







FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES

Lecture- 10 Safety issues in pesticide uses

Pesticides are toxic to both pests and humans. However, they need not be hazardous to humans and non-target animal species if suitable precautions are taken. Most pesticides will cause adverse effects if intentionally or accidentally ingested or if they are in contact with the skin for a long time. Pesticide particles may be inhaled with the air while they are being sprayed. An additional risk is the contamination of drinking-water, food or soil. Special precautions must be taken during transport, storage and handling. Spray equipment should be regularly cleaned and maintained to prevent leaks. People who work with pesticides should receive proper training in their safe use.

Toxicity labels viz; red label, yellow label, blue label and green label are mandatory labels employed on pesticide containers in India identifying the level of toxicity (that is, the toxicity class) of the contained pesticide. The schemes follow from the Insecticides Act of 1968 and the Insecticides Rules of 1971.

The labeling follows a general scheme as laid down in the Insecticides Rules, 1971, and contains information such as brand name, name of manufacturer, name of the antidote in case of accidental consumption etc. A major aspect of the label is a color mark which represents the toxicity of the material by a color code. Thus the labelling scheme proposes four different colour labels: viz red, yellow, blue, and green.

Label	Name	Level of toxicity	Oral lethal dose (mg/kg)	Listed chemicals
	Red label	Extremely toxic	1–50	Monocrotophos, zinc phosphide, ethyl mercury acetate, and others.
	Yellow label	Highly toxic	51–500	Endosulfan, carbaryl, ^[2] quinalphos, ^[2] and others.
	Blue label	Moderately toxic	501–5000	Malathion, thiram, glyphosate, ^[2] and others.
	Green label	Slightly toxic	> 5000	Mancozeb, oxyfluorfen, mosquito repellent oils and liquids, and most other household insecticides.

Precautions taken while purchasing pesticides:

- ✓ Purchase pesticides/biopesticides only from registered pesticide dealers having valid License
- ✓ Purchase only just required quantity of pesticides for single operation in a specified area
- ✓ See approved labels on the containers/packets of pesticides
- ✓ See Batch No., Registration Number, Date of Manufacture / Expiry on the labels
- ✓ Purchase pesticides well packed in containers
- ✓ Always purchase with proper Bill or Invoice and all details like batch number, manufacturing date & expiry date should be mentioned in it

Precautions taken while storing pesticides:

- ✓ Store the pesticides away from house premises
- ✓ Keep pesticides in original containers
- ✓ Pesticides/weedicides must be stored separately
- ✓ The area where pesticides have been stored, should be marked with warning signs

- ✓ Pesticides be stored away from the reach of the children and livestock
- ✓ Storage place should be well protected from direct sunlight and rain

Precautions taken while handling, preparing spray solution and application

- ✓ Keep pesticides separate during transportation
- ✓ Bulk pesticides should be carried carefully to the site of application
- ✓ Always use clean water
- ✓ Use protective clothing viz., hand gloves, face masks, cap, apron, full trouser, etc. to cover whole body
- ✓ Always protect your nose, eyes, ears, hands, etc. from spill of spray solution
- ✓ Read instructions on pesticide container label carefully before use
- ✓ Prepare the solution as per requirement
- ✓ Granular pesticides should be used as such
- ✓ Select right kind of equipments
- ✓ Select right sized nozzles
- ✓ Use separate sprayer for insecticides and weedicides
- ✓ Apply only recommended dose and dilution
- ✓ Spray operation should be conducted on cool and calm day
- ✓ Spray operation should be conducted on sunny day in general
- ✓ Use recommended sprayer for each spray
- ✓ Spray operation should be conducted in the wind direction
- ✓ After spray operation, sprayer and buckets should be washed with clean water using detergent/soap
- ✓ Avoid the entry of animals/workers in the field immediately after spray

Precautions taken after application of pesticides

- ✓ Left over spray solutions should be disposed-off at safer place viz. barren isolated area
- ✓ The used/empty containers should be crushed with stone/stick and buried deep in soil away from water sources
- ✓ The used/empty containers should be crushed with stone/stick and buried deep in soil away from water sources
- ✓ Wash hands and face with clean water and soap before eating/smoking
- ✓ On observing poisoning symptoms give the first aid and show the patient to doctor. Also show the empty container to doctor

Maintenance of sprayers

The inside and exposed parts of the sprayer should be thoroughly cleaned after each use and before storage. As a rule, first wash the tank with soap and water and then rinse with water.

Wettable powders and solutions are easily cleaned from sprayers by rinsing thoroughly with water. Clean the sprayer as follows:

- Fill the tank half full with clean water and shake vigorously. Flush out the cleaning water through the nozzle by operating the sprayer;
- Repeat the procedure above;
- Remove nozzle tips and screens. Clean them in kerosene or detergent solution using a soft brush;
- Do not use a knife, wire, or any hard materials to clean the nozzle tips and never blow into them with your mouth;
- Fill the tank again to about half full with water and add a small amount of household soap;
- Operate the pump to circulate the soap solution through the sprayer, and then flush it out through the sprayer nozzle;
- At the end of the spraying season, follow the cleaning operations listed above and finally rinse the sprayer with a light oil to protect the metal and rubber parts from corrosion;
- Remove nozzle tips, strainers and screens and apply a coating of light oil before storage;