



IPM PACKAGE NO. 43



INTEGRATED PEST MANAGEMENT PACKAGE

FOR

CASHEW



Government of India
Ministry of Agriculture
Department of Agriculture & Cooperation
Directorate of Plant Protection, Quarantine & Storage
N. H. IV, Faridabad - 121 001.

IPM PACKAGE FOR CASHEWNUT

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(IPM Package for Cashewnut)

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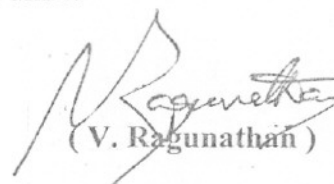
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FOREWARD

Integrated Pest management (IPM) approach has been globally accepted for achieving sustainability in agriculture. It has become more relevant due to a number of advantages like safety to environment, pesticide-free food commodities, low input based Crop Production Programme etc. Though IPM approach has been taken up since 1981, its impact has not been felt until 1994. Human Resource Development has helped to sensitise extension functionaries and farmers about the usefulness of IPM.

For successful implementation of IPM, the scattered information on various components of this eco-friendly approach forms basic necessity. In this direction, initial attempts were made in 1992 to harmonise the IPM Package of Practices of various crops. Subsequently concerted efforts were made in 1998, 2001 and 2002 to update and develop IPM package of practices for agricultural and horticultural crops. Presently, IPM package of practices for 51 crops have been finalised to help the extension workers and farmers to manage the pests/ diseases and to minimise the over use/ misuse of chemical pesticides. Efforts have been made to incorporate the relevant available technical input provided by the scientists of ICAR Institutes/ SAUs and State Departments of Agriculture. However, suggestions for further improvement in future publication/ revision will be of immense help. Hopefully, these IPM Package of Practices will be useful for the Researchers, Plant Protection Workers and Farmers alike.

April 1, 2002


(V. Raguathan)

(IPM Package for Cashewnut)

P R E F A C E

In order to minimise the indiscriminate and injudicious use of chemical pesticides, INTEGRATED PEST MANAGEMENT (IPM) has been enshrined as cardinal principle of Plant Protection in the overall Crop Protection Programme under the National Agricultural Policy of the Govt. of India. IPM is an eco-friendly approach for managing pest and disease problems encompassing available methods and techniques of pest control such as cultural, mechanical, biological and chemical in a compatible and scientific manner. The greater emphasis has been given on biological control including use of biopesticides.


With a view to provide technical knowledge to the extension functionaries and farmers in the States, first National Workshop on IPM for harmonisation of Package of Practices was organized at National Plant Protection Training Institute (NPPTI), Hyderabad during June 29-30, 1992. Subsequently workshops were organized from April 15-17, 1998 and Nov. 5-6, 1998 at Directorate of Plant Protection, Quarantine & Storage, Faridabad and IPM package of practices for 20 crops were evolved on rice, cotton, vegetables, pulses, and oilseeds. In this series, two National Workshops on IPM have been conducted at NPPTI, Hyderabad and Dte. of PPQ&S, Faridabad during May 14-17, 2001 and Feb. 20-22, 2002 respectively to update 20 available IPM Packages and develop 31 new IPM Packages specially for Horticultural crops. In these workshops, 51 IPM Package of Practices for cereal crops (Rice, Wheat, Maize, Sorghum, Millets), commercial crops (Cotton, Sugarcane, Tobacco, Tea), pulse crops (Pigeonpea, Gram, Black gram/Green gram, Pea, Rajma), oilseeds (Groundnut, Soybean, Rapeseed/Mustard, Sesame, Safflower, Castor, Sunflower, Oilpalm), vegetables (Potato, Onion, Tomato, Brinjal, Okra, Chillies, Cruciferous vegetables, Leguminous vegetables, Cucurbitaceous vegetables), fruit crops (Citrus, Banana, Apple, Mango, Guava, Grapes, Pineapple, Sapota, Pomegranate, Litchi), spice and plantation crops (Small Cardamom, Large Cardamom, Black Pepper, Ginger, Coriander, Cumin, Fennel, Coconut, Cashew and Arecanut) have been finalised.

