



# Crop protection and Agro-chemicals

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# Storing Hazardous Materials

## Best practice :

Store all hazardous materials in a manner that avoids any risks to humans and the environment.

Construct all storage facilities out of suitable materials to keep the hazardous materials secure and dry.

All hazardous material stores are well ventilated.

### FSA29

Do you store fertilizer in a safe and secure way for humans and environment?

### FSA41

Do you handle and store crop protection products safely for humans and environment with accurate labelling?

### FSA45

Do you store fuel in a way that is safe and secure for humans and environment?

### FSA46

Do you manage and dispose waste, including hazardous materials and agro-chemicals and their containers, in a manner to avoid any risks to humans and the environment?



Background



How to answer YES



Further information



# Storing Hazardous Materials

Potentially poisonous, corrosive, volatile, flammable or dangerous materials or liquids must be stored in structurally sound facilities to prevent leaks and spills which could have a serious effect on workers, the community and the environment.

The store must be:

- Constructed of suitable materials, kept secure, dry and well ventilated.
- Located to minimise risks and offense to people and have minimum impact on the environment during normal use and in foreseeable emergencies. For example you should ensure manure storage areas (stockpiles) are not located where leachate or unusually heavy rain will result in polluting water or environments of value for biodiversity, leisure or cultural activities.
- Designated only for the storage of particular hazardous materials, e.g. fertilisers must be stored separate from CPPs, combustible materials, food, feed, living quarters, food preparation and consumption areas. This includes having separate stores for different hazardous materials (including CPP-contaminated PPE) and waste.
- Clearly labelled to identify contents and to ensure correct actions are taken in case of emergencies.





# Storing Hazardous Materials

CLOSE

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Fuels, fertilisers and Crop Protection Products (CPPs) must not be stored together.

The stores are:

- Positioned in an appropriate location and a safe distance from:
  - sensitive areas (water bodies, drains),
  - houses,
  - the property boundary,
  - ignition sources - e.g. fuel, corrosive substances or gas cylinders,
  - free of vegetation,
  - risk of flooding
- Large enough to store the largest amount of hazardous material required as well as melted containers and firefighting substances in case of a fire.
- Small quantities of CPP can be stored in a steel cabinet although it must contain sufficient storage shelving to be able to separate different groups of chemicals.
- Do not store liquids above powders and granules.
- Clearly marked with required signs warning of general danger and risk of combustion.
- Dry, clean, tidy, and both well lit and well ventilated.
- You must have access to water for washing and cleaning, ideally with access to an eye wash and an emergency shower.
- A spill kit must be available and users trained to deal with an accident.

## How to answer YES

All hazardous materials are classified and classes of material are kept separate (FSA29, 41, 45).

Use a CPP store which is a separate building, room or enclosure constructed of fire resistant material. These materials include

- Brick
- Concrete
- Steel
- Galvanised iron
- Other fire resistant materials may also be suitable (FSA 41).

The floor should be constructed of material (such as concrete or steel) which is impervious and resistant to chemical erosion and bunded to contain spills (FSA41, 45).

All stores have restricted access and are lockable (FSA29, 41, 45).

The shelving is made of (or lined with) impervious, non-absorbent material such as plastic, glass or metal. Absorbent materials like timber are not suitable. For small quantities of pesticide the containers can be placed on an impervious tray (FSA41).

All CCPs are stored in their original container with the original label.

Labelling must include:

- a. Scientific name and brand name or local name
- b. Active compound/ substance
- c. Expiration date
- d. Application rates (FSA41, 46).



# Storing Hazardous Materials

CLOSE

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A quick review of how hazardous materials are stored on the farm will give you an opportunity to check they are being stored correctly with the appropriate warning signs.

About the Store					
Type of hazardous material	Store Position	Construction material used in the store	Floor is impervious to leaks and banded	Is the store lockable?	Is the warning signage appropriate?



## Further reading and examples:

British Columbia Ministry of Agriculture, Canada: Farm Practice: Storage of hazardous material



# Storing Hazardous Materials



*Pepsico*



*BASIS*

Storage of agrochemicals, nutrients, fuels, and non-production related products should be done in accordance with any applicable regulations, and that minimizes potential negative effects to the environment and people, pets and livestock on the farm and in the community.

Storage facilities on the farm should be:

- Well-maintained,
- Clean,
- Secure,
- Safe
- Appropriately identified in a manner that conveys access and safety to all whether literate or not.



# Storing Hazardous Materials

CLOSE

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## DO

- Store on impermeable surface
- Create a bund
- Keep dry and away from direct sunlight
- Maintain the container and check for leaks



## DON'T

- Ignore leaks
- Store in open containers
- Store near watercourses/sources



## Best practice :

- Accurate records are maintained of all CPP inventory including:
  - Type of crop protection products/ product trade name
  - Target crop type
- Records show CPP usage including:
  - Type of crop protection product used
  - Product quantity used per area
  - Date and harvest interval and permissible harvesting date

### FSA40

Do you keep records of crop protection products in storage and of application?



Background



How to answer YES



Further information





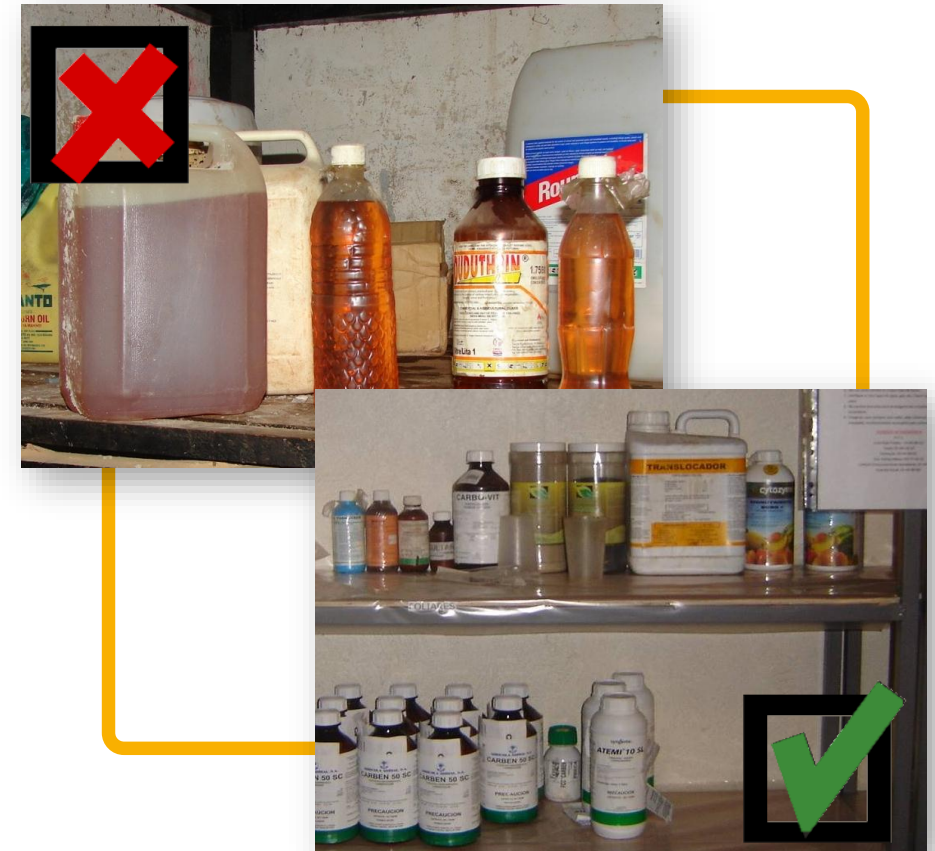
# CPP Store Management and Record Keeping

