



Safe use of pesticides on rapeseed-mustard crop



ICAR-DIRECTORATE OF RAPESEED-MUSTARD RESEARCH



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frequent clogging of the nozzle and do not blow/clean clogged nozzles with mouth. Pesticides should not be applied with the wind blowing towards an adjoining susceptible crop, water bodies, pasture field and grazing animals. Do not eat, drink or smoke beedi, cigarette, chewing tobacco, gutkha etc. during spraying. Children, animals, birds etc. should not be allowed to come in the fields at the time of spraying/dusting. Spraying should be done in the evening when there is no wind. Spraying should be done only in the direction of the wind. Avoid spraying on windy, hot and rainy days. Hold the sprayer nozzle at the knee height to avoid drift and marked the sprayed area to avoid repeated spraying. Spraying should be done in such a way that the pesticides sticks on both the upper and lower side of the leaves of the plant because most of the pest-diseases are more prevalent on the lower surface of the leaves.

8. Precaution while applying dust- Select proper duster as per need and dust the crop in early hours of the day and avoid application during the wind. Adopt boom dusting for uniform coverage and wet dusting technique in dry land crops. Do not dust the crop against the wind and maintain proper speed of the blower for uniform coverage.

9. Precaution after spraying/dusting- Leftover spray solution should be disposed off in barren isolated area or give to the needy neighbour if essential. Always keep the leftover pesticide in original container and away from the food stuff and children.



Never put the pesticide in other containers that could be mistaken for a drink container as many people have been reported to be poisoned and killed by inadvertently drinking from these containers. Destroy the empty container of pesticide by crushing and digging in barren land. Put the thorny bushes around the pit to safeguard the grazing animals. Do not dump excess, unwanted, or old pesticides in to the drain, soil, open waterways, gutters, storm drains or sewers. Put the flag written with the signal word in bold red letters *i.e.*

'DANGER' the field is sprayed or dusted with pesticide at appropriate places in the field. Do not allow the children, animals and non-workers to enter the sprayed/dusted field. Do not eat, drink or smoke with



contaminated hands after spraying. Wash the hand thoroughly with soap after handling pesticide. Wash the equipment three times with soap and water and then rinse with water properly. Remove and wash the protective cloths with detergent, take a bath and wear clean cloths. Drink sour lemon or milk and sit in a well ventilated place at least one hour after spraying/dusting to reduce the immediate effect of any pesticide. Maintain a proper record of pesticide application.

Sign and symptoms of pesticide poisoning

Pesticide poisoning mainly occur due to ignorance and negligence about the pesticides use. The symptoms of pesticidal poisoning differ with the type of pesticide, absorption and extent of exposure. Based on the extent of poisoning, the symptoms may be mild (headache, nausea, dizziness, irritation in skin, eyes, nose and throat and sense of fatigue, perspiration and loss of appetite), moderate (vomiting, blurred vision, stomach cramps, increased pulse rate, suffocation and difficulty in breathing, contracted pupils of eyes, excessive perspiration, twitching of the muscles, trembling and nervous distress etc) and severe (convulsions, respiratory failure, loss of pulse, blue skin, unconsciousness and even death).

First aid for victims of poisoning

- Remove the patient from the site of contamination to a safe and airy sheltered place.
- Remove any contaminated clothing immediately, wash all the affected parts of the body with clean water or wipe with a piece of cloth if available, or even with paper or leaves.
- Maintain the breathing of the patient through artificial respiration if unconscious.
- Never administer anything when the patient is unconscious, in coma or having convulsion.
- Took the patient and pesticide container (for identification of poisoning) to the nearest hospital or clinic for medical help.



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In the modern era, chemical fertilizers are being used along with improved varieties to get more production from agriculture. Apart from this, there is also a risk of infection of pests, diseases and weeds. To get more production, seed treatment before sowing and various pesticides are used for pest control from time to time after sowing.

A pesticide is any material (natural, organic, or synthetic) used to control, prevent, kill, suppress, or repel pests. "Pesticide" is a broad term that includes insecticides (insect killers), fungicides (fungus killers), herbicides (weed or plant killers), rodenticides (rodent killers), miticides (mite killers) and molluscicides that kill snails and slugs. No doubt pesticides are reliable source to keep the pest population below check but if they are used judiciously, they may pose serious health hazards to human beings, domestic animals, natural enemies of crop pests and other form of life through unwanted contamination of food, feed, water bodies and environment. Non-judicious use results in same time development of resistance to insect-pests against chemical pesticides, pest resurgence, secondary pest out-break and increase in cost of production due to high cost of pesticides are other disadvantages. All this realization has resulted in certain extremist quarters demanding the banning the use of the most of the insecticides. However, the sensible approach suggested and generally accepted to increase crop production and sustaining higher yields for judicious use of pesticides.

