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Department of Agriculture
Peradeniya
2019

Manual on
Pesticide Recommendations
for
"Food, Plantation, Export Agricultural and Floricultural Crops"
in Sri Lanka

Ministry of Agriculture
Department of Agriculture
Peradeniya

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Publication Formatting
Mr WL Hiran Peris
Mr S Periyasamy
Mr MFM Rizwan
Ms NKDA Sriyantha Menike

Cover Page & Page Processed by
Ms NA Lasantha Kumari Weerasinghe

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FORWORD

This updated "Manual on Pesticide Recommendation for Food, Plantation, Export Agricultural and Floricultural Crops in Sri Lanka" is a long felt need of the agriculture scientists, academics, extension specialists, technical staff in the public and private sector organizations and students engaged in pest management in agricultural crops in Sri Lanka.

The introductory chapter of this manual provides important information on the procedures adopted in selecting the best molecules for target organisms, the best application method recommended for desired results. This chapter also includes an outline of the expectations from the advisory services to help farmers minimize resistance development in pests, pathogens and weeds to pesticides which is one of the major concern in recommending a wider range of pesticides with different Mode-of-Actions for pests.

The pesticide recommendations have been categorized according to crops/pest combinations for easy reference. In addition, the Mode-of- Action of pesticides are given to help extension agents to advise farmers to select the best options to minimize resistance development in pests, pathogens and weeds to pesticides by selecting pesticides with different Mode-of-Actions (MOA) especially in case the farmers decide for a repeated application to manage difficult to control pests.

The expectations are that the extension specialists would transfer the correct information on dose, dilution, pre harvest intervals and safe application procedure to the growers to help minimize waste, environment contamination and achieve desired goals and more importantly the safety of the applicator.

It is with great pleasure that I appreciate the Officers attached to the Office of the Registrar of Pesticides, Plant Protection Service and Research Institutes in the Department of Agriculture and other crop related institutes for the untiring efforts given to make this a useful manual for the development of the agriculture sector in Sri Lanka.

Dr WMW Weerakoon
Director General of Agriculture,
Department of Agriculture, Peradeniya

ACKNOWLEDGEMENT

COORDINATORS

Dr JA Sumith
Dr RSK Keerthisena
Ms HMJ Ilangkoon Menike
Ms JKA Hettiarachchi
Dr (Ms) MTMDR Perera

CONTRIBUTORS

Rice

Ms Susanthi Chandrasena
Mr SR Sarathchandra
Ms ASK Abeysekera
Mr RMSU Bandara
Mr LC Silva
Mr S Sivanason
Dr Swarna Herath

Coarse Grains/Other Field Crops

Ms Nishanthi Gunawardena
Ms WMK Fernando

Vegetables/Root and Tuber Crops

Dr WART Wicrkramaarachchi
Mr KP Somachandra
Dr RGAS Rajapaksha
Mr SS Weligamage
Ms WAPG Weerarathne
Mr KMDW Prabath Nishantha
Ms Akila Hadji
Ms Pushpangi Kalupahana
Ms HASN Hettiarachchi
Mrs Sobashini Fernando
Ms Pradeepa Ranaweera
Ms C Ranasinghe
Mr S Rajesh Kanna
Dr KANP Bandara

Fruits

Ms AS Pushpakumari
Mr K Athapaththu

Plant Protection

Ms Nirmala Hapukotuwa
Mr Saman Perera

Tea

Dr Keerthi Mohotti
Dr GD Sinnaiah
Dr (Ms) RDPD Senanayake
Dr PGDS Amarasena
Dr (Ms) MSDL De Silva

Rubber

Dr (Ms) THPS Fernando

Coconut

Dr HTR Wijesekara
Dr (Ms) NS Aratchige

Export Agricultural Crops

Dr (Ms) MKSD Samarasinghe

Sugarcane

Ms VKASM Wanasinghe
Ms KMG Chanchala
Ms ANWS Thushari
Mr YAPK Dayasena

Floricultural Crops

Mr MMDJ Senarathne

FACILATATORS

Mr SNL Ratnaweera
Mr MTM Wasleem
Ms Janaki Dehideniya
Ms HARP Vilasini
Ms HGK Kalpashika
Ms AM Disna Ranjani
Mr MU Haturusinghe
Ms IDMV Pathirana
Ms JPC Jayasinghe

CROPLIFE SRI LANKA

Mr Suresh Fernando (Chair person)
Mr HMR Bandara (Secretary)
All Members

CONSULTANTS

Dr Laxman Amarasinghe
Dr L Nugaliyadde

EDITORS

Dr JA Sumith
Dr (Ms) Mangalika M Nugaliyadde
Ms Jeevani P Marasinghe
Ms Upendra SK Abeysinghe

INTRODUCTION

Since gaining independence in 1948, all successive governments have given the highest priority to increase the food production in the country to reach the cherished goal of self-sufficiency in food. Introduction of modern high-yielding crop cultivars accompanied with the adoption of improved crop production and crop protection practices such as chemical fertilizers, pesticides, increased cultivated extent, improved irrigation facilities and increased cropping intensities have significantly contributed to a steady increase of food production over the last several decades in the country.

However, adoption of modern agricultural practices supported a favorable climate for a rapid development of pests, disease-causing pathogens and weeds in agricultural fields. Besides, high yielding modern crop varieties with relatively narrow genetic base are inherently more vulnerable to pests, diseases and weed infestations. The results have been a heavy dependence on synthetic pesticides for the control of these organisms. Thus, pesticides have become a critically important component in modernization of agriculture in the country.

Despite many advantages, there are some potential hazards and risks associated with pesticide use. In many developing countries like ours, very often small farmers are not competent enough to use highly toxic pesticides safely while protecting their health and quality of the environment. Non-optimal and non-judicious use of pesticides may lead to the development of resistance in pests to pesticides in the long run and certain externalities like environmental pollution and health hazards. However, pesticides can be used safely and effectively without these undesirable effects if proper procedures and guidelines are followed. Hence, farmers are advised to avoid misuses (use of pesticides for purposes that are not intended for), abuses (improper use/ use in a wrong manner away from the normal usage) and overuses (use too much) of pesticides to protect human health and the environment.

Conventional use of pesticides tends to ignore the causal factors related to pest problems and instead relying on routine, scheduled calendar-based (prophylactic) applications. Very often pesticides are applied immediately after observation of a pest, disease or weed without considering damage thresholds. Pesticides are often temporary fixes and ineffective over the long-term use. Prophylactic chemical pest control has been associated with destruction of other beneficial species (viz. parasitoids, predators, pollinators) resurgence of the targeted pest populations, availability of residues in food, feed and the environment and debilitating farmer's health from prolonged exposure to pesticides. All these undesirable effects of pesticide use can be effectively minimized through adoption of Integrated Pest Management (IPM) techniques which are based on the balancing forces in ecological system.

Integrated Pest Management (IPM) in a global perspective involves the adoption of a combination of various pest control techniques in a compatible manner to maintain the pest populations below an economic threshold level with minimum reliance on high-toxic pesticides as an ultimate option. Adoption of IPM in various cropping situations in many countries across the world, including Sri Lanka has been quite effective and contributed significantly to reduce the over use of pesticides.

This text is a set of procedures and guidelines to help agriculture extension specialists to empower the farming community on the correct usage of pesticides for crop protection

ADOPTION OF PESTICIDES

According to the definition given in the Control of Pesticides Act No.33 of 1980, Pesticide means any substance intended for use or used for Controlling a pest and shall include active ingredients, adjuvant and pesticide formulations;

Pesticides play an indispensable role in our day-to-day life. Major benefits of pesticides and their role in food production, human and animal health and environment include:

1. Increasing food quality and quantity through control of undesirable pests, disease causing organisms and weeds in agricultural and plantation crops and stored products.

2. Decreasing food prices since use of pesticides secure crop yields and minimize cost of production per unit harvest.

3. Controlling vectors of disease-causing organisms in human and domesticated animal.

4. Protection of environment through control of household pests and noxious weed management in roadsides, recreation areas, industry sites, irrigation canals and aquatic habitats.

Despite these positive advantages of pesticides to improve the quality of human life, they can cause health and environmental problems, residues in food and contamination of the environment (air, water, soil). All these negative impacts of pesticides have been due to misuse of pesticides. Internationally big effort is made in a broader sense, to promote safe use of chemicals including pesticides, which are reflected in Chapter 19 of Agenda 21 (Earth Summit). This identifies the elements for the sound management of the chemicals through adequate legislation, information gathering and dissemination, capacity for risk assessment, establishment of risk policy and capacity for implementation and enforcement including effective education programs. Also legally-binding instruments like Rotterdam Convention, Basel Convention and Stockholm Convention are important in harmonizing the pesticide regulation activities among different parties across the international community. All these conventions have been ratified by Sri Lankan government.

All pesticides in the Island are coming under the regulations of Control of Pesticides Act No. 33 of 1980 as amended by the Act No. 6 of 1994 and the Act No. 31 of 2011. According to the Preamble to the Act- Parliament deems it expedient in the public interest for the Government to control pesticides including the import, packing, labeling, storage, formulation, transport, sale and use thereof.

As deemed by the provisions of the Control of Pesticides Act all pesticides intended to be used in the country become compulsory to register to ensure that pesticides are effective for the purpose of pest control and will not subject the user, consumer or treated foods and the natural environment to unacceptable risk. The ultimate goal of registration is to provide the community with adequate protection from the adverse effects not denying access to benefits from the use of pesticides. All pesticides used in the country are imported as either formulated products or technical material for further formulation by the private sector. Formulation activities are also coming under regular inspection of the Registrar of Pesticides.

PESTICIDE REGISTRATION

Pesticide registration procedure follows a step-wise orderly process based upon a set of organized evaluation criteria that include:

1. Pre-registration evaluation: National policies as deemed by the requirements of the international treaties and conventions for which Sri Lanka has become signatory; FAO (Food and Agriculture Organization) and WHO (World Health Organization) guidelines relevant to high risk hazardous chemicals on human health, environment and food; and available alternatives.

2. Bio-efficacy testing on suitability under local environment: Evaluation at research stations and field-level based upon local standards as decided by the research organizations in the Department of Agriculture, Commodity crop research Institutes (tea, rubber, coconut, and sugarcane) and Department of Export Agriculture.

3. Evaluation of pesticide dossiers: risk/benefit analysis with respect to chemical, toxicological and environmental effects.

4. Registration and issuing a license:
   4.1. Registration of the product after approval from PeTAC and issue a license valid only for 3 years: A product is registered once all the previous steps in the registration process are successfully completed. The product will be registered under one of the categories as general, restricted or domestic.

   4.2. Registration of the product and issue a provisional permit – pending verification of minor issues

5. Re-registration of the product and issue a license: Three years after a product has been registered for marketing, the registrants are requested to follow a re-registration procedure to extend its marketing rights for another period of 3 years. The formulation has to be re-evaluated for its efficacy on target pests. In addition, the formulation will be evaluated on the basis of benefits and risks using the latest technical data/information available at local and global level.

Failing to meet the requirements at any stage of the registration procedure would result in rejecting the pesticide from registration process. In the interest of the public as guided by the Pesticide Technical and Advisory Committee (PeTAC), Registrar of Pesticides takes necessary actions to cancel, suspend or modify the conditions of registration given on a pesticide. As a result of continuous monitoring and latest technical data available at local and global level, several registered pesticides have been withdrawn from pesticide recommendations from time to time.

Based upon the availability to consumers, toxicity of the chemical and the intended use, pesticides are classified into three main groups:

1. General pesticides - All agricultural pesticides
   Can be sold only in authorized sales outlets certified by an Authorized Officer.

2. Restricted pesticides - Highly hazardous chemicals
   Most products are not available in the retail market Distribution is restricted
   can be used by trained applicators under strict market and distribution supervision

3. Domestic pesticides - Can be sold without sales certificate
Pesticides are of low strength
Less hazardous on health and environment

PESTICIDE APPLICATION ON FIELD CROPS

Precise application of a specific rate of pesticide becomes a deciding factor for effective and economical control of pests. Usually water is used as a carrier to apply pesticides and the spray volume required for a given area of a crop is a function of several factors including the type of sprayer, (knapsack vs. power), walking speed of the applicator, nozzle type, canopy size of the crop etc. A lethal dose of the pesticide should reach the target organism for effective control of the pest and this is guaranteed through adhering to the correct dilution rate supplementary with the recommended dosage. Thus prominence has given to the spray volume while calculating the amount of total pesticide dosage that is required to apply on a given crop. Since the spray volume for a crop may vary with the developing canopy size, three basic canopy sizes have been identified as low canopy, medium canopy and high canopy. Approximate spray volumes per hectare required to apply with a knapsack sprayer for these different canopy sizes have been developed to determine the rate of application per ha, keeping the dilution rate of the spray mixture more or less fixed. It is important to note that all crops do not encompass all three canopy stages during their crop growth cycle. Dilution rate for power sprayers should be calculated accordingly as volume per unit area is lesser than knapsack sprayers due to more atomization.

Canopy size of the crops and required spray volume l/ha (No. of 16 L tanks)

Stage I: low canopy	320 - 400 l/ha (20 - 25)
Stage II: medium canopy	500 - 640 l/ha (30 - 35)
Stage III: high canopy	700 - 800 l/ha (40 - 50)

Spray volume considered for canopy sizes of different crops

320-400 ml	Rice and Onion
320-640 ml	Coarse grains, Chilli, Legumes, Cesame, Potato and Vegetables
320-800 ml	Cucurbits
320-500 ml	Leafy vegetables
500-1,000 ml	Fruits

Total spray volume needed for fungicides and insecticides may vary according to the canopy size of a given crop. Unlike fungicides and insecticides which may be applied at different canopy stages, herbicides are usually applied either before weed emergence (pre-emergent) or at early stage of weed growth (post-emergent). Thus the total spray volume becomes mostly be around 320 - 400 l/ha. Further, lower dosage is recommended when weeds are at young stage while the higher dose, when weeds are little matured. On the other hand, under non-crop situations where extensive foliage is encountered, it is appropriate to apply an adequate volume of the spray mixture to entirely wet the total canopy of the standing weed biomass.

NOZZLE CHOICE FOR PESTICIDE APPLICATION

The proper selection of a nozzle type is essential for effective use of pesticides. A nozzle is an atomizing device that breaks the liquid into droplets, form the spray pattern, and propel the droplets in the proper direction. Nozzles determine the amount of spray volume at a given operating pressure, the amount of spray applied to an area, the uniformity of application, the coverage obtained on the target surface and the amount of potential drift. Drift can be minimized by selecting nozzles that produce the largest droplet size while providing adequate coverage at the intended application rate and pressure. Minimizing drift is especially important for herbicides. Nozzles are classified according to the spray pattern they emit and the commonly used nozzle types in low-pressure agricultural sprayers include flat-fan, flood jet, hollow-cone and full-cone nozzles. Using the correct nozzle enables safer and more effective spraying.

Flat fan nozzle

The spray droplets emerge in a fan shape on leaving the nozzle orifice. The spray pattern "tapers" at the edges. The standard flat-fan nozzle normally operates, pressure between 30 and 60 pounds per square inch (psi), with an ideal range between 30 and 40 psi. The flat fan nozzle delivers droplets in small to medium range at 30-40 psi pressure. Commonly used flat fan nozzles have a 65, 80 or 110 spray angle at 40 psi pressure. This nozzle is best suited for spraying of post-emergent herbicides.

Flood fan or flood jet nozzle

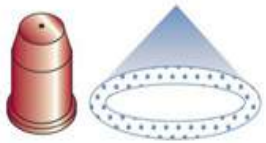
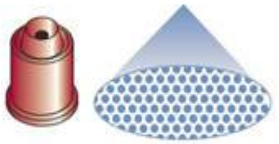
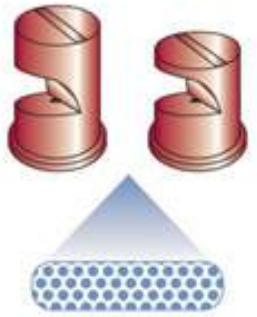
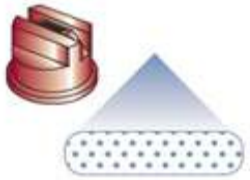
The spray pattern of the flood fan nozzle is similar to the flat fan nozzle, but has a much wider angle from 115^0 to 147^0, depending on the nozzle size. These nozzles produce relatively larger droplets at pressures of 10 to 25 psi and reduce spray drift problems. Usually, flood nozzles are commonly used to apply soil incorporated and pre-emergent herbicides.

Hollow Cone and Solid Cone Nozzles

These two types of nozzles deliver circular spray patterns. The hollow cone nozzle delivers a few liquid droplets to the center leaving majority of the droplets distributed along the peripheral area of the circular spray pattern. The solid cone nozzle delivers liquid droplets uniformly to the entire circle. Hollow - cone nozzles are generally used to apply insecticides or fungicides to field crops when foliage penetration and complete coverage of the leaf surface is required. These nozzles operate in a pressure range from 40 to 100 psi. Spray drift potential is higher from hollow-cone nozzles than from other nozzles due to the small droplets produced. Generally, this type of nozzle should not be used to apply herbicides.

The wide-angle, solid-cone nozzles are a good choice if drift is a concern because they produce larger droplets than flood nozzles. Usually full-cone nozzles are recommended over flood nozzles for pre-emergent herbicides. Full-cone nozzles operate between a pressure range of 15 to 40 psi.

NOZZLE CHOICE FOR APPLICATION OF PESTICIDES

Type of Pesticide	Type of Nozzle	Nozzle and Spray Pattern	Approximate Pressure (Bars)
Insecticides and Fungicides	Hollow cone nozzle		1-3
	Solid cone nozzle		1-2
Herbicides	Flood-jet nozzle		1-2
	Flat fan nozzle		1-2

1 Bar = 14.5 (psi)

PESTICIDE APPLICATION IN PROTECTED HOUSES

In general, extra care and attention are required in pesticide application in crops grown in protected houses. The risk of pesticide exposure to the applicator is extremely high in protected houses; therefore, it is advisable to select the less hazardous pesticides and follow adequate safety measures (i.e. insecticides in MOA groups 7, 15, 17 and 18 and those with a Green or Blue color band, preferred over those with Yellow colour bands).

In protected houses the environmental conditions and biotic factors are highly conducive for rapid multiplication of insects, mites and pathogens. As such best approach would be to initiate control measures at the early sign of pest or disease incidence. Granular pesticides need to be preferred over the liquid formulations. In general EW, SL, SC formulations are considered safer than EC formulations while WG formulations are safer than WP formulations.

The techniques like chemigation and fertigation need yet to be developed. It is encouraged to explore possibilities of using bio-control agents for the management of pests in protected houses.

SAFER AND EFFECTIVE APPLICATION OF PESTICIDES

Pesticides are also hazardous to humans, non-target animals and the environment. For these reasons, it is extremely important to know how to apply pesticides safely. Proper application is not only safer, but also more effective. The correct calibration of spraying equipment is the key to safe, efficient and cost- effective pesticide use. Correct calibration means you are applying the right amount of chemical at the right concentration. Over-application of pesticides can cause off-target damage and pollute the environment including the ground water resources. Make sure you use these chemicals correctly and according to the label directions.

1. General instructions for pesticide use, storage and disposal.
   Read the label carefully before application of pesticides: The label contains information on:
   a. Specific purpose of the pesticide,
   b. Level of toxicity with “caution” being the less toxic and “harmful” the more toxic.
   c. Pesticide safety information. (precautions for safe use).
   d. Protective clothing and equipment (PPE) needed for safety in pesticide application.

2. Strictly follow the recommendations given on pesticide labels.
3. Apply pesticides based on the economic thresh hold levels, but not on prophylactic basis.
4. Select the least toxic and least persistent pesticides.
5. Select the correct nozzle type and a trouble free recommended knapsack sprayer.
6. Choose the best day and time of the day for safety in pesticide application.

7. Avoid breezy days to minimize the pesticide drift.
8. Never apply herbicides when it is windy and stop if the wind picks up.
9. Mornings and evenings are usually better times of the day for pesticide application.
10. Estimate the total spray volume required to apply for the extent of the crop/intended application area.
11. Mix the pesticide with required amount of water found by calibration according to the dosage given on the label.
12. Wear protective clothing and other personal protective equipments.
13. Apply on to the target area with the minimum amount of pesticides required.
14. Do not use pesticides of the same mode-of-action continuously.
15. If available, prefer mixed formulations with different mode-of-actions.
16. Adhere strictly to the pre-harvest intervals.
17. Clean up after pesticide application. Rinse spray equipment and flush hoses and nozzles. Remove clothing before washing face, hands and body. Wash yourself, clothing and protective equipment. Do not release rinsate to waterways/apply to the same field.
18. Store pesticides in original containers in a locked cabinet away from temperature extremes and away from children and pets.
19. Buy only the amount of pesticide required to avoid having to dispose of unused pesticides.
20. Disposal of expired products and empty cans should be done according to the standard methods and avoid haphazard dumping to the environment.

PESTICIDE SAFETY

Pesticides are potentially hazardous chemicals when fail to use judiciously. Spray operators should be aware of the toxic nature of pesticides not only on pests, disease causing organisms and weeds, but also on beneficial organisms and human health. Most of this information is available in the pesticide label. As spraying can be on open crop fields, orchards, non-crop areas and green houses, exposure of the spray operator to pesticide drift could vary according to the situation. Determine in advance the parts of the body that is most liable to be exposed to and wear appropriate personal protective equipment and clothing while mixing and application of pesticides. Smoking and chewing betel should be totally avoided while handling pesticides.

Pesticide applicators are encouraged to consider the Color band of the label and MOA group of the selected pesticide. The order of preference of pesticides using the color band should be Green (more preferred) > Blue > Yellow. In Mode-of-Action Grouping, give preference to pest- specific pesticides over the broad spectrum pesticides. For example prefer Insect Growth Regulators over the neuro-toxic compounds.

INTERNATIONAL FORMULATION CODING SYSTEM

The following is the list of formulation types and their international codes as introduced by GIFAP and now adopted by the FAO. These two letter codes appear on pesticide labels.

