TI (tree trunk injection solution)	One liter
2. Q-Pest (25% imidacloprid WP)	200g
3. Fairturf-T (Tree fertilizer)	8kg
4. NP-9 (cleansing detergent)	100ml
5. Injector syringe	28pcs
6. Portable electrical drill with 11/64” drill bit	0ne set
7. Protective glove	2 set
8. Eye goggle	2 set
9. Plastic apron	2 set
10. Dispensing container with cover	One
11. Water bucket	Two
12. Measuring tape (metric scale, one cm division)	One
13. Digital Camera	One
14. garbage bag	Three

Safety Precaution:

- Enclosed the area where treatment taking place
- Secure the area and avoid any un-authorized person entry
- Warn signs should be post around the area
- For person handling the Q-Pest-TI, should wear protective glove, eye goggle and plastic apron
- In case of spillage, washed the glove before handle another syringe
- Washed hands and face after finishing the application.
- During the period of injection, applicator should attend in the application site.
- Do not leave the injector on the tree without any authorized person

Treatments:

Tree number	DBH (cm)	Fertilizer application	Q-Pest-TI Volume Used	Injection (ml/injector)	Q-Pest Used with hole method
1	32/3 (11)	1kg	14ml	7ml X 2	2 packs 10g Q-pest
2	31/3 (10)	1kg	14ml	7ml X 2	2 packs 10g Q-pest
3	32/3 (11)	1kg	14ml	7ml X 2	2 packs 10g Q-pest
4	36/3 (12)	1kg	14ml	7ml X 2	2 packs 10g Q-pest
5	42/3 (14)	1kg	14ml	7ml X 2	2 packs 10g Q-pest
6	30/5 (10)	1kg	14ml	7ml X 2	2 packs 10g Q-pest
7	33/3 (11)	1kg	14ml	7ml X 2	2 packs 10g Q-pest
8	36/3 (12)	1kg	14ml	7ml X 2	2 packs 10g Q-pest

Result evaluation:

By observation:
Take photo every week for each tree
Observe leaves and branches growth
Record rating with using 5 point rating scale

five-point numerical rating system

Rating	Description	Approx gall weight per 20g of leaf
1	Very light infestation, only very slight galling	<3g
2	Moderate galling	3-8g
3	Heavy galling of leaves but minimal leaf deformity	8-14g
4	Heavy galling moderate leaf deformity	14-18g
5	extreme galling and deformity with no expanded leaves	>18g

Tree number	1	2	3	4	5	6	7	8
Growing environment	✧ Loose soil ✧ Flat ground ✧ Individual confined area ✧ Herbal plants growing on the ground			✧ Convex ground ✧ heavy shrubs growing around the tree			✧ Flat ground ✧ Moderate shrubs growing around the tree	
				✧ Compact soil ✧ Grow on the same confined area ✧ Shrubs and bushes type plants growing on the ground				
Leaves density on 21 June, 2007	medium	light	medium	Very light		No leaf	Very light	
Leaves density on 10 October, 2007	Heavy			Light				
Rating on 21 June, 2007	3	4	3	4	4	-	4	4
Rating on 10 October, 2007	0	0	0	0	0	0	0	0
Galls distribution	No Gall was found							
Remark	Some of the new grow leaves had found yellowing, burn and weakening, especially at the lower level where closed to the injecton position. Tree #9 only had few leaves on 21June, 2007. On 10 October 2007, leave density become medium. However, small amount of gall were found on the top and outer canopy of Tree #9.							

Conclusion:

In this study, Q-Pest-TI (10% imidacloprid solution) control Erythrina gall wasp significantly with using tree trunk injection method. Although new branches and medium density leaves were found in the control sample (tree #9), galls are also found on the top and out position of canopy. From our previous study of controlling EGW by Q-Pest with using soil drenching and hole method, the result is related to the health condition of the infected tree. The number of remaining healthy branches is very critical to the result controlling EGW by Q-Pest. However, in this study, even in very bad health condition, the tree number 6 have the very positive result after the treatment of tree trunk injection method. That means tree can be heal from EGW infestation by Q-Pest-TI treatement even as the health condition like tree #6.

Unfortunately, tree trunk injection with Q-Pest-TI created a stress. New grown leaves were showing burn, yellowing and sometime fallen, although the application rate had been cut down from 2ml per 1cm DBH to 1ml per 1cm DBH. That could be caused by the active ingredient, inerts and also the drilling wounds.

A continue observation should be needed to assess the effect of tree truck injection with Q-Pest-TI. The observation should include the EGW recuring, health condition of treated tree and the wounds of drilling holes.

