

SERVICE BOOKLET

PLANT HEALTH LABORATORY DIAGNOSTIC & LABORATORY SERVICES



PLANT HEALTH LABORATORY DEPARTMENT
AGRI-FOOD & VETERINARY AUTHORITY OF SINGAPORE
ANIMAL & PLANT HEALTH CENTRE, NO. 6 PERAHU ROAD, SINGAPORE 718827
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1. Sample Submission Procedures

Selection of Sample for Analysis

Incomplete information or poorly selected specimens may result in an inaccurate diagnosis or inappropriate control recommendation. Badly damaged specimens are often unidentifiable and additional sample request may result in delays. As such, when submitting a sample, please observe the following general guidelines:

Select plant materials that are showing the symptoms you are concerned about. Send several samples showing various stages of the disease, especially the early stage. Place samples into a plastic bag or wrap samples in a newspaper to keep them moist but do not add water. Wrap roots in a second bag to keep the leaves free of soil. In addition, please observe the following specific guidelines for the various categories of samples:

Plant Samples for Disease Diagnosis

Herbaceous Plants: For general decline or dying of plants, send whole plants (if practical) including roots, showing early symptoms. Dig up carefully to include 500 grams of surrounding soil (see guidelines for soil samples below for more details). It is important to keep soil off the foliage.

Tree Wilts: Collect branches or twigs which are actively wilting but not totally dead. Wrap in plastic to retain moisture.

Leaves, Branches, Fleshy Parts: When localised infections such as cankers, leaf spots and rots are involved, send specimens representing early and moderate stages of disease. Press leaves flat between papers. Send entire or small parts of infected branches and twigs to include several centimeters of healthy wood adjacent to the diseased part. Wrap fleshy parts e.g. fruits or vegetables separately in dry paper.

Turf: Turf sample plugs should be around 9 cm in diameter and include the transition area between the diseased and healthy portion of grass. It is best to place root systems separate in another plastic bag. Submit around 500 g of turf sample plugs.

Insect Specimens and Infested Materials for Diagnosis

For insect pest diagnosis, collect several (the more the better) specimens of the insects together with associated plant parts (hosts). Collect all stages of the life cycle if available. Care should be taken to pack insects so that they arrive as complete specimens. If 2 or more species are included in the same package, be sure to separate and label the insects and provide appropriate information on each. Identification is dependent on the quality of sample (s) submitted i.e identification would not be possible for poorly decomposed samples.

Affected Plant Parts: e.g. leaves, flowers or fruits: Send affected twigs, branches, leaves or flowers with presence of pest related products (webs, bags, frass) together with unaffected plant parts. Place highly mobile pests in a vial with some alcohol (70%) or in separate plastic bags. For fruits, send freshly damaged fruits, wrapped individually in paper.

Tiny and / or Soft-bodied Specimens: e.g. aphids, mites, thrips, caterpillars, spiders: Submit specimens in a small leak proof bottle or vial with 70% alcohol.

Hard-bodied Specimens: e.g. flies, grasshoppers, butterflies and beetles: Submit specimens dry in a crush-proof container. Do not tape insects to paper or place them loose in envelopes.

Soil Samples for Plant Nutrition or Nematode Analysis

Take several sub-samples from the root zone at depth of about 15 to 20 cm, especially from around plants showing similar symptoms. Mix the sub-samples to form a composite sample for submission. Avoid collecting samples when the soil is extremely dry or wet, or immediately after fertiliser application. Transfer the soil to a clean polythene bag or paper bag and label.

Submit around 500 g of soil (mixture of sub-samples) from plants showing nutritional problems e.g. yellowing or unhealthy colour in a plastic bag for submission. It will be useful in the diagnosis to include a sample of soil from the same plant type/species without the symptoms (healthy) for concurrent analysis for comparison. Reference samples will not be charged.

Soil-less Media: Submit around 2 litre sample in a sealed polythene/paper bag.

Compost / Organic Fertiliser: Submit around 500 g compost/organic fertiliser in a sealed polythene bag.