CS	Capsules suspension
DC	Dispersible concentration
DP	Duster powder
EC	Emulsifiable concentration
EW	Emulsion, oil in water
GR	Granule
RB	Ready to use bait
SC	Suspension concentration
SG	Water soluble granules
SL	Soluble concentration
SP	Water soluble powder
WG	Water dispersible granules
WP	Wetable powder
WS	Water dispersible powder for slurry treatment
OD	Oil dispersion

FOOD CROPS - RICE

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		PHI Days	Remarks
				Low foliage	High foliage		
RICE : INSECTICIDES/MITICIDES/NEMATICIDES/RODENTICIDES							
Rice thrips *Stenchaetothrips biformis*	**For seed treatment:**						In epidemic areas and in late-planted crops, it is strongly advisable to treat the soaked seeds with insecticide powder dissolved in water before incubation. Wear gloves & masks during handling chemicals and broadcasting seeds. Apply foliar sprays when 50% of leaves/hill show damage symptoms.
	Thiamethoxam 70% WS	4		20 g/500 ml water/100 kg seed			
	Imidacloprid 70% WS	4		20 g/500 ml water/100 kg seed			
	For foliar application:						
	Buprofezin 250 g/l SC	16	32 ml	640 ml	-	14	
	Quinalphos 250 g/l EC	1	24 ml	480 ml	-	14	
	Imidacloprid 200 g/l SL	4	8 ml	160 ml	-	14	
	Imidacloprid 70% WG	4	2.5 g	50 g	-	14	
	Thiacloprid 240 g/l SC	4	5 ml	100 ml	-	14	
	Ethiprole 100 g/l SC	2	16 ml	320 ml	-	14	
	Fipronil 50 g/l SC	2	8 ml	160 ml	-	14	
	Carbosulfan 200 g/l SC	1	32 ml	640 ml		14	
Rice gall midge *Orseolia oryzae*	Fipronil 0.3% GR	2	-	12 kg		14	When damage symptoms appear, it is too late for effective control. In epidemic areas, as regular practice treat nurseries 5 days after seeding 12 g Fipronil/10 m^2. Broadcast granules on wet mud or into 1 cm of standing water 1 - 2 weeks after transplanting or 1 - 3 weeks after broadcasting (ETL - 5% Galls)
Leaf folder *Cnaphalocrosis medinalis* *Marasmia patnalis* **Caseworm** *Nymphula depunctalis*	Flubendiamide 24% WG	28	2.5 g	50 g	60 g	05	Apply insecticides when 25% of the leaves show more than 50% leaf damage or 10 live larvae (in rolled leaves) in 10 randomly selected hills.
	Flubendiamide 20% WG	28	3 g	60 g	75 g	07	
	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28 + 4	5 g	100 g	125 g	10	
	Tebufenozide 200 g/l SC	18	32 ml	640 ml	800 ml	14	
	Methoxyfenozide 240 g/l SC	18	16 ml	320 ml	400 ml	10	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		PHI Days	Remarks
				Low foliage	High foliage		
Leaf folder *Cnaphalocrosis medinalis* *Marasmia patnalis* **Caseworm** *Nymphula depunctalis*	Azadirachtin 10 g/l EC	UN	80 ml	1,600 ml	2,000 ml	07	
	Chromafenozide 50 g/l SC	18	16 ml	320 ml	400 ml	10	
	Chlorfluazuron 50 g/l EC	15	13 ml	260 ml	320 ml	10	
	Novaluron 100 g/I EC	15	16 ml	320 ml	400 ml	14	
	Bistrifluron 100 g/l EC	15	24 ml	480 ml	600 ml	07	
	Spinetoram 25% WG	5	5 g	100 g	125 g	07	
	Fipronil 50 g/l SC	2	20 ml	400 ml	500 ml	14	
	Acephate 75% SP	1	16 g	320 g	400 g	14	
Stem borer *Scirpophaga incertulas*	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28 + 4	5 g	100 g	125 g	14	
	Fipronil 0.3% GR	2		12 kg		14	Apply insecticides only when damage exceeds 10% dead hearts or 5% white heads.
	Carbosulfan 200 g/l SC	1	48 ml	960 ml	1,200 ml	14	
	Phenthoate 500 g/l EC	1	32 ml	640 ml	800 ml	14	
	Quinalphos 250 g/l EC	1	48 ml	960 ml	1,200 ml	14	
Brown planthopper *Nilaparvata lugens* **White-backed planthopper** *Sogatella furcifera*	Buprofezin 10% WP	16	30 g	600 g	750 g	14	Apply insecticides only when number of BPH (nymphs+ Adults) exceeds 5/hill at tillering and 8/hill at reproductive stage. When sprays are used, direct to the base of the plant.
	Buprofezin 250 g/l SC	16	16 ml	320 ml	400 ml	14	
	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	1,000 g	14	
	Thiocyclam (Hydrogen Oxalate) 4% GR	14		25 kg		14	
	Pymetrozine 50% WG	9	10 g	200 g	250 g	07	
	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28 + 4	5 g	100 g	125 g	10	
	Imidacloprid 70% WG	4	2.5 g	50 g	62 g	14	
	Imidacloprid 200 g/l SL	4	8 ml	160 ml	200 ml	14	
	Thiamethoxam 25% WG	4	5 g	100 g	120 g	14	
	Sulfoxaflor 50% WG	4	8 g	160 g	200 g	07	
	Etofenprox 100 g/l EC	3	24 ml	480 ml	600 ml	07	
	Ethiprole 100 g/l SC	2	24 ml	480 ml	600 ml	14	
	Fenobucarb 500 g/l EC	1	56 ml	1,120 ml	1,400 ml	14	
	Carbosulfan 200 g/l SC	1	40 ml	800 ml	1,000 ml	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		PHI Days	Remarks
				Low foliage	High foliage		
Brown planthopper *Nilaparvata lugens*	Fipronil 50 g/l SC	2	24 ml	480 ml	600 ml	14	
	Novaluron 100 g/l EC	15	16 ml	320 ml	400 ml	14	
White-backed planthopper *Sogatella furcifera*	Acetamiprid 20% SP	4	16 g	320 g	400 g	14	
	Acetamiprid 200 g/l SL	4	16 ml	320 ml	400 ml	14	
Paddy bug *Leptocorisa oratorius*	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	1,000 g	14	Apply pesticides when the bug density is 1 per 10 hills. Paddy bug infestation is confined to canopy stage only.
Pentatomid bug *Nezara viridula*	Sulfoxaflor 50% WG	4	5 g	100 g	125 g	07	
	Ethiprole 100 g/l SC	2	32 ml	640 ml	800 ml	14	
	Carbosulfan 200 g/l SC	1	64 ml	1,280 ml	1,600 ml	14	
	Phenthoate 500 g/l EC	1	80 ml	1,600 ml	2,000 ml	14	
	Quinalphos 250 g/l EC	1	80 ml	1,600 ml	2,000 ml	14	
Field crab *Paratelphusa ceylonensis*	Fenobucarb 500 g/l EC	1	Mix 3 ml of insecticide in 1 l of water				Squirt insecticide solution into crab burrows after removing the swirl plate from the nozzle.
	Quinalphos 250 g/l EC	1	Mix 3 ml of insecticide in 1 l of water				
Leaf mites *Hemitarsonemus* spp. *Oligonychus* spp. *Tetranychus* spp.	Hexythiazox 50 g/l EC	10	24 ml	480 ml	600 ml	14	
	Sulphur 80% WP/WG	UN	128 g	2,560 g	3,200 g	14	
Sheath mite/Panicle rice mite *Steneotarsonemus spinki*	Fenpyroximate 50 g/l EC	21	14 ml	280 ml	350 ml	14	Spray at the late-booting stage of the crop. Do not apply insecticides after panicle emergence.
	Hexythiazox 50 g/l EC	10	36 ml	720 ml	900 ml	14	
Rats *Rattus* spp. *Bandicoota* spp.	Difenacoum 0.005% RB Brodifacoum 0.005% RB		1,000 g/ha				Start baiting soon after transplanting and continue up to grain maturity. Place the bait inside a piece of bamboo about 1 foot long (40 baiting stations/ha).
Root knot nematodes *Meloidogyne graminicola*	Abamectin 0.5% GR			50 kg/ha			Apply on to nematode infested areas only. Nematode infestation should be confirmed through soil testing before application of nematicides for other areas.

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
RICE : STORED PRODUCT PESTS								
Rice moth *Sitotroga cerealella* **Rice weevil** *Sitophilus oryzae* **Red flour beetle** *Tribolium castaneum*	Pirimiphos-methyl 500 g/l EC	1	40 ml					Clean all stores well in advance of harvesting. Walls, floors and storage bags should be cleaned and given residual spray and air dried before storing products.
	Deltamethrin 318 mg/m^2 (treated bags)	3						Restricted use for protection against insect pests of seed paddy.
RICE : FUNGICIDES								
Blast *Magneporthae grisea*	Tebuconazole 250 g/l EW	3	10 ml	200 ml	250 ml	7-10	21	Fungicide spray should be directed to the leaf sheath.
	Isoprothiolane 400 g/l EC	6	20 ml	400 ml	500 ml	7-10	14	
	Carbendazim 50% WP/WG	1	11 g	225 g	280 g	10-14	14	
	Carbendazim 500 g/l SC	1	11 ml	225 ml	280 ml	10-14	14	
	Tricyclazole 75% WP	16.1	10 g	200 ml	250 ml	10-14	14	
	Trycylazole 75% WP	16.1		20-40 g/10 kg			14	Soak seeds with fungicide Mixture (2-4 g/5 ml/1 kg seed) before incubation
Sheath blight *Rhizoctonia solani*	Tebuconazole 250 g/l EW	3	10 ml	200 ml	250 ml	7-10	21	
	Pencycuron 25% WP	20	32 g	640 g	800 g	7-14	14	
	Hexaconazole 50 g/l EC	3	32 ml	640 ml	800 ml	7-14	21	
	Thiophanate-methyl 70% WP	1	16 g	320 g	400 g	7-14	21	
	Propiconazole 250 g/l EC	3	16 ml	320 ml	400 ml	7-14	21	
	Flutolanil 50% WP	7	32 ml	640 ml	800 ml	7-14	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)	Application interval (days)	PHI Days	Remarks
RICE : PRE-PLANTING POST-EMERGENT TOTAL WEED CONTROL - HERBICIDES							
Herbaceous weeds Annual weeds	Glufosinate ammonium 280 g/l SL	H	64 ml	1,600 ml	BLP		Apply thoroghly to wet the green foliage when weeds are at active growing stage. 4 - 6 hrs of sunny weather is required after application for effective absorption of the herbicide. Do not till the land before 12 - 14 days after application
	Glufosinate ammonium 150 g/l SL	H	120 ml	3,000 ml	BLP		
	Tiafenacil 50 g/l ME	E	125 ml	3,125 ml	BLP		
RICE : POST- PLANTING SELECTIVE PRE-EMERGENT HERBICIDES FOR GRASSES, SEDGES & BROAD-LEAF WEEDS							
Common annual grasses, sedges & broad-leaf weeds *Echinochloa* spp. *Ischaemum rugosum* *Leptochloa chinensis* *Cyperus difformis* *Cyperus iria* *Fimbristylis* spp. *Ludwigia* spp. *Eclipta alba* *Monochoria vaginalis* *Commelina diffiusa* *Isachnae globossa*	Pretilachlor 300 g/l EC	K3	64 ml	1,600 ml	0-4 DAS/DAP		Apply on to wet/moist soil. Proper land levelling is important. Maintains soil moisture for 2 - 3 weeks. Safner is added to protect rice seedlings from herbicide injury.
	Oxyfluorfen 480 g/l SC	E	12 ml	300 ml	0-5 DAS/DAP		Broadcasted rice only. Apply on to wet/moist soil before opening the 1st leaf of rice plants. Proper land levelling is important. Maintain soil moisture for 2 - 3 weeks.
	Oxyfluorfen 240 g/l EC	E	20 ml	500 ml	0-5 DAS/DAP		

***DAS = Days After Sowing** *** DAP = Days After Planting** **DBS = Days Before Sowing** **BLP = Before Land Preparation**

Number of rice leaves ; 0 - 5 DAS - 0 - 2 leaves, 7 - 12 DAS - 2 - 3 leaves, 7 - 15 DAS - 2 - 5 leaves, 8 - 15 DAS - 2 - 5 leaves, 16 - 18 DAS - 3 - 6 leaves

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)	Application interval (days)	PHI Days	Remarks
RICE : POST- PLANTING SELECTIVE POST-EMERGENT HERBICIDES FOR GRASSES, SEDGES & BROAD-LEAF WEEDS							
Common annual grasses, sedges & broad-leaf weeds including *Echinochloa* spp. *Ischaemum rugosum* *Leptochloa chinensis* *Cyperus difformis* *Cyperus iria* *Fimbristylis* spp. *Ludwigia* spp. *Eclipta alba* *Monochoria vaginalis* *Commelina diffiusa*	Pretilachlor 300 g/l + Pyribenzoxim 20 g/l EC	K3 + B	48 ml	1,250 ml	6-10 DAS/DAP		Apply on to wet/moist soil.
	Propanil 330 g/l + Pretilachlor 170 g/l EC	K3 + C2	80 ml	2,000 ml	6-10 DAS		Apply on to wet/moist soil. Proper land levelling is important. Maintain soil moisture for 2 - 3 weeks.
	Florpyrauxifen-benzyl 25 g/l EC	O	48 ml	1,200 ml	7-12 DAS		Drain thoroughly to expose weeds. Impound water after 2 - 3 days of spraying. Do not apply for varieties Bg 360, Bg 366, Bg 403, Bg 379/2, Bg 359, Bg 374, Bg 406
	Triafamone 200 g/l SC	B	6 ml	150 ml	7-12 DAS/DAP		Drain thoroughly to expose weeds. Impound water after 2 - 3 days of spraying.
	Thiobencarb 900 g/l + Bispyribac-sodium 15 g/l OD	B + N	60 ml	1,500 ml	7-14 DAS/DAP		Drain thoroughly to expose weeds. Impound water 2 - 3 days after spraying. Retain water for more than 7 days.
	Azimsulfuron 50% WG	B	2.4 g	60 g	7-15 DAS/DAP		Recommended only for wet zone districts (Colombo, Gampaha, Kalutara, Galle, Matara and Rathna pura)

***DAS = Days After Sowing** *** DAP = Days After Planting** **DBS = Days Before Sowing** **BLP = Before Land Preparation**

Number of rice leaves ; 0 - 5 DAS - 0 - 2 leaves, 7 - 12 DAS - 2 - 3 leaves, 7 - 15 DAS - 2 - 5 leaves, 8 - 15 DAS - 2 - 5 leaves, 16 - 18 DAS - 3 - 6 leaves

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)	Application interval (days)	Remarks
Common annual grasses, sedges & broad-leaf weeds including *Echinochloa* spp. *Ischaemum rugosum* *Leptochloa chinensis* *Cyperus difformis* *Cyperus iria* *Fimbristylis* spp. *Ludwigia* spp. *Eclipta alba* *Monochoria vaginalis* *Commelina diffiusa*	Pyribenzoxim 50 g/l EC	B	20 ml	500 ml	7-18 DAS/DAP	Apply on to wet/moist soil. Impound water 2 - 3 days after spraying.
	Bispyribac-sodium 40 g/l + Metamifop 100 g/l SC	B+A	25 ml	625 ml	8-14 DAS/DAP	Apply on to wet/moist soil. Impound water 2 - 3 days after spraying.
	Flucetosulfuron 10% WG	B	8 g	200 g	8-14 DAS/DAP	
	Propyrisulfuron 100 g/l SC	B	20 ml	500 ml	8-14 DAS/DAP	
	Propanil 60% + MCPA 7.5% WG	C2+O	90 g	2,250 g	10-12 DAS/DAP	Apply on to wet/moist soil. Impound water 2 - 3 days after spraying. Propanil-based products are prohibited for use in the districts of Anuradhapura, Kurunegala, Polonnaruwa, Monaragala and DS divisions of Mahiyanganaya, Rideemaliyadda, Kandeketiya in Badulla district.
	Propanil 200 g/l + Thiobencarb 400 g/l EC	C2+N	140 ml	3,500 ml	6-10 DAS/DAP	
	Cyhalofop-butyl 60 g/l + Pyribenzoxim 25 g/l EC	A+B	50 ml	1,250 ml	10-14 DAS/DAP	Apply on to wet/moist soil. Impound water 2 - 3 days after spraying.
	Pyrazosulfuron-ethyl 0.75% + Pretilachlor 30% WG	B+K3	70 g	1,750 g	5-7 DAS/DAP	Maintain soil moisture condition for 2 - 3 weeks.
	Fenoxaprop-*p*-ethyl 69 g/l + Ethoxysulfuron 20 g/l OD	A+B	20 ml	500 ml	14-21 DAS/DAP	Apply on to drained wet soil. Impound water 2 - 3 days after spraying.
	Propanil 230 g/l + Oxadiazone 80 g/l EC	C2+E	140 ml	3,500 ml	7-12 DAS/DAP	Apply on to wet/moist soil. Impound water 2 - 3 days after spraying.

***DAS = Days After Sowing** *** DAP = Days After Planting** **DBS = Days Before Sowing** **BLP = Before Land Preparation**

Number of rice leaves ; 0 - 5 DAS - 0 - 2 leaves, 7 - 12 DAS - 2 - 3 leaves, 7 - 15 DAS - 2 - 5 leaves, 8 - 15 DAS - 2 - 5 leaves, 16 - 18 DAS - 3 - 6 leaves

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)	Application interval (days)	Remarks
RICE : POST- PLANTING SELECTIVE POST-EMERGENT HERBICIDES FOR SEDGES & BROAD-LEAF WEEDS						
Common annual broad-leaf weeds and sedges Including *Cyperus difformis* *Cyperus iria* *Fimbristylis* spp. *Eclipta alba* *Ludwigia* spp. *Monochoria vaginalis* *Commelina diffiusa*	Bensulfuron-methyl 8.25% + Metsulfuron-methyl 1.75% WP	B + B	10 g	250 g	12-25 DAS/DAP	
	Bentazone 480 g/l SL	C3	100 ml	2,500 ml	12-18 DAS	
	Penoxulam 240 g/l SL	B	4 ml	100 ml	10-18 DAS/DAP	
	Carfentrazone-ethyl 240 g/l EC	E	4.8 ml	120 ml	14-21 DAS/DAP	Apply on to wet/moist soil. Impound water 2 - 3 days after spraying
	Carfentrazone-ethyl 40% WG	E	3.6 g	90 g	14-21 DAS/DAP	
	Orthosulfamuron 50% WG	B	6 g	150 g	15-18 DAS/DAP	Apply on to wet/moist soil. Impound water 2 - 3 days after spraying
	MCPA 600 g/l SL	O	72 ml	1,800 ml	21-28 DAS/DAP	
	Pyrazosulfuron-ethyl 10% WP	B	4.5 g	112 g	7-21 DAS/DAP	Apply on to wet/moist soil. Impound water 2 - 3 days after spraying.
	Mefenacet 50% + Bensulfuron-methyl 3% WP	15 + B	56 g	1,400 g	6-10 DAS/DAP	

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Number of rice leaves ; 0 - 5 DAS - 0 - 2 leaves, 7 - 12 DAS - 2 - 3 leaves, 7 - 15 DAS - 2 - 5 leaves, 8 - 15 DAS - 2 - 5 leaves, 16 - 18 DAS - 3 - 6 leaves

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	Remarks
RICE : POST- PLANTING SELECTIVE POST-EMERGENT HERBICIDES FOR GRASSES & BROAD-LEAF WEEDS							
Common annual broad-leaf weeds including *Eclipta alba* *Ludwigia* spp. *Monochoria vaginalis* *Commelina diffiusa*	Bispyribac-sodium 100 g/l SC	B	20 ml	500 ml		8-12 DAS/ DAP	Drain thoroughly to expose weeds. Always mix with non-ionic surfactant at the rate of 10 - 15 ml/16 l of spray mixture. Impound water 2 - 3 days after spraying.
Excluding *Ischaemum rugosum* *Leptochloa chinensis*	Bispyribac-sodium 20% WP	B	10 g	250 g		8-14 DAS/ DAP	
RICE : POST-PLANTING SELECTIVE POST-EMERGENT HERBICIDES FOR GRASSES							
Mainly annual grasses including *Echinochloa* spp. *Ischaemum rugosum* *Leptochloa chinensis*	Cyhalofop-butyl 100 g/l EC	A	80 ml	2,000 ml		7-15 DAS/ DAP	Apply on to wet/moist soil. or with little standing water. (2-3 leaf stage of annual grasses)
	Metamifop 100 g/l EC	A	50 ml	1,250 ml		8-12 DAS/ DAP	Apply on to drained fields
	Quinclorac 250 g/l SC	O	32 ml	800 ml		8-15 DAS/ DAP	Apply on to wet/moist soil (3-5 leaf stage grassess). Irrigate 1 - 3 days after application. Do not apply if succeeding crop belongs to Solanaceae family.

***DAS = Days After Sowing** *** DAP = Days After Planting** **DBS = Days Before Sowing** **BLP = Before Land Preparation**

Number of rice leaves ; 0 - 5 DAS - 0 - 2 leaves, 7 - 12 DAS - 2 - 3 leaves, 7 - 15 DAS - 2 - 5 leaves, 8 - 15 DAS - 2 - 5 leaves, 16 - 18 DAS - 3 - 6 leaves

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	High foliage	Application interval (days)	Remarks
	Clomazone 200 g/l + Propanil 400 g/l EC	F4+ C2	100 ml	2,500 ml		8-15 DAS/ DAP	Apply on to wet/moist soil. Impound water 2 - 3 days after spraying. Propanil-based products are prohibited for use in the districts of Anuradhapura, Kurunegala, Polonnaruwa, Monaragala and DS divisions of Mahiyanganaya, Rideemaliyadda, Kandeketiya in Badulla district
	Fenoxaprop-*p*-ethyl 75 g/l EW	A	14 ml	350 ml		16-25 DAS/DAP	Drain the field thoroughly to expose weeds. Impound water 2 - 3 days after spraying. Do not apply if *Ischaemum rugosum* dominate in the field.
	Fenoxaprop-*p*-ethyl 69 g/l EC	A	20 ml	500 ml		14-18 DAS/DAP	
	Profoxydim 75 g/l EC	A	40 ml	1,000 ml		20-25 DAS/DAP	Apply on to wet/moist soil. Impound water 2 - 3 days after spraying.
RICE : SELECTIVE HERBICIDES FOR WEEDY-RICE							
Weedy-rice *Oryza sativa*	Pretilachlor 300 g/l EC	K3	64 ml	1,600 ml		3 DBS	Apply on to wet/moist soil. Proper land levelling is important. Maintains residual effect for 2 weeks.

FOOD CROPS - COARSE GRAINS

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	High foliage	PHI Days	Remarks
COARSE GRAINS : MAIZE, FINGER MILLET AND SORGHUM - INSECTICIDES							
Stem borer *Chilo partellus* *Sesamia* spp.	Fipronil 0.3% GR	2		12 kg		14	Place granules in the central whorl at 3 and 5 weeks after planting.
	Thiocyclam (Hydrogen Oxalate) 4% GR	14		15 kg		14	
	Etofenprox 100 g/l EC	3	24 ml	480 ml	960 ml	07	Direct spray to central whorl. Apply 25-35 and 45-55 days after planting.
	Novaluron 100 g/l EC	15	16 ml	320 ml	640 ml	14	
	Thiodicarb 375 g/l SC	1	32 ml	640 ml	1,280 ml	14	
Cob borer *Helicoverpa armigera*	Etofenprox 100 g/l EC	3	24 ml	480 ml	960 ml	07	Spray at tasseling in the evening
	Novaluron 100 g/l EC	15	16 ml	320 ml	640 ml	14	
	Thiodicarb 375 g/l SC	1	32 ml	640 ml	1,280 ml	14	
Fall armyworm *Spodoptera frugiperda*	Spinetoram 25% WG	5	5 g	100 g	200 g	07	• This is a biological insecticide for the Integrated control of *Spodoptera frugiperda* (Fall armyworm) • This product contains at least 7.5 x10^9 Occlusion Bodies (OB) of SfMNPV per milliliter. • SfMNPV should only be applied to larvae of less than half an inch long (1st, 2nd, and 3rd instar), 4th instar is responding very little margin compare to the early stages. • Therefore, SfMNPV should be applied to the early stage of the crop for the control of FAW larvae
	Spinosad 25 g/l SC	5	16 ml	320 ml	640 ml	07	
	Emamectin benzoate 5% SG	6	6 g	130 g	240 g	07	
	Chlorantraniliprole 200 g/l SC	28	5 ml	100 ml	200 ml	03	
	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28 + 4	4 g	80 g	150 g	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	Remarks
	Nucleo Polyhedrosis Virus (NPV) 32%	U	5 ml	100 ml	200 ml		• Application time – During late afternoon or early morning. This is very important because larvae feed during nights and early mornings • Thorough coverage of the crop is important to makesure virus get ingested by the larvae
COARSE GRAINS : MAIZE, FINGER MILLET AND SORGHUM - PRE - AND POST-EMERGENT HERBICIDES							
Common annual grasses, sedges and broad-leaf including *Sida acuta* *Amaranthus* spp. *Cleome* spp.	Pendimethalin 300 g/l EC	K1	140 ml	3,500 ml		0 - 5 DAS/DAP	
Digitaria spp.	Topramezone 336 g/l SC	F2	4 ml	100 ml		10-15 DAS	Apply at 2-3 leaf stage of weeds
Echinochloa spp. *Setaria* spp. *Eleusine indica*	Nicosulfuron 40 g/l OD	B	50 ml	1,250 ml		10-15 DAP	Apply on to field with adequate soil moisture for effective results.
COARSE GRAINS : MAIZE - POST-EMERGENT HERBICIDES							
Sedges including *Cyperus rotundus*	Halosulfuron-methyl 75% WG	B	2.4 g	60 g		10-15 DAP	Apply when crop is 2-3 weeks old.

