SENATE RURAL & REGIONAL AFFAIRS & TRANSPORT LEGISLATION COMMITTEE

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Inquiry into the Agricultural and Veterinary Chemicals Legislation Amendment Bill 2012

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Tabled Document

A list of Australia's most dangerous pesticides

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Introduction

Over 8000 pesticide and veterinary products are registered for use in Australian agriculture, horticulture, livestock, forestry, commercial premises, parks, homes and gardens. This document lists some of Australia's most dangerous pesticides. More than 80 of these are prohibited in the United Kingdom, France, Germany and the other 24 member countries of the European Union.

In Europe, pesticides have to be proven safe – in terms of human health, residues in the food chain and the environment – in order to be allowed on the European market. It is the responsibility of industry to provide the data showing that a pesticide can be used safely.

Australia does not have the same system as Europe and our national regulator, the Australian Pesticides and Veterinary Medicines Authority (APVMA) does not apply the same precautionary approach.

This list also includes 17 pesticides that are known, likely or probable carcinogens, and 48 pesticides flagged as potential endocrine (hormone) disruptors. More than 20 of the listed pesticides are classified as either extremely or highly hazardous by the World Health Organisation. Three of the pesticides are subject to actions by International Conventions but are still used in Australia.

Some examples

Endosulfan

Despite its ban in more than 60 countries, including New Zealand,[i] because of health and environment concerns, endosulfan remains registered in Australia for a wide variety of uses, including many fruits, vegetables, field crops, nuts and cotton.

Endosulfan is in the final stages of assessment under the *Stockholm Convention on Persistent Organic Pollutants* (POPs). In October 2009, the United Nations POPs Review Committee concluded that endosulfan was a persistent organic pollutant on the basis of its persistence, toxicity, ability to bio-accumulate and be transported long distances. It found endosulfan was "likely, as a result of its long-range environmental transport, to lead to significant adverse human health and environmental effects, such that global action is warranted".[ii]

Endosulfan has been detected in air, water, sediment, and biota thousands of kilometers from use areas[iii] and in the tissue and blood of Arctic and Antarctic wildlife including seals and whales.

Endosulfan was prohibited from use in the European Union (EU) following reassessment because there was insufficient information about its environmental fate and ecotoxicology, operator exposure under indoor conditions and the route and rate of degradation of endosulfan in soil and water/sediment systems.[iv] Endosulfan is listed in the EU Water Policy's Annex X as a priority substance for control of pollution in the aquatic environment.[v] It is also included in the *List of Chemicals for Priority Action by the OSPAR Commission for the Protection of the Marine Environment in the North-East Atlantic* because of its pollution of the marine environment.[vi]

In June 2010, the United States Environmental Protection Agency (US EPA) announced it would terminate all uses of endosulfan on the basis of its unacceptable neurological and reproductive risks to agricultural workers and wildlife.[vii] Although already a restricted use pesticide, a human health risk assessment found that handler risks were "of concern for most use scenarios, even with maximum personal protective equipment or engineering controls, such as closed mixing/loading systems or enclosed cabs."[viii]

The APVMA began a review of endosulfan in 1995 and issued its final report in 2005. A key concern of the review "was to prevent cattle from ingesting endosulfan residues".[ix] As a result of the review, the APVMA made a number of changes to endosulfan products: declaring them to be restricted chemical products; requiring users to undertake specified training and keep records of use; restricting the number of applications per season in some crops; mandatory buffer zones for

spraying and neighbourhood notification before application (in cotton only).[x]

The APVMA continues to support the registration of endosulfan. Its current position is that "on the basis of the available evidence, endosulfan can be used safely in accordance with the conditions outlined on product labels."[xi]

Endosulfan has been identified as an endocrine disruptor however the APVMA considers "the endocrine disrupting potential of endosulfan is not a significant risk to public health under the existing management controls and health standards".[xii]

The APVMA has identified endosulfan in its priority list of chemicals to be assessed for spray drift risks due to human health, environmental, residue and trade concerns.

