

Pesticides

*The Handling, Application and
Storage of Pesticides on Farms*



*Voluntary Code
of Good Practice*

PESTICIDES

The main concern of this code of practice is the avoidance of damage by pesticides to the health and safety of sprayer operators and to the environment. However, implementation of the code should also lead to more efficient use of pesticides, which should balance any additional costs involved in the improvement of pesticide handling and storage facilities.

The Safety, Health and Welfare at Work Act of 1989 requires employers to safeguard the health and welfare of employees at their work-place. Employees have corresponding obligations to co-operate with management in the implementation of safe working practices. The self-employed have a responsibility for their own well-being and that of third parties. All of these issues are spelt out in more detail in the Safety, Health and Welfare at Work (General Application) Regulations 1993.

The 1989 Act and 1993 Regulations require employers and the self-employed to prepare a safety statement listing the hazards in the work-place and the steps being taken to reduce the risk of accident or health damage arising from these hazards. Farms where pesticides are used should include all aspects of this operation in their statement.

The 1977 Water Pollution Act, revised and strengthened in 1990, specifies severe penalties for pollution of water-courses. This has implications for the methods used in the filling and washing-out of sprayers.

The Pesticide Control Service of the Department of Agriculture, Food and Forestry regulates the registration, packaging and labelling of pesticides in Ireland. It also monitors pesticide residues in food crops to ensure that specified residue levels are not exceeded through over-dosing, uneven or late application, or unauthorised use of pesticides.

INSTRUCTION AND TRAINING OF SPRAYER OPERATORS

The Safety, Health and Welfare at Work Act and its 1993 Regulations specify that any operator carrying out a hazardous task should receive adequate training in the safe conduct of that task. Training for sprayer operators should include familiarisation with the hazards of the products being applied, safe handling and storage of pesticides, safe procedures for mixing and applying pesticides, calibrating, operating and washing-out the sprayer, drift avoidance, disposal of washings and empty containers, use of protective clothing, and first aid.

To help employers in the provision of training, Teagasc is providing two-day training courses for sprayer operators, which lead to the award of a Certificate of Competence in pesticide application.

THE PESTICIDE LABEL

The label on the container provides a precise summary of precautions to be taken and restrictions on the use of the pesticide. It is a legal requirement that the pesticide is handled, applied and stored in accordance with the label instructions. Particular attention should be paid to the label when tank mixing. Failure to comply with label details may lead to damage to the crop, the environment or the sprayer.



**READ THE LABEL CAREFULLY
BEFORE OPENING THE CONTAINER**

EQUIPMENT AND FACILITIES

Pesticide storage

Once a pesticide has been purchased, it is the owner's responsibility to see that it is kept safely until used. Safe, lock-up storage for pesticides is essential. The main requirements of a pesticide store are as follows:

- ▶ It should be big enough to contain all the pesticides that may need to be stored on the farm at any time during the year.
- ▶ It should be easy to lock securely.
- ▶ Risk of fire in the vicinity of the store should be kept to a minimum; use fire-resistant construction materials and locate in a place where there is no fire hazard. Where possible, light switches should be kept outside the door. Very flammable pesticides may require special precautions.
- ▶ Chemical spillages should be contained within the store, by bunding rather than drainage to a sump. The floor should be sealed to above bund (retaining) level. It should be well lit, well ventilated and reasonably frost-proof.



A simple pesticide storage cabinet.

- ▶ There should be clear access to the store.
- ▶ It should be clearly labelled as a pesticide store.
- ▶ Facilities for washing up and storage of protective gear should be provided near the store. Eye-wash facilities (2 x 500ml saline solution rather than eye-baths) should be provided in or beside the store.

In practice the pesticide store can be anything from a lock-up cabinet to a special-purpose building, depending on the scale of operation. Nothing other than pesticides should be kept in the store. In managing the store, all products should be stored on shelves, segregated (fungicide, herbicide, etc) as far as practicable, and rotated so that the oldest containers, or those on which the label is becoming detached or illegible, are used first. Powders should be stored above liquids, not vice versa.