CLOSE

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The storage of hazardous materials must be strictly controlled to protect workers, the community and the environment. It helpful to keep records of all the hazardous chemicals you store (for both fixed and mobile stores). These records will help to:

- Keep an accurate and up-to-date list of the contents of the chemical store if there is an emergency or theft
- Avoid overstocking
- Make sure that you do not have any unapproved or unwanted pesticide products
- Rotate stock to ensure you use up oldest stocks first to avoid deterioration.
- Keep the store clean and tidy



## DO's

Shelves made of (or lined with) non-absorbent material such as plastic, glass, or metal.

CPPs are in their original containers with clear and correct labelling.



## How to answer YES

All crop protection products (CPPs) are stored in their original container with the original label. Labelling of crop protection products must include:

- Scientific name, brand name or local name,
- Active compound/ substance,
- Expiration date.
- Application rates.

### Keep the following records:

- An accurate inventory, one in the store (close to the door) and one away from the store (e.g. in the farm office, in the home).
- Copies of the Material Safety Data Sheets (MSDS), again keep copies in the store and away from the store.
- An emergency contingency plan, which may include:
  - A map of the site and telephone numbers for:
  - Emergency services/ Fire brigade
  - Doctors and Poison Centre
  - Local office of the Environmental Authority
  - Approved hazardous-waste disposal contactors
- Address of the store.
- Store is kept clean and tidy, disposing of any waste in the most appropriate way.

Develop an accurate inventory to monitor the contents of your CPP store (FSA40).

Maintain records of CPP use recording:

1. Type of crop protection product used
2. Product quantity used per area
3. Date and harvest interval and permissible harvesting date (FSA40).



# CPP Store Management and Record Keeping

CLOSE

An accurate and comprehensive recording system must cover all the relevant information and be simple to complete. The following information should be included and used in tandem with the spray application records (adapted from FAO stock record sheet):

Pesticide group			
Ref. no.			
Common name			
Trade name			
Formulation/concentration			
Manufacturer/supplier			
Quantity (agreed issuing quantity/package)			
Primary packaging quantity			
Date received			
Use-by date			
MSDS sheet available (yes/no)			
Notes (shelf-life; special storage conditions; inspection frequency)			
Date	Quantity issued (litres)	Balance in stock (litres)	Notes(stock inspection: notes on condition etc. storekeeper's initials)
Other notes such as disposal of out of date stock, spillages etc			



## Further reading and examples:

FAO: Pesticide stock planning and recording systems





# Dealing with Spillages

## Best practice :

- A protocol is in place to efficiently deal with spillages of hazardous materials.
- First aid kit, Personal Protective Equipment (PPE) and spill kit are available.
- Training is in place for all who may be required to deal with spills.
- Records kept of those trained to deal with spills and any incidents that occur.

### FSA49

Do you have procedures and equipment to deal with accidents and spills of crop protection products, fertilizers, and fuels?

### FSA50

Is everyone who uses or is in close proximity to crop protection products, fertilizers, fuels trained on procedures to deal with accidents and spills?



Background



How to answer YES



Further information



# Dealing with Spillages

A spillage of any hazardous material must be dealt with carefully and efficiently using an established procedure and equipment. It is important to prevent chemicals from entering any body of water.

## If a spill occurs:

- Clean it up immediately and remember the three C's:

### Control the spill:

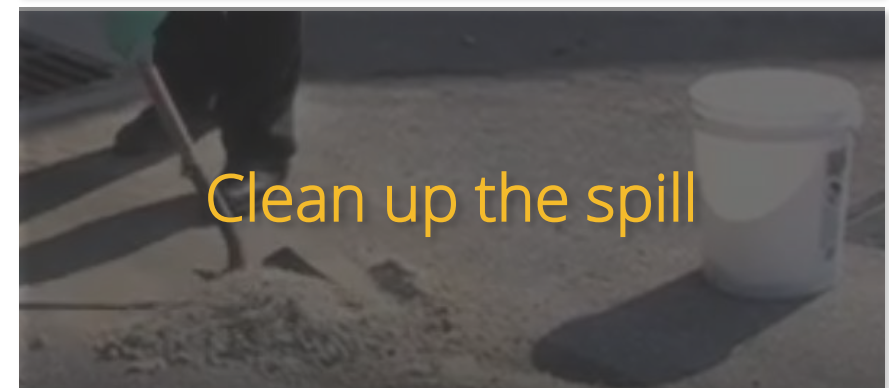
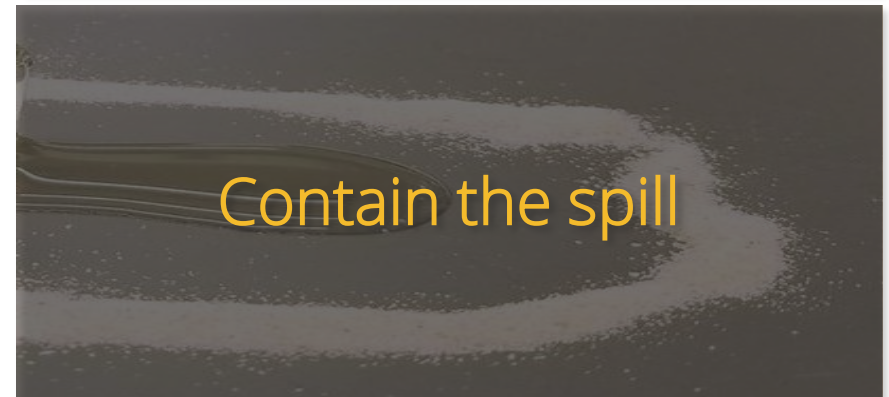
- Always put on PPE before handling a pesticide spill.
- Stop the spill or leak immediately. Controlling the flow limits the damage it can cause.
- Isolate the spill and prevent unprotected people, children and animals from entering the area.

