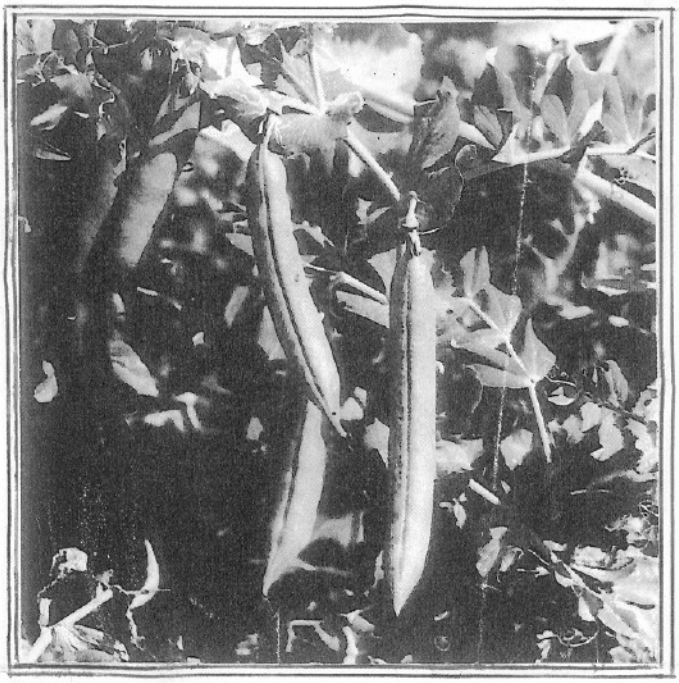
IPM PACKAGE NO. 51

INTEGRATED PEST MANAGEMENT PACKAGE

FOR

PEA



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

(No. 51)

IPM PACKAGE FOR PEA

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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 Progamme 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. Ragunathan)

(IPM Package for Pea)

PREFACE

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, Cucurbitacious vegatables), 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 Pea)

ACKNOWLEDGEMENTS

The IPM Package of Practices for **Pea** crop was discussed and finalised in the National Workshop on IPM held at Central Insecticide Laboratory (CIL), Dte of Plant Protection, Quarantine & Storage, Faridabad during Feb.20-22, 2002. The technical input received from the following experts is thankfully acknowledged.

I. Chairman, Technical Session : Dr. AD Pawar, Director (IPM), Dte of PPQS, Faridabad

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IPM PACKAGE FOR PEA

I. MAJOR PESTS

A. Pests of National Significance

1. **Insect pests:**
   - 1.1 Pea pod borer (*Etiella zinckenella)*
   - 1.2 Stemfly (*Ophiomyia phaseoli)*

2. **Diseases:**
   - 1.1 Powdery mildew (*Erysiphe pisi* syn. *E. polygoni*).
   - 1.2 Rust (*Uromyces viciae fabae* syn. *U. fabae*).

3. **Weeds:**
   - 1.1 Bathua (*Chenopodium album)*
   - 1.2 Matri *(Lathyrus aphaea)*
   - 1.3 Chatri (*Vicia sativa)*
   - 1.4 .Senji (*Melilotus alba)*

4. **Nematodes:**
   - 1.1 Root knot nematodes (*Meloidogyne incognita* and *M. javanica)*

5. **Rodents:**
   - 1.1 Smaller Bandicoot

B. Pests of Regional Significance

1. **Insect pests:**
   - 1.1 Pea black aphid (*Aphis craccivora)* - Indo gangetic plain
   - 1.2 Leaf miner (*Chromatomyia horticola)*

2. **Diseases:**
   - 1.1 Downy mildew (*Peronospora viciae* syn. *P. pisi*) – Indo Gangetic plains
   - 1.2 Ascochyta blight (*Ascochyta pisi, A.. pinodes, A.. pinodella*)-Himalayan Region.
   - 1.3 White rot (*Sclerotinia sclerotiorum*) - J &K, Himachal Pradesh
   - 1.4 Root rot (*Fusarium solani, Rhizoctonia solani*) – Early sown crops and irrigated crops of U. P., Bihar and West Bengal.