Fertilisers (chemical): Submit around 250 g fertiliser in a sealed polythene bag.

Tissues for Plant Nutrition Analysis

Send 150 grams of fresh plant tissues showing nutritional problems e.g. yellowing or unhealthy colouring in a plastic/paper bag. For plant tissues, include similar plant parts of same plant species from a healthy source for concurrent analysis. **DO NOT WET** the leaves. It will take a longer time to dry them for analysis and the foliage may rot.

Water / Nutrient Solution for Nutrition Analysis

Submit 1 litre in a sealed bottle and state the required analysis to be performed e.g. pH, EC, N, P, K, Na, Mg, Ca etc.

Completion of Application Form

Application form for Plant Health Services is available as a hardcopy (pdf format) or as an electronic form for customers applying using eServices from AVA website.

For home growers or individual, please give your name, mailing/billing address, contact number and NRIC no. for billing purpose. For company representative, please include your name and your company name, mailing/billing address, your contact number and your Company's UEN number for billing purpose.

The application form together with the worksheet for tests must be filled in and signed. Please read the terms and conditions before signing/submitting the form.

For the first time, it is recommended that you complete the form and the worksheet with an AVA plant health officer. He or she can help you fill in the relevant information requested or the necessary tests to be performed for your particular sample.

Submission of Samples and Application Form

Sample submitted for analysis must be accompanied by the hardcopy form or the eService acknowledgement slip with the acknowledgement reference. The samples together with the completed application form or acknowledgement reference should be submitted to the Animal and Plant Health Centre (APHC) soon after collection. Otherwise keep the samples cool (refrigerated at 5 to 10°C) if you are unable to submit immediately.

Alternatively, you may mail/courier the sample in a sturdy box (to prevent damage) with the completed application form.

Sample Submission from Overseas (including Malaysia)

AVA regulates the import of plants and plant products, biological control agents, soil and organic fertilisers in Singapore under the Control of Plants Act (Chapter 57A, Section 49). An import permit fee would be levied for overseas samples by the Quarantine and Inspection Group for each application. Customer will be billed for the import permit in addition to the lab analysis. When sending plant samples from overseas, International Air Transport Association (IATA) Packaging Instruction 650 should be followed. Further information on regulations covering postal packages can be obtained from IATA.

2. Test Reports

Test results¹ are generally ready within 5 to 14 days depending on test types. Report will only be released upon full payment for services. One report will be issued for one application, any additional request is chargeable. Please call 6316 5168 to check if the report is ready for collection.

For customers using our eServices, results can be viewed online upon payment. The official report will be sent to you based on your preferred method of receipt.

3. Payment Procedures

Payment for all laboratory services is by NETS, GIRO, Cheque or Internet Banking ONLY. For clients not residing in Singapore, please contact APHC for payment arrangements. (+65-63165188, E-mail: chan_geok_hua@ava.gov.sg) Payment can be made at time of submission of samples upon testing confirmation or via an issued invoice.

For customers using our eServices, payment is by credit card (VISA, Mastercard), GIRO or Internet banking (eNets Debit). Applications for payment by GIRO should be made in advance to allow time for processing. Please contact APHC for GIRO application forms (+65-63165188, E-mail: chan_geok_hua@ava.gov.sg)

¹Explanatory Note: There could be exception cases to the above guidelines, such as cases involving incubation tests which requires > 14 days to complete, cases where further confirmation of results is needed or delay due to unforeseen equipment breakdown. Customers will be informed if results will not be ready within 14 working days.