### Contain the spill

- Stop the spill from spreading.
- For liquid spills create a barrier of soil, sand, or absorbent material. Cover the spill with an absorbent material, such as cat litter, newspaper, soil or sand and keep adding the absorbent until all the liquid is soaked up.

### Clean up the spill

- Collect the contaminated absorbent materials, and seal them in an impermeable container. Store ready for disposal.





# Dealing with Spillages

CLOSE

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## Basic spill kit:

- Brush
- Shovel
- Absorbent granules (cat litter) / sand
- Impermeable container (e.g. bin, heavy duty bags, old Intermediate Bulk Container (IBC) without the top, etc.)
- Tags and labels

## Personal Protective Equipment (PPE):

- Locate near but not inside the chemical store. This avoids contamination of PPE.
- Needs to be appropriate to the chemical being used/ stored. Guidance is given on the chemical label and Material Safety Data Sheet (MSDS).

Ensure workers are suitably experienced to manage the situation. Training to be considered includes:

- Training in handling pesticides
- First aid
- Hazardous chemical and spillage control

Any dirty equipment, containers, plastic bags, lids and foils should be kept separate while waiting to be cleaned or disposed of.

## How to answer YES

Have a protocol in place for dealing with spills showing the step-by-step sequence of actions to take in the event of a spill (FSA49).

Procedures to deal with spills are included as part of health and safety training and all users and other relevant workers are trained to deal with spills (FSA49, 50).

Delegate responsibilities and be able to show who is responsible for what and keep details of the training received (FSA49, 50).

Have a spill kit available and the necessary PPE (FSA49).

Have a first aid kit, including emergency contact details, available (FSA49).

The chemical store is banded or at least liquid chemicals are stored in plastic containers that can contain any spillage (FSA49).

Maintain records of training given (FSA50).



# Dealing with Spillages

In the event of an accident or spill, an accessible list of local emergency contacts should be available: A trained local first aider should be appointed who is conversant with the chemical products in use and the emergency procedures in the event of an accident. The first-aider should have copies of all the latest product labels for reference.

Contact	Name	Telephone Number

- Local emergency contacts**
1. Emergency medical assistance:  
Doctor, Health centre and Hospital
  2. Local manufacturers and suppliers of pesticide
  3. Environmental and pollution control agency
  4. Water authority
  5. Emergency fire authority
  6. Local authority, Police and highway control
  7. Health and Safety authority
  8. Approved waste disposal contractor

## Further reading and examples:

Penn State University, USA: How to Handle Chemical Spills

Cornell University, USA: Pesticide Spills – Prevention and Cleanup

University of Nebraska, USA: Pesticide spill management (video)

Pesticidewise, Syngenta: minor pesticide spill (video)

University of Kentucky, USA: Dealing With Pesticide Emergencies and Spills

Croplife International: Guidelines for the safe and effective use of crop protection products



# Application Equipment- Maintenance and Cleaning

## Best practice :

Application equipment is maintained in good working order and is safe to use, calibrated to deliver the desired flow rates and distribution patterns.

Application equipment is cleaned after use and cleaned in a manner that does not have an impact upon the user, their family, bystanders, the local community and the environment.

All application equipment is stored separate from food, feed, living quarters, food preparation and consumption areas.

### FSA43

Do you ensure that the recommended maintenance and calibration requirements of crop protection product and fertilizer application equipment are followed?

### FSA44

Do you safely clean and store equipment and empty containers contaminated with agro-chemicals to minimise the risk to humans and environment?



Background



How to answer YES



Further information





# Application Equipment- Maintenance and Cleaning

When a pesticide or fertiliser application has been completed the equipment used must be cleaned properly.

The owner's instruction manual is a good source of reference and guide to the maintenance and cleaning of applicators.

- Wear appropriate Personal Protective Equipment (PPE) while cleaning the applicator.
- Choose an area where the waste wash-water run-off will not affect the environment or create a danger to people, especially children, and animals.

## Dust and granule applicators:

- Check the applicator is empty and brush out any residual dust or granules.
- Check over the equipment to make sure none of the pipes and bungs are damaged, replace any that are. Do not rely on duct tape.
- Store equipment in a dry place with the hopper lid open.

## Spray applicators:

- Thoroughly rinse the applicator with water several times. It may be easier to partly dismantle the sprayer.
- Reassemble and partly fill with water and test to make sure there are no blocked nozzles or hoses and no CPP residue is left in them. Never blow into a blocked nozzle.
- The applicator should be stored so water will drain out.
- Other equipment, such as PPE and measuring jugs, should be rinsed thoroughly and stored dry.

Thoroughly clean machine inside and out to prevent premature rust from fertiliser or crop protection products.

- Clean and flush solution system.
- Open pipe plug on solution pump to remove any chemicals. Replace plug.
- Remove clean and install fill strainer, pressure strainers and flowmeter(s).
- Remove and clean nozzle tips and screens.
- Store tips and screens off the machine in a dry place.
- Rinse and drain tanks.
- Change the engine oil and other lubricants.
- Grease all service points.
- Remove, clean and install air cleaner elements.
- Drain and flush cooling system.
- Store in a warm, dry place



## How to answer YES

### Application equipment - maintenance and cleaning

- Application equipment must be maintained in good working order and safe to use. It must be cleaned after use.
- Never use leaky or defective equipment
- Clean and check equipment at the end of each day's operations

### Application equipment – calibration and maintenance

The applicator must deliver the desired flow rates and distribution patterns. If applying fertilisers manually it is important to achieve an even distribution and ensure correct placement of the fertiliser.

- All application equipment must be maintained. Annual checks of sprayers and other Crop Protection Product (CPP) application equipment must be conducted to regulate distribution patterns and application rates to align with manufacturers recommendations.

### Application equipment storage and handling

CPP application equipment, including measuring/weighing equipment, must be stored and handled as specified by the CPP manufacturers.

- Equipment must be kept clean and dry in a secure location separated from living quarters, food or feed.

Application equipment must be maintained in good working order and safe to use (FSA43).

Equipment repairs are promptly addressed and replacement parts ordered. Common spare parts for both tractor and knapsack sprayers should be kept in stock. Repairs to spray equipment should be recorded (FSA43).