DAS - Days After Sowing and DAP - Days After Planting to Remarks Column

FOOD CROPS - VEGETABLES

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	High foliage	PHI Days	Remarks
BEANS AND YARD-LONG BEAN - INSECTICIDES							
Bean fly *Ophiomyia phaseoli*	Seed Treatment: Thiamethoxam 70% WS	4		1.5 g/kg seed			Mix 1.5 g of Thiamethoxam 70% WS in 8-10 ml of water & mix with the seeds, & keep for about 1 hours before planting. Wear gloves & masks when handling chemicals & planting treated seeds.
	Carbosulfan 200 g/l SC	1	48 ml	960 ml	2,400 ml	14	Apply at 7 days after planting or when first pair of leaves appear & repeat after 2 weeks if necessary. Repeat application at flowering if infestation is severe.
Bean pod borer *Maruca vitrata* *Helicoverpa armigera* *Lampides boeticus*	Etofenprox 100 g/l EC	3	24 ml	480 ml	1,200 ml	07	Start spraying at flowering and repeat at 10-14 days intervals if necessary. Three sprayings may be necessary for pulses.
	Novaluron 100 g/l EC	15	16 ml	320 ml	800 ml	14	
	Chlorfluazuron 50 g/l EC	15	16 ml	320 ml	800 ml	10	
	Flubendiamide 24% WG	28	2 g	40 g	100 g	05	
	Chlorantraniliprole 200 g/l SC	28	5 ml	100 ml	250 ml	14	
	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28+ 4	2.4 g	48 g	120 g	14	
	Thiodicarb 375 g/l SC	1	32 ml	640 ml	1,600 ml	14	
Thrips *Scirtothrips dorsalis* *Thrips palmi*	Imidacloprid 70% WG	4	2 g	40 g	100 g	14	
	Imidacloprid 200 g/l SL	4	16 ml	320 ml	800 ml		
	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28+ 4	4.8 g	96 g	240 g	14	
	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	2,000	14	
Aphids *Aphis gossypii* *Aphis craccivora,* *Myzus persicae*	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28+ 4	4.8 g	96 g	240 g	14	
	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	2,000 g	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
Whiteflies *Bemisia tabaci, Trialeurodes vaporar-iorum*	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28+ 4	4.8 g	96 g	240 g		14	
	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	2,000		14	
	Sulfoxaflor 50% WG	4	5 g	100 g	250 g		14	
	Pymetrozine 50% WG	9	8 g	160 g	400 g		14	
	Azadirachtin 50 g/l EC	UN	16 ml	320 ml	800 ml		07	
Mites *Tetranychus* spp.	Abamectin 18 g/l EC	6	10 ml	200 ml	500 ml		14	
BEAN AND YARD-LONG BEAN - FUNGICIDES								
Angular leaf spot *Isariopsis griseola*	Propiconazole 250 g/l EC*	3	6 ml	120 ml	300 ml	14-21	21	Last application should be done one week before flowering. Alternate application of systemic* fungicide with contact fungicide is recommended. Maximum number of applications per season must be limited to three.
	Hexaconazole 50 g/l EC*	3	6 ml	120 ml	300 ml	14-21	21	
	Hexaconazole 50 g/l SC*	3	6 ml	120 ml	300 ml	14-21	21	
	Each above followed by Propineb 70% WP	MO3	32 g	640 g	1,600 g	7-10	14	
	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	640 g	1,600 g	10-12	14	
	Tebuconazole 250 g/l EW	3	6 ml	120 ml	300 ml	14-21	21	
	Tebuconazole 200 g/l + Azoxystrobin 120 g/l SC	11+3	5.6 ml	112 ml	280 ml	14-21	14	
Rust *Uromyces appendiculatus*	Propiconazole 250 g/l EC*	3	6 ml	120 ml	300 ml	14-21	21	Last application should be done one week before flowering. Alternate application of systemic* fungicide with contact fungicide is recommended.
	Hexaconazole 50 g/l EC*	3	6 ml	120 ml	300 ml	14-21	21	
	Hexaconazole 50 g/l SC*	3	6 ml	120 ml	300 ml	14-21	21	
	Tebuconazole 250 g/l EW*	3	6 ml	120 ml	300 ml	14-21	21	
	Each above followed by Propineb 70% WP	MO3	32 g	640 g	1,600 g	7-10	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	640 g	1,600 g	10-12	14	Maximum number of applications per season must be limited to three.
	Tebuconazole 200 g/l + Azoxystrobin 120 g/l SC	11+3	6.4 ml	160-240 ml/ ha			14	
Anthracnose *Colletotrichum lindemuthianum*	Propiconazole 250 g/l EC*	3	6 ml	120 ml	300 ml	14-21	21	Alternate application of systemic* fungicide with contact fungicide is recommended. Last application should be done one week before flowering.
	Hexaconazole 50 g/l EC*	3	6 ml	120 ml	300 ml	14-21	21	
	Hexaconazole 50 g/l SC*	3	6 ml	120 ml	300 ml	14-21	21	
	Tebuconazole 250 g/l EW*	3	6 ml	120 ml	300 ml	14-21	21	
	Each above followed by Propineb 70% WP	MO3	32 g	640 g	1,600 g	7-10	14	
	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	640 g	1,600 g	10-12	14	Maximum number of applications per season must be limited to three.
Root rot *Fusarium* spp.	Thiram 80% WP	MO3		70 g/50 l/10 m^2	-	6-8		Drench the soil as a spot application at the appearence of symptoms
	Thiophanate-methyl 70% WP	1		30 g/50 l/10 m^2	-	10-12		
	Thiophanate-methyl 50% + Thiram 30% WP	1+ MO3		50 g/50 l/10 m^2	-	7-10		
	Flutolanil 50% WP	7		30 g/50 l/10 m^2	-	10-12		
	Carbendazim 500 g/l SC	1		35 ml/50 l/10 m^2	-	10-14		
	Carbendazim 50% WP	1		35 g/50 l/10 m^2	-	10-14		
BEET ROOT - INSECTICIDES								
Leaf miner *Liriomyza huidobrensis*	Neem Seed Water Extract	UN	640 g	12 kg	24 kg		07	Use IPM practices with bio-control agents. Apply Abamectin 18 g/l EC only during epidemics.
	Abamectin 18 g/l EC	6	10 ml	200 ml	400 ml		14	
	Azadirachtin 50 g/l EC	UN	32 ml	640 ml	1,280 ml		07	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		PHI Days	Remarks
				Low foliage	High foliage		
BRINJAL & THIBBATU - INSECTICIDES/MITICIDES							
Shoot & fruit borer *Leucinodes orbonalis*	Chromafenozide 50 g/l SC	18	32 ml	640 ml	1,28g0 ml	07	Apply at flowering. Continue application at fortnightly intervals after harvesting. Repeated application of similar may lead to resistance buildup. Collect and destroy all damaged fruits and shoots before applying insecticides.
	Chlorantraniliprole 200 g/l SC	28	3 ml	60 ml	120 ml	14	
	Flubendiamide 24% WG	28	8 g	160 g	320 g	07	
	Flubendiamide 20% WG	28	10 g	200 g	400 g	07	
	Etofenprox 100 g/l EC	3	24 ml	480 ml	960 ml	07	
	Deltamethrin 25 g/l EC	3	10 ml	225 ml	420 ml	07	
	Lambda-cyhalothrin 50 g/l CS	3	12 ml	600 ml	825 ml	07	
Leaf hopper *Amarasca* spp.	Acetamiprid 20% SP	4	16 g	320 g	640 g	14	Stop application at onset of fruiting.
	Acetamiprid 200 g/l SL	4	16 ml	320 ml	640 ml	14	
	Thiamethoxam 25% WG	4	5 g	100 g	200 g	14	
	Acephate 75% SP	1	16 g	320 g	640 g	14	
Mites *Tetranychus* spp.	Hexythiazox 50 g/l EC	10	24 ml	480 ml	960 ml	14	
Thrips *Scirtothrips dorsalis* *Thrips palmi*	Imidacloprid 70% WG	4	2.4 g	48 g	96 g	14	
	Imidacloprid 200 g/l SL	4	16 ml	320 ml	640 ml	14	
	Buprofezin 250 g/l SC	16	30 ml	590 ml	1,260 ml	14	
Scales and Mealy bugs	Imidacloprid 200 g/l SL	4	16 ml	320 ml	640 ml	14	
	Fipronil 50 g/l SC	2	16 ml	320 ml	640 ml	14	
	Thiamethoxam 25% WG	4	8 g	160 g	320 g	14	
	Acetamiprid 200 g/l SL	4	16 ml	320 ml	640 ml	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	PHI Days	Remarks
CABBAGE/RADISH/KNOLKHOL/CAULIFLOWER - INSECTICIDES								
Leaf-eating caterpillars *Spodoptera litura* *Hellula undalis* *Chrysodeixis eriosoma* *Crocidolomia binotalis*	Etofenprox 100 g/l EC	3	24 ml	480 ml	960 ml		07	Apply insecticides at the first sign of damage and repeat at 2 weeks intervals if necessary. Count caterpillars weekly in 12 plants at random and spray if the count exceeds 8 DBM or 4 larvae of the caterpillar species. Spot application at early stage of detection is more economical for *S.litura* and *C.binotalis*
	Emamectin benzoate 5% SG	6	6.4 g	128 g	256 g		07	
	Chlorfluazuron 50 g/l EC	15	16 ml	320 ml	640 ml		10	
	Bistrifluron 100 g/l EC	15	24 ml	480 ml	960 ml		07	
	Tebufenozide 200 g/l SC	18	24 ml	480 ml	960 ml		10	
Diamondback moth *Plutella xylostella*	Chromafenozide 50 g/l SC	18	32 ml	640 ml	1,280 ml		10	
	Chlorantraniliprole 200 g/l SC	28	3 ml	60 ml	120 ml		14	
	Neem Seed Water Extract	UN	640 g	12 kg	24 kg		07	
	Azadirachtin-A 7.5 g/l EC	UN	80 ml	1,600 ml	3,200 ml		07	
	Azadirachtin 50 g/l EC	UN	32 ml	640 ml	1,280 ml		07	
	Lufenuron 50 g/l EC	15	16 ml	320 ml	640 ml		14	
	Novaluron 100 g/l EC	15	20 ml	375 ml	750 ml		14	
	Flubendiamide 24% WG	28	6 g	120 g	240 g		07	
	Indoxacarb 150 g/l EC	22	6.4 g	128 ml	300 ml		14	
	Spinosad 25 g/l SC	5	16 ml	320 ml	600 ml		07	
Diamondback moth *Plutella xylostella*	Spinetoram 25% WG	5	4 g	80 g	150 g		07	
Black cutworm *Agrotis ipsilon* *Arotis segetum*	Chlorfluazuron 50 g/l EC	15	16 ml	320 ml			10	Drench the soil around the base of the plant late the evening when the damage is observed
	Etofenprox 100 g/l EC	3	24 ml	480 ml			7	
CABBAGE - FUNGICIDES								
Ring spot *Mycosphaerella brassicicola*	Propiconazole 250 g/l EC	3	6 ml	120 ml	240 ml	21	21	Apply to the entire foliage and repeat if necessary at three weeks intervals. Strictly adhere to recommended rates to avoid phytotoxicity.
	Hexaconazole 50 g/l EC	3	6 ml	120 ml	240 ml	21	21	
	Hexaconazole 50 g/l SC	3	6 ml	120 ml	240 ml	21	21	
	Tebuconazole 250 g/l EW	3	6 ml	120 ml	240 ml	21	21	
	Epoxiconazole 125 g/l SC	3	6 ml	120 ml	240 ml	21	21	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
Downy mildew *Peronospora parasitica*	Captan 50% WP	MO4	32 g	640 g	1,280 g	6-8	14	
	Captan 80% WG	MO4	20 g	400 g	800 g	6-8	14	
	Mancozeb 75% WG	MO3	32 g	640 g	1,280 g	7-10	14	
	Mancozeb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Maneb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
Fusarium Rot *Fusarium* spp.	Thiophanate-methyl 50% + Thiram 30% WP	1 + MO3	16 g	320 g	640 g	7-10	14	
	Captan 50 % WP	MO4	32 g	640 g	1,280 g	6-8	14	
CAPSICUM/BELLPEPPAR - INSECTICIDES								
Leaf curl complex **Thrips** *Scirtothrips dorsalis* **Aphids** *Aphis gossypii* *Myzus persicae* **Whiteflies** *Bemisia tabaci* *Trialeurodes vaporariorum*	Carbosulfan 200 g/l SC	1	48 ml	960 ml	1,920 ml		14	Treat the nursery if symptoms appear in athe nursery. Spray insecticides at 10-14-day intervals if symptoms appear after transplanting Aphids population on plants should be monitored visually or by placing yellow water traps in the field. Spot application is desirable at initial stage of infestation. Direct spray to the shoot and underside of leaves. In severe infestation, repeat at 10-14 days intervals if necessary. Eggs and immature stages of whiteflies are controlled by Buprofezin
	Thiamethoxam 25% WG	4	16 g	320 g	640 g		14	
	Imidacloprid 200 g/l SL	4	16 ml	320 ml	640 ml		14	
	Abamectin 18 g/l EC	6	10 ml	200 ml	400 ml		07	
	Pymetrozine 50% WG	9	8 g	160 g	320 g		07	
	Lufenuron 50 g/l EC	15	32 ml	640 ml	1,280 ml		14	
	Fenobucarb 500 g/l EC	1	32 ml	640 ml	1,280 ml		14	
	Acephate 75% SP	1	16 g	320 g	640 g		14	
	Profenophos 500 g/l EC	1	32 ml	640 ml	1,280 ml		14	
	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28 + 4	4 g	80 g	160 g		14	
	Thiocyclam (Hydrogen Oxalate) 50% SP	14	8 g	160 g	320 g		14	
	Fipronil 50 g/l SC	2	16 ml	320 ml	640 ml		14	
	Azadirachtin-A 7.5% EC	UN	80 ml	1,600 ml	3,200 ml		07	
	Buprofezin 250 g/l SC	16	30 ml	590 ml	1,260 ml		14	
	Sulfoxaflor 50% WG	4	5 g	100 g	200 g		14	
	Azadirachtin 50 g/l EC	UN	16 ml	320 ml	640 ml		07	
	Ethiprole 100 g/l SC	2	20 ml	400 ml	800 ml		14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
Mites *Hemitarsonemus latus*	Abamectin 18 g/l EC	6	9.6 ml	190 ml	380 ml		07	Should be sprayed to the underside of the leaves at early infestation stage.
	Sulphur 80% WP	UN	128 g	2,500 g	5,000 g		07	
	Sulphur 80% WG	UN	128 g	2,500 g	5,000 g		07	
Pod borers *Helicoverpa armigera* *Spodoptera litura*	Chlorfluazuron 50 g/l EC	15	16 ml	320 ml	640 ml		10	Start spraying at flowering & repeat if necessary at 10-day intervals. Spray in the evening.
	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28 + 4	4 g	80 g	160 g		14	
	Thiodicarb 375 g/l SC	1	24	480 ml	960 ml		14	
CAPSICUM/BELL PEPPER - FUNGICIDES								
Foot rot/collar rot *Sclerotium rolfsii* *Fusarium solani*	Thiram 80% WP	MO3		70 g/50 l /10 m^2		10-12	14	Drench the soil as spot application at the appearance of symptoms.
	Thiophanate-methyl 70% WP	1		30 g/50 l /10 m^2		10-12	14	
	Thiophanate-methyl 50% + Thiram 30% WP	1+ MO3		50 g/50 l /10 m^2		7-10	14	
Anthracnose *Colletotrichum* spp.	Thiophanate-methyl 70% WP*	1	16 g	320 g	640 g	7-14	21	Alternate application of systemic* fungicide with contact fungicide is recommended. Maximum number of applications per season must be limited to three.
	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	640 g	1,280 g	10-12	14	
	Fluazinam 500 g/l SC*	29	16 ml	320 ml	640 ml	7-10	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	
	Tebuconazole 50% + Trifloxystrobin 25% WG*	11 + 3	10 g	200 g	400 g	10-12	21	
Blossom blight *Choanephora* spp.	Mancozeb 75% WG	MO3	32 g	640 g	1,280 g	7-10	14	
	Mancozeb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Maneb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Propineb 70% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	
Powdery mildew *Laveillula taurica*	Thiophanate-methyl 70% WP*	1	16 g	320 g	640 g	7-14	21	Alternate application of systemic* fungicide with contact fungicide is recommended.
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
Phytophthora blight *Phytophthora capsici*	Mancozeb 75% WG	MO3	32 g	640 g	1,280 g	7-10	14	
	Mancozeb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Maneb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Propineb 70% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Mancozeb 64% + Metalaxyl 8% WG	MO3 +4	40 g	800 g	1,600 g	12-14	14	
	Mancozeb 64% + Metalaxyl-M 4% WG	MO3 +4	40 g	800 g	1,600 g	12-14	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	
Powdery mildew *Erysiphe* spp.	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	
	Thiophanate-methyl 70% WP	1	16 g	320 g	640 g	7- 14	21	
CARROT - FUNGICIDES								
Alternaria blight Alternaria spp.	Mancozeb 75% WG	MO3	32 g	640 g	1,280 g	7-10	14	
	Mancozeb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Maneb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Propineb 70% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	
Powdery mildew *Erysiphe* spp.	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	
	Thiophanate-methyl 70% WP	1	16 g	320 g	640 g	7- 14	21	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
CARROT - POST-PLANTING SELECTIVE PRE-EMERGENT - HERBICIDES								
Common annual weeds including *Digitaria sanguinalis* *Echinochloa* spp. *Eleusine indica,* *Lolium* spp. *Amaranthus* spp. *Portulaca oleracea* *Solanum nigrum* *Galinsoga parviflora* *Polygonum* spp.	Metribuzin 70% WP Metribuzin 70% WG	C1 C1	20 g 20 g		500 g 500 g			Sufficient soil moisture will improve the efficacy of weed control.
CUCURBITS (SNAKE GOURD, BITTER GOURD, RIDGE GOURD, PUMPKIN, GHERKIN & CUCUMBER) - INSECTICIDES/ NEMATICIDES/MITICIDES								
Gall fly *Lasioptera falcata*	Profenophos 500 g/l EC	1	48 ml	960 ml	2,400 ml		14	
	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	2,000 g		14	
	Chlorantraniliprole 200 g/l SC	28	5 ml	100 ml	250 ml		14	
Melon fly *Bactrocera cucurbitae*	Spinosad 25 g/l SC	5	20 ml + 400 ml of protein bait	1,000 ml	2,000 ml		07	Application of protein bait is a major component in IPM practices. **First application method (spot)** 1 Protein bait should be applied in spots on to the underside of leaves using knapsak sprayer . 2. Spraying in the morning before 9.00 am is more effective. 3. Reapply in 5-7 day interval