3. **Nematodes :**
   - 1.1 Reniform nematode

II. PEST MONITORING:

The objectives of pest monitoring is to detect the initial development of pest and diseases and also the bio-control agents in the field situations.

1. Rapid Roving Survey:

a. 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 Surveys. During survey the observations are to be made at every 5 to 10 kms, distance in the pre-selected route at 7 to 10 days intervals depending upon pest and disease situation. Record the incidence of pests and diseases and defender population at each spot on 5 plants at random. (12 spots per ha.)

b. Root-knot produces diagnostic symptoms are "gall" formation on roots. Reniform produces "dirty roots system." Stunting of plants and early florescence. Patches and uneven rows of plants in the field indicate heavy infestation of root knot nematode.

c. The working index for rodent pests: 25 live burrows/ha.

2. Field Scouting

Based on the observation of Rapid Roving Survey 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 to 10 days in their own fields as per Agro Eco System Analysis (AESA) approach. The State Departments of Agriculture should make all possible efforts by using different media mode and publicity to inform the farmers about field scouting in the specific crop areas having indication of insect pest or disease build up.

3. Agro Eco System Analysis (AESA)

AESA is an approach which can be gainfully employed by extension functionaries and farmers to analyse field situation with regard 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 AESA are:

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

The details of the AESA are given in Annexure-I.

4. Economic Threshold Levels (ETLs)

Insects

Pea pod borer – 5% pod damage
Stem fly - 5% plant damage
Rodents -25 live burrows/ha.
Nematode -1 to 2 larvae per gram of soil or
1 gall/knot on root system.

Diseases:

1. Powdery mildew – 5 to 10% severity/if achieved.
2. Rust – 5 to 10% severity/ before grain.
3. Downy mildew - 10 to 15% severity/filling stage.
4. Root rots - 5.0 -10% incidence.

III. INTEGRATED PEST MANAGEMENT PRACTICES:

A. Cultural:

1. Deep ploughing in summer.
2. Use of tolerant/resistant varieties
3. Crop rotation with non leguminous crops.
4. Early and timely sowing of selected varieties
5. Inter crop with linseed/mustard/barley
6. Hoeing/weeding 30-35 DAS
7. Collection and burning of crop residues
8. Green manuring in Kharif in those fields where root rots are above 10%
9. Wider spacing particularly for tall varieties to avoid damage by rust, powdery mildew, white rot and *Ascochyta* blight.
10. Optimum depth of sowing (5-7cm) to avoid seed rots.
11. Timely weeding to remove V*icia sativa, Chenopodium album, Melilotus alba* and *V. hirsuta.*
12. Intercropping with mustard or faba bean to reduce powdery and rust.
13. Use balanced dose of NPKS (20 kg: 40kg : 20 K: 20 kg). Avoid excessive nitrogen.
14. Apply need based and light irrigation (Excessive moisture increase root rots, rust white rot and powdery mildew).

B. Mechanical:

1. Clean the seed properly. No crop residue should be intermixed with the seed.
2. Rogue out the plants showing virus symptoms such as mosaic, top yellows, streaks, brown ring spots etc.
3. Use of bird scarers for crows.
4. Use of barriers for porcupine.

(IPM Package for Pea)

C. Biological:

Inundative release of *Coccinella septempunctata* @ 1000 adults/4000 sq.m. for aphid management (2 release at 10 days interval).

