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Diseases Management in the Agriculture Plants and Crops

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CHAPTER 2
BOOK: INSECT PESTS, DISEASES AND WEEDS MANAGEMENT

DISEASES MANAGEMENT IN THE AGRICULTURE PLANTS AND CROPS

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Subtitle: Prescription: A Handbook for Agriculturist

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Abstract

This chapter mainly attention to the management of the diseases of different grain crops, vegetables, flower crops, oil crops, and others. The diseases were very harmful to produce the quality crops/fruits and this paper study on the common name and scientific name of the common diseases/causal organisms in different plants. This paper investigated the use of biochemical, chemical, and biological insecticides in the field and also with the cultural practices in the seedbed, field, and storage condition. The farmers used balance fertilizer and also used chemical insecticides to minimize crop damage. It has been estimated that of the average at 36.5% of total losses, 14.2% are caused by disease, 15.1% by insects, and 6.2% by weeds. This chapter has efforted the prescription to the disease's management in farmer fields. Hence, I think if this book is available for all agriculturists and farmers then they will benefit.

Keywords: Diseases, plants, grain crops, vegetables, flower crops, oil crops

1. INTRODUCTION

Bangladesh is an argon-based country. The principle crops are rice, jute, potato, sugarcane, pulses, oil seed, different vegetables and different plants. Plant disease causes enormous losses to crop. Total number of plant disease in the world may be more than 90,000. According to rough estimate disease insect pests and weeds destroy between 31 and 42% of all crops of the world. It has been estimated that of the average at 36.5% of total losses, 14.2% are caused by disease, 10.2% by insects and at 12.2% by weeds. Among the diseases, fungi, bacteria and various causes 12% crop loss annually, 11% losses by nematodes. The climate of Bangladesh is said to harbor of the growth and reproduction of large number of plant pathogen like fungi, virus, bacteria, nematodes etc. One study from 1974 observed that the listed 391 diseases on 124 different crops of Bangladesh. Then another study in 1985, speculated the occurrence of plant diseases (400) on 162 crops of Bangladesh. Most of the farmers of our country are illiterate. They don't get enough advice from DAE due to lack of enough skilled personnel. With this view point, a prescription is prepared for plant diseases of our country and control of disease by using proper chemicals in time on by adoption of other proper ways.

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2. **Rice Diseases**

Disease Name	Prescription (Application/spraying)	Advices
Brown spot *Bipolaris oryzae*	Application of **Carbendazing/iprodione** is advisable.	Healthy seed use, Balance fertilizer use, Water management in timely.
Blast *Pyricularia oryzae*	Spraying of **Zill/trope/native** @ 107mg/ha with 100L water.	Organic fertilizer use, Healthy seed use, Resistant variety use.
Narrow brown spot *Cercospora oryzae*	Fungicides containing **propiconazole** show activity against NWLS & should be applied between boot & heading growth stages.	Resistant variety use, Early maturity cultivars use.
Sheth blight *Rhizoctonia solani*	Infested plants with fungicides as like as **tilt** @67ml/bigha at 15days interval 2-3 time is effective.	Planted in a line, Field dried in certain period, Balance fertilizer use.
Leaf scald *Rhychosporium oryzae*	Application of **Thiovit** at booting stage.	Plant residue burning, Resistant variety use.
Stem rot *Sclerotium oryzae*	**Fentin** hydroxide sprayed at the mid tillering stage.	Apply potassium fertilizer, Crop rotation pattern follow, Resistant variety use.
Sheath rot *Sarocladium oryzae*	Spraying of **tilt** @133cc/bigha was found to reduce sheath rot.	Healthy seed use, Remove the stubbles.
False smut *Ustilaginoidea virens*	Fungicides containing **propiconazole & copper foliar** sprays applied at the boot growth stage.	Resistant/tolerant variety use, Remove stubbles.
Bakanae/foot rot *Fusarium moniliforme*	Seed treated with **bavistin** 3g/kh before sowing.	Balance urea fertilizer use, Remove stubbles, Crop rotation follow.
Bacterial leaf blight *Xanthomonas oryzae pv. Oryzae*	Application of **potash fertilizer** @ 5kg/bigha, Judicious use of N fertilizer.	Good drainage, Plant spacing.
Tungro-virus disease Vet-Green leaf hopper	Control of vector by using proper insecticides as like as **malathion.**	Remove stubbles, Control of BPH, Timely planted.
Grassy stunt-virus disease Vet-Brown plant hopper	Control of vector by using proper insecticides as like as **malathion.**	Remove stubbles, Control of BPH, Timely planted.
Ufra *Ditylenchus angustus*	Spread of **furadan 5G** at 5kg/bigha to reduce nematode population.	Heat soil upto 3-4” depth, Deeply plough, Burn stubbles.