4. Contact Details / Hours of Service & Location Map

Animal and Plant Health Centre (APHC)

Agri-Food and Veterinary Authority

6 Perahu Road, Singapore 718827

Tel: (65) 63165168 / (65) 63165188

Fax: (65) 63161090

E-mail: AVA_Planthealth@ava.gov.sg

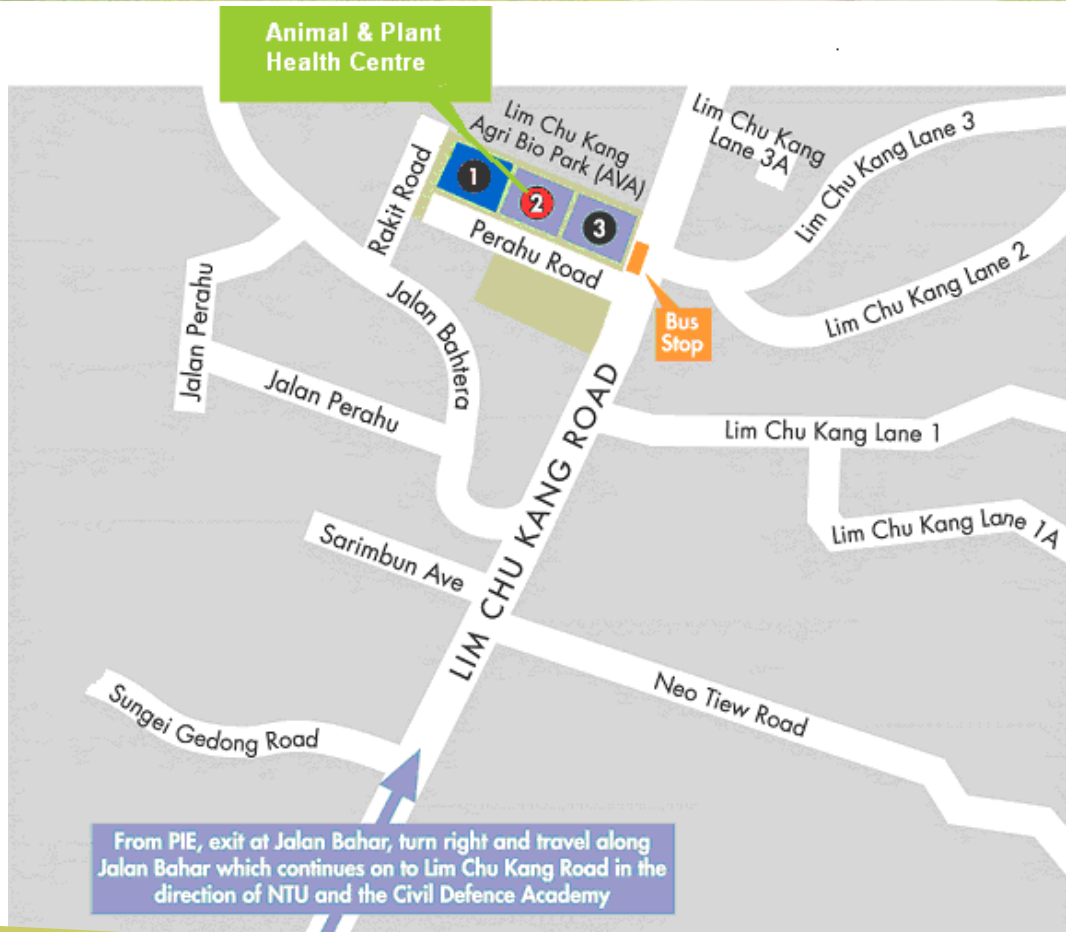
Hours of Service

	Counter Services	Sample Submission
Mondays to Thursdays	8:00 am to 12:30 pm 1:30 pm to 5:00 pm	8:00 am to 12:30 pm 1:30 pm to 5:00 pm
Fridays	8:00 am to 12:30 pm 1:30 pm to 4:30 pm	8:00 am to 12:30 pm 1:30 pm to 4:30 pm
New Year's Eve, Chinese New Year's Eve and Christmas Eve	8:00 am to 12:30 pm	8:00 am to 12:00 noon
Saturdays, Sundays and Public Holidays	Closed	Closed
Lunch break - 1230 to 1330 hrs		

