

## Using Pesticides Selectively

It is also important that pesticides are used selectively otherwise they can disrupt other natural pest and disease control processes which are going on in the crop.

The main ways to make pesticide use as selective as possible are outlined below:

- **Give natural control a chance.** This means scouting properly for pests, diseases and natural enemies and giving time for the natural enemies and host plant resistance to demonstrate whether they can maintain pests and/or diseases at low levels. Only if pests and diseases are increasing to damaging levels and natural enemies do not appear to be increasing too, should pesticides be used.
- **Choose selective products.** Biocontrol products such as *Bacillus thuringiensis* are highly selective, but there are very few selective synthetic insecticides. Fungicides have a smaller impact than insecticides on natural enemies. Even if a product is broad spectrum, the shorter its persistence, the smaller its impact on natural enemies. Tables 2c and 2f identify some products which are likely to be more selective.
- **Apply only when necessary.** Even if the decision has been made to spray pesticides, the applications should be made as few times as possible, always on the basis of scouting. This will at least give a chance for natural enemy numbers to recover between sprays and to start to exert a controlling influence on the pests again.
- **Reduce volumes applied.** Smaller nozzles will apply lower volumes and will produce finer spray which will penetrate the foliage better and be retained better on all parts of the plant. The lower volumes will mean lower doses of active ingredient and the greater efficacy of the smaller drops will reduce the need for as many sprays in future. Both of these factors will tend to favour natural enemies. Also, the smaller droplets will reduce the level of run off to the soil where the pesticide can affect soil-living natural enemies.
- **Calibrate properly.** Natural enemies will be badly affected if doses are accidentally higher than those recommended. Doses can in most instances be reduced below recommended levels, provided the application quality is good. Test any reduced doses first on a small scale to be sure that they are still effective.
- **Target the pest.** The V lance is a device which improves underleaf spray cover, increasing the possibility of good pest and disease control with reduced doses.

- **Localise the application.** *Spot spraying* and stratified spraying are methods of spraying only part of the plant or field. This allows natural enemies to survive in the unsprayed areas and to re-enter the sprayed area when pesticide residues have diminished.
- **Time the application carefully.** Spraying should be carried out at a time when pests are likely to receive a dose, but natural enemies are not. Watch the natural enemies of the pest to see when they are most active and where they are at different times of day. It may be possible to identify times when natural enemies are less likely to be contaminated by pesticide, for example, spraying late evening and early morning is less likely to affect parasitoid wasps which tend to be most active during the warmer parts of the day. However, spraying too early in the morning or late at night is likely to affect ladybird and hoverfly larvae which tend to be most active at night.