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3. Wheat Diseases

Disease Name	Prescription (Application/spraying)	Advices
Leaf spot/leaf blight/spot blotch *Bipolaris sorokinia*	Spraying of **Dithane M-45, tilt** @0.04%/1ml/2.50L of solution at 12-14 days interval for 3 times.	Crop rotation follow, Crop residue burn.
Foot rot *Sclerotium rolfsii*	Spraying of **dithane M-45, tilt** @0.04%/1ml/2.50L of solution at 12-14 days interval for 3 times.	Crop residue burn, Resistant variety use.
Black point *Bipolaris sorokiniana*	Spraying **tilt** @250 EC @0.004%/1ml 12.5L of water.	Uprooting of diseased plant, Crop rotation follow.
Stem rust/black rust *Puccinia graminis f.sp. tritici*	Spraying **tilt** @ 0.02% with 100L water at 15 days interval of 2-3 times.	Removal of susceptible volunteer wheat & barberry plants.
Loose smut Ustilago tritici	Seeds are treated with vitavax 200 @2.5-3,0g/kg seed.	Resistant variety use, Hot water treatment of seed.
Leaf rust/brown rust *Puccinia recondia f.sp. tritici*	Spraying **Tilt** @ 0.02% with 100L water at 15 days interval of 2-3 times.	Avoid excess N fertilizer. Early maturity cultivars use.

4. Barley Diseases

Disease Name	Prescription (Application/spraying)	Advices
Cover smut *Ustilago hordei*	Seeds are treated with **Carboxin, Fenpiclonil, Tebuconazole, Triadimonol, Triticonazole.**	Resistant variety use, Healthy seed collected.
Leaf blight *Dranlara* sp.	Spraying **Tilt 250 EC** @ 0.04% /1ml of 250L water.	Burning of crop residues, Resistant variety use.

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5. Jute Diseases

Disease Name	Prescription (Application/spraying)	Advices
Stem rot *Macrophomina phaseolina*	Spraying of **Blitox-50** is @ 0.2%/ **Dithane M-45** @ 0.2-0.3% for 2-3 times at 15 days interval.	Healthy seed collected, Rouging out the infected plant.
Black band *Botroyodiplodia theobromae*	Spraying of **Blitox-50** is @ 0.2%/ **Dithane M-45** @ 0.2-0.3% for 2-3 times at 15 days interval.	Healthy seed collected, Rouging out the infected plant.
Anthracnose *Colletotrichum corchori*	Spraying of **Blitox-50** is @ 0.2%/ **Dithane M-45** @ 0.2-0.3% for 2-3 times at 15 days interval.	Rotation with *corchorus olitorious* is practiced.
Leaf mosaic-virus disease Vet-white fly	Control the white fly with using proper insecticides like **Malathion.**	Remove the infected plant.

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6. Maize Diseases

Disease Name	Prescription (Application/spraying)	Advices
Seed rot & seedling blight *Pythium ultimum, Fusarium spp.*	Seed treated within **Thirum & Vitavax** 0.25% at 2.5-3.0 g/kg seed.	Healthy seed use, Resistant variety use.
Ear & kernel rot of corm *Giberella ear rot *Giberella zeae*	Insecticide apply for the insect & pest as like as **Mathion, Dust, sulphur powder.**	Crop rotation follow, Resistant variety use, Insects, birds control. Burn the plant derbies.
*Diplodia ear rot (*Diplodia maydi),* *Aspergillus ear rot (*Aspergillus flarus)*		

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7. Sugarcane Diseases

Disease Name	Prescription (Application/spraying)	Advices
Ret rot *Colletotricum falcatum*	Setts treatment with **Bavistin** @ 0.5% solution for 30 minutes to 1 hours.	Disease free cane use, Dugout & burnt the diseased plant.
Smut *Ustilago scitaminea*	Setts treatment with 0.1% **$HgCl_2$/1% formalion** solution for 5 minutes.	Remove smutted whips, Avoid rationing.
Wilt *Fusarium sacchari*	Application of **Boron & Manganese** can reduce the wilt incidence.	Avoid rationing, Crop derbies remove.
Pineapple disease *Ceratocystis paradoxa*	Setts treatment with **Bavistin** @0.5%/**Thiram** @ 0.1% for 30 minutes to 1 hour.	Healthy seeds use, Hot water treatment.
Ratoon stunting *Clavibacter xyli*	Setts treatment with **Bavistin** @ 0.5 for 30 minutes to 1 hour.	Rouging out infested plant, Crop rotation follows.
White leaf Mycoplasma like organism Vet-leafhopper & psyllids	**Malathion** sprays @0.16% during early stage of crop growth to control insect vector.	Healthy setts use, Hot water treatment use for setts.
Grassy shoot Mycoplasma like organism Vet-Aphid	**Malathion** sprays @0.16% during early stage of crop growth to control insect vector.	Healthy setts use, Hot water treatment use for setts.