IPM technology manages the pest population in such a manner that economic loss is avoided and adverse side effects of chemical pesticides are minimized. The IPM packages encompasses various management strategies for containing the pest and disease problems. Pest monitoring is also one of the important component of IPM to take proper decision to manage any pest problem. It can be done through Agro-Ecosystem Analysis (AESA), field scouting, light, pheromone, sticky/yellow pan traps. The economic threshold levels (ETL) of important pests and diseases are also given in the packages to take appropriate control measures when pest population crosses ETL.

These IPM packages developed with the technical inputs from experts from Indian Council of Agriculture Research, State Agricultural Universities, Central Directorate of Plant Protection, Pesticide Industries and State Departments of Agriculture/Horticulture will provide technical backup in the management of pests, diseases, weeds, nematodes and rodents in the Indian Agriculture and Horticulture. These will also be useful in reducing the pesticide residues in exportable agricultural commodities and would also help in the management of pests/diseases/weeds/nematodes which may get inadvertently introduced in the country.

IPM Package of Practices for Agricultural and Horticultural crops will be helpful to minimize the ill effects of chemical pesticides to promote the IPM for sustainable production. These packages will be useful for the researchers, extension workers and farmers alike who are engaged in the agricultural practices.

April 1, 2002


(A.D. Pawar)
Director (IPM)

(IPM Package for Cashewnut)

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- | | | | |
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IPM PACKAGE FOR CASHEWNUT

Cashew is one of the most important commercial crop of our country that helps to earn considerable amount of foreign exchange through export of its kernels. Successful cashew cultivation depends on the selection of the best varieties suited for the Agro-Climatic condition and adoption of right package of practices recommended for the region. Kerala produces 46,500 tonnes of cashew sharing 11% of all India production from 86,300 ha area with mean yield of 537kg /ha.

I. MAJOR PESTS:

A. Pests of national significance:

1. Insect pests:

- 1.1 Tea mosquito (*Helopeltis antonii*)
- 1.2 Stem borer (*Plocoederus ferrugineus*)
- 1.3 Leaf miner (*Acrocercops syngamma*)
- 1.4 The shoot and blossom webber (*Macalla monocusalis*)
- 1.5 Thrips

2. Diseases:

- 2.1 Dieback. (*Colletotrichum gloeosporioides*)
- 2.2 Leaf spot (*Phoripsis anacardic*)
(*Pestalotia dichatea*)

II. PEST MONITORING:

The objective of pest monitoring is to monitor the initial development of pests and diseases in the field. Field scouting for pests/diseases and biocontrol fauna/flora by extension agencies and farmers once in a fortnight should be undertaken to assess increasing/decreasing trend in the pest/disease incidence and availability of biocontrol potential. Therefore, for field scouting, farmers may be mobilized to observe the pest and disease occurrence at the intervals as stipulated under different developmental stage. The plant protection measures are required to be taken only when pests and diseases cross economic threshold level (ETL) as per results of field scouting.

1. Rapid Roving Survey (RRS):-

In the beginning of the crop season, survey routes are required to be identified in the pest and disease endemic areas to undertake Rapid Roving Survey (RRS). During survey the

observations are to be made at every 5-10 Kms. distance in the pre-selected route at 7-10 days intervals depending upon pest and disease situation. Record the incidence of pest, disease and defender population at each spot in 5 plants at random and 12 spots per ha.

2. Field scouting:-

Based on the observations of RRS the farmers at village level are to be mobilized to undertake field scouting . During field scouting farmers may record pest, disease, and defenders populations once in 7-10 days in their own fields as per Agro Eco System Analysis (AESAs) approach. The State Departments of Agriculture should make all possible efforts by using different media, mode and publicity to inform the farmers the need for field scouting in the specific crop areas having indication of pest or disease built up.

