

KNAPSACK SPRAYERS  
AND WATER PROTECTION

# Do's and Don'ts



The  
Voluntary  
Initiative

Promoting responsible pesticide use



A clear solution  
for farmers

CATCHMENT SENSITIVE FARMING

# Do Read the label before use and follow instructions

- Keep all pesticides in a dedicated secure bunded labelled store (see HSE "Guidance on storing pesticides for farmers and other professional users" AIS 16).
- Check with your pesticide supplier or a BASIS registered agronomist that the product you are planning to use is
  - approved for the planned situation or crop
  - will control the target weed, pest or disease
  - suitable for hand held use and will control the target weed or pest.
- Check the sprayer is clean, in good condition and safe to use.
- Use stored water or a double check valve on mains water supplies for making spray solutions.
- Use clean water to check the sprayer for leaks, and that the lance cut off valve is working properly.
- Check the correct nozzle is fitted and spares are available.
- In general use
  - a flood jet for herbicide spraying
  - a hollow cone nozzle for insecticide/ fungicide spraying
  - consider using an air induction nozzle or a controlled droplet applicator (cda) to reduce the risk of drift
- Check battery status of electrically dependant sprayers eg cda sprayers.
- Check the spray pattern is correct, and the nozzle flow rate is within 5% of manufacturers stated output.

# Do check pesticide dose rates and any supportive guidance

- Double check dose rates and mixing quantities using the product label and the tables in this leaflet, web sites and other information sources.
- Fill up in an appropriate pesticide handling area.
- Have a spill kit ready for use.
- Position sprayer, pesticide container and measuring jugs within a spill tray or within a bunded area.
- Only take the amount of pesticide you are likely to use for the planned spraying activity out of the store.
- Follow correct mixing sequences; usually some water is added to spray tank before adding product.
- Take care to avoid splashing any pesticide concentrate or spray solution when filling.
- Rinse empty containers and measuring jugs at least three times and until visibly clean.
- Add any washings to spray solution in the knapsack sprayer.

# Do use safe, effective spraying methods

- Check the site for hazards that may impede good spraying practices.
- Measure your spraying speed in the intended treatment area.
- Check wind direction is away from – or will not cause spray to drift to any environmentally sensitive areas.
- Project the spray downwards with the nozzle at its optimal distance from target vegetation.
- Consider using a shroud to target applications and minimise drift.
- Apply the correct dose at all times.
- Return to mixing area and work in the spill tray or bunded area to rectify sprayer faults.
- Carefully note exact location where spray solution has run out, so that the subsequent load starts in the right place.



Use a spill tray to capture any drips and splashes. Keep sprayer well away from drains when filling and cleaning.

## Do clean sprayer thoroughly after spraying

- Triple rinse the inside of the spray tank.
- Remove tank lid, direct nozzle to within tank and flush the lance with clean water.
- Remove nozzle and filters to enable thorough cleaning.
- Spray out all washings over a small unsprayed area within the overall treatment zone.
- Dispose of visibly clean waste packaging through a waste/recycling contractor.



Controlled droplet applicators (cda) are a useful alternative to a knapsack. They usually come with a closed transfer system which means there is no mixing and minimal cleaning.

# Don't risk pesticides reaching water

- Never take water directly from a water course, borehole or without use of double check valves from a domestic supply.
- Never prepare any spray solutions near a water course or drain and keep at least 50m away from any borehole, spring or well.
- Avoid preparing spray solutions over hard core or unbunded concrete.
- Never wash splashes or spills into drains.
- Avoid use of adjustable nozzles.
- Never be tempted to overdose by either adding more pesticide than is needed when preparing the spray solution or during the application.
- Do not apply pesticides if heavy rain is expected within 48 hours of application.
- Never over-spray buffer zones, drains or water courses.
- Avoid spray drift at all times.
- Avoid use of fine sprays which are more prone to drift.
- Do not spray upwards and avoid spraying laterally as spray drift may move for very long – and uncontrolled – distances.
- Do not apply so much spray that it runs off the target.
- Do not try and rectify sprayer faults within the treatment area.

# Useful tables for knapsack spraying

## Spraying speed:

Seconds taken to spray 50 metres:	40	50	60
metres/second	1.25	1.00	0.83
Kilometres/hour	4.5	3.6	3.0

## Area treated with 20 litres of spray solution:

Spray volume rate; litres/hectare	150	200	250
Treated area; square metres	1333	1000	800

## Amount of product used to make 20 litres of spray solution; mls of product

Label dose rates; litres/hectare of product		1	2	3	5	10
Spray volume rate; litres/hectare	150	133	266	333	667	1334
	200	100	200	300	500	1000
	250	80	160	240	400	800

## Amount of product used to make 20 litres of spray solution at a label specified spray concentration/dilution ratio

Spray concentration; %	0.5	0.75	1.00	1.25	1.50	2.00	2.5
Dilution ratio	1:200	1:150	1:100	1:80	1:67	1:50	1:40
Product; mls	100	150	200	250	300	400	500

# FURTHER INFORMATION

**In the first instance, talk to your pesticide supplier or consult a BASIS registered agronomist**

## **Websites offering more information:**

The Voluntary Initiative  
**[www.voluntaryinitiative.org.uk](http://www.voluntaryinitiative.org.uk)**

Environment Agency  
**[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)**

Catchment Sensitive Farming  
**[www.naturalengland.org.uk/csf](http://www.naturalengland.org.uk/csf)**

Health and Safety Executive  
**[www.hse.gov.uk](http://www.hse.gov.uk)**

Scottish Environment Protection Agency  
**[www.sepa.org.uk](http://www.sepa.org.uk)**

National Association of Agricultural Contractors  
**[www.naac.org.uk](http://www.naac.org.uk)**

Crop Protection Association  
**[www.cropprotection.org.uk](http://www.cropprotection.org.uk)**

Chemicals Regulation Directorate  
**[www.pesticides.gov.uk](http://www.pesticides.gov.uk)**

National Sprayer Testing Scheme (NSTS)  
**[www.nsts.org.uk](http://www.nsts.org.uk)**

National Register of Sprayer Operators (NRoSO)  
**[www.nroso.org.uk](http://www.nroso.org.uk)**