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8. Cotton Diseases

Disease Name	Prescription (Application/spraying)	Advices
Bacterial blight/angular leaf spot *Xanthomonas campestris pv. Malvacearum*	Application of **Polash** @ 5kh/bigha.	Use disease free seeds. Crop rotation should be followed.
Fusarium wilt *Fusarium oxysporum fsp. Vasinfectum*	Spray 1% **Carbendazine** with 100L water at 10-14 days interval.	Remove & destroy infested plant. Weeds control. Reduce nematode.
Verticillum wilt *Verticillum albo-atrum*	Spraying **Tricodrame** with the solution.	Rotation with corn, sorghum & soybean. Control irrigation & N rate.
Seedling disease *Rhizoctonia solani,* *Pythium sp.* *Fusarium sp.* *Phoma exugua*	Applying Fungicide like **Demosan, Bayton, Captan, Chloroneb** @ 2% are effective against **Rhizoctonia** but not **Pythium.** **Baytan** @ 0.2-0.3% is the only Fungicide that retards black root rot.	Destroy crop residue. Crop rotation should be followed. Lime acid used in soil. Worm soil used.

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9. Mustard Diseases

Disease Name	Prescription (Application/spraying)	Advices
Alternaria leaf spot *Alternaria brassicae* *Alternaria brassicicola*	Spray **Rovral WP**@0.2% at 30-45 days and 50-55 days of plant after seed sowing.	Sowing healthy & disease free seeds. Destroy residues.
Broome rape *Orobanche sp.*	Destroy parasite by spraying **2,4-D.**	Deep ploughing & opening the land.

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10. Sunflower Disease

Disease Name	Prescription (Application/spraying)	Advices
Alternaria blight *Alternaria helianthi*	Spray **Rovral WP** @ 0.1% at 30 days,40 days, & 50 days of plant after seed sowing.	Removal of crop residues. Crop rotation should be followed.

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11. Ground Nut Diseases

Disease Name	Prescription (Application/spraying)	Advices
Tikka disease/Cercospora leaf spot *Cercospora arachidicola* *Cercosporadium personatum*	Spray **Bavistin/Tilt-250EC** @0.2% at 2-3 times at 10 days intervals from 30-45 days after seed sowing.	Remove residues Sowing healthy & disease free seeds.
Rust disease *Puccinia anachidieda*	Foliar spray of **Tilt-250EC** @0.05% on the leaf.	Crop rotation should be followed. Resistant variety used.

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12. Pulse Diseases

Disease Name	Prescription (Application/spraying)	Advices
Foot & root rot pulses *Fusarium oxysporum, Rhizoctonia solani, Sclerotium rolfsii*	Spray with **Macuprax/Bavistin** @0.2% at 30-45 days of plant.	Destroyed crop residues. Good drainage system followed. Healthy seed use
Cercospora leaf bean *Cercospora cruenta*	Spray with **Copper oxychloride/Tilt-250EC** @0.2at 2-3 times at 10 days intervals.	Good drainage system. Healthy seed use.
Blight disease of gram *Ascochyta rabiei*	Spraying **Potash** at the 5 kg/bigha.	Balance fertilizer use. Crop rotation should be followed.
Leptosphaerulina leaf blight *Leptosphaerulina trifoli* (All pulses except gram, pigeon pea)	Spray **Bavistin, Dithane M-45** @0.2% for 3 times at 15 days interval.	Destroy crop residue. Healthy seed use
Bean common mosaic-virus Vet-Aphid	Controlled Aphid by using Malathion-57 EC @ 0.2% to control insect vectors.	Roughing out of infested plants. Destroy crop residue.
Rust bean (gram, lentil, pea) *Uromyces ciceria*	Spray **Dithane M-45** @0.2% at 3 times at 15 days interval.	Destroy crop residue. Healthy seed use.
Powdery mildew *Oidium sp.,* *Erysiphe polygony* (All pulses except pea)	Spray **Ridomil MZ-92** or **S-containing Fungicide** @0.2% 12-14 days interval.	Destroy crop residue. Healthy seed use.
Wilt of pulses *Fusarium oxysporum, Pythium sp.,Scleratium sp.,Rhizoctonia sp*.	Spray with **Macprax/Bavistin** @0.2% at 30-45 days of plant.	Drying land before sowing. Good drainage system. Crop rotation should be followed.
Yellow mosaic mashkalai Vet-Yellow mosaic virus	Foliar spray of **Admire 200 @**0.25ml/litre of 7-11days interval.	Rouging out virus infected plant.
Leaf rot *Sclerotinia scleratium*	Foliar spray of **Tilt-250EC** @0.02% at 10-15 days interval.	Rouging out virus infected plant. Healthy seed use.
Cercospora leaf spot of mungbean *Cercospora cruenta*	Systemic **Fungicide Bavistin 70Wp**.	Rouging out virus infected plant.
Stem phylium blight of lentil *Stemphylium botnyosum*	Spraying of **Rovral-50WP**@0.2% at 10-15 days interval.	Good healthy seed use. Crop rotation should be followed.