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
		5	20 ml + 400 ml of protein bait	1,000 ml	2,000 ml		07	**Second application method (Trap)** 1. Make a PVC ring (one side at an angle) 9.0 cm diameter width - upper side 6-7 cm, lower side 2.5 cm painted in yellow 2. Insert a spong disc (2.5 < m thick) in to the PVC ring 3. Hang the trap in verticle position wider side top position 4. Apply the bait mixture (0.8 ml + 400 ml of protein bait without water) as a thick paste as a ring on the sponge (4-5 ml trap) 5. Re-apply mixture at 10-14 day intervals. **Common** Remove the damaged fruits into a black polythene bag, tie the mouth up & keep exposed to the sunlight. Spraying/trapping should be initiated one month after flowering.
Leaf hoppers *Amrasca* spp.	Imidacloprid 200 g/l SL	4	16 ml	320 ml	800 ml		14	Stop application at pod initiation stage.
	Acephate 75% SP	1	16 g	320 g	800 g		14	
	Acetamiprid 200 g/l SL	4	16 ml	320 ml	800 ml		14	
	Acetamiprid 20% SP	4	16 g	320 g	800 g		14	
Mites *Tetranychus* spp.	Abamectin 18 g/l EC	6	10 ml	200 ml	500 ml		07	Should be sprayed to the underside of the leaves at early infestation stage.
	Azadirachtin 10 g/l EC	UN	8 ml	160 ml	400 ml		07	
Beetles *Aulacophora* spp.	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	2,000 g		14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
Aphids *Aphis gossypii* *Aphis craccivora* *Myzus persicae*	Imidacloprid 70% WG	4	2 g	40 g	100 g		14	Recommended along with IPM practices. Spray early morning when the activity of whiteflies are low. Restrict spray sessions of same MOA products up to a maximum of two.
	Imidacloprid 200 g/l SL	4	16 ml	320 ml	800 ml		14	
	Thiamethoxam 25% WG	4	5 g	100 g	250 g		14	
	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	2,000 g		14	
	Sulfoxaflor 50% WG	4	5 g	100 g	250 g		14	
	Pymetrozine 50% WG	9	8 g	160 g	400 g		14	
Whiteflies *Bemisia tabaci* *Trialeurodes vaporariorum*	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	2,000 g		14	
	Sulfoxaflor 50% WG	4	5 g	100 g	250 g		14	
	Pymetrozine 50% WG	9	8 g	160 g	400 g		14	
	Azadirachtin 50 g/l EC	UN	16 ml	320 ml	800 ml		07	
Thrips *Scirtothrips dorsalis* *Thrips palmi*	Imidacloprid 70% WG	4	2 g	40 g	100 g		14	Restrict spray sessions of same MOA products up to a maximum of two.
	Imidacloprid 200 g/l SL	4	16 ml	320 ml	800 ml		14	
	Fipronil 50 g/l SC	2	16 ml	320 ml	800 ml		14	
	Pymetrozine 50% WG	9	8 g	160 g	400 g		14	
	Thiamethoxam 25% WG	4	5 g	100 g	250 g		14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	PHI Days	Remarks
CUCURBITS (SNAKE GOURD, BITTER GOURD, RIDGE GOURD, CUCUMBER, PUMPKIN & GHERKIN) - FUNGICIDES								
Downy mildew *Pseudoperonospora cubensis*	Mancozeb 64% + Metalaxyl-M 4% WG	MO3 + 4	40 g	800 g	2,000 g	12-14	14	
	Mancozeb 64% + Metalaxyl 8% WP	MO3 + 4	40 g	800 g	2,000 g	12-14	14	
	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	640 g	1,600 g	10-12	14	Maximum number of applications per season must be limited to three
	Propineb 70% WP	MO3	32 g	640 g	1,600 g	7-10	14	Alternate application of systemic* fungicide with contact fungicide is recommended.
	Azoxystrobin 250 g/l SC*	11	16 ml	320 ml	800 ml	10-12	14	
	Captan 50% WP	MO4	32 g	640 g	1,600 g	6-8	14	
	Captan 80% WG	MO4	20 g	400 g	1,000 g	6-8	14	
	Tebuconazole 200 g/l + Azoxystrobin 120 g/l SC*	11+3	6 ml	120 ml/ha	300 ml	14-21	14	
Powdery mildew *Erysiphe* spp.	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	2,400 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,600 g	7-10	14	
	Flutriafol 250 g/l SC	3	16 ml	320 ml	800 ml	10-12	14	
	Potassium bicarbonate 82% SP	-	24 g	480 g	1,200 g	7-10	01	
	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	640 g	1,600 g	10-12	14	Maximum number of applications per season must be limited to three.
	Azoxystrobin 250 g/l SC*	11	16 ml	320 ml	800 ml	10-12	14	
	Captan 50% WP	MO4	32 g	640 g	1,600 g	6-8	14	
	Captan 80% WG	MO4	20 g	400 g	1,000 g	6-8	14	
Alternaria blight *Alternaria* spp.	Mancozeb 75% WG	MO3	32 g	640 g	1,600 g	7-10	14	
	Mancozeb 80% WP	MO3	32 g	640 g	1,600 g	7-10	14	
	Maneb 80% WP	MO3	32 g	640 g	1,600 g	7-10	14	
	Propineb 70% WP	MO3	32 g	640 g	1,600 g	7-10	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	2,400 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,600 g	7-10	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
OKRA - INSECTICIDES								
Shoot and pod borer *Earias vitella*	Chlorantraniliprole 200 g/l SC	28	3 ml	60 ml	120 ml		14	Frist application at flowering stage. If infestation is further seen, harvest all pods & re-apply strictly respecting the pre-harvest intervels
	Tebufenozide 200 g/l SC	18	24 ml	480 ml	960 ml		10	
Leaf hopper *Amrasca* spp.	Acetamiprid 200 g/l SL	4	16 ml	320 ml	640 ml		14	Stop application at pod initiation stage.
	Acetamiprid 20% SP	4	16 g	320 g	640 g		14	
	Thiamethoxam 25% WG	4	5 g	100 g	200 g		14	
	Acephate 75% SP	1	16 ml	320 ml	640 ml		14	
Aphids *Aphis gossypii Aphis craccivora, Myzus persicae*	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	1,600 g		14	
	Imidacloprid 70% WG	4	2 g	40 g	80 g	-	14	
	Imidacloprid 200 g/l SL	4	16 ml	320 ml	640 ml	-	14	
	Thiamethoxam 25% WG	4	4.8 g	100 g	200 g	-	14	
Mites *Tetranychus* spp.	Abamectin 18 g/l EC	6	10 ml	200 ml	400 ml		14	
	Azadirachtin 10 g/l EC	UN	8 ml	160 ml	320 ml		07	
	Neem Seed Water Extract	UN	640 g	12 kg	24 kg		07	
OKRA - FUNGICIDES								
Powdery mildew *Erysiphe cicho-racearum*	Sulphur 80% WG	MO2	80 g	1,600 g	3,200 g	6-8	14	Alternate application of *systemic fungicide with contact fungicide is recommended. Maximum number of applications per season must be limited to three.
	Sulphur 80% WP	MO2	80 g	1,600 g	3,200 g	6-8	14	
	Carbendazim 50% WP*	1	11 g	225 g	450 g	10-14	14	
	Carbendazim 500 g/l SC*	1	11 ml	225 ml	450 ml	10-14	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	High foliage	Application interval (days)	PHI Days	Remarks
TOMATO - INSECTICIDES								
Aphids *Aphis gossypii Aphis craccivora, Myzus persicae*	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	1,600		14	
	Pymetrozine 50% WG	9	8 g	160 g	320 g		7	
	Buprofezin 250 g/l SC	16	30 ml	590 ml	1,260 ml		14	
	Imidacloprid 70% WG	4	2 g	40 g	80 g	-	14	
	Imidacloprid 200 g/l SL	4	16 ml	320 ml	640 ml	-	14	
	Thiamethoxam 25% WG	4	5 g	100 g	200 g	-	14	
Whiteflies *Bemisia tabaci, Trialeurodes vaporariorum*	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	1,600 g		14	Eggs and immature stages are controlled by Buprofezin
	Buprofezin 250 g/l SC	16	30 ml	590 ml	1,260 ml		05	
	Pymetrozine 50% WG	9	8 g	160 g	320 g		14	
Thrips *Scirtothrips dorsalis Thrips palmi*	Pymetrozine 50% WG	9	8 g	160 g	320 g		14	
	Buprofezin 250 g/l SC	16	30 ml	590 ml	1,260 ml		14	
	Imidacloprid 70% WG	4	2 g	40 g	80 g	-	14	
	Imidacloprid 200 g/l SL	4	16 ml	320 ml	640 ml	-	14	
	Thiamethoxam 25% WG	4	4.8 g	100 g	200 g	-	14	
Fruit borer *Helicoverpa armigera*	Novaluron 100 g/l EC	15	16 ml	320 ml	640 ml		14	The first spraying may be done at the time of flowering and formation of fruits and repeat if necessary at 10-14 day intervals.
	Chlorfluazuron 50 g/l EC	15	24 ml	480 ml	960 ml		10	
	Chlorantraniliprole 200 g/l SC	28	4 ml	80 ml	160 ml		14	
	Fubendiamide 24% WG	28	5 g	100 g	200 g		07	
	Fubendiamide 20% WG	28	6 g	120 g	240 g		07	
Tomato leafminer & Fruit borer *Tuta absoluta*	Emamectin benzoate 5% SG	6	6 g	120 g	240 g		10	Apply only for larvae control. Apply minimum of seven days interval if the damage is seen. The insect is showing high resistance for insecticides. Therefore, do not repeat same insecticides. Recommended along with IPM practices.
	Abamectin 18 g/l EC	6	10 ml	200 ml	400 ml		14	
	Indoxacarb 150 g/l EC	22	6 ml	120 ml	240 ml		14	
	Spinetoram 25% WG	5	4 g	80 g	150 g		14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
Leafminer *Liriomyza sativa*	Neem Seed Water Extract	UN	640 g	12 kg	24 kg		07	Use IPM practices with bio-control agents. Apply Abamectin 18 g/l EC only during epidemics.
	Abamectin 18 g/l EC	6	10 ml	200 ml	400 ml		14	
	Azadirachtin 50 g/l EC	UN	32 ml	640 ml	1,280 ml		07	
TOMATO - FUNGICIDES								
Leaf mold *Cladosporium fulvum*	Thiophanate-methyl 70% WP	1	16 g	320 g	640 g	7-14	21	A common disease in Poly-tunnels.
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	
Early blight *Alternaria solani*	Mancozeb 75% WG	MO3	32 g	640 g	1,280 g	7-10	14	Alternate application of *systemic fungicide and contact fungicide is recommended. Start spraying after observing first symptoms. Maximum number of applications per season must be limited to three.
	Mancozeb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	
	Maneb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Propineb 70% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Mancozeb 64% + Metalaxyl 8% WP	MO3 + 4	40 g	800 g	1,600 g	12-14	14	
	Mancozeb 64% + Metalaxyl-M 4% WG	MO3 + 4	40 g	800 g	1,600 g	12-14	14	
	Captan 50% WP	MO4	32 g	640 g	1,280 g	6-8	14	
	Captan 80% WG	MO4	20 g	400 g	800 g	6-8	14	
	Isoprothiolane 400 g/l EC*	6	40 ml	800 ml	1,600 ml	7-10	14	
	Mancozeb 60% + Dimethomorph 9% WP	MO3 + 40	80 g	1,600 g	3,200 g	12-14	14	
	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	640 g	1,280 g	10-12	14	
	Azoxystrobin 120 g/l + Tebuconazole 200 g/l SC*	11+3	5.6 ml	112 ml	225 ml	10-12	14	
	Difenoconazole 250 g/l EC*	3	24 ml	480 ml	960 ml	14	14	
	Fluazinam 500 g/l SC	C5	16 ml	320 ml	640 ml	7-10	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
Late blight *Phytophthora infestans*	Mancozeb 75% WG	MO3	32 g	640 g	1,280 g	7-10	14	Alternate application of *systemic fungicide with contact fungicide is recommended. Start spraying after observing first symptoms. Maximum number of applications per season must be limited to three.
	Mancozeb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	
	Maneb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Propineb 70% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Mancozeb 64% + Metalaxyl 8% WP	MO3 + 4	40 g	800 g	1,600 g	14	14	
	Mancozeb 64% + Metalaxyl-M 4% WG	4 + MO3	40 g	800 g	1,600 g	14	14	
	Propamocarb 607 g/l SL*	28	64 ml	1,280 ml	2,560 ml	14	14	
	Mancozeb 60% + Dimethomorph 9% WP	MO3 + 40	80 g	1600 g	3,200 g	12-14	14	
	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	640 g	1,280 g	10-12	14	
	Azoxystrobin 120 g/l + Tebuconazole 200 g/l SC*	11+3	5.6 ml	112 ml	225 ml	10-12	14	
	Isoprothiolane 400 g/l EC*	6	40 ml	800 ml	1,600 ml	7-10	14	
	Fluazinam 500 g/l SC	29	16 ml	320 ml	640 ml	7-10	14	
	Azoxystrobin 250 g/l SC*	11	16 ml	320 ml	640 ml	10-12	14	
	Difenoconazole 250 g/l EC*	3	24 ml	480 ml	960 ml	14	14	
Foot rot / Root rot *Rhizoctonia* spp. *Fusarium* spp.	Pencycuron 25% WP	20		100 g/50 l/10 m^2		-	14	Soil drenching in the field is recommended only as a spot application.
	Thiram 80% WP	MO3		70 g/50 l/10 m^2		-	14	
	Thiophanate-methyl 50% + Thiram 30% WP	1+ MO3		50 g/50 l/10 m^2		-	14	
	Carbendazim 50% WP	1		70 g/50 l/10 m^2		-	14	
	Carbendazim 500 g/l SC	1		70 ml/50 l/10 m^2		-	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	PHI Days	Remarks
LEAFY VEGETABLES - AMARANTHUS & MUKUNUWENNA - FUNGICIDES								
White rust *Albugo* spp. **Red leaf spot** *Cercospora* spp.	Azoxystrobin 250 g/l SC*	11	16 ml	320 ml	500 ml	10-12	14	Alternate application of *systemic fungicide with contact fungicide is recommended. Start spraying after observing first symptoms.
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,500 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,000 g	7-10	14	
	Mancozeb 75% WG	MO3	32 g	640 g	1,000 g	7-10	14	
	Mancozeb 80% WP	MO3	32 g	640 g	1,000 g	7-10	14	
LEAFY VEGETABLE - GOTUKOLA - FUNGICIDES								
Red leaf spot *Cercospora* spp.	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,500 ml	7-10	14	Alternate application of *systemic fungicide with contact fungicide is recommended. Start spraying after observing first symptoms.
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,000 g	7-10	14	
	Mancozeb 75% WG	MO3	32 g	640 g	1,000 g	7-10	14	
	Mancozeb 80% WP	MO3	32 g	640 g	1,000 g	7-10	14	
	Azoxystrobin 250 g/l SC*	11	16 ml	320 ml	500 ml	10-12	14	
Root rot/collar rot *Sclerotium rolfsii* *Fusarium* spp.	Thiram 80% WP	MO3		70 g/50 l/10 m^2		6-8	14	Drench the soil as spot application at the appearance of symptoms.
	Thiophanate-methyl 70% WP	1		30 g/50 l/10 m^2		10-12	14	
	Thiophanate-methyl 50% + Thiram 30% WP	1+ MO3		50 g/50 l/10 m^2		7-10	14	
LEAFY VEGETABLE - MUKUNUWENNA - INSECTICIDES/NEMATICIDES								
Flea hopper *Halticus* spp.	Sulfoxaflor 50% WG	4	5 g	100 g	160 g		7	Recommended along with other IPM practices. Apply only once per one cropping cycle either 7-14 days after pruning of the crop or whenever the damage is visible. Use an alternative after 7-14 days of application if the damage is severe. Strictly adopt the label recommendations and PHI
	Pymetrozine 50% WG	9	8 g	160 g	250 g		7	
Leaf and planthoppers *Harmalia heitensis* *Amrasca* spp.	Sulfoxaflor 50% WG	4	5 g	100 g	160 g		7	
	Pymetrozine 50% WG	9	8 g	160 g	250 g		7	
	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	1,250 g		14	
Flea beetle *Chaetocnema* spp.	Sulfoxaflor 50% WG	4	5 g	100 g	160 g		7	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	High foliage	Application interval (days)	PHI Days	Remarks
Root knot nematodes *Meloidogyne* spp.	Abamectin 20 g/l SC	6	6 ml	3,750 ml			0	Drench the selected area with recommended volume of nematicide + water mix before planting at the rate of 10 l/10 m^2. Repeat the process after 2 weeks till 2 months after planting. Reapply two weeks after harvesting if necessary
LEEKS - FUNGICIDES								
Purple blotch *Alternaria porri*	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	640 g	1,280 g	10-12	14	Alternate application of *systemic fungicide with contact fungicide is recommended. Maximum number of applications per season must be limited to three.
	Mancozeb 75% WG	MO3	32 g	640 g	1,280 g	7-10	14	
	Mancozeb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Maneb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Propineb 70% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	
	Fluazinam 500 g/l SC	29	16 ml	320 ml	640 ml	7-10	14	
OCCATIONAL PESTS (CARROTS, CABBAGE & POTATO) - INSECTICIDES/MOLLUSCICIDES								
Snails & slugs *Achatina* spp. *Aplysoa* spp. *Deroceras reticulatum*	Metaldehyde 5% RB			4 kg				Mix with sufficient water to form balls and place at several points in the garden. Apply in bands between rows or broadcast in soil at the rate of 4 g/10 m^2.

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	PHI Days	Remarks
DISEASES IN NURSERIES (TOMATO, CHILLI, CAPSICUM, BRINJAL, CABBAGE) - FUNGICIDES								
Damping-off *Pythium* spp. *Phytophthora* spp. *Rhizoctonia* spp. *Sclerotium* spp. *Fusarium* spp.	Captan 50% WP	MO4		6 g/kg				Seed treatments should be done just before sowing. Burning or solarisation is the best to eliminate most soil-borne pathogens in nursery beds. Use broad spectrum fungicides (Captan and Thiram) if the causal fungus is not identified. Thiophanate-methyl is highly effective on *Fusarium* spp. and *Sclerotium rolfsii*. But it is not effective on *Phythium* spp. and *Phytophthora* spp. (water moulds).
	Captan 80% WG	MO4		4 g/kg				
	Thiram 80% WP	MO3		5 g/kg				
	Thiophanate-methyl 50% + Thiram 30% WP	1+ MO3		4 g/kg				
	Hymexazole 360 g/l SL	32		2 ml/kg				
	Captan 50% WP	MO4		60 g/50 l/10 m²		6-8	14	Soil should be treated with fungicide mixture 3 days before sowing. Soil drenching in the field is recommended only as a spot application.
	Captan 80% WG	MO4		40 g/50 l/10 m²		6-8	14	
	Flutolanil 50% WP	7		30 g/50 l/10 m²		10-12	14	
	Thiram 80% WP	MO3		70 g/50 l/10 m²		6-8	14	
	Thiophanate-methyl 50% + Thiram 30% WP	1+ MO3		50 g/50 l/10 m²		7-10	14	
	Hymexazole 360 g/l SL	32		20 ml/50 l/10 m²			14	Soil should be treated with the fungicide at two weeks after sowing seeds

FOOD CROPS - ROOT & TUBER

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		PHI Days	Remarks
				Low foliage	High foliage		
POTATO - INSECTICIDES/MITICIDES/NEMATICIDES							
Thrips *Scirtothrips dorsalis* *Thrips palmi*	Imidacloprid 200 g/l SL	4	8 ml	160 ml	320 ml	14	
	Imidacloprid 70% WG	4	2 g	40 g	80 g	14	
	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28 + 4	4 g	80 g	160 g	10	
	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	1,600 g	14	
	Pymetrozine 50% WG	9	8 g	160 g	320 g	14	
	Buprofezin 250 g/l SC	16	45 ml	960 ml	1,800 ml	14	
	Fipronil 50 g/l SC	2	16 ml	320 ml	640 ml	14	
	Ethiprole 100 g/l SC	2	20 ml	400 ml	800 ml	14	
	Thiacloprid 240 g/l SC	4	4 ml	80 ml	160 ml	14	
	Carbosulfan 200 g/l SC	1	32 ml	640 ml	1,280 ml	14	
Aphids *Aphis gossypii* *Aphis craccivora* *Myzus persicae*	Imidacloprid 200 g/l SL	4	8 ml	160 ml	320 ml	14	Timing of insecticide application is critical. Aphids population on plants should be monitored visually or by placing yellow water traps in the field. Spot application is desirable at initial stage of infestation. Direct spray to the shoot and underside of leaves. In severe infestation, repeat at 10-14 days intervals if necessary.
	Imidacloprid 70% WG	4	2 g	40 g	80 g	14	
	Thiacloprid 240 g/l SC	4	4 ml	80 ml	160 ml	14	
	Thiamethoxam 25% WG	4	5 g	100 g	200 g	14	
	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28 + 4	4 g	80 g	160 g	10	
	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	1,600 g	14	
	Pymetrozine 50% WG	9	8 g	160 g	320 g	14	
	Buprofezin 250 g/l SC	16	45 ml	900 ml	1,800 ml	14	
	Carbosulfan 200 g/l SC	1	32 ml	640 ml	1,280 ml	14	
	Ethiprole 100 g/l SC	2	20 ml	400 ml	800 ml	14	
	Quinalphos 250 g/l EC	1	32 ml	640 ml	1,280 ml	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		PHI Days	Remarks
				Low foliage	High foliage		
Whiteflies *Bemisia tabaci, Trialeurodes vaporariorum*	Thiacloprid 240 g/l SC	4	4 ml	80 ml	160 ml	14	
	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28 + 4	4 g	80 g	160 g	10	
	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	1,600 g	14	
	Pymetrozine 50% WG	9	8 g	160 g	320 g	14	
	Ethiprole 100 g/l SC	2	20 ml	400 ml	800 ml	14	
Leaf miner *Liriomyza huidobrensis*	Neem Seed Water Extract	UN	640 g	12 kg	24 kg	07	Under normal condition use IPM practices with bio control Agent Abamectin 18 g/l EC apply on only during epidemics. Apply on to leaf surfaces when damage is seen. Spray at initial stoge as infestation.
	Abamectin 18 g/l EC	6	10 ml	200 ml	400 ml	14	
	Azadirachtin 50 g/l EC	UN	32 ml	640 ml	1,280 ml	07	
White grub *Melolontha* spp. *Anomala* spp.	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28 + 4	5 g	3,125 g		14	Drench soil at planting at the rate of 10 l/ 10 m^2
Tuber moth (Stores) *Phthorimaea operculella*	Pirimiphos-methyl 500 g/l EC	1	64 ml	-	-	-	Clean all stores well in advance of harvesting potatoes. Walls, floors and storage trays should be cleaned and sprayed with a residual insecticide and air-dried before storing seed potatoes.
	Acetamiprid 20% SP	4	16 g	-	-	14	
	Novaluron 100 g/l EC	15	16 ml	-	-	14	
Tuber moth (Seed Potato) *Phthorimaea operculella*	Thiocyclam (Hydrogen Oxalate) 50% SP	14		40 g /100 kg		14	Inspect stores on a fortnightly basis. If there is any sign of insect damage apply a recommended insecticide.
Tuber moth (Field) *Phthorimaea operculella*	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28+ 4	5 g	100 g	200 g	14	When first sign of damage are seen, direct spray to under side of the foliage close to the stem and branches.
Mites *Tetranychus* spp.	Fenpyroximate 50 g/l EC	21	20 ml	400 ml	800 ml	14	
Cyst nematode *Globodera rostochiensis*	Calcium hypochlorite 70%	UN	-	35 kg			Apply to furrows at planting or one day before planting at the rate of 35 g/10 m^2 and cover with soil. Do not mix with inorganic fertilizers.

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	PHI Days	Remarks
POTATO - FUNGICIDES								
Storage dry rot (Seed Potato) *Fusarium solani*	Thiophanate-methyl 70% WP	1		1 kg/t				Mix with seed potatoes after harvest within 10 days before storage. Not recommended for table potato.
	Thiophanate-methyl 50% + Thiram 30% WP	1 + MO3		1 kg/t				
Early blight *Alternaria solani*	Mancozeb 75% WG	MO3	32 g	640 g	1,280 g	7-10	14	Alternate application of *systemic fungicide and contact fungicide is recommended. Start spraying after observing first symptoms. Maximum number of applications per season must be limited to three.
	Mancozeb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	
	Maneb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Propineb 70% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Mancozeb 64% + Metalaxyl 8% WP	MO3 + 4	40 g	800 g	1,600 g	12-14	14	
	Mancozeb 64% + Metalaxyl-M 4% WG	MO3 + 4	40 g	800 g	1,600 g	14	14	
	Captan 50% WP	MO4	32 g	640 g	1,280 g	6-8	14	
	Captan 80% WG	MO4	20 g	400 g	800 g	6-8	14	
	Isoprothiolane 400 g/l EC*	6	40 ml	800 ml	1,600 ml	7-10	14	
	Mancozeb 60% + Dimethomorph 9% WP	MO3 + 40	80 g	1600 g	3,200 g	12-14	14	
	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	640 g	1,280 g	10-12	14	
	Difenoconazole 250 g/l EC*	3	24 ml	480 ml	960 ml	14	14	
Late blight *Phytophthora infestans*	Mancozeb 75% WG	MO3	32 g	640 g	1,280 g	7-10	14	Alternate application of *systemic fungicide with contact fungicide is recommended. Start spraying after observing first symptoms. Maximum number of applications per season must be limited to three.
	Mancozeb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	
	Maneb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Propineb 70% WP	MO3	32 g	640 g	1,280 g	7-10	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
	Mancozeb 64% + Metalaxyl 8% WP	MO3 + 4	40 g	800 g	1,600 g	12-14	14	
	Mancozeb 64% + Metalaxyl-M 4% WG	MO3 + 4	40 g	800 g	1,600 g	12-14	14	
	Propamocarb 607 g/l SL*	28	64 ml	1,280 ml	2,560 ml	12-14	14	
	Mancozeb 60% + Dimethomorph 9% WP	MO3 + 40	80 g	1600 g	3,200 g	12-14	14	
	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	640 g	1,280 g	10-12	14	
	Isoprothiolane 400 g/l EC*	6	40 ml	800 ml	1,600 ml	7-10	14	
	Fluazinam 500 g/l SC	29	16 ml	160 ml	320 ml	7-10	14	
	Azoxystrobin 250 g/l SC*	11	16 ml	320 ml	640 ml	10-12	14	
Foot rot/Root rot *Rhizoctonia* spp. *Fusarium* spp.	Pencycuron 25% WP	20		100 g/50 l/10 m^2		-	14	Drench soil as spot application at the appearance of symptoms. Soil drenching in the field is recommended only as a spot application.
	Thiram 80% WP	MO3		70 g/50 l/10 m^2		6-8	14	
	Thiophanate-methyl 50% + Thiram 30% WP	1 + MO3		50 g/50 l/10 m^2		7-10	14	
	Carbendazim 50% WP	1		70 g/50 l/10 m^2		10-14	14	
POTATO - POST-PLANTING SELECTIVE PRE-EMERGENT HERBICIDES								
Common annual weeds including *Digitaria sanguinalis* *Eleusine indica* *Lolium* spp. *Galinsoga parviflora* *Amaranthus* spp. *Polygonum* spp. *Portulaca oleracea* *Solanum nigrum*	Metribuzin 70% WP	C1	40 g	1 kg		1-6 DAP		Apply leveled field with adequate soil moisture for effective results.
	Metribuzin 70% WG	C1	40 g	1 kg		1-6 DAP		