ANIMAL & PLANT HEALTH CENTRE (APHC), 6 PERAHU ROAD, SINGAPORE 718827



Animal & Plant Health Centre



Location Map

From PIE, exit at Jalan Bahar, turn right and travel along Jalan Bahar which continues on to Lim Chu Kang Road in the direction of NTU and the Civil Defence Academy

Map not to scale

S/N	Sample Type	Tests	Cost (+ GST)	Est. TAT*	Remarks
PLANT PEST DIAGNOSIS / IDENTIFICATION					
1.	Plant sample	Bacteria Disease Diagnosis	\$28.35 per test	7-14 days	\$13.65 per test from 4th test onwards for same pest type. Time taken for diagnosis is dependent on quality of sample submitted & rate of growth of isolated pathogenic bacteria.
2	Plant sample	Fungus Disease Diagnosis	\$28.35 per test	5-14 days	\$13.65 per test from 4th test onwards for same pest type. Time taken for diagnosis is dependent on quality of sample submitted & rate of growth of isolated pathogenic fungi.
3	Plant sample	Virus Disease Diagnosis (By ELISA)	\$28.35 per test	5-7 days	\$13.65 per test from 4th test onwards for same pest type.
4	Plant sample	Virus/Viroid/Phytoplasma Disease Diagnosis	\$68.25 per test	5-7 days	
5	Plant sample/ insect specimen	Insect or arthropod pest identification	\$28.35 per test	5-7 days	\$13.65 per test from 4th test onwards for same pest type. Time taken for identification may take longer i.e. weeks if rearing is required for immature stages of insect i.e. larvae, pupa.
6	Plant or soil sample	Nematode Disease Diagnosis	\$28.35 per test	5-7 days	\$13.65 per test from 4th test onwards for same pest type. Submit 500g soil around affected roots / 200-300g of affected plant roots/stem/leaves.
PHYSICAL & CHEMICAL ANALYSIS					
7	Soil or soil mix or soil-less media	Bulk density or moisture content	\$15.75 per test	7-10 days	Bulk density is only offered for soil mix (disturbed sample).
8	Soil or soil mix or soil-less media or Compost or organic fertiliser	Cation Exchange Capacity (CEC)	\$47.25 per test	7-10 days	
9	Soil or soil mix or soil-less media	Particle size or soil texture	\$42.00 per test	7-10 days	\$37.80 per test from 4th test onwards for same test. Soil texture can be performed only on mineral soil and not on soil mixes.
10	Soil or soil mix or soil-less media or Compost or organic fertiliser	pH or Electrical Conductivity (EC)	\$10.50 per test	5-7 days	\$9.45 per test from 6th test onwards for same test.
11	Soil or soil mix or soil-less media	Each analysis—N, P, K, Ca, Mg, Na, B, Fe, Cu, Mn, Zn, Organic carbon/Total carbon/Organic matter, C:N ratio*	\$28.35 per test	7-14 days	\$23.10 per test from 4th test onwards for same test. *For C:N ratio, cost is \$56.70 for C & N tests. Boron (B) is not offered for soil-less media.
12	Soil or soil mix or soil-less media	Package A1 (Soil & Soil Mix) & A2 (Soil-less media) Analysis of N, P, K, pH & EC.	\$94.50	7-14 days	

* Estimated TAT = Estimated Turnaround Time for testing and issuance of report. The actual TAT may vary. Please check during submission.