Atrazine

Atrazine is one of the most widely used herbicides in Australian agriculture. It is used to control weeds in sorghum, maize, and sugar cane crops, and is also used in pine and eucalypt plantations and on triazine-tolerant canola crops.[xiii]

The APVMA conducted a review of atrazine from 1995 to 2008 due to concerns for human and animal carcinogenicity, environmental impacts, including the potential for atrazine to contaminate ground and surface water, and residue uncertainties. The review affirmed atrazine's approval in Australia and made relatively minor changes to label instructions; updated information on withholding periods; and required additional information on weed resistance reporting.

The APVMA has identified atrazine in its priority list of chemicals to be assessed for spray drift risks due to human health and environmental concerns.

Atrazine was prohibited in the European Union in 2003 following re-assessment. The scientific review concluded that atrazine and its breakdown products presented a risk to EU groundwater quality standards.[xiv]

The US EPA is currently re-evaluating atrazine because of "the new body of scientific information as well as the documented presence of atrazine in both drinking water sourced and other bodies of water".[xv]

Atrazine is a suspected endocrine/reproductive disrupter.

Diuron

Diuron is a broad-spectrum residual herbicide and algaecide used in Australia to control weeds in a variety of crops including wheat, oats, barley, rye, triticale, lupin, sugar cane, cotton, coffee, citrus, apples and pears, pawpaw, pineapples, bananas, grapes, asparagus, peas, cut flowers and various seed crops. It is also registered as a cotton defoliant, for controlling weeds and algae in and around water bodies and in marine antifouling paints.[xvi]

The APVMA began a review of diuron in 2002 because of concerns about human health and environmental risks, particularly because of its detection in the Great Barrier Reef. In 2005 the APVMA released preliminary review findings, including that:

- diuron is posing an unacceptable risk to corals, seagrass and dugongs in the Great Barrier Reef;
- diuron is posing an unacceptable risk to the environment from 13 of its 22 registered uses.[xvii]

The APVMA made a number of preliminary recommendations to change the way diuron can be used but none have yet been implemented. The review has not been completed. Diuron has subsequently been added to the APVMA's list of priority pesticides for spray drift risk assessment due to environmental concerns.

The EU originally withdrew diuron under its re-assessment process. Risks to operators, groundwater and birds and mammals were deemed unacceptable on the basis of the available scientific information.[xviii] However, a further review was undertaken based on additional confidential data provided by the main registrant, and a recommendation to re-include diuron was accepted for limited uses under strict conditions. Diuron application in the EU is now limited to ground in strip-band application under rows, avoiding drift by using low pressure and shields.[xix] These conditions address operator safety and the protection of aquatic organisms and non-target plants.

Diuron is a known/likely human carcinogen and has been identified as a suspected endocrine disruptor.

Chlorpyrifos

Chlorpyrifos is an insecticide used on a wide range of Australian fruit and vegetable crops, sugar cane, cotton, cereals and pastures, in termite management, home gardens and domestic pests. The APVMA initiated a review of chlorpyrifos in 1996 because of its human toxicity, acute toxicity to birds, water pollution potential and other factors.[xx] After 14 years, the review is still

ongoing.

In 2000, the APVMA released interim findings that the home and garden uses of chlorpyrifos with concentrations of greater than 50g/L could no longer be supported because of acute toxicity concerns. The APVMA also found that there was inadequate residue data for the use of chlorpyrifos in some commodities. In 2009 the APVMA released further findings and recommended a number of use restrictions, as well as extending the withholding periods for products sprayed with chlorpyrifos.[xxi] It is unclear which, if any, of these recommendations have been implemented.

The APVMA has identified chlorpyrifos in its priority list of chemicals to be assessed for spray drift risks due to human health and environmental concerns.