OTHER FIELD CROPS

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	High foliage	PHI Days	Remarks
CONDIMENTS : CHILLI - INSECTICIDES/MITICIDES							
Leaf curl complex **Thrips** *Scirtothrips dorsalis* **Aphids** *Aphis gossypii* *Myzus persicae* **Whiteflies** *Bemisia tabaci* *Trialeurodes vaporariorum*	Carbosulfan 200 g/l SC	1	48 ml	960 ml	1,920 ml	14	Treat the nursery if symptoms appear in athe nursery. Spray insecticides at 10-14-day intervals if symptoms appear after transplanting Eggs and immature stages of whiteflies are controlled by Buprofezin
	Thiamethoxam 25% WG	4	16 g	320 g	640 g	14	
	Imidacloprid 200 g/l SL	4	16 ml	320 ml	640 ml	14	
	Abamectin 18 g/l EC	6	10 ml	200 ml	400 ml	07	
	Pymetrozine 50% WG	9	8 g	160 g	320 g	07	
	Lufenuron 50 g/l EC	15	32 ml	640 ml	1,280 ml	14	
	Fenobucarb 500 g/l EC	1	32 ml	640 ml	1,280 ml	14	
	Acephate 75% SP	1	16 g	320 g	640 g	14	
	Profenophos 500 g/l EC	1	32 ml	640 ml	1,280 ml	14	
	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28 + 4	4 g	80 g	160 g	14	
	Thiocyclam (Hydrogen Oxalate) 50% SP	14	8 g	160 g	320 g	14	
	Fipronil 50 g/l SC	2	16 ml	320 ml	640 ml	14	
	Azadirachtin-A 7.5% EC	UN	80 ml	1,600 ml	3,200 ml	07	
	Buprofezin 250 g/l SC	16	30 ml	590 ml	1,260 ml	14	
	Sulfoxaflor 50% WG	4	5 g	100 g	200 g	14	
	Azadirachtin 50 g/l EC	UN	16 ml	320 ml	640 ml	07	
	Ethiprole 100 g/l SC	2	20 ml	400 ml	800 ml	14	
Mites *Hemitarsonemus latus*	Abamectin 18 g/l EC	6	10 ml	190 ml	360 ml	07	Should be sprayed to the underside of the leaves at early infestation stage.
	Sulphur 80% WP	UN	128 g	2,500 g	5,000 g	14	
	Sulphur 80% WG	UN	128 g	2,500 g	5,000 g	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
Pod borers *Helicoverpa armigera* *Spodoptera litura*	Chlorfluazuron 50 g/l EC	15	16 ml	320 ml	640 ml		10	Start spraying at flowering & repeat if necessary at 10-day intervals. Spray in the evening.
	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28 + 4	4 g	80 g	160 g		14	
	Thiodicarb 375 g/l SC	1	24	480 ml	960 ml		14	
CONDIMENTS : CHILLI - FUNGICIDES								
Foot rot/collar rot *Sclerotium rolfsii* *Fusarium solani*	Thiram 80% WP	MO3		70 g/50 l /10 m^2		10-12	14	Soil drench Drench the soil as spot application at the appearance of symptoms
	Thiophanate-methyl 70% WP	1		30 g/50 l /10 m^2		10-12	14	
	Thiophanate-methyl 50% + Thiram 30% WP	1+ MO3		50 g/50 l /10 m^2		7-10	14	
Anthracnose *Colletotrichum* spp.	Thiophanate-methyl 70% WP*	1	16 g	320 g	640 g	7-14	21	Alternate application of systemic* fungicide with contact fungicide is recommended. Maximum number of applications per season must be limited to three.
	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	640 g	1,280 g	10-12	14	
	Fluazinam 500 g/l SC*	29	16 ml	320 ml	640 ml	7-10	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	
	Tebuconazole 50% + Trifloxystrobin 25% WG*	11+ 3	10 g	192 g	360 g	10-12	21	
Blossom blight *Choanephora* spp.	Mancozeb 75% WG	MO3	32 g	640 g	1,280 g	7-10	14	
	Mancozeb 80% WG	MO3	32 g	640 g	1,280 g	7-10	14	
	Maneb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Propineb 70% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	
Powdery mildew *Laveillula taurica*	Thiophanate-methyl 70% WP*	1	16 g	320 g	640 g	7-14	21	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
Phytophthora blight *Phytophthora capsici*	Mancozeb 75% WG	MO3	32 g	640 g	1,280 g	7-10	14	
	Mancozeb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Maneb 80% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Propineb 70% WP	MO3	32 g	640 g	1,280 g	7-10	14	
	Mancozeb 64% + Metalaxyl 8% WP	MO3 + 4	20 g	400 g	800 g	12-14	14	
	Mancozeb 64% + Metalaxyl-M 4% WG	MO3 + 4	20 g	400 g	800 g	12-14	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,920 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,280 g	7-10	14	
CONDIMENTS : ONION - INSECTICIDES								
Thrips *Thrips tabaci*	Fipronil 50 g/l SC	2	16 ml	320 ml	400 ml		14	Insecticides should be be applied at first sign of infestation. Repeat application if necessary at 10-14 day intervals.
	Imidacloprid 200 g/l SL	4	16 ml	320 ml	400 ml		14	
	Thiacloprid 240 g/l SC	4	16 ml	320 ml	400 ml		14	
Onion caterpillars *Spodoptera litura* *Spodoptera exigua*	Emamectin benzoate 5% SG	6	6 g	120 g	150 g		07	Insecticides should be applied at first sign of infestation. Spray in the evening.
	Chlorfluazuron 50 g/l EC	15	16 ml	320 ml	400 ml		10	
	Lambda-cyhalothrin 50 g/l CS	3	8 ml	160 ml	200 ml		07	
	Deltamethrin 25 g/l EC	3	10 ml	200 ml	250 ml		07	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	PHI Days	Remarks
CONDIMENTS : ONION - FUNGICIDES								
Bulb rot/Seedling blight *Fusarium* spp. *Botrytis* spp. *Sclerotium* spp. *Pythium* spp. *Phytophthora* spp.	Captan 50% WP	MO4		5 g/kg		-	-	Bulb treatment Immerse bulbs for 1 hr in fungicide solution just before planting. Thiophanate-methyl is highly effective on *Fusarium* spp. and *Sclerotium rolfsii.*
	Captan 80% WG	MO4		3 g/kg				
	Thiram 80% WP	MO3		5 g/kg				
	Thiophanate-methyl 50% + Thiram 30% WP	1 + MO3		5 g/kg				
	Thiophanate-methyl 50% + Thiram 30% WP	1 + MO3		50 g/50 l/10 m^2		7-10	14	Soil drench Soil drenching in the field is recommended only as a spot application.
	Thiophanate-methyl 70% WP	1		30 g/50 l/10 m^2		7-10	14	
	Thiram 80% WP	MO3		70 g/50 l/10 m^2		6-8	14	
Purple blotch *Alternaria porri*	Tebuconazole 250 g/l EW*	3	6 ml	120 ml	150 ml	14-21	21	Alternate application of *systemic fungicide with contact fungicide is recommended.
	Trifloxystrobin 25% + Tebuconazole 50% WG*	11 + 3	10 g	200 g	250 g	10-12	21	
	Azoxystrobin 250 g/l SC*	11	16 ml	320 ml	400 ml	10-12	14	
	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	640 g	800 g	10-12	14	
	Mancozeb 75% WG	MO3	32 g	640 g	800 g	7-10	14	Maximum number of applications per season must be limited to three.
	Mancozeb 80% WP	MO3	32 g	640 g	800 g	7-10	14	
	Maneb 80% WP	MO3	32 g	640 g	800 g	7-10	14	
	Propineb 70% WP	MO3	32 g	640 g	800 g	7-10	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,200 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	800 g	7-10	14	
	Fluazinam 500 g/l SC	29	16 ml	320 ml	400 ml	7-10	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	PHI Days	Remarks
Anthracnose *Colletotrichum gloeosporioides*	Thiophanate-methyl 70% WP*	1	10 g	200 g	250 g	10-12	14	Alternate application of *systemic fungicide with contact fungicide is recommended. Maximum number of applications per season must be limited to three.
	Trifloxystrobin 25% + Tebuconazole 50% WG*	11+ 3	10 g	200 g	250 g	10-12	21	
	Azoxystrobin 250 g/l SC*	11	16 ml	320 ml	400 ml	10-12	14	
	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	640 g	800 g	10-12	14	
	Mancozeb 75% WG	MO3	32 g	640 g	800 g	7-10	14	
	Mancozeb 80% WP	MO3	32 g	640 g	800 g	7-10	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,200 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	800 g	7-10	14	
	Fluazinam 500 g/l SC	29	16 ml	320 ml	400 ml	7-10	14	
CONDIMENTS : BIG ONION & RED ONION - PRE- & POST-PLANTING SELECTIVE PRE-EMERGENT HERBICIDES								
Common annual grasses, sedges and broad-leaf weeds	Oxyfluorfen 240 g/l EC	E	20 ml	500 ml		2-12 DAP		Apply on to leveled field with adequate soil moisture for effective results.
	Oxyfluorfen 480 g/l EC	E	10 ml	250 ml		2-12 DAP		
	Pendimethalin 300 g/l EC	K1	140 ml	3,500 ml		0-5 DAP		
GRAIN LEGUMES : MUNGBEAN, COWPEA, BLACKGRAM, SOYBEAN - INSECTICIDES								
Bean fly *Ophiomyia phaseoli*	Thiamethoxam 70% WS	4		1.5 g/kg seed				Seed Treatment Mix 1.5 g of insecticide in 8 - 10 ml of water and mix with 1 kg of seeds and keep for about 1 hour before planting. Wear gloves and masks when handling chemicals and planting treated seeds.
	Carbosulfan 200 g/l SC	1	48 ml	960 ml	1,920 ml		14	Apply at 7 days after planting or when first pair of leaves appear and repeat after 2 weeks if necessary. Repeat application at flowering if infection is severe.

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
Legume pod borers *Maruca vitrata* *Helicoverpa armigera* *Lampides boeticus*	Etofenprox 100 g/l EC	3	24 ml	480 ml	960 ml		07	Start spraying at flowering and repeat at 10-14-day intervals, if necessary.
	Novaluron 100 g/l EC	15	16 ml	320 ml	640 ml		14	
	Chlorfluazuron 50 g/l EC	15	16 ml	320 ml	640 ml		10	
Pod sucking bugs *Nezara viridula* *Riptortus* spp. *Anaplocnemis* spp.	Imidacloprid 70% WG	4	2.4 g	48 g	96 g		14	
	Thiacloprid 240 g/l SC	4	16 ml	320 ml	640 ml		14	
Mites *Tetranychus* spp.	Azadirachtin 50 g/l EC	UN	8 ml	160 ml	300 ml		07	
	Abamectin 18 g/l EC	6	10 ml	200 ml	400 ml		07	
Cutworm *Spodoptera litura*	Etofenprox 100 g/l EC	3	24 ml	480 ml	960 ml		07	
	Chlorfluazuron 50 g/l EC	15	16 ml	320 ml	640 ml		10	
Thrips *Scirtothrips dorsalis* *Thrips palmi*	Imidacloprid 70% WG	4	2 g	40 g	80 g		14	Recommended along with IPM practices. Restrict spray sessions of same MOA products up to a maximum of two.
	Imidacloprid 200 g/l SL	4	16 ml	320 ml	400 ml			
	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28+ 4	4 g	80 g	160 g		10	
	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	1,600		14	
Aphids *Aphis gossypii* *Aphis craccivora,* *Myzus persicae*	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28+ 4	4 g	80 g	160 g		10	
	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	1,600 g		14	Recommended along with IPM practices. Restrict spray sessions of same MOA products up to a maximum of two.

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		PHI Days	Remarks
				Low foliage	High foliage		
Whiteflies *Bemisia tabaci, Trialeurodes vaporariorum*	Chlorantraniliprole 20% + Thiamethoxam 20% WG	28 + 4	4 g	80 g	160 g	10	
	Thiocyclam (Hydrogen Oxalate) 50% SP	14	40 g	800 g	1,600	14	
	Sulfoxaflor 50% WG	4	5 g	100 g	200 g	14	
	Pymetrozine 50% WG	9	8 g	160 g	320 g	14	
	Azadirachtin 50 g/l EC	UN	16 ml	320 ml	640 ml	07	
Storage pest Pulse bruchids *Callosobruchus* spp.	Pirimiphos-methyl 500 g/l EC	1	40 ml	-	-	-	Clean all stores well in advance of storing pulses. Walls and floors should be cleaned and sprayed with a residual insecticide and air-dried before storing pulses.
	Acetamiprid 20% SP	4	16 g	-	-	14	
	Novaluron 100 g/l EC	15	16 ml	-	-	14	
GRAIN LEGUMES : COWPEA - FUNGICIDES							
Ashy-stem blight *Macrophomina phaseolina* *Rhizoctonia* spp.	Tebuconazole 250 g/l EW	3	6 ml	120 ml	150 ml	21	
GRAIN LEGUMES: SOYBEAN, BLACK GRAM, GREEN GRAM & COWPEA - PRE- & POST-PLANTING SELECTIVE PRE-EMERGENT HERBICIDES							
Common annual weeds including *Digitaria sanguinalis* *Echinochloa* spp. *Eleusine indica* *Lolium* spp., *Cleome* spp. *Portulaca oleracea* *Ageratum conizoides* *Digitaria* spp.	Metribuzin 70% WP	C1	40 g	1 kg		0-3 DAS	Apply after seeding
	Metribuzin 70% WG	C1	40 g	1 kg		0-3 DAS	
	Imazethapyr 100 g/l SC	B	30 ml	600 ml		0-3 DAS	Apply at 2-3 leaves stage of weeds

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	High foliage	Application interval (days)	PHI Days	Remarks
OIL SEED CROPS : SESAME - INSECTICIDES								
Leaf webber *Antigastra catalaunalis*	Neem Seed Water Extract	UN	640 g	12 kg	24 kg		7	Insecticides should be applied to the growing points when damage symptoms appear.
	Chlorfluazuron 50 g/l EC	15	16 ml	320 ml	640 ml		10	
	Tebufenozide 200 g/l SC	18	24 ml	480 ml	960 ml		10	
	Acephate 75% SP	1	32 g	640 g	1,280 g		10	
OIL SEED CROPS : SESAME & MUSTARD - INSECTICIDES								
Leaf-eating caterpillars *Spodoptera litura* *Hellula undalis* *Chrysodeixis eriosoma* *Crocidolomia binotalis* *Plutella xylostella*	Etofenprox 100 g/l EC	3	24 ml	480 ml	960 ml		07	Apply insecticides at the first sign of damage and repeat at 2-week intervals if necessary. Count caterpillars weekly in 12 plants at random and spray if the count exceeds 8 DBM or 4 larvae of the caterpillar species. Spot application at early stage of detection is more economical for *S.litura* and *C.binotalis*
	Emamectin benzoate 5% SG	6	6.4 g	120 g	240 g		10	
	Chlorfluazuron 50 g/l EC	15	16 ml	320 ml	640 ml		10	
	Bistrifluron 100 g/l EC	15	24 ml	480 ml	960 ml		07	
	Tebufenozide 200 g/l SC	18	24 ml	480 ml	960 ml		14	
	Chromafenozide 50 g/l SC	18	32 ml	640 ml	1,280 ml		07	
	Chlorantraniliprole 200 g/l SC	28	6 ml	120 ml	240 ml		03	
	Neem Seed Water Extract	UN	640 g	12 kg	24 kg		07	
	Azadirachtin-A 7.5 g/l EC	UN	128 ml	2,560 ml	5,120 ml		07	
	Lufenuron 50 g/l EC	15	16 ml	320 ml	640 ml		14	
OIL SEED CROPS : GROUND NUT - FUNGICIDES								
Foot rot/Root rot *Sclerotium rolfsii* *Aspergillus niger* *Fusarium oxysporum*	Thiram 80% WP	MO3		70 g/50 l/10 m^2		6-8	14	Soil drench Drench the soil as spot application at the appearance of symptoms
	Thiophanate-methyl 70% WP	1		30 g/50 l/10 m^2		10-12	14	
	Thiophanate-methyl 50% + Thiram 30% WP	1+ MO3		50 g/50 l/10 m^2		7-10	14	

FOOD CROPS - FRUITS

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	PHI Days	Remarks
APPLE AND PEAR - FUNGICIDES								
Apple scab *Venturia inaequalis*	Tebuconazole 250 g/l EW*	3	6 ml	180 ml	360 ml	14-21	21	Alternate application of *systemic fungicide with contact fungicide is recommended.
Pear scab *Venturia pirina*	Followed by: Maneb 80% WP	MO3	32 g	1,000 g	2,000 g	7-10	14	
Pink disease *Nectria cinnabarina*								
AVOCADO - FUNGICIDES								
Shoestring root rot *Armillaria mellea*	Carbendazim 500 g/l SC	1		35 ml/50 l/10 m^2		10-14	14	Soil drench Drench the soil around the plant at the appearance of symptoms.
	Carbendazim 50% WP	1		35 ml/50 l/10 m^2		10-14	14	
BANANA - INSECTICIDES								
Banana Stem Weevil	Fipronil 0.3% GR	2		10 g/trap				Prepare traps using 6-10 cm fresh pseudo stems and sandwiched with a recommended insecticide. Place 25 traps/Ac. Replace traps at 14-day intervals.
	Thiocyclam (Hydrogen Oxalate) 4% GR	14		10 g/trap				
BANANA - FUNGICIDES								
Sigatoka leaf spot *Mycosphaerella musicola* **Cordana leaf spot** *Cordana musae*	Chlorothalonil 500 g/l SC	MO5	48 ml	1,500 ml	3,000 ml	6-8	14	Fungicides are sprayed only during epidemic conditions. Alternate application of *systemic fungicide with contact fungicide is recommended.
	Chlorothalonil 75% WP	MO5	32 g	1,000 g	2,000 g	6-8	14	
	Mancozeb 75% WG	MO3	32 g	1,000 g	2,000 g	6-8	14	
	Mancozeb 80% WP	MO3	32 g	1,000 g	2,000 g	6-8	14	
	Carbendazim 50% WP*	1	11 g	350 g	700 g	10-14	14	
	Carbendazim 500 g/l SC*	1	11 ml	350 ml	700 ml	10-14	14	
	Tebuconazole 250 g/l EW*	3	5.6 ml	175 ml	350 ml	10-14	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
	Isoprothiolane 400 g/l EC*	6	20 ml	625 ml	1,250 ml	7-10	14	
	Thiophanate-methyl 70% WP*	1	16 g	500 g	1,000 g	10-14	14	
	Propiconazole 250 g/l EC*	3	5.6 ml	175 ml	350 ml	10-14	14	
	Potassium bicarbonate 82% SP	-	24 g	750 g	1,500 g	7-10	01	
	Flutriafol 250 g/l SC*	3	16 ml	500 ml	1,000 ml	10-12	14	
	Azoxystrobin 250 g/l SC*	11	16 ml	500 ml	1,000 ml	10-12	14	
CITRUS - INSECTICIDES								
Leaf miner *Phyllocnistiss citrella*	Phenthoate 500 g/l EC	1	16 ml	500 ml	1,000 ml	7-10	14	Before spraying remove infested leaves. Apply insecticide to new flush.
CITRUS - FUNGICIDES								
Foot rot/Gummosis *Phytophthora parasitica*	Carbendazim 500 g/l SC	1		35 ml/50 l/10 m^2		10-14	14	Soil drench
	Carbendazim 50% WP	1		35 ml/50 l/10 m^2		10-14	14	
	Mancozeb 64% + Metalaxyl 8% WP	MO3 + 4		150 g/50 l/10 m^2		12-14	14	
	Mancozeb 64% + Metalaxyl-M 4% WG	MO3 + 4		150 g/50 l/10 m^2		12-14	14	
Pink disease *Corticium salmonicolor*	Tebuconazole 250 g/l EW	3	6 ml	180 ml	360 ml	14-21	21	
Powdery mildew *Oidium tingitaninum*	Azoxystrobin 250 g/l SC	11	16 ml	500 ml	1,000 ml	10-12	14	
	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	1,000 g	2,000 g	10-12	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	PHI Days	Remarks
GRAPE - FUNGICIDES								
Shoestring root rot *Armillaria mellea*	Carbendazim 500 g/l SC	1		35 ml/50 l/10 m^2		10-14	14	Soil drench Drench the soil around the plant at the appearance of symptoms.
	Carbendazim 50% WP	1		35 g/50 l/10 m^2		10-14	14	
Downy mildew *Peronospora viticola*	Mancozeb 64% + Metalaxyl 8% WP*	MO3 + 4	20 g	625 g	1,250 g	12-14	14	Alternate application of *systemic fungicide with contact fungicide is recommended. Maximum number of applications per season must be limited to three.
	Mancozeb 64% + Metalaxyl-M 4% WG	MO3 + 4	40 g	1,250 g	2,500 g	12-14	14	
	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	1,000 g	2,000 g	10-12	14	
	Propineb 70% WP	MO3	32 g	1,000 g	2,000 g	7-10	14	
	Azoxystrobin 250 g/l SC*	11	16 ml	500 ml	1,000 ml	10-12	14	
GUAVA - INSECTICIDES/NEMATICIDES								
Root knot nematodes *Meloidogyne* spp.	Abamectin 20 g/l SC	6	60 ml	3,600 ml			0	Drench the soil at planting at the rate of 10 l of mixture per 10 m^2. Repeat application to wet the whole root system in one-month interval up to two consecutive months. After six months of planting, another two consecutive applications in one month interval. Continue this practice for three years
	Fluopyram 400 g/l SC	7	1 ml	625 ml			0	
GUAVA - FUNGICIDES								
Anthracnose/Twig blight *Colletotrichum* spp. *Gloeosporium* spp.	Hexaconazole 50 g/l EC*	3	6 ml	180 ml	360 ml	7-14	21	Alternate application of *systemic fungicide with contact fungicide is recommended. Maximum number of applications per season must be limited to three.
	Hexaconazole 50 g/l SC*	3	6 ml	180 ml	360 ml	7-14	21	
	Tebuconazole 250 g/l EW*	3	6 ml	180 ml	360 ml	7-14	21	
	Propineb 70% WP	MO3	32 g	1,000 g	2,000 g	7-10	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	High foliage	PHI Days	Remarks
MANGO - INSECTICIDES							
Leaf hopper *Idioscopus* spp. *Amritodus* spp.	Imidacloprid 200 g/l SL	4	16 ml	500 ml	1,000 ml	14	Prior to new flush growth spray to colonized areas on the trunk & foliage as spot applications. If necessary, apply at flower initiation & new flush growth
	Thiamethoxam 25% WG	4	16 g	500 g	1,000 g	14	
Fruit fly *Bactrocera* spp.	Spinosad 25 g/l SC	5	20 ml + 400 ml of protein bait	1,000 ml	2,000 ml	07	Application of protein bait is a major component in IPM practices. **First application method (spot)** 1 Protein bait should be applied in spots on to the underside of leaves using knapsak sprayer . 2. Spraying in the morning before 9.00 am is more effective. 3. Reapply in 5-7 day interval **Second application method (Trap)** 1. Make a PVC ring (one side at an angle) 9.0 cm diameter width - upper side 6-7 cm, lower side 2.5 cm painted in yellow 2. Insert a spong disc (2.5 < m thick) in to the PVC ring 3. Hang the trap in verticle position wider side top position 4. Apply the bait mixture (0.8 ml + 400 ml of protein bait without water) as a thick paste as a ring on the sponge (4-5 ml trap) 5. Re-apply mixture at 10-14 day intervals. **Common** Remove the damaged fruits into a black polythene bag, tie the mouth up & keep exposed to the sunlight. Spraying/trapping should be initiated one month after flowering.

