Appendix 1
Average nutrient content of common manures and fertilizers

Material	Nutrient content (%)		
	N	P_2O_5	K_2O
Ammonium sulphate	20.5	-	-
Ammonium sulphate nitrate	26.0	-	-
Ammonium nitrate	33.5	-	-
Ammonium phosphate	20.0	20.0	-
Calcium ammonium nitrate	20.5/25.0	-	-
Nitrate of soda	16.5	-	-
Urea	46.0	-	-
Superphosphate (single)	-	18.0	-
Superphosphate (double)	-	35.0	-
Superphosphate (triple)	-	46.0	-
Mussooriephos	-	18c20	-
Rajphos	-	18-20	-
Muriate of potash	-	-	50/60
Bone meal	3.5	21.0	-
Fish meal	4.1	3.9	0.3-1.5
Poultry manure	1.2-1.5	1.4-1.8	0.8-0.9
Sheep manure	0.8-1.6	0.3-0.4	0.3-0.4
FYM	1.0	0.5	1.0
Compost	0.5	0.4	0.8
Groundnut cake	7.0	1.5	1.5
Castor cake	4.3	2.0	1.3
Neem cake	5.0	1.0	1.5
Gingelly cake	6.2	2.0	1.2
Coconut cake	3.0	1.9	1.8

Note: Composition of organic manures vary widely

Appendix 2
Neutralizing value of liming materials

Liming material	Chemical formula	Neutralizing value
Calcium carbonate (powdered lime stone)	$CaCO_3$	100
Burnt lime (quick lime)	CaO	179
Slaked lime	$Ca(OH)_2$	136
Dolomite	$CaMg(CO_3)_2$	109

Appendix 3
Conversion of nutrients (kg/ha) to common fertilizers (kg/ha)

Rate of application	Ammonium sulphate (20% N)	Urea (46% N)	Superphosphate (18% P_2O_5)	Muriate of potash	
				(50% K_2O)	(60% K_2O)
10	50	22	56	20	17
20	100	43	III	40	33
30	150	65	167	60	50
40	200	87	222	80	67
50	250	109	278	100	83
60	300	130	333	120	100
70	350	152	389	140	117
80	400	174	444	160	133
90	450	196	500	180	150
100	500	217	556	200	167
110	550	239	611	220	183
120	600	261	667	240	200
130	650	283	722	260	217
140	700	304	778	280	233
150	750	326	833	300	250

Appendix 4
Guide for mixing fertilizers

Muriate of potash	Potassium sulphate	Ammonium sulphate	Calcium ammonium nitrate	Sodium nitrate	Urea	Super phosphate	Ammonium phosphate	Calcium carbonate	
√	√	√	Ψ	Ψ	Ψ	√	√	√	Muriate of potash
√	√	√	Ψ	Ψ	Ψ	√	√	√	Potassium sulphate
√	√	√	√	Ψ	Ψ	√	√	X	Ammonium sulphate
Ψ	Ψ	√	√	Ψ	Ψ	Ψ	Ψ	√	Calcium ammonium nitrate
Ψ	Ψ	√	√	√	Ψ	Ψ	Ψ	√	Sodium nitrate
Ψ	Ψ	Ψ	Ψ	Ψ	√	Ψ	Ψ	Ψ	Urea
√	√	√	Ψ	Ψ	Ψ	√	√	X	Super phosphate
√	√	√	Ψ	Ψ	Ψ	√	√	X	Ammonium phosphate
√	√	X	√	√	Ψ	X	X	√	Calcium carbonate

√	Can be mixed
Ψ	May be mixed only prior to application
X	Should not be mixed

Appendix 5

Pesticide guide (The pesticides maybe applied according to the severity of infection in a need-based manner only)