3. Agro Eco System Analysis (AESAs):-

AESA is an approach, which can be gainfully employed by extension functionaries and farmers to analyse field situations with regards to pest, defenders, soil conditions, plant health, the influence of climatic factors and their inter relationship for growing healthy crop. Such a critical analysis of the field situations will help in taking appropriate decision on management practices. The basic components of AESAs are:-

1. Plant health at different stages.
2. Built-in-compensation abilities of the plant.
3. Pest and defenders population dynamics.
4. Soil conditions.
5. Climatic factors.
6. Farmers past experience.

III. INTERGRATED PEST MANAGEMENT STRATEGIES

1. Cultural practices:

- 1.1 Select high yielding pest/ disease resistant/ tolerant varieties.
- 1.2 Prefer soft wood grafts as planting material.
- 1.3 Maintain proper spacing i.e. 7.5 x 7.5 m for poor soil, 10 x 10m for rich and deep soil, 10-15 x 6-8m for deep slope area.
- 1.4 4 to 6 months old plant grafts of suitable varieties be selected.
- 1.5 Adopt pit method of planting making pit size not less than 60x60x60 cm.
- 1.6 Plant grafts at the onset of monsoon.
- 1.7 Remove polythene tape from the graft before planting carefully.
- 1.8 Provide proper staking and mulching of young plants.
- 1.9 Apply recommended dose of manure and fertilizers.

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- 1.10 Provide proper irrigation during the initial years of plants.
- 1.11. Weeding to be done during June-July or Aug-Sept either chemically or mechanically
- 1.12. Remove branches emerging from the root stock
- 1.13. Train and prune the plants to get a one meter straight stem at the bottom.
- 1.14. Ensure gap filling in time (not later than second year).
- 1.15 For poor yielding trees of 5-20 years rejuvenate by top dressing. The stem should be sawed off during May-Sept. and cut portion should be given swabbing with Blitox /Sevin 50% WP.
- 1.16. Seed nut must be collected during peak period of harvest.

2. Mechanical practices:

- 2.1 Chisel out the damaged area of the tree and swab that portion with 5% neem oil (50ml Neem oil +1 litre water + 5ml tepol or 5gm of soap) on the tree trunk upto a height of 1meter during April-May and Oct-Nov to control stem borer.
- 2.2 Remove and destroy dead and decaying plant parts to ensure plantation sanitation.

3. Biological Control:

- 3.1 Conserve the potential natural enemies as stated in annexure-I
- 3.2 Use of green muscardine fungi, *Metarhizium anisopliae* or *Beauveria bassiana* against stem borer.
- 3.3 Augmentatively release of *Telenomus* or *Crematogaster* egg parasites.

4. Chemical Control:

- 4.1 For control of Tea mosquito spray 0.05% Endosulfan, 0.1% Carbaryl*, 0.05% Quinalphos* or 0.03% Phosphamidon*. A rational rotation of insecticide would be desirable to counteract the tendency of pest to develop field resistance.
- 4.2 Identification of alive borer hole for control of stem borer and chisel out the damaged area and swab that portion ^{with} 0.2% Carbaryl* solution or apply 75 Sevidol*(4G per tree) in the soil at the tree base.
- 4.3 For control of leaf spot disease, spray Bordeaux mixture (1%) if the attack is severe.
- 4.4 For control of Dieback or Pink disease, chisel out the affected parts and apply Bordeaux paste. Give prophylactic sprays of 1% Bordeaux mixture during May-June and October.
- 4.5 Recommended schedule of pesticide application to contain Tea mosquito and Dieback:-

To control both Tea mosquito and the Dieback fungal infection a spray schedule involving three sprays are recommended

1 st spray	Oct-Nov	*Quinalphos (25EC) 2ml + Copper oxychloride 3gm in one litre water	At the emergence of Vegetative flushes
2 nd spray	Dec-Jan	*Endosulfan 35EC 1.5ml + mancozeb 2gm in 1 litre of water.	At the commence of panicle emergence.
3 rd spray	Jan-Feb	*Carbaryl (50%WP) 2gm in 1 litre of water.	At the completion of flowering and initiation of fruiting.

* Not as per approved usage under Insecticides Act, 1968.