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	PHI Days	Remarks
Stem borers and tree borers *Batocera* spp.	Fipronil 50 g/l SC	2	16 ml	-	-		14	Presence of frass or bore dust on tree trunks is a sign of borer damage and tree trunk should be thoroughly cleaned with a brush and larvae have to be taken out by a hook before spaying with insecticide at the rate of 1 ml per 1 l of water on to trunks. then folicur and kandasan 10:1 mixture should be applied to wounds followed by plastering with mud or cement.
PAPAYA - INSECTICIDES								
Mealy bug *Paracoccus marginatus*	Thiamethoxam 25% WG	4	16 g	160 g	200 g		14	Parasitoid of Papaya mealy bug (*Acerophagus papayae)* is well stablished under natural conditions and application of insecticide is recommonded under severe infestation only.
PAPAYA - FUNGICIDES								
Root rot/ Stem rot *Phythium* spp. *Phytophthora* spp.	Captan 50% WP	MO4		60 g/50 l/10 m^2		6-8	14	Soil drench Drench around the base of the plant as spot application.
	Captan 80% WG	MO4		40 g/50 l/10 m^2		6-8	14	
	Flutolanil 50% WP	7		30 g/50 l/10 m^2		10-12	14	
	Thiram 80% WP	MO3		70 g/50 l/10 m^2		6-8	14	
	Thiophanate-methyl 50% + Thiram 30% WP	1+ MO3		50 g/50 l/10 m^2		7-10	14	
	Hymexazole 360 g/l SL	32		20 ml/50 l/10 m^2			14	
	Mancozeb 64% + Metalaxyl 8% WP	MO3 + 4		``		12-16	14	
	Mancozeb 64% + Metalaxyl-M 4% WG	MO3 + 4		150 g/50 l/10 m^2		12-16	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	PHI Days	Remarks
Leaf spot *Corynespora cassiicola* *Asperisporium caricae*	Mancozeb 75% WG	MO3	32 g	1,000 g	2,000 g	6-8	14	
	Mancozeb 80% WP	MO3	32 g	1,000 g	2,000 g	6-8	14	
	Maneb 80% WP	MO3	32 g	1,000 g	2,000 g	6-8	14	
PINEAPPLE - INSECTICIDES								
Mealy bug *Dysmicoccus brevipes*	Carbosulfan 200 g/l SC	1	48 ml	1,500 ml	3,000 ml		14	Dip planting materials in one of the recommended insecticide solutions for 5 minutes. Allow to dry for a day. To prevent crown rot treat with fungicide containing Mancozeb 64% + Metalaxyl 8% WP and leave to dry for another day before transplanting. At the end of the first harvest, monitor ant/mealy bug incidences. If infestation is seen apply one of the above insecticides at same dilution. Direct the spray to the base of the leaves and the crown.
	Acetamiprid 20% SP	4	16 g	500 g	1,000 g		14	
	Thiamethoxam 25% WG	4	8 g	250 g	500 g		14	
	Profenophos 500 g/l EC	1	48 ml	1,500 ml	3,000 ml		14	
FRUITS - PINEAPPLE - FUNGICIDES								
Heart/Stem/Root rot *Phytophthora* spp.	Mancozeb 64% + Metalaxyl 8% WP	MO3 + 4		125 g/50 l/10 m^2		12-16	14	Soil drench Drench soil at the base of the plant at the apperence of symptoms. Dip planting metirial after insecticide treatment befor transplanting.
	Mancozeb 64% + Metalaxyl-M 4% WG	MO3 + 4		125 g/50 l/10 m^2		12-16	14	
FRUITS : PINEAPPLE - PRE-EMERGENT & EARLY POST-EMERGENT HERBICIDES								
Common annual herbaceous weeds	Diuron 80% WP	C2	128 g	3,200 g				Residual effect of diuron exist for about one month in the soil. Therefore germination of crops may be affected
	Diuron 500 g/l SC	C2	72 ml	1,800 ml				

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	PHI Days	Remarks
POMEGRANATE - FUNGICIDES								
Cercospora leaf/fruit spot *Cercospora punicae*	Mancozeb 75% WG	MO3	32 g	1,000 g	2,000 g	7-10	14	Prior to fungicide spraying, prune and clean the diseased plants.
	Mancozeb 80% WP	MO3	32 g	1,000 g	2,000 g	7-10	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	1,500 ml	3,000 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	1,000 g	2,000 g	7-10	14	
	Thiophanate-methyl 70% WP	1	10 g	320 g	640 g	10-12	14	
Anthracnose *Colletotrichum gloeosporioides*	Mancozeb 75% WG	MO3	32 g	1,000 g	2,000 g	7-10	14	Prior to fungicide spraying, prune and clean the diseased plants. Alternate application of *systemic fungicide with contact fungicide is recommended.
	Mancozeb 80% WP	MO3	32 g	1,000 g	2,000 g	7-10	14	
	Thiophanate-methyl 70% WP*	1	10 g	320 g	640 g	10-12	14	
	Carbendazim 50% WP*	1	11 g	340 g	680 g	10-12	14	
	Carbendazim 500 g/l SC*	1	11 ml	340 ml	680 ml	10-12	14	
RAMBUTAN - FUNGICIDES								
Powdery mildew *Oidium* spp.	Sulphur 80% WG	MO2	80 g	2,500 g	5,000 g	14-21	14	Repeat if necessary in 2 weeks.
	Sulphur 80% WP	MO2	80 g	2,500 g	5,000 g	14-21	14	
	Thiophanate-methyl 70% WP	1	16 g	320 g	640 g	10-12	14	
STRAWBERRY - FUNGICIDES								
Gray mold *Botrytis cinerea*	Mancozeb 75% WG	MO3	32 g	640 g	1,000 g	7-10	14	Fungicide spraying must be started during flowering stage.
	Mancozeb 80% WP	MO3	32 g	640 g	1,000 g	7-10	14	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,500 ml	7-10	14	
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,000 g	7-10	14	
	Maneb 80% WP	MO3	32 g	640 g	1,000 g	7-10	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	PHI Days	Remarks
Leaf spot *Mycosphaerella fragariae*	Tebuconazole 250 g/l EW*	3	6 ml	120 ml	190 ml	14-21	21	Alternate application of *systemic fungicide with contact fungicide is recommended.
	Propineb 70% WP	MO3	32 g	640 g	1,000 g	7-10	14	
Leaf blight *Phomopsis obscurans* *Dendrophoma obscurans*	Tebuconazole 250 g/l EW*	3	6 ml	120 ml	190 ml	14-21	21	
	Propineb 70% WP	MO3	32 g	640 g	1,000 g	7-10	14	
Anthracnose *Colletotrichum* spp.	Thiophanate-methyl 70% WP*	1	10 g	200 g	312 g	10-12	14	
	Metiram 55% + Pyraclostrobin 5% WG	MO3 + 11	32 g	640 g	1,000 g	10-12	14	
	Propineb 70% WP	MO3	32 g	640 g	1,000 g	7-10	14	
	Azoxystrobin 250 g/l SC*	11	16 ml	320 ml	500 ml	10-12	14	

CROPS - PLANTATION

Crop/Pest	Common name, Strength & Formulation type	MOA	Dosage & application instructions	PHI Days	Remarks
TEA - NEMATICIDES, MITICIDES & INSECTICIDES					
Root lesion nematode *Pratylenchus loosi* **Burrowing nematode** *Radopholus similis*	Metham sodiom 423 g/l SL	8	800 ml/m^3 of soil	n/a	Nursery fumigation. Sprinkle the product evenly on the surface of soil heap and mix into the soil immediately.
Root knot nematode *Meloidogyne brevicauda*	Fluopyram 400 g/l SC	7	800 g/500 l	n/a	Application through spraying after planting as a prophylactic measure. (40 ml solution/plant).
			1 kg in 1,000 l of water	n/a	Application through spraying after pruning in mature tea fields (80 ml solution/plant).
Red spider mite *Oligonychus coffeae* **Scarlet mite** *Brevipalpus californicatus* **Yellow mite** *Hemitarsonemus latus* **Purple mite** *Calacarus carinatus* **Pink rust mite** *Acaphylla theae*	Sulphur 80% WG Sulphur 80% WP	UN	40 g/8 l of water/1,000 plants	n/a	Apply on nursery plants using knapsack sprayer.
			4.5 kg/900 l of water/ha	n/a	Apply on young tea not brought into bearing and fields recovering from pruning using knapsack sprayer.
			4.5 kg/250 l of water/ha	n/a	Apply on young tea not brought into bearing and fields recovering from pruning using mistblower
Shot hole borer *Xyleborus fornicatus*	Fipronil 50 g/l SC	2	10 ml/8 l of water/1,000 plant	n/a	Prophylactic treatments for nursery plants. Spray onto susceptible stems and branches of 8-10 months old nursery plants using knapsack sprayer.
			200 ml/250 l of water	n/a	Prophylactic treatments for young, immature tea and new clearings. Spray I: Spray onto susceptible stems/ branches, 6-10 months after planting
			400 ml/500 l of water		Spray II: Spray onto susceptible stems/branches of 2nd and 3rd year plants using knapsack sprayer.

Crop/Pest	Common name, Strength & Formulation type	MOA	Dosage & application instructions	PHI Days	Remarks
	Lime Sulphur	UN	200 g of lime & 200 g of sulphur in 8 l for 1,000 plants	07	Prophylactic treatments for nursery plants.
			6.25 kg of Lime and 6.25 kg of Sulphur in 250 l of water/ha	07	Prophylactic treatments for young, immature tea and new clearings
			12.5 kg of Lime and 12.5 kg of Sulphur in 500 l of water/ha	07	1st Spray: 6-10 months after planting by using knapsack sprayer 2nd Spray: 2nd and 3rd year plants by using knapsack sprayer
		-	25 kg of Lime and 25 kg of Sulphur in 1,000 l of water/ha	07	Prophylactic treatments for mature tea fields by using knapsack sprayer
White grub *Holotrichia disparilis* *Microtrichia* spp.	Chlorantraniliprole 200 g/l SC	28	10 ml/10 l of water	n/a	Apply 200-400 ml per immature plants.
TEA - FUNGICIDES					
Blister blight *Exobasidium vexans*	Copper (as Cuprous oxide) 50% WP	MO1	120 g/45 l of water	n/a	Apply for 30,000 nursery plants at 4 day intervals if necessary, using a knapsak sprayer.
			450 -560 g/170 l of water		Apply fields not in plucking (Immature/ pruned until tipping) at 4-5 days intervals using a knapsak sprayer.
			280 - 420 g/40 l of water	07	Apply plucking fields by using mist blowers.
	Copper (as Copper hydroxide) 37.5% WG	MO1	45 g/45 l of water	n/a	Apply for 30,000 nursery plants at 4 day intervals if necessary, using a knapsak sprayer.
			136 -170 g in 170 l of water	n/a	Apply fields not in plucking (Immature/ pruned until tipping) at 4-5 days intervals using a knapsak sprayer.
			136 -170 g/40 l of water	07	Apply plucking fields by using mist blowers.
	Hexaconazole 50 g/l EC	3	25 ml/45 l of water	n/a	Apply for 30,000 nursery plants at 10 days intervals using a knapsak sprayer

Crop/Pest	Common name, Strength & Formulation type	MOA	Dosage & application instructions	PHI Days	Remarks
			85 ml/170 l of water	n/a	Apply fields not in plucking (Immature/pruned until tipping) at 10 days intervals using a knapsak sprayer
	Tebuconazole 250 g/l EW	3	25 ml/45 l of water	n/a	Apply for 30,000 nursery plants at 10 days intervals using a knapsak sprayer
			85 ml/170 l of water	n/a	Apply fields not in plucking (Immature/pruned until tipping) at 10 days intervals. using a knapsak sprayer
	Propiconazole 250 g/l EC	3	25 ml/45 l of water	n/a	Apply for 30,000 nursery plants at 10 days intervals using a knapsak sprayer.
		MO3	85 ml/170 l of water	07	Apply immature/pruned until tipping at 10 days intervals using a knapsak sprayer.
Black blight *Rhizoctonia solani*	Copper (as Cuprous oxide) 50% WP	MO1	425 g/170 l of water	07	Apply on nurseries and young plants. If rain continues, second spraying should be undertaken after 14 days using a knapsak sprayer
	Copper (as Copper hydroxide) 37.5% WG	MO1			
Red Rust *Cephaleuros parasiticus*	Copper (as Cuprous oxide) 50% WP	MO1	425 g/170 l of water	07	Apply three rounds per year. For young tea, first spray in late April. Second spray in May. Third spray in June.
	Copper (as Copper hydroxide) 37.5% WG	MO1	340 ml/170 l of water	07	
Black root disease *Rosellinia arcuata*	Tebuconazole 250 g/l EW	3	170 ml/170 l of water		**Treatment of infills** Apply minimum of three rounds at 2-3 monthly with intervels at the rate of 250-350 ml of solution per bush as a soil drench. Rest the treated tea bushes without harvesting for 8 weeks.
White root disease *Ridgidoporus microporus*	Hexaconazole 50 g/l EC	3	170 ml/170 l of water		
Red root disease *Poria hypolateritia*	Propiconazole 250 g/l EC	3	170 ml/170 l of water		

Crop/Pest	Common name, Strength & Formulation type	MOA	Dosage & application instructions	PHI Days	Remarks
	Tebuconazole 250 g/l EW	3	340 ml/170 l of water		**Treatment of peripheral bushes** Apply minimum of three rounds at 2-3 monthly with intervels at the rate of 250-350 ml of solution per bush as a soil drench. Rest the treated tea bushes without harvesting for 8 weeks.
	Hexaconazole 50 g/l EC	3	340 ml/170 l of water		
	Propiconazole 250 g/l EC	3	340 ml/170 l of water		
Wood rots on prune cuts	Tar acids 100 g/l EC		1.5 l/8.5 l of water	n/a	Paint/spray on to individual prune cuts 2-3 days from 2nd pruning onwards using 7-8 l per hactare. Add a colour (blue or red) to the mixture for identification purposes.
TEA - POST-EMERGENT HERBICIDES					
All Herbaceous weeds	Glyphosate (acid equivalent) 360 g/l SL	G	1.4-2.8 l/500 l of water/ha		Apply thoroughly to wet green foliage when weeds are at active growing stage. 4-6 hrs of sunny weather is required after application for effective absorption of the herbicide. Avoid spraying in new clearings and pruned fields.
	Glufosinate ammonium 280 g/l SL	H	600-700 ml/500 l of water/ha		
Perennial hard-to-control including *Panicum repens* *Imperata cylindrica*	Glyphosate (acid equivalent) 360 g/l SL	G	5-10 l/500 l of water/ha		Apply as spot application.
TEA - PRE-EMERGENT & EARLY POST-EMERGENT HERBICIDES					
All Herbaceous weeds	Oxyfluorfen 240 g/l EC	E	1.2 l/500 l of water/ha		Apply on to bare moist soil in fields not in plucking (New clearing/ pruned).
	Oxyfluorfen 480 g/l SC	E	700 ml/500 l of water/ha		
	Diuron 80% WP	C2	1.2 kg/500 l of water/ha		Apply on to bare moist soil only in plucking fields (Mature fields/after the first prune).
	Diuron 500 g/l SC	C2	1.5 l/500 l of water/ha		

Crop/Pest	Common name, Strength & Formulation type	MOA	Dosage & application instructions	PHI Days	Remarks
SUGARCANE - INSECTICIDES AND TERMITICIDES					
Termite *Odontotermes ceylonicus* *Odontotermes redemanni* *Odontotermes horni* *Coptotermes ceylonicus*	Fipronil 0.3% GR	2	18 kg/ha	14	Apply on soil near root zone.
Sugarcane Wooly Aphid (SWA) *Ceratovacuna lanigera*	Thiamethoxam 25% WG	4	5 g/16 l of water	14	If SWA presence on leaves more than 5%, spray under side of infested leaves.
SUGARCANE - PRE-EMERGENT & EARLY POST-EMERGENT HERBICIDES					
All Herbaceous weeds	Diuron 80% WP	C2	3-4 kg/400 l of water/ha		Apply on moist soil for effective weed control.
	Oxyfluorfen 240 g/l EC	E	1-2 l/400 l of water/ha		
	Ametryn 73.1% + Trifloxysulfuron 1.8% WG	B + C1	2-4 kg/400 l of water/ha		Selective on young sugarcane plants.
	Metribuzin 70% WG	C1	2-2.5 kg/400 l of water/ha		Selective on young sugarcane plants. Apply on moist soil for effective weed control.
RUBBER - PRE-EMERGENT & EARLY POST-EMERGENT HERBICIDES					
All Herbaceous weeds	Diuron 80% WP	C2	4 kg/400 l of water/ha		Apply thoroughly to wet green foliage when weeds are at active growing stage. 4-6 hrs of sunny weather is required after application for effective absorption of the herbicide.
RUBBER - POST-EMERGENT HERBICIDES					
Perennial hard-to-control including *Panicum repens* *Imperata cylindrica*	Glyphosate (acid equivalent) 360 g/l SL	G	6 l/400 l of water/ha		Apply thoroughly to wet green foliage when weeds are at active growing stage. 4-6 hrs of sunny weather is required after application for effective absorption of the herbicide.

Crop/Pest	Common name, Strength & Formulation type	MOA	Dosage & application instructions	PHI Days	Remarks
COCONUT- INSECTICIDES, MITICIDES AND TERMITICIDES					
Red weevil *Rhynchophorus ferrungineus*	Monocrotophos 600 g/l SL	1	30-40 ml/plant		If the trunk girth is less than 100 cm 30 ml/palm by trunk injection.If the trunk girth is more than 100 cm 40 ml/palm by trunk injection
Black beetle *Oryctes rhinoceros* L.	Naphthalene balls	2-3 balls per frond base			every 2 month. 1. Application of burnt engine oil/Coal tar on the base of 2-3 inner most leaf petioles (preferably the distal end of the petiole) to repel beetles Replace once a month 2. Placement of naphthalene balls bat the base of each frond
Coconut mite *Aceria guerreonis*	Sulphur 80% WP/WG	UN	100 g	Every 6 month	Palm/vegetable oil - 200 ml Soap powder- 12 g. Spray bunches from ground, except the unfertilized inflo-rescences)
Coconut caterpillar *Opisina arenosella*	Monocrotophos 600 g/l SL	1	8 ml/palm		Apply as trunk injection
	Carbosulfan 200 g/l SC	1	40 ml/10 l of water		Apply on seedlings using a knapsak sprayer
Plesispa beetle *Plesispa reichei*	Carbosulfan 200 g/l SC	1	40 ml/10 l of water		Spray to wet the bud region at 3-4 weeks intervals
Coconut scale *Aspidiotus desructor*	Monocrotophos 600 g/l SL	1	8 ml/palm		Apply as trunk injection
Nettle grub *Parasa lepida*	Monocrotophos 600 g/l SL	1	10 ml/palm		Apply as trunk injection
Termites	Imidacloprid 200 g/l SL	4	10-20 ml/10 l of water		Dip the seed nut for 5 minutes or drench the nursery bed with 5 l per m^2 or seedlings in the polybags
Leaf-eating caterpillars *Telicota palmarum* *Elymnius hypermnestra*	Carbosulfan 200 g/l SC	1	40 ml/10 l of water		Apply as a spray using a knapsak sprayer

Crop/Pest	Common name, Strength & Formulation type	MOA	Dosage & application instructions	PHI Days	Remarks
COCONUT - FUNGICIDES					
Bud rot disease *Phytophthora palmivora*	Mancozeb 64% + Metalaxyl 8% WP	MO3 + 4	40 g/10 l of water		Drench the bud region with one litre of solution once in 2-3 weeks.
	Mancozeb 64% + Metalaxyl-M 4% WG	MO3 + 4	40 g/10 l of water		
Leaf spot/blight *Pestalotiopsis palmarum*	Tebuconazole 250 g/l EW	G3	40 g/10 l of water		Drench the bud region with one litre of solution once in 2-3 weeks.
Stem bleeding disease *Bipolaris incurvata*	Copper (as Cuprous oxide) 50% WP	MO1	100 g/10 l of water		Apply after removal of affected region and apply coal tar or burnt engine oil after 2 days
	Copper (as Copper hydroxide) 37.5% WG	MO1	130 g/10 l of water		
Seedling leaf dieback *Curvularia lunta*	Tebuconazole 250 g/l EW	G3	40 ml/10 l of water		

EXPORT AGRICULTURAL CROPS

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	High foliage	Application interval (days)	PHI Days	Remarks
CASHEW - INSECTICIDES								
Cashew stem and root borer *Plocaederus ferrugineus*	Tebufenozide 200 g/l SC	18	44.8 ml	2.8 ml/tree				Apply as scattered horizontal cuts (6 cm) on damage areas of infested barks
	Novaluron 100 g/l EC	15	16 ml	1 ml/tree			n/a	Application through spraying after planting as a prophylactic measure. 40 ml solution/plant
	Phenthoate 500 g/l EC	1	44.8 ml	2.8 ml/tree			21	-do-
Sap sucking bug *Helopeltis antonii*	Acetamiprid 20% (w/w) SP	4	16 g	3 g/tree or 600 g/ha			21	An a lternative insecticide for 2nd application is recommend. Early mornin g/Late afternoon.
	Carbosulfan 200 g/l SC	1	44.8 ml	8.4 ml/tree			21	
CASHEW - DISEASES								
Rough bark disease *Phomopsis* spp.	Tebuconazole 250 g/l EW	3	8 ml	450 ml			60 day	Initial stage of the damage (more effective). 3 months interval after selective pruning or harvesting. It is need to practice other good agricultural practices simultaneously
	Hexaconazole 50 g/l EC	3	32 ml	400 ml				
Leaf blight *Colletotrichum gloeosporioides*	Tebuconazole 250 g/l EW	3	8 ml	450 ml			60 day	Initial stage of the damage (more effective). Thrice at two weeks interval. It is only recommended in nursery & less than 3 years aged plants
	Hexaconazole 50 g/l EC	3	32 ml	400 ml				
White root disease *Rigidoporus microporus*	Sulphur 80% WP/WG	MO2	80 g	4500 g			60 day	Initial stage of the damage (more effective). Twice at 2 weeks interval. It is need to practice other good agricultural practices simultaneously
	Tebuconazole 250 g/l EW	3	16 ml	900 ml				
	Hexaconazole 50 g/l EC	3	32 ml	1,800 ml				
Brown root rot disease *Phellinus noxius*	Sulphur 80% WP/WG	MO2	80 g	4,500 g			60 day	Initial stage of the damage (more effective). Twice at 2 weeks interval. It is need to practice other good agricultural practices simultaneously
	Tebuconazole 250 g/l EW	3	16 ml	900 ml				
	Hexaconazole 50 g/l EC	3	32 ml	1,800 ml				

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	High foliage		PHI Days	Remarks
CINNAMON - INSECTICIDES								
Cinnamon wood boring moth *Ichneumenoptera cinnamomumi*	Fipronil 50 g/l SC	2	16 ml	900 ml	Initial stage of the damage (more effective)	Twice at 2 months interval	30	It is recommended to adding soil to bottom of the plants after chemical application
	Imidacloprid 70% WG	4	2.4 g	135 g				
	Imidacloprid 200 g/l SL	4	16 ml	900 ml				
Cinnamon thrips	Imidacloprid 70% WG	4	2.4 g	135 g	Initial stage of the damage (more effective)	Twice at 2 weeks interval	21	Most effective stage is flushing stage of the plants
	Imidacloprid 200 g/l SL	4	16 ml	900 ml				
Upper leaf galls *Trioza cinnamomi* **Lower leaf galls** *Eriophys boisi*	Abamectin 18 g/l EC	6	9.6 ml	540 ml	Initial stage of the damage (more effective)	Twice at 2 weeks interval	21	It is only recommended in nursery & less than 3 years aged plant
White grubs	Thiamethoxam 20% + Chlorantraniliprole 20% WG	4 +28	4 g	225 g	2 weeks Before planting or damage present after planting	Twice at 2 weeks interval		Clean weeding is not recommended when the damage is severe. Apply at young age
BLACK PEPPER - INSECTICIDES								
Lace Bug *Diconocoris distanti*	Acetamiprid 20% SP	4	16 g	320 g				
Thrips *Gynaikothrips karny*	Imidacloprid 70% WG	4	2.4 g	48 g				
Vine Borer *Pterolphia annualata*	Fipronil 50 g/l SC	2	8 ml	160 ml				
Root Mealy Bug *Planococcus cittri*	Fipronil 50 g/l SC	2	8 ml	2,125 ml				Drench the base of the plant and apply