Generic name	Formulation	Required concentration of ai in spray fluid	ai/ha or actual quantity of formulation required per ha for rice (R) or for other crops (OC)	Remark
1	2	3	4	5
A. INSECTICIDES				
Organic sulphurous acid ester				
Endosulfan	Thiodan 35% *EC/AF*	0.05%		Broad.spectrum action. Relatively safer to beneficial insects and pollinators
	Starsulfan 35% *EC/AF*			
	Hildan 35% *EC/AF*			
	Haxasulfan 35% *EC/AF*			
	Endocel35% *EC/AF*			
	Parrysulfan 35% *EC/AF*			
	Corosulfan 35% *EC/AF*			
	Thiokill35% *EC/AF*			
	Hexasulfan 4% DP		2 kg ai/ha (OC)	For controlling pests infesting vegetables
	Parrysulfan 4% DP			
	Thiotox 4% DP			
Carbamates				
Carbaryl	Sevin 5% DP		2.0 kg ai/ha (R, OC)	Broad-spectrum insecticidal action. Effective against a wide range of pests. Not recommended for control of mites. Should not be sprayed in crops at flowering
	Sevin 10% DP			
	Carvint 10% DP			
	Hexavin 5% DP			
	Hexavin 10% DP			
	Sevin 50% WP		2.5 kg. (R, OC)	
	Killex Carbaryl 50% WP	0.15-0.20%	2.5 kg (R, OC)	
	Killex Carybaryl 85% WP	0.15-0.20%		

	Carvint 85% WP	-	2.0 kg	
Carbaryl + Lindane granules	Sevidol8%	-	1.5% kg ai/ha (R)	For broad spectrum pest control in rice
Carbofuran	Furadan 3 G	-	0.5 to 0.75 kg ai/ha (R)	For pest control in rice
	Hexafuran 3 G	-		
Aldicarb	Temik 10%G		-	For control of rice cyst nematode, dip seedlings in 0.02% solution of aldicarb. Also for control of burrowing nematodes in pepper at l g ai per vine and for nematode control in banana.

Organophosphorus compounds				
Methyl parathion	Metacid 50% *EC*/ AF	0.05%	500 ml (R)	Rapid knock down action. Not to be used against pests supporting a wide spectrum of natural enemies. Avoid use of sub-optimal quantities. Restricted in crops where honey bees are not pollinators.
	Metacid 2% DP		0.5 kg ai/ha (OC)	
	Parament M 50% *EC*/ AF	0.05%	500 ml (R)	
	Parataf 2% DP			
	Ekatox 2% DP		0.5 kg ai/ha (OC)	
	Parataf 50% *EC*/ AF	0.05%	500 ml (R)	
Fenitrothion	Folithion 50% EC/AF	0.05%	1000 ml (R)	Contact and stomach action - toxicity broad spectrum
	Sumithion 50% EC/AF		1000mi	
	Sumithion 5% DP		2 kg ai/ha (R)	
	Accothion 50% *EC*/ AF		1000 ml (R)	
	Malathion 25% WP			Safe insecticide for
	Malathion 50% *EC*/ AF			

Mercaptothion	Malamar 50% EC/AF	0.10%	1000 ml (R)	controlling pests of vegetables and storage pests
	Cythion 50% EC/AF			
	Star Mal 50% EC/AF			
	Cythion 5% DP		0.5 kg ailha (OC)	For control of pests of vegetables
	Malatox 50% EC			
DDVP	Vapona 76% EC/AF	0.05%	500 ml of 100% EC (R, OC) or equivalent	Contact and fumigant; less residual; toxicity lasts for only 24 hours; safer to be applied on vegetables.
	Divap 100% EC/AF			
	Nuvan 100% EC/AF			
	Marvex Super 100 % *EC/* AF			
Quinalphos	Ekalux 25% EC/AF	0.025 % to 0.05%	1000 ml (R)	Broad spectrum toxicity; particularly effective against mealy bugs and scale insects
	Kinalux 25% EC/AF			
	Quinalphos 25% EC/AF			
	Quinalphos 5% G		1.5 kg ai/ha	For rice pests control
	Quinalphos 1.5% DP		25 kg	For control of cardamom thrips.
Phosalone	Zolone 35% EC/AF	0.07%	1000 ml (R)	Broad spectrum insecticide cum acaricide
Fenthion	Lebaycid 50 % EC/AF	0.05%	1000 ml (R)	For effective control of rice stem borer and other pests of rice
Dimethoate	Rogor 30% EC	0.03 % to 0.05%	1000 ml (R)	Systemic insecticides cum nematicide
	Tara 909 30% EC/AF			
	Killex-Dimethoate 30 % EC/AF			
	Corothioate 30% EC/AF			
	Nugor 30% EC/AF			
	Hilthoate 30% EC/AF			