Sprayers

The 1989 Act clearly requires that operators be provided with a sprayer that is in good working order, and that they maintain it in that condition. All power drives should be properly covered, there should be no leaks, and it should be possible for the operator to carry out a spraying operation without undue risk of contamination. It is also important that the machine has a pressure gauge which is reading accurately.



A sprayer fitted with a low level filler, wash water container and box for protective clothing.

Where a new sprayer is being bought, it should include as many as possible of the following safety features:

- ▶ A clean water tank should be fitted on the sprayer or tractor to allow the operator to wash immediately if contaminated by spray and to facilitate clearing of blocked nozzles and filters.
- ▶ There should be a safe system for adding chemical to the tank. This may consist of a low-level induction filler, or one of the proprietary chemical transfer systems on the market. At a minimum, the operator should have safe steps and a platform to stand on while transferring the chemical into the tank.
- ▶ Multi-nozzle holders with colour-coded nozzles and bayonet couplings reduce the risk of operator contamination and mixed nozzle sizes.
- ▶ On-board storage should be provided for protective clothing, pesticides, empty containers, spare nozzles, a brush for cleaning nozzles, and equipment for checking nozzle outputs.
- ▶ In-cab controls are desirable, though they may be expensive on a small sprayer.
- ▶ New sprayers bought after Jan. 1, 1995, should have a CE marking in compliance with the E.U. (Machinery) Regulations 1994.

Filling and washing out the sprayer

The sprayer should not be self-filled from a water-course, as the risk of polluting the water-course is unacceptably high. A mobile or static water tank, or a large-diameter filling hose will speed up filling as well as keeping dirty water out of the sprayer.

The wash-up facilities should allow the operator to fill and wash out without polluting water-courses or contaminating him/her.

Disposal of washings

On the last tank-full, great care should be taken not to mix too much spray. When spraying is finished, a little water should be added to the sprayer and recirculated, and this should be sprayed out on the same crop. The final washing should be carried out on hard-core or soil; avoid washing on concrete that drains to a watercourse.



A sprayer filling and washing bay

Disposal of containers

Empty pesticide containers may not be used for any other purpose. They should be washed immediately, and the washings added to the sprayer tank. After draining, the container should be quarter-filled with water, the cap replaced and the container thoroughly shaken, before draining into the sprayer tank. This procedure should be repeated twice more.



Empty containers should not be left unattended

Container disposal options include burial, burning or a collection service which has agreed to accept them. Burning is not allowed by the REPS scheme, or by some local authority bye-laws, and is not recommended for some containers. Consult the label before making a final decision.

Empty containers should be stored safely while they are awaiting disposal. A suitable storage bin near the filling point can be used for this purpose.

CONTROL OF SPRAY DRIFT

When spraying, every effort should be made to produce the minimum amount of drift, while still maintaining the efficacy of the spray treatment. The variables within the operator's control are spray volume, pressure, nozzle type and size, boom height and forward speed. The main points to bear in mind are:

- ▶ Do not spray when the wind speed is too high. Stop when it exceeds Force 4, or the point at which dust or loose paper begins to blow.
- ▶ Avoid the use of very small nozzles or low spray volumes.
- ▶ Use low to medium pressures. Three bars is enough for normal ground-crop spraying with either fan or cone nozzles. Some fans are now designed to work at pressures as low as 1 bar.
- ▶ Keep the boom at the lowest height that will give even distribution of the spray. This is usually about 45-50 cm (18-20in) above the target.
- ▶ Conventional fan and cone nozzles produce similar amounts of drift. Several new nozzle designs which reduce drift to varying degrees are now on the market.
- ▶ Air-assisted sprayers allow drift to be reduced while still producing a fine spray.



Spray drift measurement at Teagasc, Oak Park.

No matter what precautions are taken, it is inevitable that some droplets of pesticide drift will become air-borne. To avoid contamination of susceptible crops, water-courses, apiaries, gardens or other sensitive areas, untreated strips should be left between these and the treated area.

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PROTECTIVE CLOTHING

Appropriate items of protective clothing for pesticide handling and application are as follows:

(i) SUITABLE GLOVES:

They must be of suitable material (neoprene or nitrile are best, lined or household gloves are definitely unsuitable) and the right size for each operator. They should have sufficient gauntlet to protect the wrist. A supply of spraying gloves should be kept in store, so that there is always a pair available when spraying.