Tree number 1

20070621

20070703

20070712

20070725

Tree number 1

20070818

20070911

20071010

Tree number 2

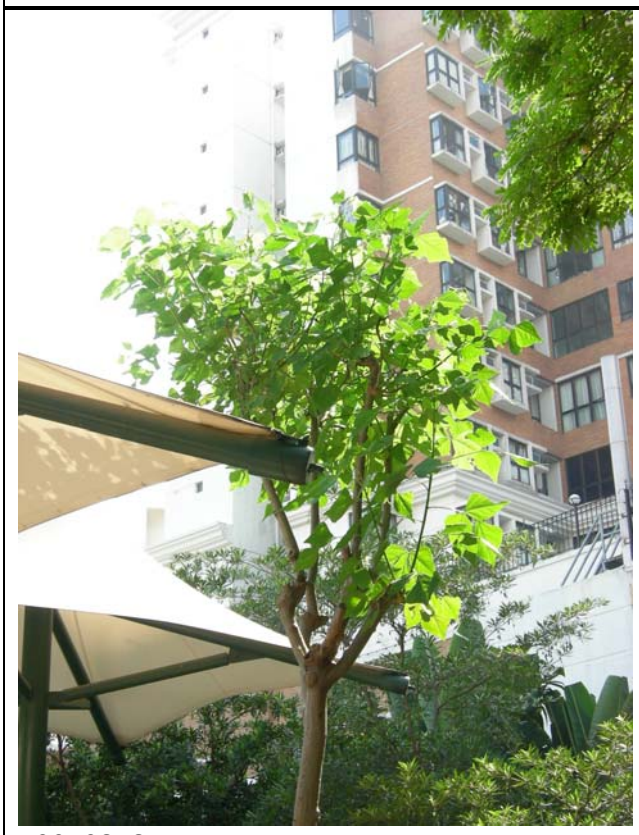
20070621

20070703

20070712

20070725

Tree number 2



20070818

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Tree number 3

20070621

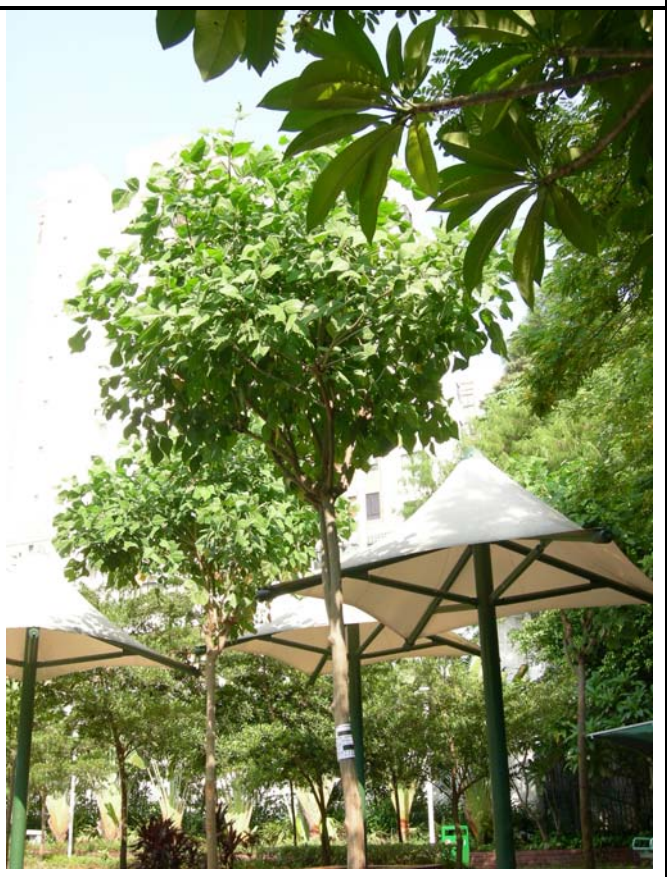
20070703