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13. Papaya Diseases

Disease Name	Prescription (Application/spraying)	Advices
Stem rot/damping off/collar rot *Pythium* sp., *Fusarium* sp.	Drench the soil with **Bordeaux mixture** @ 1% or **Metaloxyl** @ 0.1% several times during rainy season.	Avoid excess N fertilizer. Well drainage system.
Anthracnose *Colletotricum gloeosporioides*	Orchard sprays **Copper Oxichloride** @ 3g/litre water, **Carbendazin** @ 1g/litre water.	Avoid injury. Cool temperature food fruits.
Papaya mosaic *Papaya mosaic virus*	Spraying **Malathion 57EC**@ 0.2% for 3-4 times at 10 days interval.	Destroy plant debris. Resistant variety use.
Leaf curl *Tobacco leaf curl virus* Vet-white fly	Spraying **Malathion57EC** @0.2% for 3-4 times at 10 days interval.	Uproot affected plant. Avoid growing tomato, tobacco near papaya.
Ring spot *Papaya ring spot virus* Vet-aphid	Spraying **Malathion57EC** @0.2% for 3-4 times at 10 days interval.	Healthy seed use. Crop rotation should be followed.

14. Banana Diseases

Disease Name	Prescription (Application/spraying)	Advices
Anthracnose *Colletotricum musae*	Spraying of **Blitox-50** @0.2% for 2-3 times at 15 days interval.	Proper sanitation control in field. Proper drainage manage.
Cercospora leaf spot *Cercospora musae*	Spraying **Bordeaux mixture**.	Dipping row. Avoid injury.
Fusarium wilt *Fusarium oxysporum f.sp. cubease*	Spraying of 1% **Carbendazine** @0.01% at 15 days interval 2-3 times.	Resistant variety use. Diseases free sucker collect.
Bunchy top *Banana bunchy top virus*	Spraying **Malathion** for vector control.	Remove infested plants. Use diseases free planting materials.

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15. Citrus Diseases

Disease Name	Prescription (Application/spraying)	Advices
Scab *Elsinoe fawcetti*	Application of **Cupravit** @0.5% at2-3 times.	Destroy disease plant parts.
Die back *Colletotrichum gloeosporioides*	Application of **Cupravi**t @0.5% at2-3 times.	Use healthy plants. Avoid alkaline soil.
Citrus canker *Xanthomonas campestris pv. Citri*	Six/seven costly sprays of liquid **Copper** have to be applied to protect new growth from infection.	Proper pruning of diseased plant. Winds break control.
Greening/Huanglong bing/Yellow shoot disease *Candidates liberibacter asiatices*	Application of **Potash** @ 15 kg/bigha for disease controlling.	Remove infected trees. Disease free trees uses.