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage High foliage	PHI Days	Remarks
Quick Wilt disease *Phytopthora capsici*	Mancozeb 64% + Metalaxyl 8% 72% MZ	MO3 + 4	40 g	10 g per vine as soil drench	14 days	Immediately after observing the symptoms.Remove all the affected parts from the field is very important before apply the fungicides
NUTMEG - INSECTICIDES						
Stem borer *Xyleborus dedeviganulatus*	Fipronil 50 g/l SC	2	16 ml	560 ml		1:1 dilution for trunk treatment
Scale insects	Thiamethoxam 25% WG	4	8 g	700 g		
	Imidacloprid 70% WG	4	4 g	350 g		
CLOVES - INSECTICIDES						
Steam borer *Xyleborus dedeviganulatus*	Fipronil 50 g/l SC	2	16 ml	560 ml		1:1 dilution for trunk treatment
Scale insects	Thiamethoxam 25% WG	4	8 g	700 g		
	Imidacloprid 70% WG	4	4 g	350 g		
Rhizome mealy bug *Aspidiella hartii*	Thiamethoxam 25% WG	4	8 g	630 g		
	Imidacloprid 70% WG	4	4 g	315 g		Seed treatment before planting
Leaf fall disease (leaf spot & leaf blight) *Cylindrocladium* spp.	Carbendazim 50% WP	1	11 g	320 g	14 days	3.5 g per tree as foliar application
	Thiophanate–methyl 70% WP	1	10 g			3 g per tree as foliar application. When observing the leaf blight symptoms and leaf fall (initial stage is more effective). It is need to practice other good agricultural practices simultaneously
COCOA - DISEASES						
Die-back disease *Lasiodiplodia theobromae*	Carbendazim 50% WP	1	11 g	3.5 g per tree as foliar application	14	When symptoms are appeared (initial stage is more effective). 14 days (2-3 times). It is need to practice other good agricultural practices simultaneously

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	High foliage	PHI Days	Remarks
GINGER - DISEASES							
Soft rot disease *Pythium* spp.	Mancozeb 75% WG	MO3	60 g	38 g per 40 ft² bed as soil drench		14	When symptoms are appeared (initial stage is more effective). 14 days (2 times). Fungicide application should be done only infected beds and surrounding beds
Leaf spot *Phyllosticta zingiberi*	Captan 50% WP	MO4	Soil drench	60 g/50 l/10 m²		14	6-8
	Thiram 80% WP	MO3	Soil drench	70 g/50 l/10 m²		-	6-8
	Mancozeb 80% WP	MO3	40 g	500 g per ha as foliar application			
	Mancozeb 75% WG	MO3					When symptoms are appeared. (initial stage is more effective). With rain droplets spores are spread therefore, it is important to apply fungicides before starting rainy season.
TURMERIC							
Leaf blotch *Taphrina maculans*	Mancozeb 80% WP	MO3	60 g	760 g/ha as foliar application			When symptoms are appeared (initial stage is more effective). Fungicide application is recommended only the disease condition is severe Fungicide application should be done only infected beds and surrounding beds
Rhizome rot *Pythium* spp.	Mancozeb 80% WP	MO3	60 g	38 g per 40 ft² bed as soil drench			When symptoms are appeared (initial stage is more effective). 14 days (2 times). Fungicide application should be done only infected beds and surrounding beds

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	High foliage	PHI Days	Remarks
Leaf blight disease *Curvularia* spp.	Mancozeb 80% WP	MO3	48 g	12 g per tree as foliar	800 g		When symptoms are appeared (initial stage is more effective). 14 days (2 times) Remove all the affected parts from the field is very important before apply the fungicides 2nd application is only if required
Leaf fall disease *Colletotrichum gloeosporioides Neofusicoccum* spp.	Tebuconazole 250 g/l EW	3	1:1 ratio	7.5 ml per tree as trunk treatment			When New flush emergence. 14 days (3-4 times). It is need to practice other good agricultural practices simultaneously
White root disease *Rigidoporus microporus*	Tebuconazole 250 g/l EW	3	160 ml	100 ml per tree as soil drench			After observing the symptoms (initial stage is more effective). 90-120 day (two times). 3rd application is only if required It is need to practice other good agricultural practices simultaneously

FLORICULTURAL CROPS

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	PHI Days	Remarks
ANTHURIUM, ORCHID, ROSE, CHRYSANTHEMUM, FOLIAGE PLANTS AND FLOWRING ORNAMENTAL - INSECTICIDES AND MITICIDES								
Mites *Tetanchus* spp. *Tenuipalpus* spp.	Sulphur 80% WP/WG	UN	4,128 g			6-8	07	
	Abamectin 18 g/l EC	6	16 ml			7-10	07	
	Hexythiazox 10% WP	10	12.8 g			7-10	07	
Thrips *Heliothrips* spp. *Thysanoptera* spp.	Imidacloprid 200 g/l SL	4	16 ml			7-10	14	
	Thiamethoxam 25% WG	4	8 g			7-10	14	
	Fipronil 50 g/l SC	2	16 ml			7-10	07	
Mealy Bug *Psedococcus* spp. *Ferrisia virgate* *Dysmicoccus brevipes*	Acetamiprid 200 g/l SC	4	16 g			7-10	14	
	Imidacloprid 200 g/l SL	4	200 g			7-10	14	
Whitefly *Bemisia tabaci,* *Alurodicus disperses* *Trialeurodes vaporariorum*	Imidacloprid 200 g/l SL	4	16 ml			7-10		
	Imidacloprid 70% WG	4	16 ml			7-10		
	Thiamethoxam 25% WG	4	8 g			7-10		
	Acetamiprid 200 g/l SC	4	11 g			7-10		
ORCHID - INSECTICIDES								
Yellow beetle *Lema pectoralis*	Acetamiprid 200 g/l SC	4	16 g			7-10	14	Affects Flowers only, manually picking & destroying beetles is possible in small cultivations
Stem borers *Chilo partellus* *Sesamia* spp. *Batocera* spp.	Fipronil 50 g/l SC	2	16-20 ml			7-10	07	
	Carbosulfan 200 g/l	1	2 g/plant			7-10	14	
Armoured Scales *Chrysomphalus aonidum* *Pseudalacaspis pentagona* *Aspidiotus* spp. *Lepidosaphes beckii*	Imidacloprid 200 g/l SC	4	16 ml			7-10	14	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	PHI Days	Remarks
Soft scales *Coccus* spp. *Pulniner* spp. *Saissetia* spp. *Ceroplastes* spp.	Fipronil 50 g/l SC	2	16 ml			7-10	07	
ROSE - INSECTICIDES								
Scales *Coccus* spp *Pulniner* spp *Saissetia* spp *Ceroplastes* spp	Imidacloprid 200 g/l SC	4	16 ml			7-10	14	
	Fipronil 50 g/l SC	2	16 ml			7-10	07	
CHRYSANTHEMUM - INSECTICIDES								
Leaf miner *Liriomyza* spp.	Abemactin 18 g/l EC	6	10 ml			7-10	14	Traps with yellow polythene covered or made sticky with grees or gum is helpful in physical control of adults
Aphids *Aphis gossypii* *Myzus persicae* *Macrosiphum* spp.	Imidacloprid 200 g/l SC	4	16 ml			7-10	7-10	
	Imidacloprid 70% WG	4	2 g			7-10	7-10	
	Thiamithoxam 25% WP	4	8 g			7-10	7-10	
	Acetamiprid 20% SP	4	11 g			7-10	7-10	
	Fipronil 50 g/l SC	2	16 ml				7-10	
FOLIAGE PLANTS AND FLOWRING ORNAMENTALS, DALIA - INSECTICIDES								
Scales *Aspidiotus* spp. *Ceroplastes* spp.	Imidacloprid 200 g/l SC	4	16 ml			7-10	14	
	Fipronil 50 g/l SC	2	16 ml			7-10	07	
Thrips *Heliothrips* sp. *Thysanoptera* sp.	Imidacloprid 200 g/l SC	4	16 ml			7-10	14	
	Imidacloprid 70% WG	4	2 g			7-10	14	
	Thiamethoxam 25% WP	4	8 g			7-10	14	
	Fipronil 50 g/l SC	2	16 ml			7-10	07	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	Rate of application (Product ml or g/ ha) High foliage	Application interval (days)	PHI Days	Remarks
Leaf eating caterpillars *Spodoptera litura* *Hellula undalis* *Chrysodeixis eriosoma* *Crocidolomia binotalis* *Plutella xylostella*	Chorfluazuron 50 g/l SL	15	16 ml			7-10	14	
	Etopenprox 100 g/l EC	3	24 ml			7-10	14	
	Emamectin benzoate 5% SG	6	6 g			7-10	14	
	Indoxcarb 150 g/l EC	22	6 ml			7-10	14	
	Profenophos 500 g/l EC	1	48 ml			7-10	14	
HIBISCUS - INSECTICIDES								
Weevils *Pempheres affinis*	Acephate 75% SP	1	8 g	120-240 g		7-10	14	
Beetles *Mylabris phalerata*	Imidacloprid 200 g/l SC	4	10 ml	120-240 g		7-10	14	
	Acephate 75% SP	1	8 g					
Boll worms *Earias insulana* *Earias vitella*	Profenophos 500 g/l EC	1	2 ml	50 ml		10-14	14	
DAHLIA - INSECTICIDES								
Beetles *Mylabris phalerata*	Imidacloprid 200 g/l EC	4	16 ml			7-10		
	Acephate 75% SP	1	12.8 g			7-10		
Leaf Hopper *Amarasca* spp.	Acephate 75% SP	1	12.8 g			7-10		
	Acetamiprid 200 g/l SP	4	16 g					
GYPSOPHILA - INSECTICIDES								
Leaf hopper *Amarasca* spp.	Acephate 75% SP	1	12.8 g	120-240 g		7-10	07	Spider Mites, Thrips Aphids Similar to other flowers
	Acetamiprid 200 g/l SP	4	16 g	200 g/ha		7-10	07	
LAWN GRASSES - INSECTICIDES								
White Grubs *Melolontha* spp. *Anomala* spp.	Chlorantraniliprole 200 g/l	5	40 ml	250-375 ml		7-10	-	Only as preventive hence should be sprayed early before adult beetles form
	Imidacloprid 200 g/l SL	4	32 ml	200-250 ml	80-100 g	7-10		
	Thiamethoxam 25% WG	4	12.8 g			7-10		

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha)		Application interval (days)	PHI Days	Remarks
				Low foliage	High foliage			
ANTHURIUM, ORCHIDS, CHRYSANTHEMUM - FUNGICIDES								
Anthracnose *Colletotrichum gloeosporioides* *Glomerella* spp.	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,800 ml	7-10	-	Common in Anthurium, Aglaonema, Dieffenbachia, Adenium, Polyscias, Orchids and Dracaena.
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,200 g	7-10	-	
	Mancozeb 75% WG	MO3	32 g	640 g	1,200 g	7-10	-	
	Mancozeb 80% WP	MO3	32 g	640 g	1,200 g	7-10	-	
	Carbendazim 50% WP	B1	11 g	220 g	420 g	10-14	-	
	Carbendazim 500 g/l SC	B1	11 ml	220 ml	420 ml	10-14	-	
	Maneb 80% WP	MO3	32 g	640 g	1,200 g	7-10	-	
	Thiophanate-methyl 70% WP	B1	16 g	320 g	600 g	10-12	-	
Rust *Puccinia* spp. *Uromyces* spp.	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,800 ml	7-10	-	Common in Dracaena, Sandariana, Schefflera, Commelina, Aloe, Chrysanthemum and Canna.
	Chlorothalonil 75% WP	MO5	32 g	640 g	1,200 g	7-10	-	
	Mancozeb 75% WG	MO3	32 g	640 g	1,200 g	6-8	-	
	Mancozeb 80% WP	MO3	32 g	640 g	1,200 g	7-10	-	
	Tebuconazole 250 g/l EW	G1	6 ml	112 ml	210 ml	14-21	-	
Leaf spots *Alternaria* spp. *Helminthosporium* spp. *Drechslera* spp. *Exserohilum* spp. *Phaetricoconis* spp. *Myrothecium* spp. *Cercospora* spp. *Phyllosticta* spp. *Curvularia* spp. *Phomopsis* spp. *Cylindrocladium* spp.	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,800 ml	7-10	-	Alternaria leaf spot is common in Aglaonema, Calathea, Schefflera and Fatsia. Leaf spot is common and major limiting factor in Palms (mainly in *Livistonia rotundifolia*), Cacti, Marantha and Calathea. *Myrothecium* leaf spot is common In Aglaonema, Diffenbachia, Dracaena, Hedera, Marantha, Peperomia and Philodendron. Ensure the proper sanitation along with fungicide application in heavy infection.
	Chlorothalonil 75% WP	MO5	32 g	1,000 g	1,200 g	7-10	-	
	Mancozeb 75% WG	MO3	32 g	640 g	1,200 g	7-10	-	
	Mancozeb 80% WP	MO3	32 g	640 g	1,200 g	7-10	-	
	Maneb 80% WP	MO3	32 g	640 g	1,200 g	7-10	-	
	Tebuconazole 250 g/l EW	G1	6 ml	112 ml	210 ml	14-21	-	

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	High foliage	Application interval (days)	PHI Days	Remarks
ANTHURIUM, DENDROBIUM DIEFFENBACHIA, DRACAENA, ROSES, ORCHIDS - FUNGICIDES								
Leaf spots Yellow blotch *Pseudocercospora dendrobi*	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,800 ml	7-10	-	Common in Dendrobium orchids.
	Chlorothalonil 75% WP	MO5	32 g	1,000 g	1,200 g	7-10	-	
	Mancozeb 75% WG	MO3	32 g	640 g	1,200 g	7-10	-	
	Mancozeb 80% WP	MO3	32 g	640 g	1,200 g	7-10	-	
	Carbendazim 50% WP	B1	11 g	220 g	420 g	10-14	-	
	Carbendazim 500 g/l SC	B1	11 ml	220 g	420 g	10-14	-	
	Maneb 80% WP	MO3	32 g	640 g	1,200 g	7-10	-	
	Thiophanate-methyl 70% WP	B1	16 g	320 g	600 g	10-12	-	
Damping off, Collar rot, Stem rot, Root rot and Crown rot *Phytophthora* spp. *Phythium* spp. *Rhizoctonia* spp. *Sclerotium* spp. *Botryodiplodia* spp. *Fusarium* spp.	Captan 50% WP	MO3	Soil drench	60 g/50 l/10 m^2		6-8	-	Anthurium, Dieffenbachia, Dracaena, Roses, Orchids and Peperomia are susceptible to *Phytophthora* spp. Scindapsus, Philodendron, Canna and Marantha are susceptible to *Phythium* spp. Thiophante-methyl is more effective against *Fusarium* spp. and *Sclerotium rolfsii*.
	Thiram 80% WP	MO3		70 g/50 l/10 m^2		6-8	-	
	Thiophanate-methyl 70% WP	B1		30 g/50 l/10 m^2		10-12	-	
	Carbendazim 500 g/l SC	B1		35 ml/50 l/10 m^2		10-14	-	
	Carbendazim 50% WP	B1	11 g	220 g	440 g	10-14	-	
Fusarium leaf spot *Fusarium moniliforme*	Thiophanate-methyl 70% WP	B1	16 g	320 g	600 g	10-12	-	Common in Dracaena, Acorus and Sansevieria.
Fusarium stem rot *Fusarium solani*		MO3	32 g	60 g/50 l/10 m^2		6-8	-	
Fusarium wilt *Fusarium oxysporum*	Captan 50% WP							Aglaonema, Dieffenbachia and Polyscias are susceptible to stem rot. Fusarium wilt is common in Fatsia and Hedera species.
	Thiram 80% WP	MO3	22 g	70 g/50 l/10 m^2		6-8		

Crop/Pest	Common name, Strength & Formulation type	MOA	Dilution (ml or g per 16 l)	Rate of application (Product ml or g/ ha) Low foliage	High foliage	Application interval (days)	PHI Days	Remarks
Stem and Rhizome rot *Aspergillus niger*	Captan 50% WP	MO3	Soil drench	60 g/50 l/10 m^2		6-8	-	Dracaena, Polyscias and Sansevieria are susceptible to this disease. Dip the cut end of the cuttings and drench the soil with fungicide solution.
	Thiram 80% WP	MO3		70 g/50 l/10 m^2		6-8	-	
	Chlorothalonil 500 g/l SC	MO5		90 ml/50 l/10 m^2		7-10	-	
	Chlorothalonil 75% WP	MO5	32 g	1,000 g	1,200 g	7-10		
Black spot *Diplocarpon rosae*	Maneb 80% WP	MO3	32 g	640 g	1,200 g	7-10	-	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,800 ml	7-10	-	
	Chlorothalonil 75% WP	MO5	32 g	1,000 g	1,200 g	-	14	
	Tebuconazole 250 g/l EW	G1	6 ml	120 ml	225 ml	14-21	-	
	Mancozeb 75% WG	MO3	32 g	640 g	1,200 g	7-10	-	
	Mancozeb 80% WP	MO3	32 g	640 g	1,200 g	7-10	14	
Botrystis blight *Botrytis cinerea*	Mancozeb 75% WG	MO3	32 g	640 g	1,200 g	7-10	-	
	Mancozeb 80% WP	MO3	32 g	640 g	1,200 g	7-10	14	
	Maneb 80% WP	MO3	32 g	640 g	1,200 g	7-10	-	
	Chlorothalonil 500 g/l SC	MO5	48 ml	960 ml	1,800 ml	7-10	-	
	Mancozeb 80% WG	MO3	32 g	640 g	1,200 g	7-10	14	
Downy mildew *Peronospora* spp.	Captan 50% WP	MO3	32 g	640 g	1,200 g	6-8	-	
	Metiram 55% + Pyraclostrobin 5% WG*	MO3 +C3	32 g	640 g	1,200 g	10-12	-	
	Mancozeb 60% + Dimethomorph 9% WP*	MO3 +F5	80 g	1,600 g	3,000 g	12-14	-	
Powdery mildew *Sphaerotheca pannosa rosea*	Metiram 55% + Pyraclostrobin 5% WG*	MO3 +C3	32 g	640 g	1,200 g	10-12	-	
	Thiophanate-methyl 70% WP	B1	10 g	320 g	600 g	10-12	-	

MODE OF ACTION

MODE OF ACTION 112

IRAC MODE OF ACTION (MOA) CLASSIFICATION SCHEME OF INSECTICIDES: IRAC, MARCH 2020: VERSION 9.4

Main Grop	Site of Action	Primary Cite of Action in Insectisides	Active Ingradients
01.	Acetylcholinesterase (AChE) inhibitors - Nerve action	1A - Carbamates 1B - Organophosphates	Carbosulfan, Fenobucarb, Thiodicarb Diazinon, Pirimiphos-methyl, Profenofos, Quinalphos, Acephate, Monocrotophos, Phenthoate
02.	GABA-gated chloride channel - Nerve action	2A - Cyclodines 2B - Phenylpyrazoles	 Fipronil, Ethitrole
03.	Sodium channel modulators - Nerve action	3A - Pyrethroids 3B - Methoxy chlor; DDT	Etofenprox, Lambda- cyhalothrin, Esfenvalerate, Deltamethrin, Premethrin, Bifenthrin
04.	Nicotinic acetylcholine receptor (nAChR) agonists - Nerve action	4A - Nicotinoids 4B - Nicotine 4C - Sulfoxaflor	Thiamethoxam, Imidacloprid, Acetamiprid, Thiacloprid Sulfoxaflor
05.	Nicotinic acetylcholine receptor (nAChR) allosteric activators - Nerve action	5 Spinosyns	Spinosad, Spinotoram
06.	Chloride channel activators - Nerve and muscle action	6 Avermectins, Milbemycin	Abamectin, Emamectin- benzoate
07.	Juvenile hormone mimics - Growth regulation	7A Juvenile hormone analogous 7B Fenoxycarb	-
08.	Selective homopteran feeding blockers - Nerve action 9B	8A Alkyl Helides 9B Pyridine azomethine Derivatives	Methyl bromide Pymetrozine
09.	Mite growth inhibitors - Growth regulation	10A - Clofentezin Diflovidazin Hexythiazox	Hexythiazox
10.	Microbial disruptors of insect midgut membranes	11A *Bacillus thuringiensis* and the insecticidal proteins they produced	*Bacillus thuringiensist*
11.	Inhibitors of mitochondrial ATP synthase - Energy metabolism	-	-
12.	Uncouplers of oxidative phosphorylation via disruption of the proton gradient - Energy metabolism	-	-

No	MOA Class	Primary Cite of Action in Insectisides	Active Ingradients
13.	Nicotinic acetylcholine receptor (nAChR) channel blockers	Nereistoxin analogues	Thiocyclam
14.	Inhibitors of chitin biosynthesis - type 0 Growth regulation	Benzoylureas	Chlorfluazuron, Novaluron, Bistrifluron, Lufenuron,
15.	Inhibitors of chitin biosynthesis - type 1 Growth regulation	Buprofezin	Buprofezin
16.	Moulting disruptor, Dipteran - Growth regulation		
17.	Ecdysone receptor agonists - Growth regulation	Diacylhydrazines	Tebufenozide, Methoxyfenozide, Chromafenozide
18.	Octopamine receptor agonists - Nerve action		
19.	Mitochondrial complex III electron transport inhibitors - Energy metabolism		
20.	Mitochondrial complex I electron transport inhibitors - Energy metabolism	21A METI acaricides and insecticides	Fenpyroximate
21.	Voltage-dependent sodium channel blockers - Nerve action	22A Oxadiazines	Indoxacarb
		22B Semcarbozones	Metaflumizone
22.	Inhibitors of acetyl CoA carboxylase. Lipid synthesis - Growth regulation		
23.	Mitochondrial complex IV electron transport inhibitors - Energy metabolism	24A Phosphides	Aluminium phosphide, Phosphine
24.	Mitochondrial complex II electron transport inhibitors - Energy metabolism		
25./26.		Un assigned	
27.	Ryanodine receptor modulators - Nerve and muscle action	Diamides	Flubendiamide, Chlorantraniliprole
UN	Compounds of unknown or uncertain Mode of Action	Azadirachtin	Azadirachtin-A Sulphur Lime sulphur
UNM	Non-specific mechanical desruptors		Diatomaceous earth

FRAC CODE LIST 2020 OF FUNGICIDES SORTED BY MODE OF ACTION (MOA) (INCLUDING FRAC CODE NUMBERING)

Mode of Action	Target Site and Code	Common Name	FRAC Code
A - Nucleic Acid Synthesis	A1: RNA polymerase 1	Metalaxyl	4
B - Cytoskeleton and motor protein	B1: B tubuline assembly in mitosis	Carbendazim	1
		Thiophanate-methyl	
	B4: Cell division	Pencycuron	20
C - Respiration	C2: Complex II: succinate-dehydrogenase	Flutolanil	7
	C3: Complex III: Cytochrome bc1 (ubiquinoloxidase) at Qo site (cyt b gene)	Azoxystrobin, Pyraclostrobin Triclopyricarb,Trifloxystrobin	11
	C5: Uncouplers of oxidasive phosphorylation	Fluazinam	29
D - Amino acids and protein synthesis	D3: protein synthesis	Kasugamycin	24
E - Signal transduction	E3: MAP/Histidine-Kinase in osmotic signal transduction (os – 1 , Daf1)		
F - Lipids synthesis and membrane integrity	F2: Phospolipid biosynthesis, methyltransferase	Isoprothiolane	6
	F4: Cell membrane permeability, fatty acids	Propamocarb	28
G - Sterol biosynthesis in membranes	G1: C14- demethylase in sterol biosynthesis (erg11/cyp51)	Difenoconazole Epoxicanazole Flutriafol Hexaconazole Propiconazole Tebuconazole	3
H - cell wall biosynthesis	H5: Cellulose synthesis	Dimethomorph	40
I - Melanin synthesis in cell wall	I1: Reductase in melanin biosynthesis	Tricyclazole	16.1
NC-not classified	unknown	Mineral oils organic oils Inorganic salts,material of biological origin	NC