1. Soil amendment with pearl millet residues, mustard cake or mustard pod straw to reduce root rots.
2. Seed treatment with *Bacillus subtilis, Pseudomonas fluorescens* or *Gliocladium virens* for the management of root rots and damping off diseases.
3. Soil application of *Trichoderma harzianum* or spraying of *B. subtilis* for the management of white rot disease.
4. *Paecilomyces lilacinus* @ 10^8 spore (Pinch)/kg. seed as seed treatment for nematodes.
5. *Aspergillus niger* @ 10^8 spore, (Pinch)/kg seed, as seed treatment for nematodes.

D. Chemicals:

I. Insects:

Insecticides	Insects	Dose
Phorate (Seed dressing)	Stemfly	1.5 kg a.i./ha
Carbofuran (soil Application)	Stemfly	2.0 kg a.i./ha
Phorate (Granules)	Pea pod borer	1-2 kg a.i./ha
Carbofuran Granules	Pea leaf miner	1.0 kg a.i./ha
*Cypermethrin EC	Pea pod borer	0.002%
Endosulfan EC	Pea pod borer	0.03%
*Methomyl EC	Pea pod borer	0.04%
Monocrotophos EC	Pea pod borer	0.04%
*Cypermethrin EC	Black aphid	0.002%
Fenvalerate EC	Black aphid	0.004%

II. Diseases:

Chemical	Disease	Dose
*Carbendazim	Seed rot, Damping off, root rots, collar rot	2-3 g /1 kg seed
*Carbendazim + Thiram	-do-	1+2 g/1 kg seed
*Thiram	-do-	3 g/1 kg seed
Captafol	-do-	3 g/1 kg seed
Wettable sulphur	Powdery mildew and rust	3g/lit water
*Carbendazim	Powdery mildew white rot, *Ascochyta* blight	0.5-1.0 g/lit
*Triadimefon	White rot, powdery mildew	0.25-0.5 g/lit
Dinocap	Powdery mildew	1-2 g/lit
Tridemorph	Powdery mildew	0.5 g/lit
Mancozeb	Rust, Downy mildew *Ascochyta* blight	2-3 g/lit
*Copper oxychloride	*Ascochyta* blight	2.5-3 g/lit
*Zineb	*Ascochyta* blight	2.5-3 g/lit

III. Rodents:

Bromodiolone 0.005% Rats 10-15 g/burrows

IV. Nematodes:

Seed treatment

1. *Chlorpyriphos 20EC @ 0.2%
2. *Trizophos 40 EC @ 1%
3. *Dimethoate 30 EC @ 0.2%
4. *Carbosulfan @ 3%

Soil application

1. Carbofuran 3G @ 1 kg a.i./ha at sowing
2. *Phorate 10G @ 1 kg a.i./ha

*Not as per the approved usage under Insecticide Act, 1968.

(IPM Package for Pea)

E. Resistant varieties:

Variety	Yield (Q/ha)	Adaption	Special character
DMR 11	18-22	NHZ, NWPZ, NEPZ, CZ	PM resistant
HUP 2(Malviya matar 2)	18-22	NEPZ	PM resistant
Pant P 5	18-22	NWPZ	PM resistant
JP 885	18-22	CZ	PM resistant
HFP 4 (Aparna)	20-25	NWPZ	Dwarf, PM resistant
KFP 103	18-22	NWPZ	PM resistant
DMR 7 (Alankar)	20-24	NWPZ	PM resistant
DDR 13	18-22	NEPZ and CZ	Dwarf, PM resistant
HFP 8909	20-25	NEPZ and CZ	Dwarf, PM resistant
KPMR 114-1	20-25	NEPZ	Dwarf, PM resistant
Malviya Matar 15	22-30	NEPZ	Dwarf, PM & rust resistant
Rachna (KMPR 10)	20-25	NEPZ and NWPZ	Dwarf, PM resistant and tall type

NHZ : North Hill Zone (J & K and Hilly areas of Himachal Pradesh and U.P.)
NWPZ : North West Plain Zone (Punjab, Haryana, Western U.P.)
NEPZ : North East Plain Zone (Eastern U.P., Bihar, West Bengal, Plain of Assam)
CZ : Central Zone (M.P.) Parts of Rajasthan)
PM : Powdery Mildew