Methyl demeton	Metasystox 25% *EC/AF*	0.05%	1000 ml (OC)	Strongly systemic; effective against sucking insects.
Formothion	Anthio 25% *EC/AF*	0.05%	1000 ml (R, OC)	Systematic insecticide cum acaricide.
	Nuvacron 40% *EC/*			

Monocrotophos	AF Monocil40% *EC/AF* Corphos 36% *EC/AF* Monophos 40% *EC/AF* JK Mono 36% Kadett 36% Phoskill 36% Hillcron 36%	0.05%	600ml of40 % EC (R, OC)	Systemic, persistent; long residual action; has ovicidal action. Under review by expert committee
Phosphamidon	Oimecron 86% *EC/AF* Umercon 85% *EC/AF* JK Midon 85% *EC/AF*	0.05%	250 ml (R, OC)	Systemic with weak contact toxicity; insecticide cum acaricide. Under review by expert committee
Phorate	Timet 10% 0 Phorate 10% 0 JK Phorate 10% 0 Umet 10%0		1.5 kg ai/ha	Systemic granular insecticide cum nematicide; for pest control in rice and banana
Trichlorfon	Oipterex 50% *EC/AF*	0.1%	800ml	Useful only against chewing insects; contact action feeble.
Thiometon	Ekatin 25% *EC/AF*	0.10% (OC)		Systematic; effective against sap sucking insects. Under review by experts committee
Chlorpyrifos	Oursban 20% *EC/AF*	0.02 (R, OC)		Effective against stem borers and gallfly. Useful for root dipping.
Phenthoate	Phendal50% *EC/AF*	0.08% (R)	750 ml for rice leaf fodder and thrips	Broad spectrum with ovicidal
	Elsan 50% *EC/AF*			

	Phendal 2% OP	0.5 kg ai/ha		and larvicidal action
Triazophos	Hostathion 40% *EC/AF*	0.25 kg ai/ha	625 ml	Effective against rice leaf folder Under review by expert committee
Acephate	Asataf75 SP Starthene 75 SP	600 g ai/ha	800g	Effective against rice leaf folders
Chloronicotinyl				
Imidacloprid	Confidor 200 SL	0.006	150 ml/ha	Effectie against brown plant hopper

B. FUNGICIDES			
Generic names	Formulations	Required concentration In spray formulation required per ha for rice (R) or other crops (OC)	Remarks
I	2	3	4
Copper based products			
Copper oxychloride	Blitox 50 W	0.3-0.4 % (R, OC)	For foliar spray
	Blue Copper 50 W		
	Cuparmar 50 W		
	Esso Fungicide Copper		
	Fungimar Copper 50 W		
	Fytolan 50 W		
	Starcop 50 W		
	Killex Copper Fungicide 50 W		
Sulphur based products			
Sulphur	Cosan	0.2-0.5 % (OC)	For foliar spray against powdery mildew. Also effective against mites.
	Esso Wettable Sulphur		
	Thiovit 80 WP		
	Microsul 80% W		
Carbamates and others			
	Cuman-Z 27%		Residual acting

Ziram (zinc dimethyl dithio carbamate)	JK Ziram	0.2-0.4% (R, OC)	protective fungicide for foliar application Under review of the expert committee
Zineb (zincethylene bisdithio-carbamate)	Dithance Z- 78 Sandoz Zineb Zineb 75 Hexathane 75 W	0.2-0.4 % (R, OC)	Under review of the expert committee
Thiram (tetramethyl thiruram dislphide)	Thiride 75 WP Hexathir 75 W JK Thiram 75 W	0.2-0.3 % (OC)	For foliar spray, soil and seed treatment
Mancozeb (zinc ions and manganese ethylene bisdithiocarbamate)	Dithame M-45 Indofil M-45 Manzeb 75% WP Hilthane M-45 Uthane M-45	0.2-0.4 (R,OC)	Foliar fungicide
Organopbosphorus compounds			
Ediphenphos	Hinosan 50% EC H-Phos 50% EC	0.1 % of the formulated products (R)	For control of blast and sheath blight, high volume spray recommended. To be reviewed by expert committee
Chlorinated nitrobenzene			
Dinoocap	Karathane 25% WP 48 EC	0.05% spray of 48 EC or 300 g/ha of25 WP	For foliar spray for powdery mildew control of cucurbits and rose