IV. CROP STAGE WISE IPM PRACTICES

Crop stage/ pest	IPM component	IPM practices
Pre sowing	Cultural practices	<ol style="list-style-type: none"> 1. Seednuts must be collected during peak period of harvest and sundried for two to three days 2. Medium sized nuts (7-9gm) may be selected to get vigorously growing seedlings. 3. Seed nuts should be soaked over night in water before sowing. 4. Sow the soaked nuts in the polythene bags filled with potting mixture. 5. Seedlings will be ready for grafting 40-50 days after germination.
Selection of root stock	Cultural Practices	<ol style="list-style-type: none"> 1. Select 40-50 days old healthy seedlings having unbranched main stock
Selection of scions	Cultural Practices	<ol style="list-style-type: none"> 1. Select a high yielding variety cashew as a mother plant to collect adequate number of scions 2. The graft should be prepared on the root stock with appropriately selected scions and will be ready for planting after 5-6 months.
Nursery	Mechanical	<ol style="list-style-type: none"> 1. Remove new sprouts emerging from root stock at frequent intervals. 2. Shift the grafts frequently from one place to another to prevent them from striking roots into the ground.
	Chemical Practice	<ol style="list-style-type: none"> 1. Spray insecticides frequently to control infestation of sucking pests.
Leaf spot	Chemical Practice	<ol style="list-style-type: none"> 1. Spray Bordeaux mixture (1%) if the attack is severe.

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Flushing stage (in Sept. & Oct.)	Cultural practices	<ol style="list-style-type: none"> 1. Removal of weed. 2. Apply recommended dose of fertilizer.
Tea mosquito	Chemical Practices	<ol style="list-style-type: none"> 1. Need based spray. Spray *Quinalphos 25EC 10 ml + 5 litre water or *Phosphomidon 86EC 3 ml + 5 litre water for young trees. Spray *Quinalphos 25EC 20 ml + 10 litre water or *Phosphamidon 6 ml + 10 litre water for adult trees. 2. The maximum number of sprays per year should not exceed three. 3. The same insecticide should not be used for subsequent sprays.
Flushing and flowering stage (in Nov. & Dec.) Stem borer	Mechanical/Chemical Practices	<ol style="list-style-type: none"> 1. Identify the borer hole (alive) and extract mechanically by chiseling out the damaged area of the tree and swab that portion with 0.2% *Carbaryl or by pouring the solution at the tree base. OR swab neem oil (50 ml neem oil + 1 litre water + 0.5 ml teepol/5 gm of soap) on the trunk up to a height of 1 meter. OR prophylactic treatment by swabbing the trunk region up to 1 meter height from the ground level with a suspension of *Carbaryl 0.2% or with coal tar and kerosene (1:2) can be given twice a year during March-April and Nov.-Dec.
Tea mosquito	Chemical Practices	<ol style="list-style-type: none"> 1. Adopt the control measures as shown at flushing stage (in Sept.-Oct.).
Flowering-Fruiting stage (Jan-Feb)	Cultural Practices	<ol style="list-style-type: none"> 1. Plant may require irrigation, about 200 litre of water per adult tree may be applied an interval of 15 days.

Tea mosquito	Biological control Chemical Practices	- Augumentative release of egg parasite <i>Telenomus</i> or <i>Crematogaster</i> for the control of tea mosquito. 1. For young trees spray Thiordan 35EC (*Endosulfan) 16ml+ 8 litre of water or *Carbaryl 50WP 15gm+ 5 litre of water and for adult trees spray *Endosulfan35EC 16ml + 10 litre of water or the *Carbaryl 50 WP 30gm + 10 litre water.
Stem borer	Chemical Practices	1. Adopt control measures as on during Nov -Dec. at flushing and flowering stage.
Fruiting -Harvesting stage (March-April-May)	Cultural Practices	1. Deep irrigation is effective 2. About 2000 litre of water per adult tree may be applied at a interval of 15 days. 3. Mature nuts that fall on the ground may be collected as it may result production of poor quality kernels.
Stem borer	Mechanical/ Biological/ Chemical Practices	1. Keep vigil for infestation of stem borer. If it reveals, adopt the control measure as shown during the month of Nov-Dec at flushing and flowering stage. 2. Use of <i>M. anisoplae</i> or <i>B. bassiana</i> .