Upon completion of the application ensure that all equipment, including measuring jugs and PPE, is thoroughly cleaned down to remove any residual product (FSA44).

Empty CPP containers are triple rinsed in an area away from food, feed, living quarters, food preparation and consumption areas (FSA44).

All applicators must be maintained and calibrated regularly (at least once a year) in accordance with the manufacturers instructions and records made to show that this has been carried out. You must at least be able to describe how the equipment is maintained and calibrated (FSA43).



Institute of Agriculture and Natural Resources, Nebraska University, USA: Cleaning pesticide application equipment.

## Further reading and examples:

Virginia Department of Agriculture and Consumer Services, USA: Application Equipment Maintenance & Safety

The Nature Conservancy, USA: Upkeep and maintenance of herbicide equipment

University of Nebraska, USA: Cleaning Pesticide Application Equipment

US Forest Services, USDA: Maintenance, cleaning and storage of sprayers

Latin America (CropLife):

How to perform triple-rinsing

(video)



## Best practice :

All forms of hazardous waste are stored, handled and disposed of safely.

Accurate records are maintained of hazardous waste.

All hazardous waste is dealt with in a manner to avoid any risks to humans and the environment.

### FSA44

Do you safely clean and store equipment and empty containers contaminated with agro-chemicals to minimise the risk to humans and environment?

### FSA46

Do you manage and dispose waste, including hazardous materials and agro-chemicals and their containers, in a manner to avoid any risks to humans and the environment?

### FSA51

Are waste materials properly and legally stored on your farm?



Background



How to answer YES



Further information



# Hazardous Waste

Hazardous waste encompasses an expansive range of materials used to aid animal health, maintain and repair machinery, protect crops and ensure general upkeep of the farm.

It is important that all wastes are handled and disposed of in accordance with regulation. These typically apply to the:

- Safe storage, handling and disposal of waste
- Burning and land-filling of waste
- Recycling
- Licensing of waste-handling contractors and disposal sites
- Manure storage
- Application of manures and composts, sewage etc. to land
- Disposal of animal carcasses

It is also important to ensure that hazardous materials are disposed of in a way that avoids soil and water contamination and does not impact upon the community.

**Duty of care: waste transfer note** Keep this page and copy it for future use. Please write as clearly as possible.

---

**Section A – Description of waste**

**A1** Description of the waste being transferred \_\_\_\_\_  
 \_\_\_\_\_  
 List of Waste Regulations code(s) \_\_\_\_\_

**A2** How is the waste contained?  
 Loose  Sacks  Skip  Drum   
 Other  \_\_\_\_\_

**A3** How much waste? For example, number of sacks, weight \_\_\_\_\_

---

**Section B – Current holder of the waste – Transferor**  
 By signing in Section D below I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011 Yes

**B1** Full name \_\_\_\_\_  
 Company name and address \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Postcode \_\_\_\_\_ SIC code (2007) \_\_\_\_\_

**B2** Name of your unitary authority or council \_\_\_\_\_

**B3** Are you:  
 The producer of the waste?   
 The importer of the waste?   
 The local authority?   
 The holder of an environmental permit?   
 Permit number \_\_\_\_\_  
 Issued by \_\_\_\_\_  
 Registered waste exemption?   
 Details, including registration number \_\_\_\_\_  
 A registered waste carrier, broker or dealer?   
 Registration number \_\_\_\_\_  
 Details (are you a carrier, broker or dealer?) \_\_\_\_\_

---

**Section C – Person collecting the waste – Transferee**

**C1** Full name \_\_\_\_\_  
 Company name and address \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Postcode \_\_\_\_\_

**C2** Are you:  
 The local authority?

**C3** Are you:  
 The holder of an environmental permit?   
 Permit number \_\_\_\_\_  
 Issued by \_\_\_\_\_  
 Registered waste exemption?   
 Details, including registration number \_\_\_\_\_  
 A registered waste carrier, broker or dealer?   
 Registration number \_\_\_\_\_  
 Details (are you a carrier, broker or dealer?) \_\_\_\_\_

---

**Section D – The transfer**

**D1** Address of transfer or collection point \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Postcode \_\_\_\_\_  
 Date of transfer (DD/MM/YYYY) \_\_\_\_\_

**D2** Broker or dealer who arranged this transfer (if applicable)  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Postcode \_\_\_\_\_  
 Registration number \_\_\_\_\_  
 Time(s) \_\_\_\_\_

Transferor's signature \_\_\_\_\_ Name \_\_\_\_\_  
 Representing \_\_\_\_\_

Transferee's signature \_\_\_\_\_ Name \_\_\_\_\_  
 Representing \_\_\_\_\_

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# Hazardous Waste

CLOSE

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- There must be separate storage for different types of hazardous waste.
- All forms of waste are stored a safe distance from:
  - sensitive areas (water bodies, drains etc.)
  - houses
  - the property boundary
  - ignition sources - e.g. fuel, corrosive substances or gas cylinders, free of vegetation
  - risk of flooding.
- The store is secure and positioned so unauthorised people do not have access to it.
- Hazardous materials are disposed of in a way that avoids soil and water contamination and does not impact upon the community.

## How to answer YES

All waste is managed and disposed of in compliance with any relevant legislation and regulations, copies of which should be available for review (FSA46).

Have a clear hazardous material management plan and all involved in the plan are aware of the requirements and their responsibilities (FSA44, 46, 51).

Be able to show that hazardous waste is stored in a secure location in an area that is not going to impact upon the environment, the community or people living and working on the farm (FSA44, 46, 51).

Be able to show evidence that hazardous waste disposal is through a reputable licensed waste-handling contractor (FSA46).

Make sure appropriate PPE is available (FSA46).

Keep consignment notes or other documentation to confirm the transfer of wastes to contractors, and the dates, volumes and types of wastes disposed of (FSA46).



# Hazardous Waste

To help in managing hazardous waste consider developing a simple table listing the types of waste on the farm and the method of disposal. This can then be developed to include the details of any relevant legislation, the contractor used, the person responsible for managing the waste and training given/ required.