Generally, farmers spend enough time for monitoring pests in their fields. This is a good thing, but some farmers spray pesticides available at home or buy them immediately on seeing some insects. On the other hand, some farmers wait that there are less pests, and in that wait the pests start causing economic losses, and then arrange for spraying. In both the methods, instead of benefiting from spraying, expenditure/labour etc. goes waste. For this some things should be kept in mind:-

1. Strive for the success of natural control.
2. If the ratio of harmful insects and beneficial insects in the crop is 2:1, there is no need to spray pesticides. An effective remedy should be adopted only when the number of insects increases and the number of beneficial insects decreases. Use of pesticides should be the end goal.
3. It is necessary to study the methods of causing harm by insects and their life cycle. That is, only after getting information from an experienced specialist, an effective insecticide should be selected.
4. If spraying of pesticides is necessary, keep in mind that there should be maximum protection of beneficial insects and pollinating insects. Therefore, such chemicals should be selected which cause least harm to these beneficial insects.

Therefore, along with taking care of some things, it is necessary for the farmers to know the following precautions to be taken while purchasing, using, transporting, storing, handling, etc. of pesticides

- 1. Purchase of pesticides-** Always purchase recommended pesticide from registered pesticide dealers having valid licence of the product after identification of disease, insect or weed in the crop. If there is any problem in their identification, get them identified from the agricultural expert/agricultural scientist/officer/employee of agriculture department. Do not buy banned chemicals.



Purchase only the required quantity for single operation. The container of pesticide should have proper seal and original labels. See batch number, registration number, expiry date of pesticide on the label. Do not use pesticides after the expiry date. Pesticide should be well packed in container. Do not buy mutilated or leaking cans in any way. Do

not buy loose pesticides. Always take the receipt of purchased product from the dealer.

- 2. Transportation of pesticides-** Do not load the pesticide into a vehicle carrying passengers, animals, foodstuff or animal feed. Do not place heavy object or sharp or protruding material such as nails on or near the pesticides. Load and unload the vehicle with care and clean the vehicle thoroughly before transporting other items.

- 3. Storage of pesticides-** Do not store pesticide with food stuff or animal feed. Never store pesticide in living room, kitchen, animal house and toilets.

Do not purchase pesticides too early to avoid unnecessary storage of pesticide for a longer period. Always keep pesticide stored under lock and key. Check the pesticide container for any leakage or damage. Always keep the pesticide in original container. Store in dry and cool place and avoid sunlight etc. Keep all pesticides away from the source of drinking water, well, stream, fire, direct sunlight, reach of children and other family members. Do storage in classified manner like - insecticides, fungicides, herbicides etc.



- 4. Dilution of pesticides-** Always read the label for safety precautions to be observed. Select the dose rate and note the instructions for mixing on the product label. Proper measuring of concentrated formulations of pesticides is essential for their effective and safe use. Dilute pesticide with water. Generally do not make solution by mixing more than one chemical while making solution.



Wear protective clothing *i.e.* Apron, boots, gloves, respirator and goggles. Avoid contact of pesticide solution to skin, wounds, eyes, mouth etc. Keep children and animals away from the mixing area. Stand opposite to the wind direction. Always use clean water for mixing of pesticides. Use bucket and sticks for mixing purpose (do not mix with hand). Use funnels to pour liquids into sprayers to avoid spillage and splashes. Pesticides should be mixed at the working site not at the home. Never leave pesticide un-attended in the field.

- 5. Sprayer Calibration –** Calibrate the sprayer with water to find out the quantity to be used per unit area before mixing and spraying any pesticide.

This enables the person to know the quantity of water to be required to mix the recommended product per unit area for uniform application of pesticide over a given area of land/tree. Do not make arbitrary assumptions about the required quantity of water and pesticide to be mixed during spraying.



- 6. Use suitable nozzles-** Always use suitable nozzles while spraying *i.e.* jet nozzle for spraying for herbicides and hollow cone nozzle for insecticides and fungicides. Before use, check the nozzles etc. of the sprayer/duster, machines by filling them with water and running them empty. Do not blow through your mouth while cleaning the nozzle. There should not be any kind of leakage in these nozzles.



Many farmers do not aware which type of nozzle is fitted on the sprayer and they use to spray the herbicide, insecticide and fungicide with the same nozzle which will certainly affect the bio-efficacy of the pesticide in pest control programme.

- 7. Precautions while spraying-** The sprayer should be thoroughly washed with clean and soft water twice or thrice to remove any unwanted residue of previously used chemical pesticide that may be phytotoxic to the crop. If there are open wounds on the body, tie a thick bandage on them.

Each and every component of sprayer should function well and check to avoid any leakage of pesticide. The sprayer should not be over filled in order to avoid leakage. Filter the water through muslin cloth to avoid