V. INTER CROPPING WITH CASHEW

Pineapple is the most profitable intercrop in cashew plantation during earlier stages. Tapioca, groundnut, pulses etc. can also be raised successfully during the initial 3 to 4 years. Care should be taken to see that both the crops (cashew and intercrops) are adequately manured.

VI. INTEGRATED WEED MANAGEMENT IN CASHEW

1. Depending upon the types of weed and intensity of weed growth, weeding is to be done during June-July and on Aug-Sept either chemically or mechanically.
2. Application of Paraquat 0.4 Kg ai/ha thrice at monthly intervals starting from July will effectively control all type of weeds. 2 litre of commercial formulation

of Paraquat 20%EC may be required/ ha. Mix Paraquat @ 4-5 ml/litre of water. 400-500 litre of water may be required/ha.

- Application of Glyphosate once @ 0.8 kg ai/ha (2 litre of commercial formulation during July or Aug. can effectively check all types of weeds. Mix Glyphosate @ 4-5 ml/litre of water and 400-500 of water may be required /ha.

VII. DO'S AND DONT'S IN IPM OF CASHEW:

Do's	Dont's
Grow only recommended varieties.	Don't grow the planting material which are not suited for the Agro-climate zone and pest prone.
Transport grafts carefully to minimize transporting shock.	Don't tamper the graft.
Apply recommended fertilizers and manures as per soil testing.	Don't use imbalance fertilizer.
Ensure regular surveillance for timely detection of pest/disease infestation/infection.	Don't go for blanket ^{spry} without field survey.
Follow a need based spraying strategy. The time of spray must coincide with flushing, flowering and early fruiting depending on the severity of infestation.	The maximum number of sprays/year should not exceed three.
A rational rotation of insecticide would be desirable to counteract the tendency of pest to develop field resistance.	Don't spray the same pesticide for the subsequent year.
Use only recommended pesticides.	Don't use unrecommended mixture of various pesticides.
Apply only recommended weedicide at recommended dose otherwise do it manually or mechanically.	Weedicide should not be applied with irrigation water or by mixing with soil, sand or urea.
The mature nuts that fall to the ground may be collected.	Immature nuts should not be collected as it may results production of poor quality kernels.

VIII. POTENTIAL NATURAL ENEMIES OF CASHEW INSECT PEST

Sl.no.	Name of defender	Host	Stage attacked
1.	Flower bugs(Anthocorids)	Thrips, Aphids, Mites, Lepidoptera	Adult and nymph Egg & small larvae
2.	Shield bug(Predatory Pentatomids)	Bugs, Lepidoptera	Immature & adult stage
3.	Lady bird beetle(Coccinellids)	Aphid, Mealy bug, Jassid, Thrips, Lepidoptera	Nymph and adult

4.	Ground beetle(Carabids)	Soft bodied insect	Larvae & adult
5.	Praying mantids	All insects	All stage
6.	Hover flies(Syrphids)	Aphid	All stage
7.	Ants	Soft bodied insects	Egg and larvae
8.	Predatory cricket(Gryllids)	Lepidoptera	Eggs
9.	Earwigs(Carcinophorids)	Lepidoptera	Larvae
10.	Spiders	All insects	All stage preferably moving stage
11.	Braconids/Ichneumonids	Lepidoptera/Coleoptera	Immature stage
12.	Damselflies/Dragonflies	All insects	Nymph, larvae, adult
13.	Trichogrammatids	Lepidoptera, Coleoptera	Eggs
14.	NPV	Lepidoptera, Coleoptera	Larvae
15.	Green muscardine fungus	Lepidoptera, Coleoptera, Jassid.	Larvae