Type of Waste	Stored safely?	Disposal method



## Further reading and examples:

University of New Hampshire, USA:

Pesticide Storage and Disposal

(video)

Pesticide Stewardship Alliance, USA:

How to clean caged CPP tanks for recycling



# Hazardous Waste

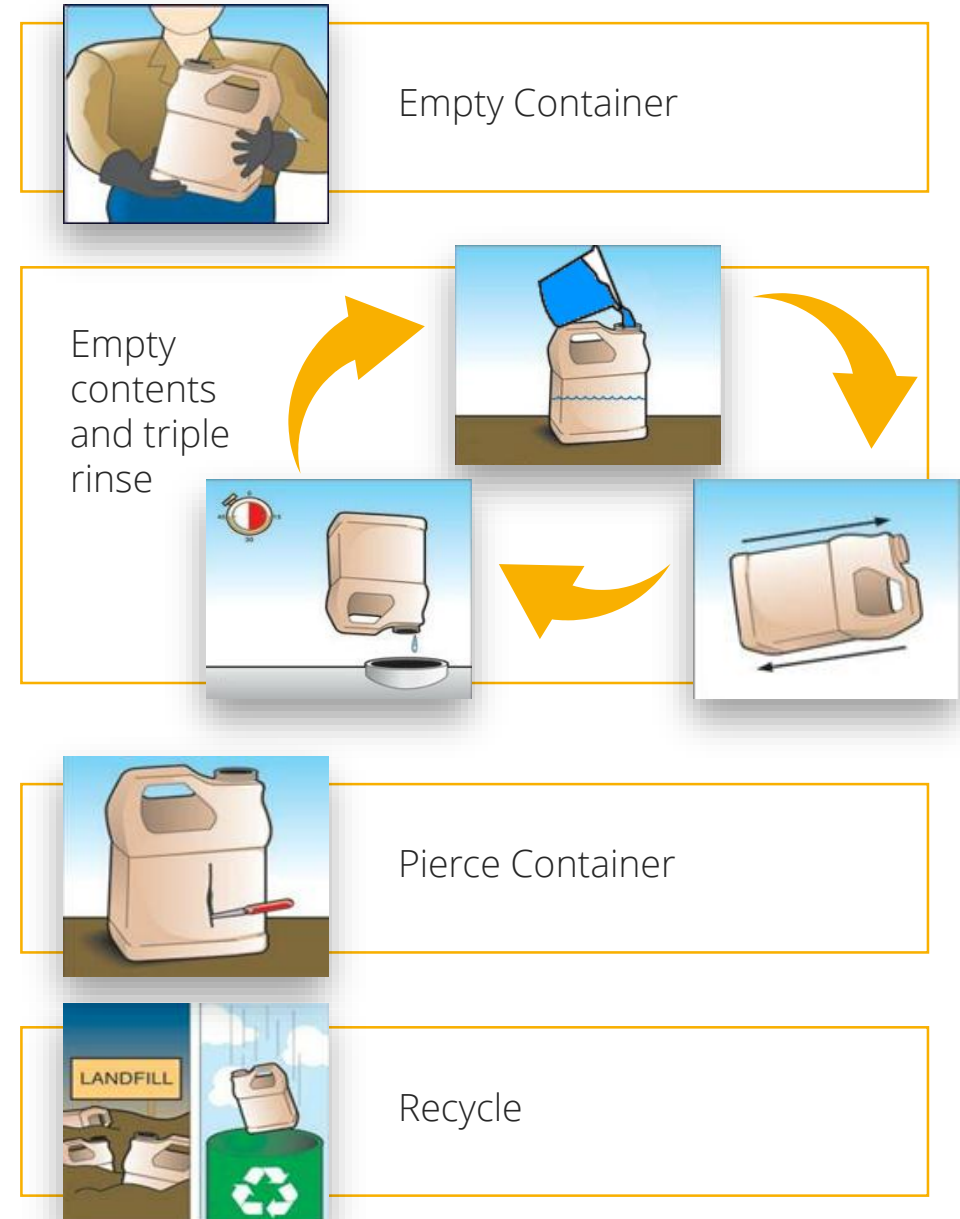
Triple rinse empty crop protection product (CPP) containers after use making sure to wash container caps and threads.

1. Drain the empty CPP container fully into the sprayer
2. Fill the empty container 10 – 20% full of water, replace cap securely
3. Shake the container vigorously
4. Remove the cap, add the washings to the sprayer and let the container drain for 30 seconds or more.
5. Repeat steps 2 to 4 three times to ensure that the containers are clean

Inspect and fully drain the triple rinsed containers

Puncture empty CPP containers

Store the triple rinsed, clean and punctured CPP containers and washed caps safely ready for recycling.







# Integrated Pest Management (IPM)

**Best practice :**

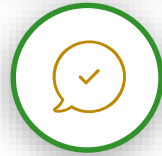
Have an IPM strategy to minimise the use of Crop Protection Products (CPPs)	Only using CPPs and other interventions when economically justified
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Crop residues are managed to prevent the spread of disease

- FSA12** Do you use crop rotation where applicable?
- FSA35** Do you apply chemical crop protection products only when absolutely necessary and use alternative methods where possible?
- FSA38** Do you prevent the spread of disease in your crop by managing sources of contamination?
- FSA31** Do you apply the principles of Integrated Pest Management (IPM) or use IPM based pest management advisors or services when controlling weeds, pests and disease on your farm?
- FSA36** Do you minimize the impact/harm to non-target organisms of crop protection product use by using selective pesticides (rather than broad spectrum), targeted application and/or seed dressing?



Background



How to answer YES



Further information



# Integrated Pest Management (IPM)

Ensuring crops are healthy involves:

- Choosing the right crops and varieties for the location
- Creating ideal growing conditions
- Controlling pests (including insects, weeds and diseases), where they threaten to compromise yield or quality

IPM aims to protect human health and the environment by adopting cultural, biological, mechanical, physical and other strategies to reduce the need for Crop Protection Products (CPPs) and only resorting to CPPs when economically justified. The decision to apply crop protection products should be based on:

- Visual inspections, taking into account economic thresholds of pest occurrence
- Weather forecasts, favourable conditions can cause a significant increase in pest populations which can cause substantial losses
- Warning systems such as pest mapping and monitoring within a wider area
- Local knowledge

If using a CPP is planned then:

- Must use a less hazardous product where suitable
- Must adopt safe working practices





# Integrated Pest Management (IPM)

CLOSE

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## How to answer YES

### Develop an IPM system which includes:

- Clear assignment of responsibilities for planning and carrying out pest control and for implementing IPM.
- Being able to show the selection processes and criteria for choosing growing areas, crop rotations and varieties.
- Biological and cultural controls for minimising pest and disease pressures. For example: sensitive areas (water bodies, drains etc.)
  - Use pest resistant crops
  - Use healthy (certified) planting material and seeds
  - Follow suitable crop patterns (correct crop density)
  - Follow a suitable crop rotation
  - Remove infested materials from the field
  - Maintain a good soil fertility to keep crops healthy
- Carrying out scouting and identification of key pests and how you establish thresholds for further action.
- Maintaining documentation of infestation levels and control measures taken.
- Showing an understanding of the environmental and human health risk of using Crop Protection Products (CPPs) and reasons for selection where there is a choice of different CPPs.