S/N	Sample Type	Tests	Cost (+ GST)	Est. TAT*	Remarks
13	Soil or soil mix	Package B1A (Soil) & B1B (Soil mix) Analysis for any 5 nutrients: OC/TC/OM, pH & Particle size/soil texture	\$183.75	7-14 days	You have to choose 5 nutrients from the following list: N, P, K, Ca, Mg, Na, Fe, Cu, Mn & Zn. B is not offered for this package.
14	Soil or soil mix	Package C (Soil & Soil mix) Analysis of pH, EC, N, P, K, Ca, Mg, Na, Cu, Fe, Mn, Zn, OC/TC/OM, CEC, C:N ratio & Moisture content	\$367.50	7-14 days	
15	Compost/ Organic Fertiliser	Particle size	\$42.00 per test	5-7 days	
16	Compost/ Organic Fertiliser	Each analysis—N, P, K, Ca, Mg, Na, Fe, Cu, Mn, Zn, Organic carbon/Organic matter.	\$28.35 per test	7-10 days	\$23.10 per test from 4th test onwards for same test.
17	Compost/ Organic Fertiliser	Carbon: Nitrogen Ratio	\$56.70 per test	7-10 days	\$46.20 per test from 4th test onwards for same test.
18	Compost/ Organic Fertiliser	Package A3 pH, N, P, K and EC	\$94.50	7-10 days	
19	Compost/ Organic Fertiliser	Package B3 pH, Organic carbon/OM, any 5 nutrients and Particle size	\$183.75	7-10 days	You have to choose 5 nutrients from N, P, K, Ca, Mg, Na, Fe, Cu, Mn & Zn.
20	Compost/ Organic Fertiliser	Package C3 Analysis of pH, EC, N, P, K, Ca, Mg, Na, Cu, Fe, Mn, Zn, OC/OM, CEC, C:N ratio & Moisture content	\$367.50	7-14 days	
21	Nutrient solution or Water	Package A4 (Nutrient solution) pH, EC, N, P & K; Package A5 (Water) pH, EC, Na, Ca & Mg.	\$94.50	7-14 days	To submit 1L of water/ nutrient solution
22	Nutrient solution or Water	pH & EC	\$10.50 per test	5-7 days	\$9.45 per test from 6th test onwards for same test.
23	Nutrient solution or Water	Each analysis—N, P, K, Ca, Mg, Na, Fe, Cu, Mn & Zn	\$28.35 per test	5-7 days	\$23.10 per test from 4th test onwards for same test.
24	Fertiliser (Chemical)	Each analysis—N, P, K, Ca, Mg, Na, Fe, Cu, Mn, Zn.	\$28.35 per test	7-14 days	\$23.10 per test from 4th test onwards for same test. Submit 250g fertiliser sample. N—Total form; P—Total & water soluble form. All others—water soluble form only.
25	Leaf tissue	Each analysis –N, P, K, Ca, Mg, Na, Cu, Mn, Fe, Zn & B.	\$28.35 per test	7-14 days	\$23.10 per test from 4th test onwards for same test. Submit at least 150g leaf sample.
26	Leaf tissue	Moisture content	\$15.75 per test	7-10 days	Submit at least 150g leaf sample.

* Estimated TAT = Estimated Turnaround Time for testing and issuance of report. The actual TAT may vary. Please check during submission.

S/N	Sample Type	Tests	Cost (+ GST)	Est. TAT*	Remarks
SEED HEALTH TESTING					
27	Seeds	Seed Purity test	\$50.00 per test	3-5 days	Sample size varies. Please call to check.
PROFESSIONAL & TECHNICAL SERVICES					
28	—	Plant health site assessment	\$63 per professional hour or part thereof &/ or \$38 per technical hour or part thereof	—	Cost is based on the length of time i.e. travel time and time spend on site for the assessment visit. This is strictly based on appointment. Tel: 63165168.
LABORATORY EXAMINATION FOR EXPORT HEALTH CERTIFICATION (PHYTOSANITARY CERTIFICATION)					
29	Plant & plant products	Laboratory examination for plant pests (bacteria, insects, fungi, nematodes and viruses (by ELISA) to certify freedom from stipulated pests for the purpose of issuance of Phytosanitary certificate for export.	\$50.00 per consignment per pest type.	5-14 days	This service is strictly for export health certification. Samples should be submitted through the Quarantine & Inspection Group, AVA for the issuance of phytosanitary certificate only. Please contact the Quarantine & Inspection Group (Plant Health) at 67530657 for sample inspection and collection for laboratory test.
30	Plant & plant products	Urgent examination for plant pests—specifically for freedom from insects and nematodes only for the purpose of urgent issuance of Phytosanitary certificate for export.	\$100.00 per consignment per pest type.	2 days	This service is strictly only to check freedom from insects or/& nematodes under export health certification. Results would be available within 48 hrs upon submission of sample for testing. Estimated TAT excludes the time required for inspection and sample submission. Samples should be submitted through the Quarantine & Inspection Group, AVA for the issuance of phytosanitary certificate only. Please contact the Quarantine & Inspection Group (Plant Health) at 67530657 for sample inspection and collection for laboratory test.