Heterocyclic nitrogen compounds			
Captan	Captan 75% WP Hexacap 75% WP	*0.1%* (OC)	For seed treatment at 1.5 g per kg seed
Captafol	Oifolatan 80% WP Foltaf 80% WP	0.1 to *0.3%* (R, *OC)*	Shall be used only for seed dressing
Systemic fungicides			
	Bavistin 50%WP		

Carbendazim	B-Stin	500 g/ha (R, *OC)*	Effective against powdery mildew diseases in ornamental plants; and blast, sheath blight and sheath rot of rice.
	Bengard 50% WP		
	JK Stein 50% WP		
	Zoom 50% WP		
Benomyl	Benlate 50% WP	1-2 g/litre ®	Foliar fungicide for blast control in rice. Under review by expert committee
Caboxin	Vitavax 80% WP	500 g of the formulated product / ha ®	For seed treatment and for foliar application
	Vitavax 75%		
Kitazin	Kitazin-P 48 EC	I ml/litre (500 ml/ha) ®	For foliar spray against rice blast
Pyroquilon	Fongorene 50 WP	2 g/kg seed	For seed treatment
Tricyclazole	Beam 75 WP	2 g/kg seed	For seed treatment
Hexaconazole	Contaf 5 EC	750 ml/ha	For foliar spray against sheath blight
Propeconazole	Tilt 25 EC	*0.5* to *0.75* ml	For foliar spray against sheath blight
Potassium phosphonate	Akomin	*0.3* %	Effective against *Phytophthora* foot rot of pepper
Tridimorph	Calaxin 5%		Coconut stem bleeding
Antibiotics			
Antifungal materials	Aureofungin sol	50 g/ha (R)	For foliar spray
Antibacterial materia	Agnmycin-IOO	750 gin 500 I water (R, *OC)*	For foliar spray
	Plantomycin		
	Paushamycin		
	Streptocycline	15 g in 300 I water (R, *OC)*	
Validacin 3 L	Validamycin A 3%	2m/I	Control of sheath blight

C. HERBICIDES					
Common names	Commercial formulations and concentration	Recommen-ded dose, kg ai/ha	Product per ha	Crops recommended	Hints *on* time and *method of* application
Selective herbicides					
2.4-D sodium salt	Fernoxone 80% WSP	0.8-1.0	1.0-1.2 kg	Rice - for control of broad leaved	Apply at 20-25 DAS /

				weeds and sedges	DAT
2.4-D amine	Agrodar 96-58% WSL	0.8-1.0	I .4 - 1.71	Do	Do

2.4-D ethyl ester	Agrodon 34-48% EC	0.8-1.0	2.4-2.91	Do	Mix with 40 kg slightly moist soil and broadcast evenly at 4-5 DAT keeping 5 cm water in the soil.
Thiobencarb	Saturn 50% EC	2	4.01	Rice - dry sown and transplanted	Pre-emergent spray at 0-6 DAS or at 6 DAT
Pendimethalin	Stomp 30% EC	1.50	4.51	Rice - dry sown and vegetables	Pre-emergence spray at 0-6 DAS
Butachlor	Machete 50% EC Butachlor 50% EC	1.25	2.51	Rice - dry sown	0-6 DAS
				Rice - wet sown	6-9 DAS
				Rice - transplanted	6-9 DAT
	Machete 5% G			Rice - wet sown and transplanted	Broadcast evenly on soil surface at 7 DAS or at 4-8 DAT
Oxyfluorfen	Goal 23.5% EC	0.15	0.641	Rice - dry sown	0-3 DAS
				Banana	Pre-emergent spray
Pretilachlor	Refit 50% EC	0.75	1.51 .	Rice - dry sown	0-6 DAS
Pretilachlor + safener	Sofit 30% EC	0.45	1.51	Rice - wet sown	3-5 DAS
Cyhalofop butyl	Clincher 10% EC	0.08	800ml	Rice - for control of *Echinochloa* sp.	Spray 18-20 DAS
Anilofos	Arozin 30% EC Aniloguard 30% EC	0.40	1.31	Rice-transplanted	6DAT
Diuron	Klass 80% WP	1.50 - 3.00	1.9 -3.8 kg	Banana Pineapple	Pre-emergence spray or directed spray when tank-mix with paraquat