### Your IPM system should also include:

- a) Minimising resistance to CPPs by rotation of active ingredients with different modes of action.
- b) Managing beneficials and antagonists to reduce pest pressure for example by creating biodiversity habitats.
- c) Using biological or physical controls before using CPPs.
- d) Establishing and using action thresholds for pests that do not fall under the definition of key pests.

Employ a range of preventative strategies to manage weeds, pests and disease in your crops (FSA31, 35).

Have a clear IPM strategy and be able to explain how it is used on the farm (FSA31).

Use crop rotation as part of your farm management plan (FSA12).

Carry out scouting for key pests (FSA31, 35).

Minimise the quantity of CPPs used for pest management and be able to justify their use (FSA35).

Show examples of the removal of sources of infection from the farm (FSA38).

Create biodiversity habitats (FSA31).

Minimise environmental impacts by using species specific pesticides and targeting application areas carefully (FSA31, 36).



# Integrated Pest Management (IPM)

CLOSE

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Croplife: Integrated Pest Management



FAO: Integrated Pest Management of major pests and diseases in eastern Europe and the Caucasus

(this issue focuses on pests and diseases in eastern Europe but there is a lot of useful and interesting information in this booklet)



## Further reading and examples:

- [FAO: AGP - Pest and Pesticide Management](#)
- [FAO: Integrated Pest Management \(IPM\)](#)
- [National Pesticide Information Center, USA: Integrated Pest Management \(IPM\)](#)
- [Entomological Society of America: What is IPM?](#)
- [Aglearn.net: Wheat IPM](#)
- [Aglearn.net: Vegetable IPM](#)



# Integrated Pest Management (IPM)

IPM Record for .....(crop type) Field Name..... Year.....

Name of Observer..... Cultural Control used prior to cropping (e.g. crop rotation).....

**What you will need:**

Pen, pencils (coloured) and notepad

Macronutrients table (see soil and nutrient management module)

**Field visit Instructions:**

1. Walk across the field and choose 5-10 plants/acre randomly for analysis
2. Observe keenly each of these plants and record your observations - just make notes in your notebook and draw pictures/ take photographs of the plants effected by diseases, insects etc. to help you remember the symptoms
3. Observe the plant height, any nutrition deficiency and collect the insect/pests from different parts of the plant
4. Observe and count any beneficial insects
5. From your observations what actions would you recommend?

Field Observation	Date	Growth Stage (E.g. sprout development, vegetative stage)	Count	Recommended action		
				Biological control	Mechanical control (e.g. rouging)	Chemical control as last resort (e.g. insecticide)
Insect/pest Observations						
• .....						
• .....						
• .....						



# Crop Protection Products (CPPs)

**Best practice :**

The CPPs used are in compliance with applicable laws and regulations.	All CPPs are acquired from trustworthy sources.
All CPPs are used in accordance with the product label.	

**FSA32**

Do you use only crop protection products that are officially registered and permitted in your country for use on the respective crops and in accordance with your buyer requirements (when available) and are the crop protection products you use from trustworthy sources?

**FSA34**

Do you respect the maximum authorized rates of crop protection products, the label recommendations and the appropriate pre-harvest intervals and re-entry times?

**FSA33**

Do you prevent the use of any of the crop protection products included in applicable international conventions?

**FSA36**

Do you minimize the impact/harm to non-target organisms of crop protection product use by using selective pesticides (rather than broad spectrum), targeted application and/or seed dressing?



Background



How to answer YES



Further information



# Crop Protection Products (CPPs)

Be aware of banned products

The product label carries statutory instructions for the user, which must cover:

- The crops for which it is registered
- The recommended dose rate
- The number of permitted treatments during the growing season
- The pre-harvest interval, how many days after the last treatment before the crop can be harvested
- The time after treatment before it is safe to re-enter the crop

Additionally, the label will list the correct Personal Protective Equipment (PPE) to be used when handling and applying the product, actions required in the event of an accident and advise on environmental protection measures.

Pesticides must only be transported and stored in their original transport containers and packages.

Before choosing a pesticide, read and understand the directions on the product label and Material Safety Data Sheet (MSDS). This will minimise your chance of having a problem with the pesticide once you use it.





# Crop Protection Products (CPPs)

CLOSE

32

## How to answer YES

- The decision to select a given CPP must be based on
  - An assessment of the risks and benefits
  - Hazard potential to the workers, community and the environment
- Has the product been approved for use in your area? In many, but not all, countries legislation is in place to control and regulate the manufacture, importing, distribution and sale of pesticides. Only CPPs registered for use can be used.
- Where there is a choice of product, the material offering the least hazard should always be selected. Where local regulations are not in place the International Code of Conduct offers guidance (see toolbox).
- The manufacturer's product label is the main source of information about the chemical and its safe application. It is essential to read this and if there is anything you do not understand to seek guidance.
- If a licence is required to apply CPPs under local regulations, this must be obtained.

Review the CPPs used on the farm and make sure none are listed under the Stockholm Convention or other conventions (see toolbox) (FSA33).

Be aware of the CPPs available for use in your region and restrictions that may apply (FSA32, 33).

All CPPs you use are from trustworthy sources (FSA32).

Determine if a safer CPP or formulation can be used (FSA36).

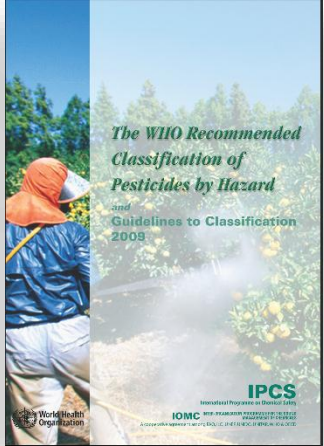
All who use CPPs understand the content of the label and use the chemical in accordance with the label (FSA34).

Maintain chemical application records to show correct application of crop protection products (FSA34).