In the EU, chlorpyrifos is authorised but only for for limited purposes. Chlorpyrifos is also registered in the United States but its use there is more restricted compared to Australia. For example, chlorpyrifos is not permitted for use on tomatoes or for post bloom use on apples, home gardens and lawns, inside homes for crack and crevice treatments, post construction termite treatments for barriers and spot treatments, or for any area where children could be exposed to it such as schools and parks.[xxii] In 2009, the US EPA announced plans to introduce additional limitations on the use of chlorpyrifos to protect 28 species of endangered and threatened salmon and steelhead fish in four US States, following assessment under the US *Endangered Species Act*.[xxiii]

Table 1: A list of the most dangerous pesticides registered in Australia

Pesticide	Function	EU Status and International Conventions	WHO Classification	Potential carcinogen	Potential endocrine disruptor	APVMA status	No. of registered products in Australia	Examples of registered uses in Australia
Acephate	Insecticide	Prohibited in EU	Moderately hazardous	IARC: Not classifiable US EPA: Possible human carcinogen	EU 2; US EPA (Screen list)	Nominated for review (Priority 1): Human health and residues	12	Bananas, crucifers, macadamias, ornamentals, potatoes, tobacco, tomatoes
Acifluorfen	Herbicide	Prohibited in EU	Moderately hazardous	US EPA: Multiple Descriptors, likely to be carcinogenic to humans at high doses, not likely to be carcinogenic to humans at low doses			3	Broadleaf weeds and grasses in certain crops
Allethrin	Insecticide	Prohibited in EU	Moderately hazardous	US EPA: Not likely to be carcinogenic to humans	OSF		111	Household broad spectrum surface spray and insect killer, mosquitos
Aldicarb	Insecticide, Nematicide	Prohibited in EU	Extremely hazardous	IARC: Not classifiable	EU 2	Review completed 2001	3	Cotton, sugar cane, citrus
Ametryn	Herbicide	Prohibited in EU	Moderately hazardous	US EPA: Data inadequate for an assessment of human carcinogenic potential			20	Weeds and grasses in sugar cane
Amitraz	Insecticide, Parasiticide	Prohibited in EU	Moderately hazardous	US EPA: Suggestive evidence of carcinogenic potential to humans			26	Cattle (ticks), pigs (mange), cotton
Atrazine	Herbicide	Prohibited in EU	Slightly hazardous	IARC: Not classifiable US EPA: Not likely to be carcinogenic to humans	EU 1; OSF; US EPA (Screen list)	Review completed 2008 Spray drift priority list: Human health and environmental concerns	68	TT canola, sorghum, broom millet, maize, sweet corn, sugar cane, lupins, Eucalyptus and *Pinus radiata* plantations, grass seed crops, ryegrass seed crops, roadside and rights of way
Azaconazole		Prohibited in EU	Moderately hazardous				1	Residual insect spray
Azamethiphos	Insecticide	Prohibited in EU	Moderately hazardous				3	
Azinphos-methyl	Insecticide	Prohibited in EU	Highly hazardous			Under review since 1994 Spray drift priority list: Human health and environmental concerns	4	Fruit, macadamias
Bendiocarb	Insecticide, Parasiticide	Prohibited in EU	Moderately hazardous	US EPA: Evidence of non-carcinogenicity for humans			4	Household nuisance pests, bananas, cattle
Bensulide	Herbicide	Prohibited in EU	Moderately hazardous	US EPA: Not likely to be carcinogenic to humans			2	Selective turf herbicide
Bifenthrin	Insecticide, Miticide, Termiticide	Prohibited in EU	Moderately hazardous	US EPA: Possible human carcinogen	EU 1; US EPA (Screen list)	Review completed 2008 Restricted chemical product (pre-construction termite products)	170	Apricots, bananas, barley, canola, citrus, clover, cotton, cucurbits, faba beans, field peas, grapes, lucerne, lupins, navy beans, netarines, peaches, pears, plums, poppies, sugar cane, tomatoes, wheat, ants, timber pests, garden and household pests