20070712

20070725

Tree number 3

20070818



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Tree number 4

20070621

20070703

20070712

20070725

Tree number 4

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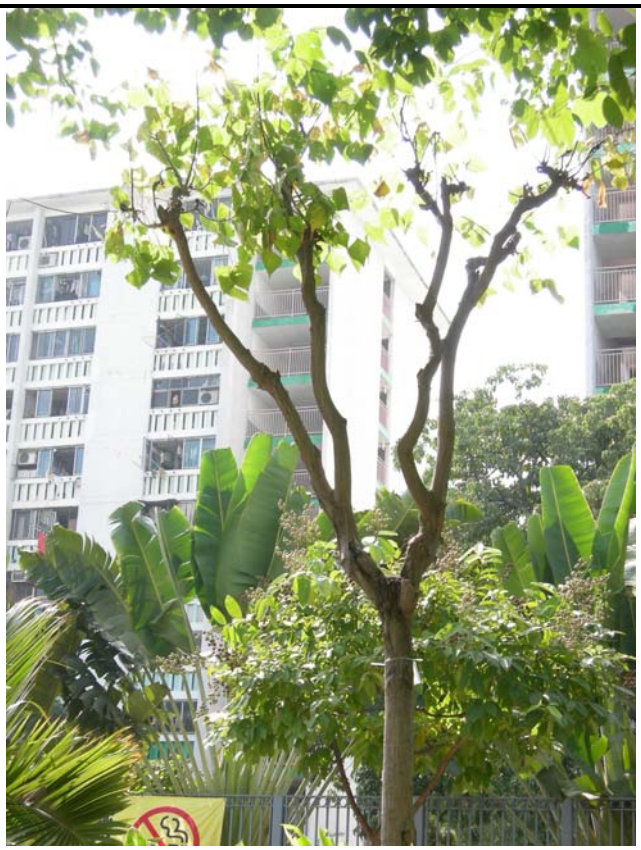

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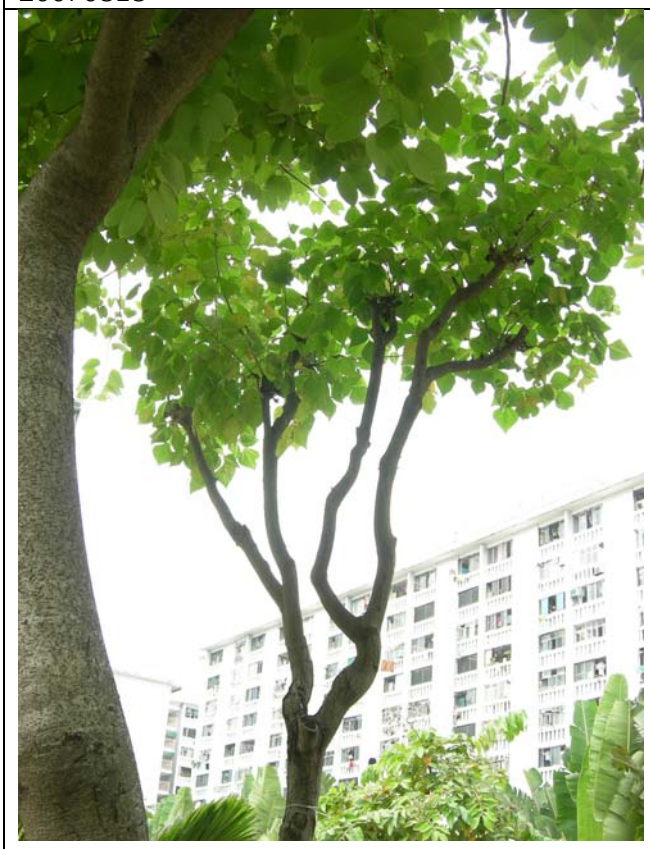