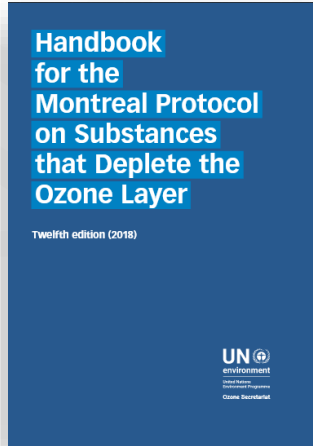




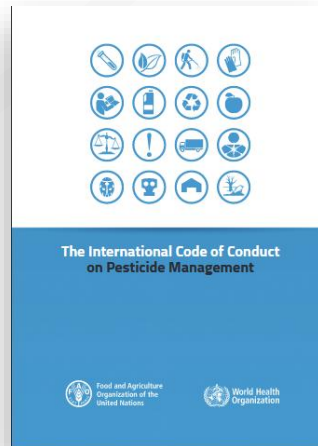
# Crop Protection Products (CPPs)



The WHO Recommended Classification of Pesticides



The Montreal Protocol



FAO: The international code of conduct on pest management



The Stockholm Convention



The Rotterdam Convention

## Further reading and examples:

Pesticide Action Network (PAN): Dirty Dozen Pesticides

WHO: Recommended classification of pesticides by hazard and guidelines to classification 2009

FAO: AGP - International Code of Conduct on Pesticide Management

UNEP: Annex III Chemicals

Croplife International: Effective Management of Highly Hazardous Pesticides





# Application of Crop Protection Products (CPPs)

## Best practice :

- Select Crop Protection Products (CPPs) to minimise impact to the environment
- Use a range of active ingredients to decrease the chances of resistance developing
- Use the best working practices whilst preparing and using CPPs to minimise impact upon the environment, the operator, others on the farm and the community
- Do not allow those considered to be most vulnerable to the effects of CPPs to handle or apply CPPs.

**FSA39**

Do you apply precautionary measures to protect workers, neighbouring communities and the environment during the mixing and application of crop protection products?

**FSA42**

Do you protect non-target areas and crops from agro-chemical use?

**FSA105**

Do you ensure that workers who handle hazardous materials are not younger than 18 or pregnant, and do not suffer from chronic or respiratory diseases?

**FSA36**

Do you minimize the impact/harm to non-target organisms of crop protection product use by using selective pesticides (rather than broad spectrum), targeted application and/or seed dressing?

**FSA37**

Do you prevent pest, disease or weed resistance by varying the types of crop protection products (including active ingredient) used?



Background



How to answer YES



Further information



# Application of Crop Protection Products (CPPs)

By their very nature, CPPs are toxic and can pose risks to humans, animals and the environment.

- Choose active ingredients and formulations that are less damaging to beneficial organisms; and apply at times of the day using application technology that minimises direct exposure of beneficial organisms and their habitats to the CPPs.
- Consider the weather conditions (is it going to rain, how windy is it, what direction is the wind coming from?). Ensure CPPs reach targeted areas and minimise losses to non-targeted areas.
- Where possible, the risks of developing resistance to CPPs must be lowered by rotating active ingredients with different modes of action.
- Consider the best handling procedures to reduce or minimise exposure? e.g. ensuring competent/ trained operators, seed dressing, closed transfer systems, mixing practices, hygiene practices, nozzle height etc.
- Always adhere to the recommended dose rates and dilutions. Higher doses will not produce better effects, lower doses will be less effective.
- Aerial spraying must be in accordance with local legislation.
- Young people (under 18 years old), pregnant and nursing mothers must NEVER handle or apply CPPs as part of their job or be exposed to CPP contaminated Personal Protective Equipment (PPE).
- Are health checks necessary and available for those using CPPs?





# Application of Crop Protection Products (CPPs)

CLOSE

36

## How to answer YES

- When selecting a Crop Protection Product (CPP) it is important to consider what is the problem and what is the best product?
- When transporting CPPs keep away from food and livestock
- Store CPPs in a designated and secure cabinet or room
- Minimise the likelihood of spillage, confine spills and contaminated wash-water to areas where they will be confined or dispersed safely, and to clean up spills if they occur.
- Read and understand the label before use
- Check your application equipment before use
- Wear appropriate Personal Protective Equipment (PPE) when handling, mixing and applying CPPs
- Accurately measure the CPP and water when mixing
- Do not overfill the applicator
- Keep children and livestock away whilst working with CPPs. Prevent children, pregnant and nursing women from being exposed to CPPs.
- After use clean all equipment and PPE and store in a secure location
- Do not eat drink or smoke whilst working with CPPs, wash hands and exposed skin thoroughly after use
- Make a detailed account of the CPP application as evidence of traceability, accountability and stock management

Be able to demonstrate a considered approach for the selection of CPPs, opting for selective chemicals for targeted application (FSA36).

To minimise the impact of using CPPs on the operator, community and environment by having protocols in place for:

- Mixing
- Applying
- Cleaning equipment
- Dealing with spills and accidents
- Waste management
- Informing workers and community as necessary (FSA36, 39, 42).

All operators handling or applying CPPs have received basic training in how to protect themselves, their family, bystanders, local community and the environment from harm (FSA39).

All operators are provided with appropriate PPE (FSA39).

Maintain CPP application records (FSA37, 42).

Young people (under 18 years old), pregnant and nursing mothers are not allowed to handle or apply CPPs (FSA105).



# Application of Crop Protection Products (CPPs)

An accurate and comprehensive recording system must cover all the relevant information and be simple to complete. Below is an example of the information that can be recorded for the activities that occur in a particular field over a season. This information will provide useful evidence of the activities undertaken and the reasoning for the activity.

Field name / No.				Crop			Fertiliser use				
Soil type				Variety			Date	Rate	N:P:K		
Area				Seed treatment							
Sowing date				Previous crop							
Date	Product name	Amount of product used	Trigger for spraying	Reason for treatment	water volume	Area sprayed	Spray time	Field re-entry interval	Harvest interval	Weather	Wind speed & direction

## Further reading and examples:

Safe Use of Pesticides

International Institute of Tropical Agriculture:  
Safe handling of pesticides

Croplife International: Guidelines for the safe and effective use of crop protection products

Kerr Center for Sustainable Agriculture: Pesticides: Safety, Handling, Application





# Risk Management when using CPPs

## Best practice :

- Procedures are in place to ensure Crop Protection Products are not applied in conditions (e.g. wind) that could cause drift, impacting upon workers, the community and the environment.
- Workers and the neighbouring community are informed of spraying plans and re-entry times.
- PPE is provided and its use is enforced. Provision is risk-assessed against the Material Safety Data Sheet (MSDS) of all relevant CPPs.
- Protective equipment provided complies with relevant safety regulations.

**FSA39**

Do you apply precautionary measures to protect workers, neighbouring communities and the environment during the mixing and application of crop protection products?

**FSA48**

Do you provide and ensure the use of appropriate personal protective equipment to all those who handle or are exposed to agro-chemicals?

