



National Residue Survey 2022–23

Grains



The National Residue Survey (NRS) operates within the Australian Government Department of Agriculture, Fisheries and Forestry and since 1992 has been funded by industries through levies and direct contracts.

The NRS is an essential part of Australia's pesticide and veterinary medicine residue management framework providing verification of good agricultural practice in support of chemical control-of-use legislation and guidelines.

NRS programs monitor the levels of, and associated risks from, pesticides and veterinary medicine residues and contaminants in Australian food products. The programs help to facilitate and encourage ongoing access to domestic and export markets. The NRS supports Australia's primary producers and food processors who provide quality animal, grain and horticulture products which meet both Australian and relevant international standards.

Grains program overview

Since 1993, the NRS grains program has been funded by the NRS component of the statutory levy on grains. The program involves the sampling and testing of Australian export and domestic traded grains for a range of pesticides and environmental contaminants. Representative samples are collected at export out-turn and domestic receipt.

The program covers cereal grains (barley, maize, oat, sorghum, triticale, wheat, wheat durum, millet, rye), pulses (adzuki bean, chickpea, cowpea, faba bean, field pea, lentil, lupin, mung bean, navy bean, pigeon pea, soybean and vetch), and oilseeds (canola, linseed, safflower, sunflower). The milled fractions of wheat, wheat durum, soybean, rye, and maize are included in the milled grains program.

Key points

- In 2022–2023, the overall compliance with Australian standards was 98.8%.
- Australian grain producers and handlers continue to demonstrate a high degree of good agricultural practice.
- The National Residue Survey's quality management system (QMS) is certified to ISO standard 9001:2015.

Sample collection

On average, 6,000 grain samples are collected per annum at bulk export terminals, container export packers, oilseed crushers, feed mills, flour mills, feedlots and food processors. The number of samples collected is influenced by Australian production levels and export markets. A breakdown of samples collected per crop group and sample program in 2022-23 is provided in Table 1.

Once collected, grain samples are freighted to the contract laboratory for analysis. All sample data is entered into the NRS Information Management System and residue testing result reports are automatically generated for program participants.

Analytical screens

Analytical screens are developed in consultation with the industry and take into account chemicals registered in Australia, chemical residue profiles and overseas market requirements.

Grain samples are screened for a range of insecticides, herbicides, fungicides and environmental contaminants, as shown in Table 2.

Results

In 2022-23, a total of 7,024 samples were collected for analysis. The results were compared with the Australian standards and export samples were compared with the relevant international standards.

A summary of grain compliance rates against the Australian MRL standards for bulk export, container export and domestic trade programs over the past five years is provided in Table 3. The results highlight excellent compliance with Australian standards and demonstrate the strong commitment of the grains industry to good agricultural practice. The consistently high compliance rates help maintain the reputation and integrity of Australian grains in international and domestic markets.



Images courtesy of Grains Australia

The 2022-23 financial year summary datasets for the grains program are located on the department's website agriculture.gov.au/nrs-results-publications

Table 1. Summary of grain samples collected per crop group and program in 2022-23

Crop Group	Bulk export program	Container export program	Domestic trade program
Cereals	4,158	513	664
Oilseed	679	25	133
Pulses	195	629	28
Total	5,032	1,167	825

Table 2. Analytical screens for the grains program

Analytical screen	Chemical group	Analytes
Multi-residue pesticide screen	Insecticide	Over 90 analytes including acephate, abamectin, bifenthrin, diazinon, malathion, pyrethrin and spinosad
	Fungicides	Over 60 analytes including azoxystrobin, boscalid, captan, iprodione, fludioxonil and propiconazole
	Herbicides	Over 90 analytes including atrazine, bromacil, clopyralid, isoxaben, norflurazon and simazine
	Organochlorines	aldrin and dieldrin, chlordane, DDT, endosulfan, endrin, HCB, heptachlor, lindane (gamma HCH) and mirex
Specific herbicides	Herbicides	amitrole, chlormequat, dichlorprop-P, diclofop-methyl, diquat, fenoxaprop-ethyl, flamprop-M-methyl, fluzafop-p-butyl, glufosinate, glyphosate, haloxyfop, paraquat, quizalofop ethyl and quizalofop-p-tefuryl
Imidazolinone herbicides	Herbicides	Imazamox, imazapic, imazapyr, imazaquin, imazethapyr

Table 3. Compliance rates for the past five years relative to Australian standards

Years	Bulk export program		Container export program		Domestic trade program	
	Samples collected	Compliance rates (%)	Samples collected	Compliance rates (%)	Samples collected	Compliance rates (%)
2018-19	2,426	99.6	979	98.3	854	98.2
2019-20	2,211	99.7	1,130	99.3	890	97.7
2020-21	3,256	99.9	1,313	99.1	876	98.9
2021-22	4,156	99.9	1,581	98.9	832	99.4
2022-23	5,032	99.5	1,167	96.3	825	98.6

Laboratory selection and performance

The NRS contracts laboratories to analyse animal and plant product samples for pesticide/veterinary medicine residues and environmental contaminants.

Laboratories are selected through the Australian Government procurement process based on their proficiency and value for money. Laboratories must be accredited to international standard ISO/IEC 17025 at commencement of testing.

Contracted laboratories are proficiency tested by the NRS to ensure the validity of their analytical results and technical competence.

The NRS has been accredited by the National Association of Testing Authorities as a proficiency test provider since July 2005.

International export markets

The NRS maintains information on maximum residue limits (MRLs) that apply to Australia and major export markets for industries supported by the NRS. All analysis results are checked for compliance with Australian standards and relevant international MRLs.

For the Australian MRL standard see legislation.gov.au/Details/F2023L01350

For MRL standards for some international export markets see links at agriculture.gov.au/nrs-databases



Image courtesy of Grains Australia



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