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16. Tomato Diseases

Disease Name	Prescription (Application/spraying)	Advices
Early blight Alternaria solani	Spraying of **Dithane M-45** @0.2-0.3% at 10 days interval starting from the first appearance of disease symptom.	Burning the crop residues. Disease free seeds use.
Late blight *Phytophthora infestans*	Spraying of **Ridomil** @0.2 at 10 days interval or **DithanevZ-78** or **Dithane M-45** @0.2-0.3% at 10 days interval starting from first appearance of disease symptom.	Disease free seeds se. Proper sanitation manages. Crop rotation should be followed.
Fusarium wilt *Fusarium oxysporum fsp. Lycopersici*	Spraying of 1% **Carbendazim** at 10-15 days interval.	Crop rotation should be followed. Remove & destroy infected plant material.
Verticillium wilt *Verticillium albo-atrum*	Spraying **Tricodrame** with the water.	Crop rotation should be followed. Remove & destroy the infected plant.
Root knot *Meloidogyne spp.*	Spraying **Furadan 5G** @0.2% at 7 days interval 3-4days.	Proper sanitation control in field. Crop rotation should be followed.
Mosaic disease TMV & CMV; PVX & PVY Vet- Aphid	Spraying **Malathion 57EC @**0.05% for controlling the aphid.	Proper sanitation control in field. Weed eradication in field. Hot water treatment in seed.
Leaf curl Tomato leaf curl virus (TLCV) Vet- White fly	Spraying **Malathion 57EC** @0.05% for controlling the white fly.	Destroy old crops. Control white fly. Weed control.

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17. Bean Diseases

Disease Name	Prescription (Application/spraying)	Advices
Cercospora leaf spot *Cercospora cruenta*	Spraying with **Dithane M-45/Tilt** @ 0.2% solutions at 10-12 days interval.	Proper sanitation control in field. Crop rotation should be followed.
Anthracnose *Colletotrichum lindemuthianum*	Spraying with **Dithane M-45** @0.3% solution at 10 days interval.	Proper sanitation control in field. Proper drainage manages.
Rust *Uromyces phaseoli*	Application of **Shulpher** @20-25ibs/ac for 3-5 times when plants are small.	Collect & destroy crop residues.
Bean common mosaic virus (BCMV) Vet-Aphid	Spraying **Malathion 57EC** @ 0.2% for control aphid.	Resistant variety use. Remove infected plant.
Bean yellow mosaic (BYMV) Vet-Aphid	Spraying **Malathion 57EC** @ 0.2% for control aphid.	Resistant variety use. Collection destruction of infected plant parts.

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18. Brinjal Diseases

Disease Name	Prescription (Application/spraying)	Advices
Fruit rot/blight *Phomopsis vexans*	Spraying **Dithane M-45** @0.2% at 10-12 days interval when fruits are first set.	Crop rotation should be followed. Healthy seed collect.
Little leaf Mycoplasma like organism	Application of **Malathion 57EC** @0.05% for control insect. Antibiotic treatment of the plant with **Tetracyclin** @500 ppm.	Resistant & tolerant variety use.

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19. Data Disease

Disease Name	Prescription (Application/spraying)	Advices
Anthracnose *Colletotrichum dematium*	Spraying **Dithane M-45** or **Bavistin** @ 0.3% solution at 10 days intervals.	Proper planting spacing managed. Proper sanitation in the field.

20. Cabbage Diseases

Disease Name	Prescription (Application/spraying)	Advices
Cabbage yellow *Fusarium oxysporum f.sp. conglutanans*	Seed treated with **3% Formalin** solution @ 30ml/cff soil.	Resistant variety use. Seedbed soil sterilized.
Alternaria leaf spot/leaf blight/black spot *Alternaria brassicae, Alternaria brassicicola*	Spraying of **Rovral/Zilem/Zithane Z-78** @ 0.2% for 2-3 times at 15days interval.	Crop rotation should be followed. Healthy seed use.
Black rot *Xanthomonas campestris*	Seed treated with **Aureomycin** (1:1000) for 30 minutes for 2-3 days before sowing.	Healthy seed use. Sanitation in the seed bed.

21. Cauliflower Disease

Disease Name	Prescription (Application/spraying)	Advices
Leaf spot *Alternaria brassicicola*	Spraying of **Rovral/Zilem/Zithanez-78** @ 0.2% for 2-3 times at 15 days intervals.	Healthy seed used. Crop rotation should be followed.

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22. Chili Diseases

Disease Name	Prescription (Application/spraying)	Advices
Anthracnose/die back *Colletotricum capsici*	Spraying with **Perenox,Zilem** @0.2% for 12-14bdays interval.	Disease free seed used.
Leaf curl Tomato leaf curl virus (TLCV) Vet-White fly	Spraying **Malathion** @ 0.2% at 10 days interval.	Resistant variety use. Crop rotation should be followed.
Chilli mosaic TMV, CMV, PVX, PVY	Spraying **Malathion 57EC** @ 3ml/L of water to control Aphid.	Resistant variety use. Planting as maize crop for barrier crop.