Pesticide	Function	EU Status and International Conventions	WHO Classification	Potential carcinogen	Potential endocrine disruptor	APVMA status	No. of registered products in Australia	Examples of registered uses in Australia
Bioallethrin	Insecticide	Prohibited in EU	Moderately hazardous	US EPA: Suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential	EU 1		38	Household nuisance pests
Bromoxynil	Herbicide			US EPA: Possible human carcinogen	EU 2	Trade Advice Notice issued May 2008, concern over residues	54	Wheat, barley, cereal rye,oats, triticale, linseed, grass pastures and turf
Cadusafos	Insecticide, Nematicide	Prohibited in EU	Highly hazardous	US EPA: Evidence of non-carcinogenicity for humans			2	Bananas, citrus, ginger, sugar cane, tobacco, tomatoes
Carbaryl	Insecticide, Parasiticide	Prohibited in EU	Moderately hazardous	IARC: Not classifiable US EPA: Likely to be carcinogenic to humans	EU 1; OSF; US EPA (Screen list)	Under review since 1995: Residue and health concerns	12	Fruit, nuts, vegetables, crops and pastures
Carbendazim	Fungicide			US EPA: Possible human carcinogen	EU 2	Under review since 2007: Residue and occupational safety and public health concerns New restrictions introduced in 2010 Spray drift priority list: Human health and environmental concerns	16	Bananas, strawberries, ginger seed pieces (pre-planting), sugar cane setts (pre-planting), pasture, red clover and subterranean clover, chickpeas, faba beans, lentils, vetch, macadamias and in timber preservation
Carbofuran	Insecticide, Nematicide	Prohibited in EU	Highly hazardous	US EPA: Not likely to be carcinogenic to humans	EU 2; US EPA (Screen list)	Nominated for review (Priority 2): Human health	4	Rice, sugar cane, tobacco, wheat, barely
Carbosulfan	Insecticide	Prohibited in EU	Moderately hazardous				2	Cotton
Chlorfenapyr	Miticide, Insecticide	Prohibited in EU	Moderately hazardous	US EPA: Suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential		Spray drift priority list: Environmental concerns	5	Brassica vegetables, apples, peaches, pears
Chlorfenvinphos	Insecticide, Parasiticide	Prohibited in EU	Highly hazardous		EU 2	Under review since 1996: Occupational health and safety, environmental effects	8	Cattle dip and spray, flystrike and mules wound dressing
Chloropicrin	Mixed function pesticide	Prohibited in EU				Nominated for review (Priority 1): Environmental and human health and residue concerns	23	Soil and compost fumigation, rabbits, rodents
Chlorthal	Herbicide	Prohibited in EU		US EPA: Possible human carcinogen			6	Brassicas, beans, peas, garlic, onions, carrots, potaties, turnips, stawberries, cotton, Lucerne, perennial grass crops, lawns, ornamentals
Chlorothalonil	Fungicide, Antifouling paints			IARC: Possibly carcinogenic to humans US EPA: Likely to be carcinogenic	US EPA (Screen list)	Nominated for review (Priority 2): Environmental and human health concerns	51	Almonds, bananas, cucurbits, grapes, ornamentals, peanuts, pulses, stone fruits, tobacco, vegetables, turf, *Pinnus* sp.
Chlorpyrifos	Insecticide		Moderately	US EPA: Evidence of non-	US EPA	Under review since 1996:	111	Fruit, vegetables, oil seeds, cotton,