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Tree number 5

20070621

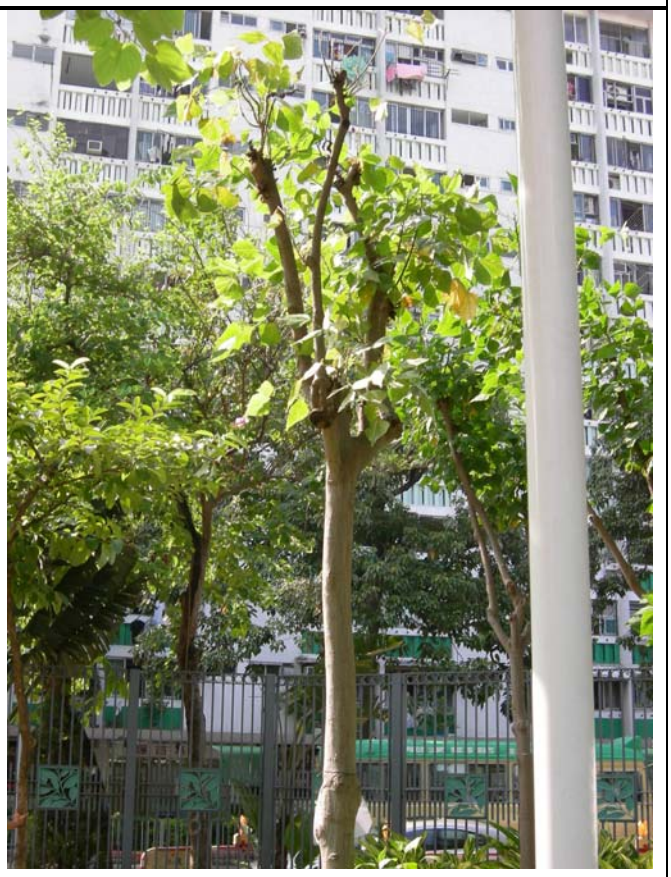
20070703

20070712

20070725

Tree number 5

20070818



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Tree number 6

20070621

20070703

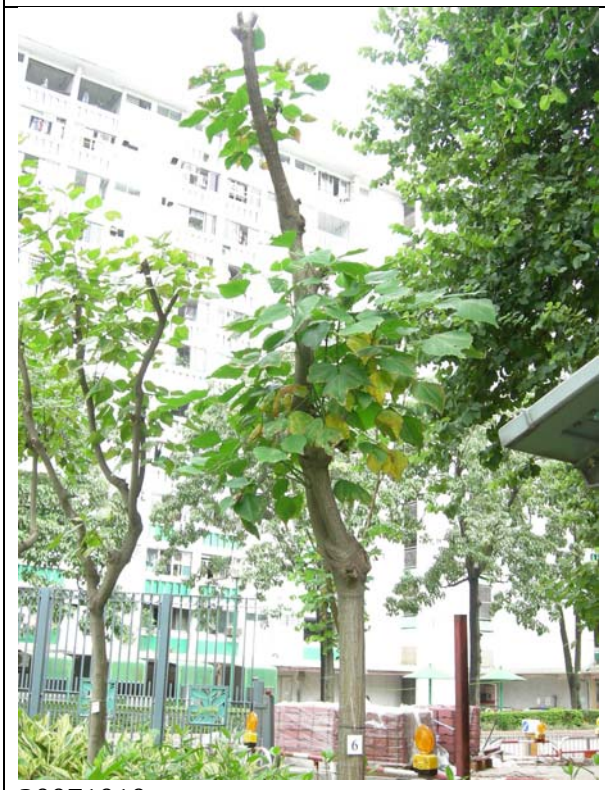
20070712

20070725

Tree number 6

20070818

20070911



20071010

Tree number 7

20070621

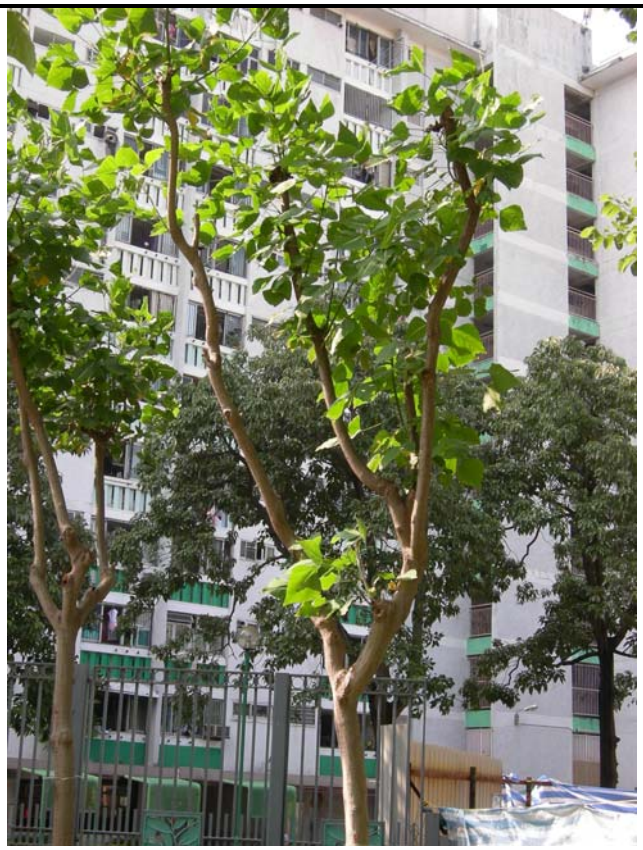
20070703

20070712

20070725

Tree number 7