Atrazine	Atrazine 50% WP	2.00	4.0 kg	Sugarcane	Pre-emergence spray at 3 DAP
b. Non-selective herbicides					
Paraquat	Gramoxone 20% EC	0.4-0.8	2.0-4.01	Rice - land preparation Plantation crops, pineapple and banana	For clearing weeds before land preparation. Directed application in inter-row areas.
Glyphosate	Roundup 41% SL Glycel41% SL Weed all 41% SL	0.8	2.01	Do	Do

DAS = Days after sowing; DAT = Days after transplanting; SP = Soluble powder; DP = Dustable powder; G = Granules; EC = Emulsifiable concentrate; AF = Aqua flowable; W= Wettable; WP = Wettable powder; S = Soluble concentrate; SL = Soluble liquid; WSP = Water soluble powder; WSL = Water soluble liquid

Appendix 6

Ready reckoner for making 100 litres of spray solution of desired strength

Strength of spray fluid required, ai%	Number of g or ml of commercial formulation required per 100 litres of water									
	Strength of insecticide or fungicide formulation, %									
	100	**80**	**75**	**50**	**40**	**35**	**30**	**25**	**20**	**10**
0.01	10	12.5	13.3	20	25.0	26.6	33.3	40	50	100
0.015	15	18.8	20.0	30	37.5	42.9	50.0	60	75	150
0.02	29	25.0	26.7	40	50.0	57.1	66.7	80	100	200
0.025	2,5	31.3	33.3	50	62.5	71.4	83.3	100	125	250
0.03	30	37.5	40.0	60	75.0	85.7	100	120	150	300
0.035	35	43.8	46.7	70	87.5	100	117	140	175	350
0.04	40	50.0	53.3	80	100	114	133	160	200	400
0.045	45	56.3	60.0	90	113	129	150	180	225	450
0.05	50	62.5	66.7	100	125	143	167	200	250	500
0.075	75	93.8	100	150	188	214	250	300	375	750
0.10	100	125	133	200	250	286	333	400	500	1000
0.20	200	250	267	400	500	571	667	800	1000	2000
0.25	250	313	333	500	625	714	833	1000	1250	2500
0.30	300	375	400	600	750	857	1000	1200	1500	3000
0.40	400	500	533	800	1000	1143	1333	1600	2000	4000
0.50	500	625	667	1000	1250	1429	1667	2000	2500	5000
1.00	1000	1250	1333	2000	2500	2857	3333	4000	5000	10000

Appendix 7
Preparation of some safer insecticidal materials for common use

Kerosene emulsion

This is a contact insecticide useful against many sucking insects. For preparing this, slice 500 g of ordinary bar soap and dissolve in 4.5 litres of water by boiling. Cool and add 91itres of kerosene under violent agitation till the oil is fully emulsified. The stock solution may be diluted with 15-20 times of water before spraying.

Tobacco decoction

This is very effective for controlling aphids and other soft-bodied insects infesting vegetable crops. Tobacco decoction can be prepared by steeping 500 g of tobacco waste in 4.5 litres of water for 24 hours. Dissolve 120 g of ordinary bar soap separately in another vessel. The soap solution is added to tobacco decoction under violent agitation. Dilute this stock solution 6-7 times before spraying.

Neem kernel suspension (NKS)

This is very effective as a repellent/deterrent against locusts, grasshoppers and other chewing insects particularly lepidopterans. The kernel should be ground into a coarse powder. The effective concentration of NKS ranges from 0.1 to 0.3%. For obtaining 0.1 % concentration, 1 g of powered neem seed is required per litre of water. The required quantity of the coarse powder should be put in a small muslin cloth bag and dipped in water for about 12 hours. Thereafter, squeeze the cloth bag repeatedly so that the out-flowing fluid turns light brownish. The NKS is now ready to be sprayed as such on crops.

Neem oil + garlic emulsion (2%)

To prepare 10 litres of2% neem oil + garlic emulsion, 200 ml neem oil, 200 g garlic and 50 g ordinary bar soap are required. Slice the bar soap Rnd dissolve in 500 milukewann water. Grind 200 g of garlic and take the extract in 300 ml water. Pour the 500 ml soap solution in 200 ml neem oil slowly and stir vigorously to get a good emulsion. Mix the garlic extract in the Deem oil + soap emulsion. Dilute this one litre stock solution by adding 9 litres of water to get 10 litres of 2% neem oil + garlic emulsion.