* Estimated TAT = Estimated Turnaround Time for testing and issuance of report. The actual TAT may vary. Please check during submission.

Please use the Application Form for Laboratory Services provided in pages 11—13 to accompany sample submission.



Agri-Food & Veterinary Authority of Singapore
 Plant Health Laboratory Services
 Animal & Plant Health Centre
 6 Derajat Road Singapore 718827
 Tel: (65) 63165168/188 Fax: (65) 63161090

For Official Use

Lab Appl. Ref: P

Svc Ack. Ref.:

Received by:

Date & Time Received:

APPLICATION FOR PLANT HEALTH LABORATORY SERVICES

[This form may take you 10 minutes to fill in.]

PART I: REQUESTOR INFORMATION Please tick (✓) in appropriate box

Personal Submission

Company Submission (Billing to the Company)

Name in BLOCK LETTER [Mr / Mrs / Ms / Dr] (Pls. <u>underline</u> your surname/family name)			Personal Identity No. (NRIC/ FIN /Others):		
Company Name:			Business Registration No. (UEN No):		
Office No:	Mobile No:	Fax No:	Email:		
Billing Address:			Mailing Address: If different from the Billing Address		
Postal Code:			Postal Code:		
Total Estimated Amount Payable: \$			Method of Receiving Report: <input type="checkbox"/> Mail <input type="checkbox"/> Fax <input type="checkbox"/> Email <input type="checkbox"/> Self Collection		
Payment Method: <input type="checkbox"/> GIRO <input type="checkbox"/> Non GIRO			(Choose 1 ONLY. If left blank, report will be sent by mail ONLY.)		

PART II: SAMPLES & TESTS INFORMATION [Please enter details of samples & laboratory tests in page 2/3]

Sampling Date: _____

Sample(s) direct from overseas (Import Permit is chargeable)

PART III: SPECIAL INSTRUCTIONS:

Sample Handling / Testing / Reporting/General Instructions: <input type="checkbox"/> Sample (s) to be returned after testing, if possible.

PART IV: DECLARATION & CONSENT BY REQUESTOR

I declare that the above information is correct and agree to the terms & conditions for the testing of the samples.

Terms & Conditions:

- AVA accepts no liability for loss or damage to plants submitted for examination / testing. Sample(s) will not be returned unless specified in the application form & where possible (non-destructive testing).
- The mention of tradename (s) is NOT an endorsement for the product (s) by AVA.
- Any unauthorised reproduction or abuse of the AVA laboratory report shall constitute an offence under Section 38 (1) and (2) of the AVA Act & subjected to prosecution.
- One Laboratory Report will be issued to the requestor for all samples submitted under this application unless otherwise specified. Request for additional reports or changes to the report after issuance will be chargeable.
- Submission of overseas samples must be accompanied with an import permit or the import permit will be chargeable.
- No recommendation will be provided for product testing.
- The report will typically be available within 7 – 14 days except if more time is required for certain testing and will be released only upon payment.
- Payment terms: 30 days from invoice date. Late payment will incur a \$20 surcharge.