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23. Cucurbit Diseases

Disease Name	Prescription (Application/spraying)	Advices
Anthracnose *Colletotrichum lagenarium*	Spraying **Dithane M-45, Bavistin** @ 0.2% solution at 14 days interval from first symptom appearance to harvest.	Proper drainage manages in land. Wild host destroyed.
Powdery mildew *Erysiphe cichoracearum*	Spraying of **$CuSo_4$** @1g/L or cu-oxichbride @0.5% at 7 days interval.	Destroy plant debris.
Downey mildew *Pseudoperonospora cubensis*	Spraying of **Dithane M-45** @0.2% at 7-10 days interval at least 2-3 times.	Crop rotation should be followed. Sanitation properly maintained.
Mosaic (CMV, CGMMV, WMN)	Spraying **Malathion/Diazinon 60EC** @ 0.2 ml/L of water to controlAphid.	Affected plants should be destroyed by burning.

24. Okra Disease

Disease Name	Prescription (Application/spraying)	Advices
Anthracnose *Colletotrichum dematium*	Spraying of **Dithane M-45** or **Bavistin** @ 0.3% solution at 10 days intervals.	Well drain should be followed. Sanitation properly maintained.

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25. Potato Diseases

Disease Name	Prescription (Application/spraying)	Advices
Early blight *Alternaria solani*	Spraying **Dithane M-45** @ 0.2-0.3% at 10 days interval starting from the first appearance of the disease symptom.	Crop residues destroy. Diseases free seeds use.
Late blight Phytophthora infestans	Spraying of **Ridomi**l @ 0.2%/ **Dithane Z-78/Dithane M-45**@ 0.2-0.3% at 10 days interval starting from first appearance of disease.	Diseases free seeds use. Proper sanitation manages in field.
Dry rot *Fusarium caerulium*	Dipping seed tuber in 1% **Formaline** for 1/2minute for satisfactory control of the disease.	Avoid injury. Checking tuber before planting.
Scab *Streptomyces scabies*	Spraying of 0.3% **Polyrum DF** for 5 minutes before planting.	Clean cultivation. Proper sanitation manages in field.
Soft rot *Erwinia carotovora*	Spraying of **Dithane M-45** @0.02% at 10-15 days interval.	Use resistant variety. Crop rotation should be followed.
Black heart	Spraying of **Diaginon** of the chemical @0.5% at 10-15 days interval.	Cultivation of resistant variety use. Crop rotation should be followed.
Hollow heart	Spraying of **Diaginon** of the chemical @0.5% at 10-15 days interval.	Cultivation of resistant variety use. Well irrigation manages.
Black rot *Ceratocystis timbriata*	Treatment with **$HgCl_2$** solution 10Z/gallon of water for 10 minutes.	Crop rotation should be followed. Healthy seed use.
Ring rot *Corynebecterium sepadonicum*	**Bleaching powder** is applied @ 12.5 kg/ha.	Healthy seed use. Avoid injury.
Leaf roll Potato leaf roll virus Vet-Aphid	Spraying **Malathion 57EC** @ 0.2%at 2-3 times for 15 days interval.	Disease free seed use. Rouging out infected plant.
Rhizopus soft rot *Phizopus nigricans*	Spray 1% **Borax** solution before stored.	Minimize the injury. Resistant variety use.

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26. Sweet Potato Diseases

Disease Name	Prescription (Application/spraying)	Advices
Black rot *Cerotocystis fimbriada*	Treatment of tuber with $HgCl_2$ solution @ 107gallon of water for 10 minutes.	Crop rotation should be followed. Healthy stem cutting use as planting material.
Rhizopus soft rot *Rhuzopus higrecam*	Spraying of Banon solution before storing of tuber.	Resistant variety use. Manage weevil population.

27. Onion Disease

Disease Name	Prescription (Application/spraying)	Advices
Purpole blotch *Alternaria porri*, *Stemphylium botryosum*	Application of **Rovral** @ 0.2% at 15 days interval for 2 times.	Avoiding dense planting. Manage storage temperature.

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28. Ginger Disease

Disease Name	Prescription (Application/spraying)	Advices
Rhizome rot *Phythium aphanidermatum*	Spraying **Acrovat/Ridomil/Dithane M-45** @ 0.2-0.3% for 2-3 times at basal part of the plant.	Disease free seed use. Crop rotation should be followed.

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29. Turmeric Diseases

Disease Name	Prescription (Application/spraying)	Advices
Leaf spot/leaf blight *Taphrina maculans*	Spraying **Bordeaux mixture** 1% has been found effective in reducing the spread to some extent.	Healthy plant material use. Resistant variety use.
Rhizome & root rot *Pythium aphanidermatum*	Spraying **Bordeaux mixture** 1% has been found effective in reducing the spread to some extent.	Resistant variety use. Avoid excess water.