Pesticide	Function	EU Status and International Conventions	WHO Classification	Potential carcinogen	Potential endocrine disruptor	APVMA status	No. of registered products in Australia	Examples of registered uses in Australia
			hazardous	carcinogenicity for humans	(Screen list)	Occupational health and safety, environmental effects Spray drift priority list: Human health and environmental concerns Restricted chemical product (pre-construction termite products)		cereals, pasture, turf
Clothianidin	Insecticide	Allowed, with additional provisions to protect honey bees introduced by Directive 2010/21/EU		US EPA Not likely to be carcinogenic to humans			5	Apples, peaches, nectarines, table and wine grapes, cotton, bananas, Eucalypts
Cyanazine	Herbicide	Prohibited in EU	Moderately hazardous	US EPA: Possible human carcinogen	EU 2	Nominated for review (Priority 2): Environmental, human health concerns	9	Peas, chickpeas, faba beans, lentils, vetches, onions, potatoes, sweet corn
Cyfluthrin, *Beta-Cyfluthrin	Insecticide, Parasiticide		Highly hazardous	US EPA Not likely to be carcinogenic to humans	US EPA (Screen list)		26	Avocados, brassicas, macadamias, tomatoes, household pests, turf, cattle
Cyhalothrin	Insecticide	Prohibited in EU	Moderately hazardous	US EPA: Not classifiable as to human carcinogenicity	EU 1 (Lamba cyhalothrin)		15	Barley, cotton, wheat, various field crops
Cypermethrin, *Alpha-cypermethrin	Insecticide, Seed treatment, Parasiticide		Moderately hazardous	US EPA: Possible human carcinogen	OSF; US EPA (Screen list)		242	Seed dressing for wheat and barely, oats, triticale, crops, sheep, household pests
Cyproconazole	Fungicide	Prohibited in EU	Moderately hazardous	US EPA: Not likely to be carcinogenic to humans at doses that do not cause a mitogenic response in the liver			5	Barely, wheat, peanuts, potatoes, pruning wounds on apples, apricots, peaches, plums, ornamentals
2,4-D	Herbicide, Growth regulator		Moderately hazardous	US EPA: Not classifiable as to human carcinogenicity	EU 2; US EPA (Screen list)	Under review since 1995. Spray drift priority list: Environmental concerns	198	Broadleaf weeds in legume based pastures, lucerne, maize, millet, peanuts, sorghum, swetcorn, cereal crops, citrus, pears, sugar cane
Dazomet	Mixed function pesticide	Prohibited in EU	Moderately hazardous	US EPA: Not classifiable as to human carcinogenicity		Review completed 1997	6	Wood preservative, soil fumigant
Diazinon	Insecticide, Parasiticide	Prohibited in EU	Moderately hazardous	US EPA: Not likely to be carcinogenic to humans	EU 2; US EPA (Screen list)	Under review since 1996: Occupational, public health, environmental, trade concerns	54	Turf, pastures, field crops, vegetables, plantation and orchard crops, household pests, flea and tick control on pets, cattle, pigs, goats
Dichlorobenzene	Insecticide, Parasiticide	Prohibited in EU	Moderately hazardous				9	Sheep, household insecticide fumigant
Dichlorophen	Herbicide, Parasiticide	Prohibited in EU	Moderately hazardous				11	Pavements, lawns, pots and synthetic courts, cats, dogs, horses, cattle,
Dichlorprop	Herbicide	Prohibited in EU	Moderately hazardous			Spray drift priority list: Environmental concerns	4	Plant growth regulator in orange and mandarin, non-crop rights of way for lantana etc