Name of Requestor	Signature	Date
Name of Submitter & NRIC	Signature	Date of submission

PART V: FOR OFFICIAL USE

Sample Receipt Date:	<input type="checkbox"/> Import Permit	Import Permit Ref:
Total Fees \$	Receipt No.:	Payment Receipt Date:
Invoice Amount \$	Invoice No.:	Invoice Date:
Date Report Issued:	<input type="checkbox"/> Certified True Copy/Additional Report Invoice No./Date:	<input type="checkbox"/> Amended Report Invoice No./Date:

Plant Health Laboratory Services
SAMPLES & TESTS DETAILS - PLANT PEST DIAGNOSIS & SEED HEALTH TESTING

Lab Appl. Ref.: P

SAMPLE DETAILS	Sample Details *	Sample No__	Sample No __	Sample No __	Sample No __	Sample No__
	Sample/Plant Name					
	Sample Label					
	Sample description i.e. plant parts					
	Symptoms <small>This information will help in the diagnosis & control recommendation.</small>					
	Local /Overseas					
	Sample Location (District) <small>i.e. Road name</small>					
	Disease Distribution <small>i.e. NA, %, only 1 plant etc.</small>					
Disease Severity <small>i.e. NA, %</small>						

* Please complete all the above information listed under Sample Details as these are required for our diagnosis. Thank you.

LABORATORY TESTS	Select Tests (✓)	Sample No__	Sample No __	Sample No __	Sample No __	Sample No__
	Bacterial Disease Diagnosis					
	Fungus Disease Diagnosis					
	Phytoplasma Disease Diagnosis					
	Virus Disease Diagnosis					
	Viroid Disease Diagnosis					
	Insect Pest Identification					
	Nematode Pest Diagnosis					
	Seed Purity (For seeds)					
Estimated Cost (\$\$)						
Total Estimated Cost (\$\$)						

Additional Comments for Testing:

Plant Health Laboratory Services
SAMPLES & TESTING DETAILS – PHYSICAL & CHEMICAL ANALYSIS

Lab Appl. Ref.:

Plant Health Laboratory Services SAMPLES & TESTING DETAILS – PHYSICAL & CHEMICAL ANALYSIS							
Lab Appl. Ref.: <input type="text" value="P"/> <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/>							
SAMPLE DETAILS	Sample Details *	Sample No __	Sample No __	Sample No __	Sample No __	Sample No __	
	Sample / Plant Name						
	Sample Label						
	Sample description i.e. Soil, Soil Mix, ASM, Compost, Fertiliser, Water, Nutrient solution, Product						
	Symptoms <small>This information will help in the diagnosis & control recommendation.</small>						
	Local / Overseas						
	Sample Location (District)						
	Symptom Distribution <small>i.e. NA or %</small>						
	Symptom Severity <small>i.e. NA or %</small>						
<small>* Please complete all the above information listed under Sample Details as these are required for our diagnosis. Thank you.</small>							
LABORATORY TESTS #	Select Tests (√)	Sample No __	Sample No __	Sample No __	Sample No __	Sample No __	
	pH						
	Electrical Conductivity (EC)						
	1. Nitrogen (N)						
	2. Phosphorus (P)						
	3. Potassium (K)						
	4. Calcium (Ca)						
	5. Magnesium (Mg)						
	6. Sodium (Na)						
	7. Copper (Cu)						
	8. Iron (Fe)						
	9. Manganese (Mn)						
	10. Zinc (Zn)						
	Organic Matter/Organic Carbon/Total Carbon						
	Boron (B)						
	Moisture Content						
	Bulk Density (Only Soil mix)						
	Soil Texture (Not for soil mix)						
	Particle size						
	Cation Exchange Capacity (CEC)						
	C: N ratio						
	Package A*						
	Package B*						
	Package C*						
	Other tests -						
	Estimated Cost (\$\$)						
	Total Estimated Cost (\$\$)						
<small>* Package A: pH, EC, N, P & K * Package B: Analysis of any 5 elements (No 1 – 10), Org M/Org C/TC, pH, Particle Size or Soil Texture * Package C: Analysis of pH, EC, N, P, K, Ca, Mg, Na, Cu, Fe, Mn & Zn, Org M/Org C/TC, CEC, C:N ratio & Moisture Content # Sample(s) submitted will have to be checked for suitability for testing. Requestor will be informed if testing is not possible.</small>							