(ii) FACE PROTECTION:

Either a visor or goggles and face-mask should be worn when handling pesticides in concentrate form.

(iii) OUTER CLOTHING:

An outer cover-all should be worn while spraying, and removed for washing or disposal when finished.

(iv) FOOTWEAR:

It is useful to wear rubber boots, as they will not absorb pesticide.



An operator wearing gloves and face protection when pouring pesticide into the sprayer.

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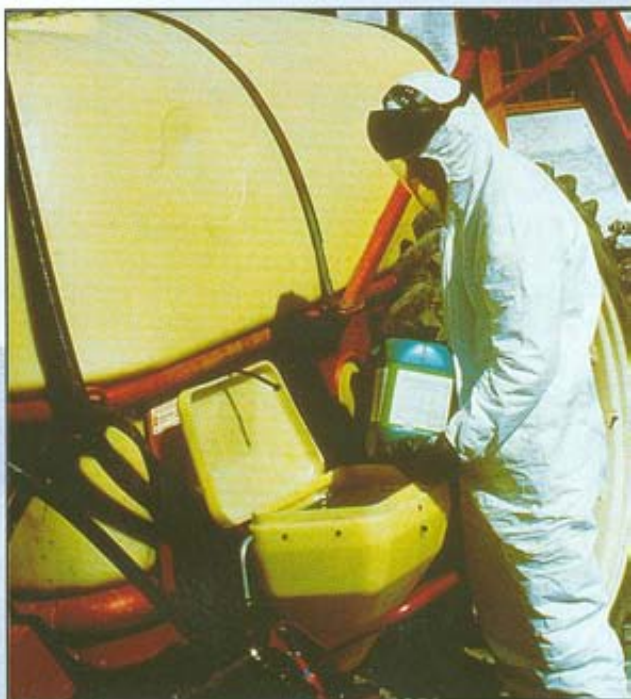
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Many operators of tractor sprayers will find this to be sufficient for their needs. Respiratory protection may be required in the following situations:

- ▶ The pesticide label specifies that it be worn.
- ▶ Operators feel that it benefits their health.
- ▶ Spraying in green-houses, orchards, etc.
- ▶ Operating knapsack or air-blast sprayers.

For use with pesticides, EN 141 A-type respirator filter units should be used. Some respirator units may restrict breathing, others limit vision or cause excessive perspiration. Operators should have the opportunity to choose versions which they find most comfortable to wear. It is important that filter units be replaced at the specified intervals.

RECORD-KEEPING

The main records that should be kept are as follows:

- ▶ A daily diary record of pesticides applied (see sample record across).
- ▶ A stock-sheet of the pesticides in storage on the farm.

Date	April 23, 1996	May 16, 1996
Field	Church Field	Bull park
Crop	Sugar beet	Spring barley
Growth stage	2-leaf	
Area	14.5 acres	10 acres
Chemical	Goltix	
Rate of chemical	5 pints/acre	
Water volume	15 gall/acre	
Pressure	3 bars	
Nozzle size	14 fans	
Weather	Cool, light breeze	

Sample daily record card

Keeping of these records may cause some initial problems, but they are useful management aids, and they also provide valuable protection if any litigation should arise as a consequence of a spraying operation.

EMERGENCY PLAN

The 1989 Safety, Health and Welfare Act and 1993 Regulations require a plan for emergency action if an accident occurs. Whatever arrangements are made to cope with other accidents - first-aid boxes, fire extinguishers, display of emergency phone numbers, etc. - should be adequate to deal with pesticide-related accidents as well.

In the event of pesticide contamination, immediate thorough washing and removal of contaminated clothing should be the first priority, and a water supply for this purpose should always be available near the operator. The second priority should be to summon medical help. Have the pesticide label or container available for inspection. Pesticide Safety Data Sheets containing more complete information on toxicology and appropriate treatment are available from pesticide suppliers.

The Poisons Information Centre of Beaumont Hospital is a valuable source of information on pesticide poisoning. Their telephone number is 01-8379966.