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CROP: Cashew nut

17. SAFETY PARAMETERS IN PESTICIDES USAGE

S. No	Name of pesticide	Classification as per Insecticides Rules, 1971	Colour of Toxicity Triangle	WHO classification by hazard	First aid measures	Symptoms of poisoning	Treatment of poisoning	Waiting period (No. of days)
INSECTICIDES								
ORGANOCHLORINE PESTICIDES								
1.	Endosulfan	Highly toxic	Yellow	Class II - Moderately Hazardous	<p>Remove the person from the contaminated environment.</p> <p>In case of (a) Skin contact - Remove all contaminated clothings and immediately wash with lot of water and soap; (b) Eye contamination - Wash the eyes with plenty of cool and clean water; (c) Inhalation - Carry the person to the open fresh air, loosen the clothings around neck and chest, and (d) Ingestion - If the victim is fully conscious, induce vomiting by tickling back of the throat. Do not administer milk, alcohol and fatty substances. In case the person is unconscious make sure the breathing passage is kept clear without any obstruction. Victim's head should be little lowered and face should be turned to one side in the lying down position. In case of breathing difficulty, give mouth to mouth or mouth to nose breathing.</p> <p>Medical aid: Take the patient to the docotr/Primary Health Centre immediately along with the original container, leaflet and label.</p>	Nausea, vomiting, restlessness, tremor, apprehension, convulsions, coma, respiratory failure and death	<ul style="list-style-type: none"> - Gastric lavage with 2-4 L. tap water - Catharsis with 30 gm. (10 oz) sodium sulphate in one cup of water - Barbiturates in appropriate dosages repeated as necessary for restlessness or convulsions - Watch breathing closely, aspirate, oxygen and/or artificial respiration, if needed. - Avoid oils, oil laxatives and epinephrine (Adrenalin) - do not give stimulants. - Give calcium gluconate (10% in 10 ml. Ampules) intravenously every four hours. 	

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ORGANOPHOSPHATE PESTICIDES						
2.	Quinalphos	Highly toxic	Yellow	Class II - Moderately Hazardous		<p>Mild - anorexia, headache, dizziness, weakness, anxiety, tremors of tongue and eyelids, miosis, impairment of visual acuity.</p> <p>Moderate- nausea, salivation, lacrimation, abdominal cramp, vomiting, sweating, slow pulse, muscular tremors, miosis.</p> <p>Severe - diarrhoea, pinpoint and non-reactive pupils, respiratory difficulty, pulmonary edema, cyanosis, loss of sphincter control, convulsions, coma and heart block.</p>
3.	Phosphamidon	Extremely toxic	Bright red	Class I a - Extremely hazardous		<p>For extreme symptoms of O.P poisoning, injection of atropine (2-4 mg., for adults, 0.5-1.0 mg for children) is recommended, repeated at 5-10 minute intervals until signs of atropinization occur.</p> <p>Speed is imperative</p> <ul style="list-style-type: none"> - Atropine injection - 1 to 4 mg. Repeat 2 mg. when toxic symptoms begin to recur (15-16 minute intervals), Excessive salivation - good sign, more atropine needed; - Keep airways open, Aspirate, use oxygen, insert endotracheal tube. Do tracheotomy and give artificial respiration as needed. - For ingestion lavage stomach with 5% sodium bicarbonate, if not vomiting. For skin contact, wash with soap and water (eyes- wash with isotonic saline). Wear rubber gloves while washing contact areas. <p>In addition to atropine give 2-PAM (2-pyridine aldoxime methiodide). 1 g and 0.25 g for infants</p>

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							intravenously at a slow rate over a period of 5 minutes and administer again periodically as indicated. More than one injection may be required.	
							Avoid morphine, theophyllin, aminophyllin, barbiturates of phenothiazines.	
							Do not give atropine to a cyanotic patient. Give artificial respiration first then administer atropine.	
CARBAMATES								
4.	Carbaryl	Highly toxic	Yellow	Class II - Moderately hazardous			Constriction of pupils, salivation, profuse sweating, lassitude, muscle incoordination, nausea, vomiting, diarrhoea, epigastric pain, tightness in chest.	<ul style="list-style-type: none"> - Atropine injection 1 to 4 mg. Repeat 2 mg when toxic symptoms begin to recur (15-60 minute intervals). Excessive salivation - good sign, more atropine needed. - Keep airway open. Aspirate, use oxygen, insert endotracheal tube. Do tracheotomy and give artificial respiration as needed. - For ingestion, lavage stomach with 5% sodium bicarbonate, if not vomiting. For skin contact wash with soap and water (eyes - wash with isotonic saline). Wear rubber gloves while washing contact