Nematode : Tolerant varieties

DDR16, HFP4, AVT-2(D), HFP9510, LFP227

IV. CROP STAGE/PEST-VIZ-A-VIZ IPM PRACTICES

S.No.	Crop Stage	Pest	IPM Component	IPM Practices
1.	Pre-sowing	Root rot Nematodes stemfly weeds	Cultural	1. Deep summer ploughing 2. Green manuring in Kharif in those fields where root rots are above 10 percent 3. Use of tolerant varieties 4. Crop rotation with non-leguminous and non-solanaceous crops 5. Application of FYM/neem cake/Mahua cake @ 500 Kg/ha prior to sowing 6. Follow optimum sowing depth of 5-7 cm 7. Inter-cropping with mustard/linseed/barley/wheat 8. Use 20 kg:40kg:20 kg and 20 kg NPKS per hectare 9. Wider spacing for tall varieties 10. Timely sowing, avoid very early sowing
			Biological	1. Soil amendment with pearl millet or mustard residues 2. Seed treatment with *Bacillus subtilis, Pseudomonous fluorescens or Gliocladium verens* if root rots are problem 3. Soil applicaton of *Trichoderma harzianum* for white rot management 4. Seed treatment with the latex of *Calotropis* @ 1 g/kg seed, *Pacilomyces lilacinus* or *Aspergillus niger* @ 10^8 spore (pinch)//kg seed for nematode management
			Chemical	1. Seed treatments with Phorate for Stemfly management 2. seed treatment with *Thiram, *Thiram+Carbendazim, Carbendazim or Captan for root rot management 3. Seed treatment with *Chlorpyriphos, *Dimethoate or *Carbosulfan for nematodes.

2.	Seed and seedling	Root rots Nematodes Stemfly weeds	Cultural	1. Avoid early irrigation unless absolutely essential.
			Mechanical	1. Rogue out the plants showing virus symptoms such as mosaic, top yellows, streaks etc.
			Chemical	1. apply pre-emergence spray of *Pendimethalin @ 0.75-1.0 kg a.i./ha
3.	Vegetative	Root rots nematodes Weed Downy mildew	Mechanical	1. Do manual weeding if needed
			Chemical	1. Spray Mancozeb @ 2.5 g/lit at the ETL of downy mildew.
4.	Flowering and podding	Root rots Nematodes Pod borer Rust Powdery mildew Leaf miner Aphids Rodents Birds	Cultural	1. Need based and only light irrigation 2. Rogue out virus infected plants
			Mechanical	1. Fix bird scarers
			Biological	1. Spray *Bacillus subtilis* in white rot prone areas. 2. Release predator *Coccinella septempunctata* at the ETL of aphids
			Chemical	1. Spray Endosulfan or Monocrotophos for insect pest management 2. Spray wettable sulphur, *Zineb, *Copper oxychloride, Mancozeb or *Carbendazim etc. as per the need for disease management 3. Apply Bromodiolone (0.005%) baits inside the rodents burrows.
5.	Post harvest	Rust seed borne fungi Bruchids	Mechanical	1. Clean the grain seed properly, remove crop debris and shrivellid grains. 2. Dry the grain properly 3. Collect crop residues from harvested field and burn 4. Store the grain in properly cleaned seed bins 5. Make "Dhal" for required quantity. Dhal is less prone to bruchids than whole grain.

*Not as per the approved usage under Insecticide Act, 1968

Strategy for decision making (Examples)

1. If during early growth stage 5% plant damage by stemfly are observed, such fields should not be grown with Pea/Rajmah next year.
2. If during podding stage, 5% Pod damage by Pea pod borer is observed, apply 0.07% Endosulfan or 0.04% Monocrotophos.
3. a) If 5-10% severity on surface area of powdery mildew or rust are recorded before grain filing stage, apply wettable sulphur @ 3 gm/lit.
   b) Apply Manocozeb @ 2-3 gm/lit. if only rust is present.
   c) Apply Carbendazium 0.5-1 gm/litre.