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30. Mango Diseases

Disease Name	Prescription (Application/spraying)	Advices
Anthracnose *Colletotrichum gleosporioides*	Spraying with **Bordeaux mixture** 2-3 times within two weeks before blossoms open.	Prune all the disease twigs & burn them.
Stem end rot *Botryodiplodia theobromae*	Dipping mangoes in (5-6) % **Borax** solution at 43^0 for 3 minutes.	Avoid harvesting immature fruit.
Die back *Colletotrichum gloeosporioides*	Spraying of **Copper Oxychloride** @ 0.3%.	Pruning of the diseased twigs.
Black tip Serious disorder	Spraying **Borax** @ 1%/**Alkaline** solution at 15 days interval.	Pruning the infected plant parts.

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31. Guava Diseases

Disease Name	Prescription (Application/spraying)	Advices
Anthracnose *Colletotrichum psidii*	Spraying **Bavistin** or **Topsin** @ 0.2% at 10 days interval for 3-4 times.	
Die *back* *Colletotrichum psidii*	Spraying trees with **Bordeaux mixture** @ 0.6%. **Pour Tilt** @ 0.2% at the infected plant parts.	Pruning infected twigs. Balance fertilizers use.
Wilt *Fusarium oxysporum f.sp. psidii*	Spraying **Carbendazine** @ 0.01% at 15 days interval for 2-3 times.	Balance N fertilizers through organic sources.

32. **Jackfruit Diseases**

Disease Name	Prescription (Application/spraying)	Advices
Rhizopus rot/fruit rot *Rhizopus artocarpi, Rhizopus stolonifer*	Spraying the mixture **Noin** @ 0.3% +**Dithane M-45** @0.3%+**Malathion** @0.2% at 10 days interval for 3 times.	Avoid wounding the fruit. Pruning tree for ventilation.

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33. Pineapple Diseases

Disease Name	Prescription (Application/spraying)	Advices
Leaf & fruit rot *Ceratocystis paradoxa*	Spraying **Dithane Z-78** at 0.3% on leaves.	Field sanitation. Remove residues.

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34. Coconut Diseases

Disease Name	Prescription (Application/spraying)	Advices
Leaf spot/grey leaf spot *Pestalotiopsis palmerum*	Spraying **Dithane M-45** @0.2% or **Bavistin** @0.25% at 15 days interval for 2 times. Spraying 1% Bordeaux mixture during May & September.	Removal of infested plant parts.
Bud rot *Phytophthora palmivora*	Spraying **Bordeaux mixture** on the croon of neighboring plant as prophylactic measure. Spraying with 1% **Bordeaux mixture** during May and September.	Removal of diseased plant & burning the plants residues.

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35. Tea Diseases

Disease Name	Prescription (Application/spraying)	Advices
Blight blight *Exobasidium vexans*	Systemic fungicides **Hexaconazole**,**Bitertazol** & **Propiconazole** are used.	Cultural control.
Gray blight *Pestalotia theae*	Spraying **Dithane M-45** @ 0.2-0.3% at 21 days interval for 3-4 spraying rainy season.	Avoid plant stress.
Stem canker *Macrophoma theicola*	Spraying of Trichoderme spore suspension using using 20L/kg of bio-agent formulation/ha is required.	Large pruning infected plant. Well drainage manages in field.
Black rot *Corticium theae*	Spray two blankets around of **CDC/Copper Hydroxide/Hexa Aconozole** at 15 days interval.	Heavy pruning infected plant. Thinning out of the dense shade.
Charcoal stump rot *Ustulina zonata*	**Trichoderma** bio-agent has been found effective in controlling primary root diseases namely, Charcoal stump rot @ 100ml/pit.	Shade trees should bering barked prior to felling.

36. Betel Vine Diseases

Disease Name	Prescription (Application/spraying)	Advices
Leaf & foot rot *Phytophthora parasitica*	Spray **Bordeaox mixture** @ 5% **or Ridomi/ Dithane M-45** @ 0.2% for 3-4 times at 8-10 days interval.	Remove infected leaves. Avoid excess irrigation.
Leaf spot *Colletotrichum piperis*	Spray **Bordeaox mixture** @ 5% or **Ridomi/ Dithane M-45** @ 0.2% for 3-4 times at 8-10 days interval.	Remove infected leaves. Avoid excess irrigation.
Foot & root rot *Sclerotium rolfsii/Rhizoctonia solani*	Spray **Bordeaox mixture** @ 5**% Dithane M-45** @ 0.2% for 3-4 times at10-15 days interval into base & stem.	Proper weeding. Avoiding excess irrigation. Removed infected leaves.

