

Testing for chemical residues

Australia prides itself on being a producer of clean and wholesome food. Yet we frequently hear reports that products are contaminated with substances that may have adverse effects on the health of consumers. Residue testing programs aim to check if these reports are true and to check that pesticides used in crop production are being used correctly.

Pesticide residue surveys are undertaken by government agencies, market organisations, industry bodies, supermarket chains, agents and growers. The results of some of these surveys are publicly available.

Surveys undertaken in Australia include the Australian Total Diet Study, the Sydney Markets Residue Survey and the FreshTest Australia Program.

Food Standards Australia New Zealand (FSANZ) undertakes the Australian Total Diet Survey every two years. This study estimates the level of dietary exposure of the population to a range of pesticides, contaminants and other substances through the testing of food samples representative of the total diet, and includes both raw and cooked foods. The 21st Australian Total Diet Study was published in 2005.

One of the longest running pesticide residue surveys (1989–2005) was the NSW DPI / Sydney Markets Ltd ‘Sydney Markets Residue Survey of Fresh Fruit and Vegetables’. The Australia Chamber of Fruit and Vegetables initiated a residue testing program in 2003, called FreshTest Australia.

Table 1: Meaning of reported residue results.

Report finding	Meaning
No residues	Tests detected no residues of the chemicals for which the product was tested. This may mean that there were no residues or that the residues were below the limits of detection. There may be residues of other chemicals not tested for.
Less than half MRL	Residues were present but were well below acceptable levels. Such levels are likely to result from correct chemical use.
Over half but less than MRL	Residues were present but were below unacceptable levels. Growers are often notified of results in this category.
MRL or over	Unacceptably high residues were detected. This result usually indicates misuse of a chemical but may also occur if no limit has been set for a particular chemical on a particular crop. In NSW the Department of Environment & Conservation (DEC) would investigate these breaches.



What are the limits?

Legal limits, called Maximum Residue Limits (MRLs) are set by Food Standards Australia & New Zealand (FSANZ) for each pesticide registered for a crop. This limit is the highest concentration of residue that is legally permitted or accepted in a food. MRLs are not health standards in themselves. They are based on the residues that might be expected in produce if the pesticide is used according to directions and withholding periods are followed. MRLs are usually set as low as possible, while still allowing the effective use of the pesticide.

Residue test reports often present results in terms of MRLs. The meanings of the most commonly reported results are shown in Table 1.

Sampling

In the Sydney Markets Residue Survey, samples were bought at random from the Sydney Markets at Flemington. However, the survey was biased towards finding residues because it targeted crops that received fairly regular pesticide applications and production districts where growers were perceived to be high users of pesticides. Sampling included local, interstate and some overseas product.

Results

Most horticultural products tested were well within legal limits for residues of chemicals and contaminants. The Sydney Markets Residue Survey tested over 6,900 samples of fruit and vegetables from 1989 to 2005, with 97.5% of samples complying with the MRLs. Only 171 samples (2.5%) had unacceptable residues.

The most common reasons for unacceptable residues in produce were:

- not following the withholding period, which is the time between chemical application and harvest;
- using the chemical at higher than the label rate specified; and
- using a chemical not registered for use on the crop.

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This information was correct at time of printing. Updated April 2006.

Less common reasons included spray drift, inadequate cleaning of spray equipment or soil contamination from residual chemicals (such as persistent organochlorines).

If residues exceed legal limits, the DEC's pesticide inspectors will trace the produce back to the grower to find out why the residue is high and to prevent such produce from being marketed in the future. In NSW, growers can face prosecution and fines of up to \$60,000 for individuals and \$120,000 for corporations if they use chemicals contrary to label directions.

Residue testing programs protect the reputation of fruit and vegetable industries from the sometimes unfounded claims of the antichemical lobby. They also provide assurance to consumers that their food is wholesome and safe to eat. At the same time, residue testing provides government with a measure of the effectiveness of chemical regulation.

Producers who misuse pesticides place themselves and their whole industry at risk.

NSW laboratories that test for pesticide residues

NATA is the National Association of Testing Authorities. The following NATA-accredited laboratories do pesticide residue testing of fruit and vegetables:

- Advanced Analytical Australia Pty Ltd, North Ryde, Phone 02 9889 9577
- Agrisearch Analytical Pty Ltd, Rozelle, Phone (02) 9810 3666
- Institute of Clinical Pathology and Medical Research, Lidcombe, Phone (02) 9646 0222
- National Measurement Institute, Pymble, Phone (02) 9449 0151
- NSW Department of Primary Industries, Wollongbar, Phone 02 6626 1103
- Weston Food Laboratories, Enfield, Phone 02 9764 8154

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