AGRO-ECO-SYSTEM ANALYSIS (AESA)

Agro-eco-system analysis (AESA) is a process which involves periodical (weekly) observations of plant health, plant compensation abilities, ETL, climate factors, change of pest and defenders population and their inter-relationship. AESA can be practices by more than one group of trained farmers in a village. AESA helps in decision making on management practice required to be adopted at each crop growth stage. AESA technique may be useful in farmer to farmer IPM training programme also.

Method:

A. **Field Observations**

a) Enter the field at least 5 ft (1.5 m). away from the bund. Select a site with a dimensation of one sq. mt. randomly.

b) Record the observations in following sequence :

i) Flying insects (both pests and defenders)

ii) Close observation on pests and defenders which remain on the plants.

iii) Observe pests like *S litura* and defenders like ground beetle/rove beetle/earwigs by scrapping the soil surface around the plants.

iv) Record disease and its intensity.

v) Record insect damage in percentage.

vi) Record species wise weed population/sq. m

c) Record in one of the selected plants, parameters like number of leaves, branches, plant height and reproductive parts (plant should be flagged for making observation in the following weeks).

d) Record the types of weeds, their size and population density in relation to crop plant.

f) Repeat the step (a) to (d) for other randomly selected four sites.

g) Record the climate factors viz. sunny, cloudy, partly cloudy, rainy etc. for the preceding week.

B. Drawing:

First draw the plant with actual number of branches/leaves etc. at the centre on a chart. Then draw pests on left side and defender on the right side. Indicate the soil condition, weed population, rodent damage etc. Give natural colours to all the drawing, for instance, draw healthy plant with green colour, diseased plant/leaves with yellow colour. While drawing the pests and the defenders on the chart care should be taken to draw them at appropriate part of the plant, where they are seen at the time of observation. The common name of pest and defenders and their population count should also be given alongwith diagram. The weather factor should be reflected in the chart by drawing the diagram of sun just above the plant if the attribute is sunny. If cloudy, the clouds may be drawn in place of sun. In the case of partially sunny, the diagram of sun may be half masked with clouds.

C. Group Discussion and Decision Making:

The observation using the previous and current charts should be discussed among the group members by raising questions relating to change in pest and defenders population, crop stage, etc. The group may evolve a strategy based up on weekly AESA, ETL and corresponding change in P:D ratio and take judicious decision for specific pest management practices.

D. Strategy for Decision Making : (Example)

Some of the defenders like lady beetles, *Chrysoperla, Syrphids*, etc. play useful role in arriving at P:D ratio.

1. By Farmers:

After a brief exposure during IPM demonstrations/field training, farmers can practice AESA in their own fields. Wherever trained farmers are available their experiences could be utilized in training their fellow farmers in their own villages. Thus a large group of farmers could be made proficiently competent in undertaking weekly AESA thereby empowering themselves in decision making on any specific pest situations. Farmers – to – farmers training approach will go a long way in practicing IPM on a large area on sustainable basis.

2. By Extension Workers:

The extension functionaries during their regular visit to the village mobilise the farmer, conduct AESA and critically analyse the various factors such as the pest population vis-à-vis defender population and their role in natural suppression of the pest, the influence of prevailing weather condition / soil conditions on the likely build up of defender/pest population. They may also take the decision based on the AESA, which IPM components like release of defenders, application of safe pesticides are to be used for specific pest situation. Such an exercise may be repeated by the extension functionaries during every visit to the village and motivate the farmers to adopt AESA in their fields.

***

ANNEXURE -II

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 polyethylene 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.
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 burried deep into soil away from water source.

3. Never re-use empty pesticide container for any purpose.