

Choosing a shielded sprayer

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There are a number of considerations that growers need to bear in mind when purchasing or using a shielded sprayer. A number of new brands and designs of shields are now entering the market and they offer a range of features — such as variable shield width for different row spacing and a range of locations where nozzles may be mounted.

From trials conducted over the 2002–03 cotton season, it became apparent that all shields leak (spray drift) to some degree. Current investigations have assessed this level of leakage (losses) and evaluated potential crop and yield loss. Research is only just beginning to map the factors that induce leakage.

The major factors that have been identified so far, came from:

- Shield height above the ground when travelling (source: CPAS University of Queensland — Gatton Campus 2003);
- Travel speed, especially into head winds; and,
- Spray quality.

From an equipment point of view, look for shields that track very well along the furrows, with a minimum of bounce across the tool bar. Also consider that the nozzles supplied with the unit may not suit all situations, and is probably a compromise for average use. You need to consider how you intend to use the shields and then consider the best nozzle option.

Try to be specific on your needs when purchasing a shield sprayer. Some of the following items might be discussed with suppliers:

- What are the crops to be sprayed?
- The row configuration?
- The target weeds?
- What herbicide(s) are planned to be applied (contact or systemic)?
- Will there be tank mixes and the type (foliar or lay-by)?
- Discuss the filtration and plumbing needs in relation to chemical use.



A Hayes and Baguley shielded sprayer.



The stealth shielded units.

- What are the minimum and maximum water (application) rates?
- Are there sensitive crops nearby that need to be taken into account?

The latter two issues affect nozzle selection and location. Sound out your supplier on back up service and query their knowledge on setting up the machine for field operations.

SOME POINTS TO CONSIDER IN PURCHASING A SHIELDED SPRAYER

Following are some of the points you may consider, based on the issues our project team has come across in working with shields. It is not exhaustive but it outlines some of the problems you may be faced with in field operations. You can compare the checklist with your personal operational needs.

- Are the hoods horizontally adjustable if required for different row spacing?
- What is the number of nozzles per shield and what is the standard nozzle? Consider the nozzle sizes (such as 015 or 03) for the volume range, given speed not exceeding 10 km/hr (currently regarded as the middle of the range of operating speeds of 8–12 km/hr).
- Approach your shield supplier with clear information on average working speed, litres per sprayed hectare, band width to be sprayed and the required droplet size. This should be done in conjunction with your agronomist/consultant. This is no different to purchasing extra features on a new tractor.
- Are other options included such as the option for lay-by sprays? One nozzle does not do it all.
- Is there a requirement for additional chemical tanks? Measure the volume marks of each tank purchased using a flowmeter. Tank volume markings vary.
- Is the nozzle height adjustable to allow for a variation in target height?
- Does each shield have a parallelogram to allow for better shield tracking? Poor ground-following shields may increase herbicide leakage.
- A cluster of perspex site gauges are essential in detecting blocked nozzles during spray operation.
- All sprayers tested to date have some drift component. How flexible is it to change nozzles to suit spray conditions?
- Can the nozzles be adjusted up, down or backwards or forwards inside the shield? Check

for obstructions that hinder the nozzle bandwidth inside the shield (such as shield walls or skids).

- How do the shields operate — individually or in groups? It may be useful to be able to turn off a group of shields across the bar (such as for skip row configuration).

- What sort of controller suits your needs? Have the minimum settings been programmed into the controller? Shields generally operate on low total volume of mixture, so check minimum total litres specification of the flow meter. Remember the chemical rates applied through shields may be expressed as a percentage of the total area or sprayed area. How easy is the controller to calibrate? Ask your supplier to assist in recalibrating your rig with different nozzles, and check the pressure at the nozzle.

- Work out the filtration needs for your shields, using a 100 mesh filter, at the chemical tank. This may allow filter removal at the nozzle.

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