Appendix 8
Preparation of common fungicides

Bordeaux mixture (1%)

Dissolve 1 kg of powdered copper sulphate crystals in 50 litres of water. In another 50 litres of water, prepare milk of lime with 1 kg of quick lime. Pour the copper sulphate solution into the milk of lime slowly stirring the mixture all the while. Test the mixture before use for the presence of free copper, which is harmful to the plants, by dipping a polished knife in it. If the blade shows a reddish colour due to the deposits of copper, add more lime till the blade is not stained on dipping. Always use wooden, earthen or copper vessels for the preparation of Bordeaux mixture.

In order to confer sticking qualities to Bordeaux mixture, rosin washing soda mixture, may be added. The addition of the sticker is particularly recommended for sprayings conducted during rainy season. For preparing the mixture, 10 litres of water out of 100 litres required for preparing Bordeaux mixture may be kept apart. Boil 10 litres of water, preferably in an earthen pot and add 500 g of good quality washing soda (sodium carbonate). Boil again until the solution becomes slightly dark in colour. Add 1 kg of powdered rosin *(arpoos)* in the boiling washing soda solution. Reduce the flame for avoiding frothing, foaming and spilling over. Boil the solution for 5-10 minutes till black bubbles appear. Cool the solution until the temperature reaches below 45°C. The cooled mixture (10 litres) is then added slowly to the prepared Bordeaux mixture (90 litres) under vigorous stirring.

Bordeaux paste

Dissolve 100 g of copper sulphate and 100 g of quick lime each in 500 ml of water separately. Mix together to make one litre of the paste.

Cheshunt compound

Weigh 60 g copper sulphate and 330 g of ammonium carbonate. These two are well powdered and thoroughly mixed. The dry mixture is stored in an airtight glass container for 24 hours before use. About 25 g of this mixture is dissolved in a little hot water and solution is made up to 8 litres with cold water and used for soil drenching.

Appendix 9

Acaricides and their use

Most of the insecticides have acaricidal properties also. The following are some of the specific acaricides:

Dicofol: Commercially available as Kelthane, Hexakel, Dicofol 18.5% EC. This is a specific acaricide with relatively long residual action. It is effective against all stages of the mites.

Chlorobenzilate: Its use in agricultural crops is banned. Being safer to bees, this is recommended for the control of the acarine disease of bees caused by *Acarapis woodi.*

Sulphur: This is used either as fine dust or as wettable fonns for the control of mites. The wettable sulphur preparations are generally recommended @ 1 g/litre.

Appendix 10

Fumigants and their use

Aluminium phosphide: Aluminium phosphide can be used for fumigating rat burrows and for control of pests infesting stored grains. This is available as 'Celphos' or as 'Aluminium Phosphide' tablets (3g) or pellets. For rat control, locate the burrows, which contain live rats. For this, seal all burrow openings with mud in evenings and examine the closed burrows next day. If the mud seal is opened, such burrows are marked as live ones. In such live burrows, introduce aluminium phosphide tablets @ 1-2 per burrow and seal off the openings immediately. For fumigating grains and grain products under cover, use aluminium phosphide @ 1-2 tablets per tonne of grains, giving an exposure period of 5 days followed by aeration for a day. For room fumigation, use 5-7 tablets for every 28 cubic metre storage space. This has to be used under strict supervision of the approved pest control operators.

Methyl bromide: This is a colourless gas at room temperature. Liquefied gas is available in steel cylinders or in 20 cc ampoules. This is used to fumigate soil required to raise rooted cuttings of pepper. For this, the recommended dose is 500 g/t of soil. The fumigant is exposed under tarpaulin covers for a period of 4-5 days to control the nematodes. Methyl bromide is also used to fumigate plants, grains and grain products. For grain fumigation, the suggested dose is 450-675 g (262-400 ml) for 28 cubic metre space. The period of exposure should be one day, the aeration being given for 4-6 hours. This has to be used under expert supervision by authorized officials.

Ethylene di-bromide (EDB): Available in glass ampoules containing 3, 6, 10 and 15 ml of liquid EDB. Its use is restricted to food grains through government and quasi-government agencies under expert supervision only.