Mode of Action	Target Site and Code	Common Name	FRAC Code
M - Chemicals with multi- site activity	Multi- site contact activity	Copper (as Cupric Hydroxide)	MO 1
		Copper (as cuprous Oxide)	MO 1
		Sulphur	MO 2
		Mancozeb,Maneb,Metriam Propineb,Thiram	MO 3
		Captan	MO 4
		Chlorothalonil	MO5
U - Unknown mode of action	Unknown	Flutinil	U13
BM-Biologicals with multiple modes of action	Competition, mycoparasitism, antibiosis,lytic enzymes and induced resistance	Trichoderma spp	BM02

MODE OF ACTION (MOA) CLASSIFICATION OF HERBICIDES JUNE 2 2020

HARC/ WSSA Group	Mode of Action	HRAC Group	Active Ingredients
01.	1. Inhibition of acetyl CoA carboxylase (ACCase)	A	Cyhalofop-butyl Metamifop Fenoxaprop-p-ethyl
02.	inhibited acetolactate synthase (ALS)	B	Halosulfuron-methyl Nicosulfuron Pyrazosulfuron-ethyl Bispyribac-sodium Penoxsulam Flucetosulfuron Propyrisulfuron Triafamone Ethoxysulfuron Pyribenzoxim Cyclosulfamuron Bensulfuron-methyl Metsulfuron-methyl Azimsulfuron Orthosulfamuron Flucetosulfuron Bentazone
03.	Inhibition of Microtubule Assembly	K1	Pendimethalin
04.	Auxin Mimics	O	Quinclorac MCPA
05.	Inhibition of photosynthesis at PS 11-D1 Serine 264 Binders	C1	Metribuzin
	Inhibition of photosynthesis at PS 11-D1 Serine 264 Binders	C2	Propanil
06.	Inhibition of photosynthesis at PS 11-D1 Histidine 215 binders	C3	
07.	Bleaching: Inhibition of 4-hydroxyphenyl-pyruvate-dioxygenase (4-HPPD)	F2	Topramezone
08.	Inhibition of glutamine synthetase	H	Glyfosinate ammonium
09.	Inhibition of Enolpyruvyl Shikimate Phosphate Synthase	G	Glyphosate
10.	Inhibition of glutamine synthetase	H	Gluphosinate-ammonium
11.	Lipid synthesis inhibition	N	+ Thiobencarb
12.	Inhibition of Phytoene Desaturase	F1	
13.	Inhibition of deoxy-D-Xylulose Phosphate Synthase	F4	Clomazone

HARC/ WSSA Group	Mode of Action	HRAC Group	Active Ingredients
14.	Inhibition of Protoporphyrinogen	E	Oxyfluorfen Carfentrazone-ethyl
15.	Inhibition of Very long Chain Fatty Acids	K3	Pretilachlor Thiobencarb
16.	Inhibition of Dihydropteroate synthesis		
17.	AIT-Auxin transport inhibition	P	
18.	PS-1 electron diversion	D	
19.	Inhibition of Microtubule organization	K2	
20.	uncouplers	M	
21.	Inhibition of Hydroxyphenyl Pyruvate Dioxygenase	F2	Topramezone,
22.	Inhibition of Cellulose Synthesis	L	
23.	Inhibition of Fatty Acid Thioesterase	Q	
24.	Inhibition of serine-threonine protein phosphatase	R	
25.	Inhibition of Solanesyl Diphosphate Synthesis	S	
26.	Inhibition of Homogentisate solanesyltransferase	T	
27.	Inhibition of Lycopene Cyclase	F3	
	Unknown Mode of Action	Z	pelargonic acid

REGISTERED INSECTICIDE LIST WITH TRADE NAMES - 2021

MODE OF ACTION 119

MODE OF ACTION 120

REGISTERED INSECTICIDE LIST WITH TRADE NAMES - 2021

No	Common Name	Strength & Formulation	Product Name
01.	Abamectin	18 g/l EC	Mitsu Abamectin, Selico Abamectin, CIC Abamectin, Aba Abamectin, CG Abamectin, ICS Abamectin, Baurs Abamectin, Narita Abamectin, ZagroAbamectin, Zoro Abamectin, Mightee Abamectin, Mig Abamectin Agstar Abamectin, Ceypetco Abamectine, Akito Abamectin, Amber Abamectin, Mack Abamectin, Navita Abamectin, ICS Abamectin
02.	Abamectin	20 g/l SC	Tervigo Abamectin
03.	Abamectin	0.5 % GR	Lankem Abamectin, Baurs Abamectin
04.	Acephate	75% SP	Harthene Acephate, Action Acephate, Nigro Acephate, Surrender Acephate, Oasis Acephate, AgStar Acephate, Asie Acephate, Ceypetco Acephate, Apollo Acephate, CG Acephate
05.	Acetamiprid	20% SP	Mospilan Acetamiprid, Azeta Acetamiprid, Miyako Acetamiprid, Rock Acetamiprid, Baurs Acetamiprid, Holiyaster Acetamiprid
06.	Acetamiprid	200 g/l SL	Miyako Acetamiprid, Azeta Acetamiprid, Mospilan Acetamiprid, Rock Acetamiprid
07.	Azadirachtin A	7.5 g/l EC	Lakgrow Neem
08.	Azadirachtin	50 g/l EC	NeemAzal F
09.	Azadirachtin	10 g/l EC	NeemAzal T/S
10.	Bistrifluron	100 g/l EC	Hanaro
11.	Brodifacoum	0.005% RB	Klerat Wax Blocks, Klerat Pellets
12.	Buprofezin	10% WP	Applaud 10 WP
13.	Buprofezin	250 g/l SC	Jawwa Buprofezin, Buprofezin 25 SC
14.	Carbosulfan	200 g/l SC	Marshal 20 SC
15.	Chlorantraniliprole	200 g/l SC	Coragen
16.	Chlorantraniliprole + Thiomethoxam	20+20 % WG	Virtako 40 WG
17.	Chlorfluazuron	50 g/l EC	Atabron 5 EC
18.	Chromafenozide	50 g/l SC	Podex Chromofenozide
19.	Cypermethrin	100 g/l EC	Award
20.	Deltamethrin	25 g/l EC	Decis Deltamethrin, Delta Deltamethrin, Browns Deltamethrin, Turbio Deltamethrin

No	Common Name	Strength & Formulation	Product Name
21.	Deltamethrin	50 g/l EC	Del-Z, Smash
22.	Difenacoum	0.005% RB	Fentrol
23.	Emamectin benzoate	5% SG	Proclaim 05 SG
24.	Ethiprole	100 g/l SC	Curbix Ethiprole, Curbix
25.	Etofenprox	100 g/l EC	Trebon 10 EC
26.	Fenobucarb	500 g/l EC	Bassa Fenobucarb, Hayleys BPMC, CG BPMC, Beepa Fenobucarb, Browns BPMC, Dozerr Fenobucarb, BPMC 50 EC, Oasis BPMC 50%, BPMC Fenobucarb, Ceypetco BPMC
27.	Fenpyroximate	50 g/l EC	Mitigate
28.	Fipronil	50 g/l SC	Shutter Fipronil, Regent 50 SC, Zees Fipronil, Baurs Fipronil, Ranger Fipronil, Difender Fipronil, Grand Fipronil, CG Fipronil, Viper Fipronil, Arrears Fipronil, Fiprogen Fipronil,Wapper Fipronil, Rio Fipronil, Tamiron Fipronil, Ricon Fipronil, Hextar Fipronil, Agstar Fipronil, Hayleys Fipronil,
29.	Fipronil	0.3% GR	Baurs Fipronil, Prince Fipronil, ATL Fipronil, Fipronil Keta, Diligent 0.3 GR, Terminator Fipronil GR, Agstar Fipronil keta, Drill Fipronil, Plantchem Fipronil, Ceypetco Fipronil, ICS Fipronil Keta
30.	Flubendiamide	24% WG	Belt 240 WG
31.	Flubendiamide	20% WG	Takumi Flubendiamide, Onigiri Flubendiamide
32.	Fluopyram	400 g/l SC	Velum Prime
33.	Hexythiazox	50 g/l EC	Nissoran
34.	Imidacloprid	70% WG	Rocco Imidacloprid, Admire Imidacloprid, Provado Imidacloprid, Montana
35.	Imidacloprid	70% WS	Gaucho Imidacloprid
36.	Imidacloprid	200 g/l SL	Admire Imidacloprid, Sun Agro Imidacloprid, Imida Imidacloprid, Armour Imidacloprid, Oasis Imidacloprid, Kobra Imidacloprid, Merit Imidacloprid, Dynamic Imidacloprid, Harii Imidacloprid, Baurs Imidacloprid, CG Imidacloprid, Kohinor Imidacloprid, Apeel Imidacloprid, Dan Imidacloprid, Agstar Imidacloprid, Kobra Imidacloprid, Imidan Imidacloprid
37.	Indoxacarb	150 g/l EC	Avaunt
38.	Lambda-cyhalothrin	50 g/l SC	Metador 5 CS
39.	Lambda-cyhalothrin	25% CS	Demand Lambda-cyhalothrin
40.	Lufenuron	50 g/l EC	Lufa Lufenuron, Nuro Lufenuron
41.	Metaldehyde	5% RB	CIC Metaldehyde

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No	Common Name	Strength & Formulation	Product Name
42.	Metham Sodium	423 g/l SL	Neemasol
43.	Methoxyfenozide	240 g/l SC	Runner SC 240
44.	Monocrotophos	60% SL	CIC Monocrotophos
45.	Nueleo Polyhedrosis virus	NPV 32%	Fawligen
46.	Novaluron	100 g/l EC	Rimon 10 EC
47.	Phenthoate*	500 g/l EC	Sun Agro Phenthoate, SeeSan Phenthoate, Leader Phenthoate, Hayleys Phenthoate, Elsan Phenthoate, Visan Phenthoate, Phenthoate 50 EC, ICS Phenthoate
48.	Pirimiphos methyl	500 g/l EC	Actellic 50 EC
49.	Profenophos	500 g/l EC	O- Cron Profenophos, Crown Profenophos, Jivro Profenophos, Calcron Profenophos, Hayleys Profenophos, CIC Profenophos, Lankem Profenophos, Kudus Profenophos, Prodan Profenophos, Oasis Profenophos, Baurcron Profenophos, Ceypetco Profenophos, Peron Profenophos, Gemini Profenophos, Harcros Profenophos, CG Profenophos, Grand Profenophos, Sun Agro Profenophos, Gem Profenophos, Agstar Profenophos 50 EC
50.	Pymetrozine	50% WG	Chess Pymetrozine 50% WG, Prime Pymetrozine
51.	Quinalphos*	250 g/l EC	Queen Quinalphos, Sucker Quinalphos, Quick Quinalphos, Quintox quinalphos, Baurs Quinalphos, Kuinal Quinalphos, Flyfox Quinalphos
52.	Spinetoram	25% WG	Radiant
53.	Spinosad	25 g/l SC	Success
54.	Sullfoxflor	50% WG	Transform 50% WG
55.	Sulphur	80% WP	Baurs Sulphur
56.	Sulphur	80 WG	Vitasul Sulphur, CG Sulphur, Sulmite Sulphur, Macksul Sulphur, Mitex Sulphur, Agstra Sulphur, Sulfex Sulphur, Sulfit Sulphur, Cosavet sulphur, Kumulus Sulphur, Microthiol Sulphur
57.	Tebufenozide	200 g/l SC	Mimic 20 F
58.	Thiacloprid	240 g/l SC	Alanto 240 SC
59.	Thiamethoxam	70% WS	Cruiser 70 WS
60.	Thiamethoxam	25% WG	Actara Thiamethoxam, Opex Thiamethoxam, Dhora Thiamethoxam, Sakura Thiamethoxam, Buzzer Thiamethoxam
61.	Thiocyclam (Hydrogen Oxalate)	50% SP	Evisect S
62.	Thiocyclam (Hydrogen Oxalate)	4% GR	Thiocyclam Hydrogen Oxalate 4% G, Evisect 4G
61.	Thiodicarb	375 g/l EC	Larvin 375 F

MODE OF ACTION 123

REGISTERED FUNGICIDE LIST WITH TRADE NAMES 2021

No	Common Name	Strength	Product Name/Trade Name
01.	Azoxystrobin	250 g/l SC	Amistar 250 SC, Polo Azoxystrobin, Codrix Azoxystrobin
02.	Captan	50% WP	Pentagan captan, CG Captan, Captaf Captan, Baurs Captan, Ceypetco Captan, ICS Captan, Captogon captan, Oasis captan, Zagro captan
03.	Captan	80% WG	Baur's captan
04.	Carbendazim	50% WP	Billet Carbendazim, Oasis Carbendazim, Hayleys Carbendazim, Alan Carbendazim, CG Carbendazim.
05.	Carbendazim	500 g/l SC	Carbin Carbendazim
06.	Chlorothalonil	75% WP	Ole Chlorothalonil,Max Chlorothalonil, Bright Chlorothalonil, Agstar Chlorothalonil, Thaloni Chlorothalonil
07.	Chlorothalonil	500 g/l SC	Ronil Chlorothalonil, Baurs Chlorothalonil, Daconil Chlorothalonil
08.	Copper (as copper oxychloride)	50% WP	CIC Copper, Coblite Copper Oxychloride
09.	Copper (as copper hydroxide)	37.5% WG	Champ Copper Hydroxide
10.	Difenoconazole	250 g/l EC	Score
11.	Epoxiconazole	125 g/l SC	Opus
12.	Fluazinam	500 g/l SC	Tizca Fluazinam, Nando Fluazinam
13.	Flutolanil	50% WP	Moncut
14.	Flutriafol	250 g/l SC	Pointer Flutriafol, Impact Flutriafol
15.	Hexaconazole	50 g/l SC	Emzole Hexaconazole, Hiper Hexaconazole
16.	Hexaconazole	50 g/l EC	Hexa Hexaconazole,.Lazer Hexaconazole, Baurs Hexaconazole, Eraser Hexaconazole, Agstar Hexaconazole, Hero Hexaconazole, Eraser Hexaconazole, CIC Hexaconazole, Emzole Hexaconazole, Hayleys Hexaconazole, Hayleys Hexaconazole
17.	Hymexazole	360 g/l SL	Tachigaren
18.	Isoprothiolane	400 g/l EC	Fuji-One 40 EC
19.	Mancozeb	80% WP	Mancozeb, Hayleys Mancozeb, Right Mancozeb, AgStar Mancozeb, Mancozeb 80% WP Jumbo Mancozeb, Lankem Mencozeb, Farmers Mancozeb, Dynamic Mancozeb, Ceypetco Mancozeb, Samit Mancozeb, Dizeb Mancozeb, Dithane Mancozeb, Mackzeb Mancozeb, SunAgro Mancozeb, Unipower Mancozeb, Grand Mancozeb, Marco Mancozeb

No	Common Name	Strength	Product Name/Trade Name
20.	Mancozeb	75% WG	Zeero Mancozeb, Mancozeb DF
21.	Mancozeb + Dimethomorph	60 % + 9% WP	Acrobat MZ, Agrofarm Dimethomorph + Baurs Dimethomorph
22.	Mancozeb + Metalaxyl	64 + 8 % WP/WG	Ridol Metalaxyl+, CIC Mancozeb +, Mancozeb+Metalaxyl Laxy Mancozeb+, Metalaxyl Ridoaxyl Metalaxyl +, Rid-All Mancozeb +
23.	Mancozeb + Metalaxyl-M	64 % + 4% WG	Ridomil Gold Metalaxyl+
24.	Maneb	80% WP	Mannar Maneb, Baurs Maneb
25.	Metiram + Pyraclostrobin	55% + 5 % WG	Baurs Pyraclostrobin +, Cabrio Top, Lankem Cabrio Top
26.	Pencycuron	25% WP	Monceren WP 25%
27.	Potassium bicarbonate	82% SP	Kaligreen
28.	Propamocarb	607 g/l SL	Previcur 607 SL
29.	Propiconazole	250 g/l EC	Sira Propiconazole, Lankem Propiconazole, Oasis Propiconazole, Bumper Propiconazole
30.	Propineb	70% WP	Protocol Propineb, Trazol Propineb, Trazol Propineb, Trazol Propineb, Trazo Propineb, Antracol Propineb, Rain Propineb
31.	Sulphur	80% WG/WP	Vitasul Sulphur, Kumulus Sulphur, Sulmite Sulphur, Baurs Sulphur, CG Sulphur, Zagro Sulphur, Mitex Sulphur, Cosavet Sulphur, Thiovit Jet Sulphur, Macksul Sulphur
32.	Tebuconazole	250 g/l EW	Folicur Tebuconazole, Lankem Tebuconazole, Orius Tebuconazole
33.	Tebuconazole + Azoxystrobin	200 + 120 g/l SC	Custodia 320 SC
34.	Thiophanate-methyl	70% WP	Morison Thiophanate Methyl, Topsin M 70
35.	Thiophanate-methyl + Thiram	50% + 30 % WP	Homai
36.	Thiram	80% WP	Oasis Thiram, Plantchem Thiram, CG Thiram, Scope Thiram, Powersol Thiram
37.	Tricyclazole	75% WP	Guruzole
38.	Tebuconazole + Tryfloxystrobin	500 + 250 g/kg WG	Nativo 75 WG

REGISTERED HERBICICDES LIST WITH TRADE NAMES - 2021

No	Common Name	Strength	Product Name
01.	Ametryn + Trifloxysulfuron- sodium	73.1 + 1.8% WG	Krismat 75 WG
02.	Azimsulfuron	50% WG	Gulliver
03.	Bensulfuron-methyl + Metsulfuron-methyl	8.25 + 1.75% WP	Sindax 10 WP
04.	Bentazone	480 g/l SL	Ahura bentazone
05.	Bispyribac-sodium	20% WP	Paddy Gold Bispyribac Sodium, Kensolo Bispyribac Sodium
06.	Bispyribac-sodium	100 g/l SC	Mikasa Bispyribac Sodium, Omega Bispyribac Sodium, Weego Bispyribac Sodium, Nominee Bispyribac-Sodium
07.	Carfentrazone-ethyl	240 g/l EC	Affinity
08.	Carfentrazone-ethyl	40% WG	Kimura Carfentrazone-ethyl, Zone Carfentrazone-ethyl
09.	Cyhalofop-butyl	100 g/l EC	Clincher, Ashka Cyhalofop-buty1, Clipper Cyhalofop-buty1
10.	Cyhalofop-butyl + Pyribenzoxim	60 g/l + 25 g/l EC	Wondergold
11.	Diuron	80% WP	Oasis diuron, Ducron Diuron, Hayleys Diuron, Ceypetco Diuron, Unipower Diuron, Lankem Diuron, Agstar Diuron, CIC Diuron, CG Diuron, Browns Diuron, Viron Diuron, Plantchem Diuron, Baurs Diuron, Japlan Diuron
12.	Diuron	500 g/l SC	Liquido Diuron, ALT Diuron
13.	Fenoxaprop-*p*-ethyl	69 g/l EC	Ricestar fenoxaprop ethyl
14.	Fenoxaprop-*p*-ethyl	75 g/l EW	Whip Fenoxaprop- *p*- ethyl, Tara Fenoxaprop-*p*-ethyl, Whip Super Fenoxaprop-*p*-ethyl, Rip Fenoxaprop-*p*-Ethyl
15.	Fenoxaprop-*p*-ethyl + Ethoxysulfuron	69 + 20 g/l OD	Tiller Gold fenoxaprop-*p*-ethyl +, Tiller Gold fenoxaprop-*p*-ethyl +, Ricestarxtra Fenoxaprop-*p*-ethyl +
16.	Florpyrauxifen benzyl	25 g/l EC	Loyant
17.	Flucetosulfuron	10% WG	Salfi Flucetosulfuron, Fluto Flucetosulfuron, Rio Flucetosulfuron
18.	Glufosinate ammonium	150 g/l SL	Basta
19.	Glufosinate ammonium	280 g/l SL	Lifeline Glufosinate ammonium
20.	Glyphosate	360 g/l SL	Ceypetco Glyphosate
21.	Halosulfuron-methyl	75% WG	Permit

No	Common Name	Strength	Product Name
22.	Imazethapyr	100 g/l SC	Pursuit
23.	MCPA	600 g/l SL	ICS MCPA 60, Mackwoods MCPA, Morale MCPA 60, Magic MCPA, Baurmat MCPA 60, Morice MCPA, Lankem M-50, CIC MCPA 60, Harcros M.C.P.A. 60, Plan`z tchem MCPA, Hayleys MCPA 60
24.	Imazethapyr	10% SC	Persuit
25.	Mefenacet + Bensulfuron-methyl	50% + 3% WP	Benciante
26.	Metamifop	100 g/l EC	Matari
27.	Metamipof + Bispyribac sodium	100 + 40 g/l SC	Kiseki
28.	Metribuzin	70% WG	Oasis Metribuzin
29.	Metribuzin	70% WP	Sencor Metribuzin
30.	Nicosulfuron	40 g/l OD	Topaz
31.	Orthosulfamuron	50% WG	Strada Orthosulfamuron
32.	Oxyfluorfen	240 g/l EC	OxyGuard Oxyfluorfen, Goal Oxyfluorfen, Gallop Oxyfluorfen, Oxo Oxyfluorfen, Osilo Oxyfluorfen, Galigan Oxyfluorfen, Kitto Oxyfuluorfen, Sonic Oxyfluorfen, Goal Tender
33.	Oxyfluorfen	480 g/l SC	Goal Tender
34.	Pendimethalin	300 g/l EC	Rower Pendimethalin, Stomp Pendimethalin
35.	Penoxulam	240 g/l SL	Granite
36.	Pretilachlor	300 g/l EC	Clear Pretilachlor, Baurs Pretilachlor, Sofit Pretilachlor, Set Pretilachlor, Solid Pretilachlor, Harness Pretilachlor
37.	Propanil + Clomazone	400 + 200 g/l EC	Compro 60 EC
38.	Pretilachlor + Pyrazosulfuron-ethyl	30% + 0.75% WG	Eros Gold
39.	Proponil + Pretilachlor	300 + 170 EC	Profit 500 EC
40.	Pretilachlor + Pyribenzo solfuron-ethyl	30% + 0.75% WG	Solito

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No	Common Name	Strength	Product Name
41.	Profoxydim	75 g/l EC	Tetris
42.	Propanil + MCPA	60% + 7.5% WG	Grant
43.	Propyrisulfuron	100 g/l SC	Sumo
44.	Propanil + Oxadiazone	230 + 80 g/l EC	Proxi 310, Avora 310
45.	Pyrazosulfuron-ethyl	10% WP	Pyrazosulfuron Ethyl, Saathi Pyrosulfuronethyl, Riseen Pyrazosulfuron- Ethyl, Sirius Pyrazosulfuron ethyl, Baurs Pyrazosulfuron Ethyl
46.	Pyribenzoxim	50 g/l EC	Pyanchor
47.	Quinclorac	250 g/l SC	Focus Quinclorac, Facet Quinclorac, Baurs Quinclorac
48.	Thiobencarb + Bispyribac-sodium	900 + 15 g/l OD	Solo
49.	Thiobencarb + Propanil	400 + 200 g/l EC	Saturn plus
50.	Tiafenacil	50 g/l ME	Terado
51.	Topramezone	336 g/l SC	Clio
52.	Triafamone	200 g/l SC	Council Prime