



National Residue Survey 2017–18

Macadamia



The National Residue Survey (NRS) is an operational unit within the Australian Government Department of Agriculture and Water Resources, and since 1992 has been funded by industries through levies or contracted by direct funding.

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 residue monitoring programs monitor the levels of, and associated risks from, pesticides and veterinary medicine residues in Australian food products. The programs help to facilitate and encourage ongoing access to domestic and export markets. 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.

The macadamia residue monitoring program

The macadamia residue monitoring program is a cooperative arrangement between the National Residue Survey, the Australian Macadamia Society and macadamia processing plants. Since 1996, the program has been funded by the NRS component of the statutory levy on macadamia production.

Key points

- National Residue Survey is certified to ISO 9001 Quality Management System.
- In 2017–18, the overall compliance rate against Australian standards was 100 percent. The macadamia industry has an unbroken record of 100 percent compliance since the program commencement in 1996.
- Australian primary producers continue to demonstrate a high degree of good agricultural practice.

The program involves the testing of Australian macadamia for a range of chemical residues and environmental contaminants, which ensures the macadamia industry can meet quality assurance and certification requirements for domestic and international markets.

Sample collection

Samples are collected at macadamia processing plants in accordance with NRS procedures. The program involves the collection of 100 to 150 samples of macadamia nut samples from seven processing plants located in northern New South Wales and Queensland. Once collected, samples are freighted to the contract laboratory for analysis. All data collected is entered into the NRS Information Management System and residue testing reports are automatically generated for the macadamia processing plants.

Analytical screens

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

Macadamia samples are screened for a range of different insecticides, herbicides, fungicides and environmental contaminants, as outlined in Table 1.

Results

In 2017–18, a total of 123 macadamia samples were collected for analysis. The results were compared with the Australian standards and where appropriate, relevant international standards.

The results over the past ten years, as provided in Table 2, highlight Australia’s excellent compliance status against Australian standards and help maintain the reputation and integrity of Australian macadamia nuts in international and domestic markets.

TABLE 2 . Compliance rates for the past 10 years against Australian standards

Years	Samples collected	Compliance rates (%)
2008–09	204	100
2009–10	185	100
2010–11	186	100
2011–12	141	100
2012–13	92	100
2013–14	126	100
2014–15	112	100
2015–16	135	100
2016–17	129	100
2017–18	123	100



TABLE 1 Analytical screens for macadamia program

Chemical screen	Chemical group	Analyte
Multi-residue pesticide screen	Insecticides	abamectin, acephate, acetamiprid, aldicarb, amitraz, azamethiphos, azinphos-methyl, bifentazate, bifenthrin, bioresmethrin, buprofezin, cadusafos, carbaryl, carbofuran, chlorantraniliprole, chlorfenapyr, chlorfenvinphos, chlorpyrifos, chlorpyrifos-methyl, clofentezine, clothianidin, cyfluthrin, cyhalothrin, cypermethrin, deltamethrin, diazinon, dichlorvos, dicofol, diflubenzuron, dimethoate, diphenylamine, disulfoton, emamectin, esfenvalerate, ethion, ethoprophos, etoxazole, fenamiphos, fenbutatin oxide, fenitrothion, fenoxycarb, fenpyroximate, fenthion, fenvalerate, fipronil, hexythiazox, imidacloprid, indoxacarb, malathion (maldison), metaldehyde, methacrifos, methamidophos, methidathion, methiocarb, methomyl, methoprene, methoxychlor, methoxyfenozide, mevinphos, monocrotophos, omethoate, parathion, parathion-methyl, permethrin, phenothrin, phorate, phosmet, piperonyl butoxide, pirimicarb, pirimiphos-methyl, profenofos, propargite, prothiofos, pymetrozine, pyrethrins, pyridaben, pyriproxyfen, spinetoram, spinosad, spirotetramat, sulfoxaflor, tau-fluvalinate, tebufenozide, tebufenpyrad, terbufos, tetradifon, thiacloprid, thiamethoxam, thiodicarb, triazofos, trichlorfon, triflumuron
	Fungicides	2-phenylphenol, azoxystrobin, benalaxyl, benomyl, bitertanol, boscalid, bupirimate, captafol, captan, carbendazim, chlorothalonil, cyproconazole, cyprodinil, difenoconazole, dimethomorph, dithianon, dithiocarbamates, dodine, epoxiconazole, etridiazole, fenarimol, fenhexamid, flonicamid, fluzainam, fludioxonil, fluquinconazole, flusilazole, flutriafol, hexaconazole, imazalil, iprodione, kresoxim-methyl, metalaxyl, metrafenone, myclobutanil, oxadixyl, paclobutrazol, penconazole, penthiopyrad, prochloraz, procymidone, propiconazole, prothioconazole, pyraclostrobin, pyrimethanil, tebuconazole, thiabendazole, tolclofos-methyl, triadimefon, triadimenol, trifloxystrobin, triticonazole, vinclozolin
	Herbicides	2,2-DPA, 2,4-D, atrazine, bromacil, bromoxynil, carfentrazone-ethyl, chlorpropham, chloresulfuron, clorthal-demethyl, clethodim, clodinafop-propargyl, clopyralid, cyanazine, dicamba, dichlobenil, dichlorprop-p, diflufenican, diuron, ethofumesate, iodosulfuron-methyl, ioxynil, isoxaben, linuron, MCPA, methabenthiazuron, metolachlor, metosulam, metribuzin, metsulfuron-methyl, napropamide, norflurazon, oryzalin, oxyfluorfen, pendimethalin, picloram, propachlor, propyzamide, quizalofop-ethyl, quizalofop-p-terfuryl, saflufenacil, sethoxydim, simazine, tralkoxydim, triasulfuron, triclopyr, trifluralin
	Contaminants	aldrin and dieldrin, chlordane, DDT, endrin, endosulfan, HCB, HCH, heptachlor, lindane, mirex
Specific herbicides	Herbicides	amitrole, dichlorprop-P, diclofop-methyl, diquat, fenoxaprop-ethyl, flamprop-M-methyl, fluzafop-p-butyl, glufosinate, glyphosate, haloxyfop, paraquat
Heavy metals	Elements	arsenic, cadmium, copper, lead and mercury

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 tendering process on the basis of their proficiency, accreditation against international standards (ISO/IEC 17025) and value for money.

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 a database of maximum residue limits (MRLs) established for Australia and major export markets for industries supported by the NRS. All analysis results are checked for compliance against Australian standards and relevant international MRLs.

Australian MRL standard can be accessed at <https://www.legislation.gov.au/Details/F2018C00574> and MRL requirements for international export markets can be found at <http://agriculture.gov.au/ag-farm-food/food/nrs/databases>.



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