37. Betel Nut Diseases

Disease Name	Prescription (Application/spraying)	Advices
Grey leaf spot *Pestalotia palmarum*	Spraying **Dithane M-45**@ 0.2% more than one year where the disease is severe.	Removal & destruction of infected leaves Crop rotation should be followed.
Fruit rot/fruit crack *Phytophthora palmivora*	Spraying with one percent **Bordeaux mixture** on the bunchesis needed to prevent the incidence of the disease.	Removal of all dried & infected brunch.

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38. Tobacco Diseases

Disease Name	Prescription (Application/spraying)	Advices
Tobacco mosaic (Tobacco mosaic virus)	Spraying Malathion 57EC @ 0.02% for controlling vectors.	Infected plant should be removed. Weeds control.
Brown spot *Alternaria alternate*	Spraying of **Dithane Z-78** do give reducing in leaf spotting.	Crop rotation should be followed. Nematode should be controllrd.
Angular leaf spot *Pseudomonas amygdale pv. Tabaci*	Sprays Antibiotics like **Streptomycine** at 200ppm.	Use proper doges of Potassium.
Leaf curl Tobacco leaf curl virus	Spraying **Chlorpyrifos 20EC** @ 25ml in 10L of water.	Remove & destroy diseased tobacco seedlings.
Frogeye leaf spot *Cercospora nicotianae*	Spraying of **Bordeaux mixture/**1% of **Benomyl/Bavistin** has given adequate control of trog-eye spot.	Avoiding excess N fertilizer.

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39. Nursery Diseases

Disease Name	Prescription (Application/spraying)	Advices
Damping off *Fusarium spp.* *Rhizoctonia spp.*	Application of **Fungicides** such as **Thiram, Captan, Copper Oxychloride** etc.	Ensuring good soil drainage. Moderate density of seedling.
Root rot of gammar *Fusarium solani*	Application of Fungicide of **Granosan-M** @ 8 per 2 gallon of water as soil drench in area of dead, dying & surrounding healthy seedlings.	Rouging seedling having well drenching of soil.
Root rot of rubber *Fusarium sp.*	Application of Fungicide like **Dithane M-45** @50g/16 L of water as soil drench at the onset of early disease symptom.	Avoiding water logging condition of polybag. Maintaining better soil aeration.
Root rot of teak *Pseudomonas solanacearum*	Application of Fungicide like **Dithane M-45** @ 50g/16 L of water as soil drench at the onset of early disease symptom.	Raising seedling on sites having well drainage soil. Avoiding water logging condition.
Die back of rubber *Botryodiplodia theobromae*	Application of **Fungicide** likes **Dithane M-45** @ 3g/16 L of water at early storage of disease at 10-15 days interval for 2-3 times.	Avoiding water manage. Germinated seeds should be planted in polyethylene bags in nursery.
Die back of keora *Chaetomella raphigera*	The **controlmeasure** has not be worked out specifically but seems very likely that at the early stage of spread of the disease, application of Foliar Fungicide such as Copper **Oxychloride,Dithane M-45** should be used.	Removal of infected plant.
Leaf spot of rubber *Corynespora cassicola*	Spraying with **Bordeaux mixture** 1%/**Dithane M-45** @ 0.2% /Bavistin @0.02% is recommended for nursery. Spraying with **Mancozeb** @0.2% at 2-3 weeks interval during defoliation is effective in mature plantation.	Adequate balance nutrition. Reduces the disease incidence.
Leaf spot of jail bet *Guignardia calami*	Application of **Dithane M-45** @ 50 g Fungicide in 16L of water & applied at the onset of early symptom expressing very often has proved to effectively control the leaf spot.	Adequate balance nutrition. Seedling in shading.
Leaf blight of oil palm *Curvularia eragrostides*	The leaf bright can be controlled by fiver Foliar spray at weekly interval with **Either,Benlate/Captan-5** suspension of 56g in 15.5 L of water & applied on every 400 seedling raised polyethylene bags.	Properly pruning in field. Balance fertilizer use.
Bamboo blight *Sarocladium oryzae*	Application of **Carbendazine** @0.25% & **Mancozeb** @ 0.3% at weekly interval.	Cutting & removing of bamboo Culm. Weed & bush should be removed.

Conclusions

From the above study, we can say that if these prescription chapters are with an educated farmer or an agriculturist, then they can be easily produced without any loss of crops or fruits. Not only that, the crops will be good and so I think it can be easily exported in any country.

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