Quantity of grain to be fumigated (quintal)	Quantity of EDB required (ml)	
	Ampoule size, ml	No. of ampoules
01	03	x I
02	06	x I
05	06	x3
10	10	x3
20	15	x4

EDB+ is a mixture of one part of EDB and 8 parts of carbon tetrachloride available in ampoules containing 11,22 and 30 ml. The suggested doses for cover fumigation are as follows:

Quantity of grain to be fumigated (quintal)	Quantity ofEDB+ required (ml)	
	Ampoule size, ml	No. of ampoules

01	11	x 1
02	22	x 1
03	30	x2
10	30	x4
20	30	x8

ED/CT: This is a mixture of ethylene dichloride and carbon tetrachloride in the ratio of 3: 1 by volume. This is soluble in fats and oils and therefore not recommended for fumigating oil seeds or copra. For cover fumigation, the suggested dose is 150 g (120 cc) per m3 (4 kg per 28 m3).

Appendix 12

Institutions under Kerala Agricultural University

1. Teaching Institutions

Faculty of Agriculture

College of Agriculture, Vellayani, Trivandrum

College of Horticulture, Vellanikkara, Trichur

College of Agriculture, Padannakad, Kasaragod

College of Co-operation, Banking and Management, Vellanikkara, Trichur

College of Forestry, Vellanikkara, Trichur

Faculty of Veterinary & Animal Sciences

College of Veterinary & Animal Sciences, Mannuthy, Trichur

College of Dairy Science and Technology, Mannuthy, Trichur

College of Veterinary & Animal Sciences, Pookode, Wayanad (now functioning at Mannuthy)

Faculty of Fisheries

College of Fish eries, Panangad, Eranakulam

Faculty of Agricultural Engineering

Kelappaji College of Agricultural Engineering & Technology, Tavanur, Malappuram

2. Regional Agricultural Research Stations

Regional Agricultural Research Station (Northern Zone), Pilicode, Kasaragod

Regional Agricultural Research Station (High Range

Zone), Ambalavayal, Wayanad

Regional Agricultural Resear£h Station (Central Zone),

Pattambi, Palakkad

Regional Agricultural Research Station (Special

Problem Area Zone), Kumarakom, Kottayam

Onattukara Regional Agricultural Research Station,

Kayamkulam, Alappuzha

Regional Agricultural Research Station (Southern

Zone), Vellayani, Trivandrum

3. Other Research Stations

Pepper Research Station, Panniyur, Thaliparamba,

Kannur

Cardamom Research Station, Pampadumpara, Idukki

Cashew Research Station, Anakkayam, Malappuram

Agricultural Research Station, Mannuthy, Trichur

Banana Research Station, Kannara, Trichur

Cashew Research Station, Madakkathara, Trichur

Pineapple Research Station, Vellanikkara, Trichur Agronomic Research Station, Chalakudy,

Trichur Cropping System Research Sub-centre, Vadakkumchery, Palakkad

Aromatic and Medicinal Plants Research Station, Odakkali, Eranakulam

Pineapple Research Station, Vazhakulam, Muvattupuzha, Eranakulam

Rice Research Station, Vyttila, Eranakulam

Rice Research Station, Moncompu, Alappuzha Sugarcane Research Station, Thiruvalla,

Pathanamthitta Soil Conservation Research Centre, Konni, Pathanamthitta

Farming Systems Research Station, Sadanandapuram, Kottarakkara, Kollam

Cropping System Research Centre, Karamana, Trivandrum

Coconut Research Station, Balaramapuram, Trivandrum

Regional Cattle Infertility Research Centre, Vellimadukunnu, Kozhikode

Livestock Research Station, Thiruvazhamkunnu, Palakkad

Cattle Breeding Farm, Thumburmuzhi, Trichur Centre for Pig Production and Research,

Mannuthy, Trichur

Goat and Sheep Farm, Mannuthy, Trichur

University Livestock Farm, Mannuthy, Trichur University Poultry and Duck Farm, Mannuthy,

Trichur Fisheries Research Station, Puduveypu, Eranakula m 4. Training and Extension Centres

Communication Centre, Mannuthy, Trichur

Central Training Institute, Mannuthy, Trichur Agricultural Technology Information Centre,

Mannuthy, Trichur

KAU Press, Mannuthy, Trichur

Krishi Vigyan Kendra, Ambalavayal, Wayanad Krishi Vigyan Kendra, Pattambi, Palakkad

Krishi Vigyan Kendra, Sadanandapuram, Kollam Krishi Vigyan Kendra, Manjeswaram,

Kasaragod Krishi Vigyan Kendra (Remandated), Kumarakom, Kottayam