9/4"



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							<p>area.</p> <ul style="list-style-type: none"> - Oxygen - Morphine, if needed. <p>Avoid theophyllin and aminophyllin or barbiturates.</p> <p>2-PAM and other oximes are not harmful and in fact contra indicated for routine usatge.</p> <p>Do not give atropine to a cyanotic patient. Give artificial respiration first then administer atropine.</p>	
FUNGICIDES								
5.	Copper oxychloride	Slightly toxic	Blue	Class III - Slightly hazardous		Headache, palpitation, nausea, vomiting, flushed face, irritation of nose, throat eyes and skin etc.,	No specific antidote. Treatment is essentially symptomatic.	
6.	Mancozeb		Green	Table 5 - Unlikely to present acute hazard in normal use.				
7.	Sevidol							

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9 1/4"



BASIC PRECAUTIONS IN PESTICIDE USAGE

A. Purchase:

1. Purchase only JUST required quantity e.g. 100,250,500 or 1000 g/ml for single application in specified area.
2. Do not purchase leaking containers, loose, unsealed or torn bags.
3. Do not purchase pesticides without proper/ approved LABELS.

B. Storage:

1. Avoid storage of pesticides in the house premises.
2. Keep only in original container with intact seal.
3. Do not transfer pesticides to other container.
4. Never keep them together with food or feed/ fodder.
5. Keep away from the reach of children and livestock.
6. Do not expose to sun-light or rain water.
7. Do not store weedicides along with other pesticides.

C. Handling:

1. Never carry/ transport pesticides along with food materials.
2. Avoid carrying bulk - pesticides (dusts / granules) on head, shoulders or on the back.

D. Precautions for Preparing Spray Solution :

1. Use clean water.
2. Always protect your NOSE, EYES, MOUTH, EARS and HANDS.
3. Use hand gloves, face mask and cover your head with cap.
4. Use polyethylene bags as hand gloves, handkerchiefs or piece of clean cloth as mask and a cap or towel to cover the head (Do not use olyethylene bag contaminated with pesticides).
5. Read the label on the container before preparing spray solution.
6. Prepare spray solution as per requirement.
7. Do not mix granules with water.

M Package for Castenrot)

8. Concentrated pesticides must not fall on hands etc. while opening sealed containers. Do not smell the sprayer tank.
9. Avoid spilling of pesticide solution while filling the sprayer tank.
10. Do not eat, drink, smoke or chew while preparing solution.
11. The operator should protect his bare feet and hands with polyethylene bags.

E. Equipment:

1. Select right kind of equipment.
2. Do not use leaky, defective equipment.
3. Select right kind of nozzle.
4. Don't blow/clean clogged- nozzle with mouth. Use old tooth- brush tied with the sprayer and clean with water.
5. Do not use same sprayer for weedicide and insecticide.

F. Precautions for applying pesticides:

1. Apply only at recommended dose and dilution.
2. Do not apply on hot sunny day or strong windy condition.
3. Do not apply just before the rains and also after the rains.
4. Do not apply against the wind direction.
5. Emulsifiable concentrate formulations should not be used for spraying with battery operated ULV sprayer.
6. Wash the sprayer and bucket etc with soap water after spraying.
7. Containers, buckets etc. used for mixing pesticides should not be used for domestic purposes.
8. Avoid entry of animals and workers in the fields immediately after the spraying.

G. Disposal:

1. Left over spray solution should not be drained in ponds or water lines etc. Throw it in barren isolated area, if possible.
2. The used/ empty containers should be crushed with a stone / stick and buried deep into soil away from water source.
3. Never re-use empty pesticide container for any purpose.