20070818



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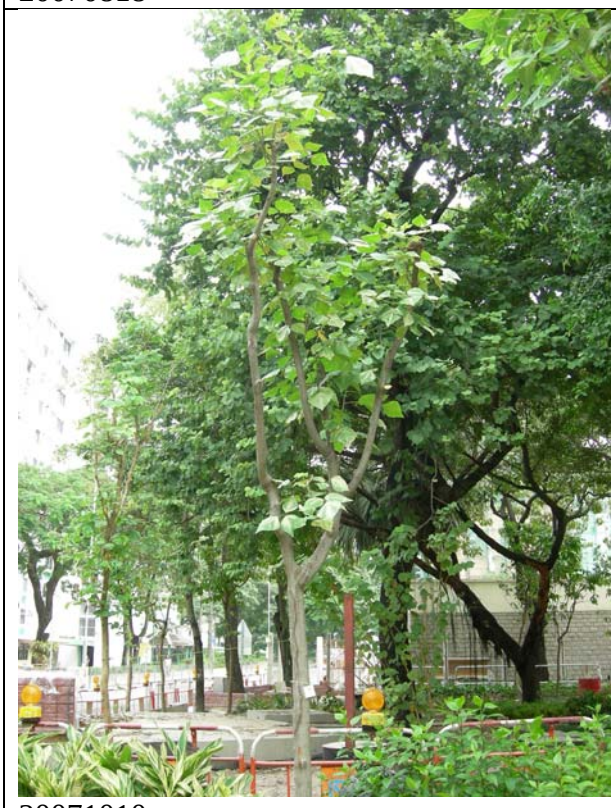


20071010

Tree number 8

20070621

20070703

20070712

20070725

Tree number 8

20070818

20070911

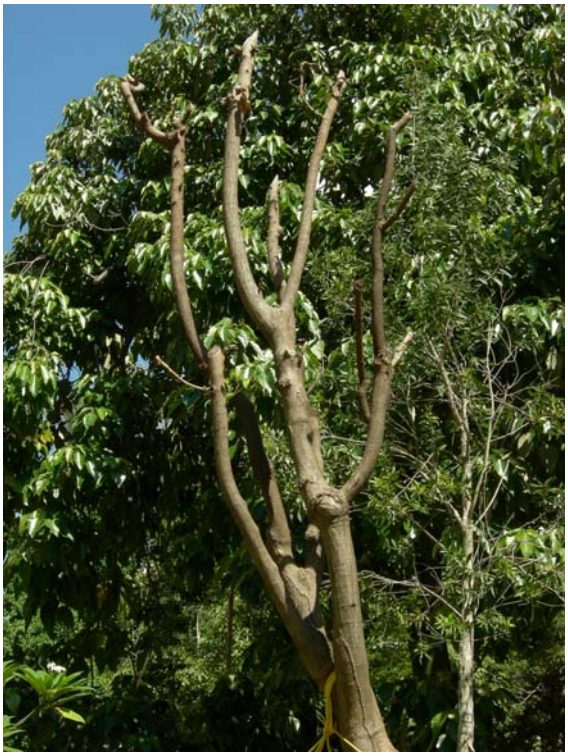
20071010

Tree number 9


20070621


20070703


20070712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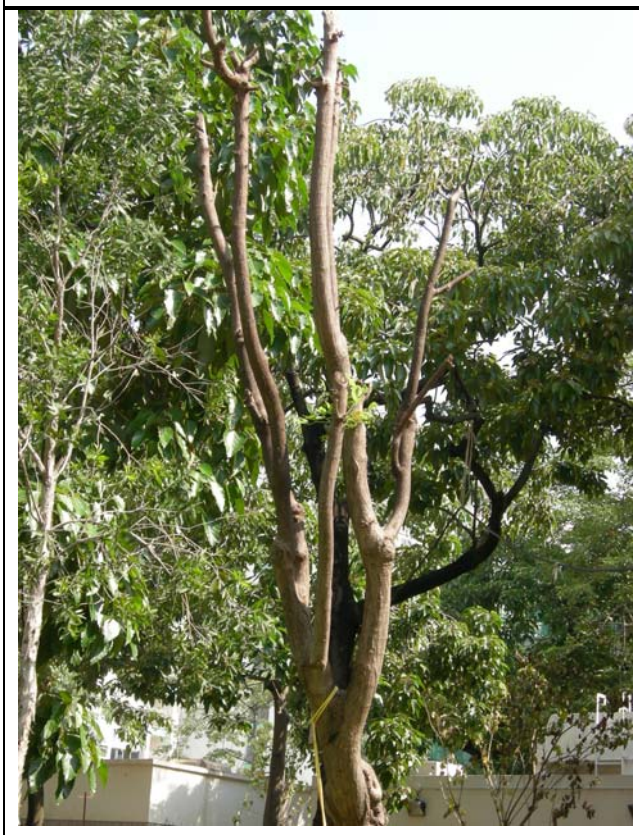
Tree number 9



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