**FSA50**

Is everyone who uses or is in close proximity to crop protection products, fertilizers, fuels trained on procedures to deal with accidents and spills?

**FSA36**

Do you minimize the impact/harm to non-target organisms of crop protection product use by using selective pesticides (rather than broad spectrum), targeted application and/or seed dressing?



Background



How to answer YES



Further information



# Risk Management when using CPPs

CLOSE

39

It is important to follow best practice guidelines when working with hazardous materials.

- Personal protection has only one objective: To keep the exposure of workers handling a pesticide as low as possible. There are three major routes by which Crop Protection Products (CPPs) can enter the body:

## The skin or eyes

- Most common form of poisoning
- Contaminated skin and clothing must be washed off immediately
- Eyes must be flushed out for at least 10 minutes
- Clothing must be well washed after use

## The mouth (ingestion)

- Do not smoke, eat and drink whilst using CPPs
- Wash hands after handling CPPs
- Do not transport or store CPPs with food

## Breathing (inhalation)

- Ensure plenty of ventilation when using CPPs
- Avoid breathing in dust and sprays

The product label will recommend what PPE to wear. Gloves must be worn and eye protection, water proof boots and an apron/ coveralls are recommended.





# Risk Management when using CPPs

CLOSE

40

## How to answer YES

- Crop Protection Products (CPPs) are only used when it can be justified as part of an Integrated Pest Management (IPM) strategy.
- The CPP selected should have the least impact upon the environment and local community.
- Only apply when weather conditions will not preclude CPPs from reaching their target areas. For example, spraying should not be carried out if there is high wind and risk of drift.
- The formulation, e.g. granules rather than dust, seed coating rather than broadcast application, can improve the accuracy of application and reduce the exposure of the operator.
- Effective training can teach the operator to minimise their exposure to CPPs. See next section.
- PPE is only as good as its maintenance and does not guarantee total protection if it becomes defective through wear or damage so regular visual checking must be carried out. To make sure safety equipment gives maximum protection training in its use, and reasons for its use is important.
- The product label and Material Safety Data Sheet (MSDS) will state what suitable PPE is required.
- Specialist equipment, such as respirators must be checked in accordance with the manufacturer's recommendation. The periods between checks will be more frequent when working conditions are more severe. Faults must be recorded and corrected before further use.

Workers and community are informed of spraying plans and re-entry times (FSA39).

The CPP (or formulation) used is the safest option minimising impact upon the environment and local community (FSA36).

The method of application minimises the impact on the operator, environment and community (FSA39).

All operators understand the best handling procedures to minimise exposure (FSA39).

Suitable PPE is readily available for all who need it and you ensure it is being used (FSA48).

PPE is in good condition and free from hazardous chemicals (FSA48).

All personnel in contact with CPPs, fertilisers or fuels have received and completed required training and guidance. This can be evidenced through certificates, evidence of participation (registration lists), and/or worker interviews (FSA50).





# Risk Management when using CPPs

CLOSE

41



University of Wyoming, USA:  
Pesticide PPE, from the ground up



SAFE Work Manitoba, Canada: SAFE  
Farms: Chemicals and Pesticides

## Further reading and examples:

Croplife International: Guidelines for the safe and effective use of crop protection products

Government of Western Australia: A guide to the management of pesticides in local government – risk assessment and management

Aglearn:  
Personal Protection

Penn State University, USA:  
Best practices for pesticide use



## Best practice :

- At least one named staff member (who is responsible for developing IPM plans) has received training, education or advice on integrated pest management (IPM) from a qualified source.
- Have a training programme in place to ensure all operators are competent in the use of Crop Protection Products (CPPs).
- Have trained staff to ensure in the event of spill it is dealt with safely and efficiently using the correct protocols and Personal Protective Equipment (PPE).

### FSA47

Is anyone who handles or is exposed to agro-chemicals provided with effective instructions and training?

### FSA30

Have you received training, education or advice on integrated pest management (IPM) from a qualified source?

### FSA50

Is everyone who uses or is in close proximity to crop protection products, fertilizers, fuels trained on procedures to deal with accidents and spills?

### FSA10

Do you regularly seek advice, training and collaboration on more effective production, technologies and human resource management?



Background



How to answer YES



Further information



# Training

Training to increase understanding and empower better decision-making is essential for the application of Integrated Pest Management (IPM) and for the safe use of Crop Protection Products (CPPs).

It is important to ensure all workers have equal access to all supplier and farm-supported education and training programmes, including literacy classes, vocational and information technology training.

The training must be continuous, in order to retain and revise skills.

Records of training undertaken should be maintained as evidence of the levels of competence

Training can be in any format such as e-learning, group events or one-to-one advice sessions.





## Integrated Pest Management (IPM):

- Training is considered to be one of the following:
  - College level courses
  - Training provided by independent accredited organisations
  - Crop advisor trainings related to IPM
  - Manuals or information from reputable sources

## Hazardous materials:

- Training highlighting topics such as the legal aspects, use, storage, environmental, safety aspects and other precautions. Training must include the need for waste minimisation, the segregation, storage and disposal of waste on-farm and in the local farming community.

## Spill management:

- To ensure in the event of spill it is dealt with safely and efficiently using the correct protocols and Personal Protective Equipment (PPE).

## Crop Protection Product (CPP) user training :

- For all who manage or are exposed to CPPs. To include equipment handling and maintenance, procedures, PPE, minimising exposure of the operator, bystanders, the environment and non-target areas, and the value of correct application methodology to ensure efficacy.

## First Aid:

- To ensure that sick and injured receive appropriate treatment before professional medically trained help can be summoned. The expectation is that first aid will be available to farmers or workers immediately in case of an accident.

## How to answer YES

Have a training plan, ensuring that all legally required training is kept up to date and that all relevant farmers and workers are trained in all relevant areas (FSA10, 30, 47, 50).

All personnel in contact with CPPs, fertilisers or fuels have received and completed required training and guidance in managing spills and dealing with accidents. This can be evidenced through certificates, evidence of participation (registration lists), and/or worker interviews (FSA47, 50).

Have a record to show you, or at least one named staff member, have received guidance or training on IPM (FSA30).



# Application of Crop Protection Products (CPPs)

Records of training undertaken should be maintained. Below is a template of content to consider using in a training record for all staff on your farm.

Name					
Job Title					
Training subject	Date trained	Date for retraining	Comments	Employee's signature	Supervisor's signature

## Further reading and examples:

Aglern

Aglern:  
Introduction to IPM

Aglern:  
Responsible Pesticide Use

Aglern:  
First Aid Treatment of Pesticide Poisoning