Pesticide	Function	EU Status and International Conventions	WHO Classification	Potential carcinogen	Potential endocrine disruptor	APVMA status	No. of registered products in Australia	Examples of registered uses in Australia
Dichlorvos	Insecticide, Parasiticide	Prohibited in EU	Highly hazardous	IARC: Possibly carcinogenic to humans US EPA: Suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential		Under review since 1996: Occupational, public health, environmental, trade concerns	15	Stored cereal grains, industrial and domestic pest control
Diclofop	Herbicide	Prohibited in EU	Moderately hazardous	US EPA: Likely to be carcinogenic to humans		Spray drift priority list: Environmental concerns	41	Wheat, barley, cereal rye, triticale, linseed, peas,
Dicofol	Miticide	Prohibited in EU	Moderately hazardous	IARC: Not classifiable US EPA: Possible human carcinogen	EU 2; OSF; US EPA (Screen List)	Nominated for review (Priority 3): Environmental, human health and residues concerns	7	Cotton, pome and stone fruit, tomatoes, vegetables, strawberries, grapevines, ornamentals
Difenoconazole	Fungicide		Moderately hazardous	US EPA: Possible human carcinogen			11	Potatoes, tomatoes, carrots, bananas, macadamias, seed treatment in barley and wheat
Dimethipin	Growth regulator	Prohibited in EU	Moderately hazardous	US EPA: Possible human carcinogen			2	Cotton
Dimethenamid	Herbicide	Prohibited in EU	Moderately hazardous	US EPA: Possible human carcinogen			2	Broadleaf weeds in green beans, navy beans, sweet corn, poppies, pumpkins, kabocha
Dimethoate	Insecticide		Moderately hazardous	US EPA: Possible human carcinogen	EU 2; US EPA (Screen List)	Under review since 2004: Toxicology, occupational health and safety, residues and trade concerns Spray drift priority list: Human health and environmental concerns	28	Fruit, vegetables, cereals, citrus,pastures, cotton, lucerne, field legumes, peanuts, ornamentals, post harvest dipping (eg avocadoes, bananas, mangoes, custard apples), home gardens
Diquat	Herbicide		Moderately hazardous	US EPA: Evidence of non-carcinogenicity for humans		Under review since 1997: Environment, public and occupational health and safety, residue concerns Spray drift priority list: Human health and environmental concerns	43	Grasses and broadleaf weeds in many crops, pre harvest crop desiccation potatoes an and seed crops, sugar cane
Diuron	Herbicide, Antifouling	Allowed, under strict conditions	Slightly hazardous	US EPA: Known/likely carcinogen	EU 2	Under review since 2002: Human health and environmental concerns Spray drift priority list: Environmental concerns	115	Apples, sugar cane, pears, asparagus, bananas, coffee, cotton, dubosia, citrus, pineapple, wheat, barely, cereal rye, triticale, oats, irrigation channels, rights of way, commercial and industrial areas
Dithianon	Fungicide	Prohibited in EU	Moderately hazardous	US EPA: Suggestive evidence of carcinogenic potential			7	Stone fruit, pome fruit, vines
Disulfoton	Insecticide	Prohibited in EU	Extremely hazardous	US EPA: Evidence of non-carcinogenicity for humans		Nominated for review (Priority 4): Potential to cause harm	1	Lucerne, cotton, potatoes, peas, beans, bulbs, gladioli
Endosulfan	Insecticide	Prohibited in EU Currently being	Moderately hazardous	US EPA: Not likely to be carcinogenic to humans	EU 2; OSF; US EPA	Review completed 2005 Restricted chemical product	9	Numerous field crops, vegetables, tree and vine crops, nursery crops,

Pesticide	Function	EU Status and International Conventions	WHO Classification	Potential carcinogen	Potential endocrine disruptor	APVMA status	No. of registered products in Australia	Examples of registered uses in Australia
		assessed for inclusion under the Stockholm Convention on Persistent Organic Pollutants			(Screen List)	Spray drift priority list: Environmental concerns, human health and residue and trade concerns		ornamentals, wildflowers, tobacco
Ethion	Insecticide, Nutrition and metabolism, Parasiticide	Prohibited in EU	Moderately hazardous	US EPA: Evidence of non-carcinogenicity for humans			56	Cotton, cattle, horses, cats, dogs
Ethylene dichloride	Insecticide						1	Fumigant in flour mills and food processing plants
Ethylene oxide	Mixed function pesticide, Wetting agent, Sanitiser	Prohibited in EU		IARC: Carcinogenic to humans			21	Fumigation, sterilisation, spray adjuvant
Fenamiphos	Insecticide, Nematicide		Highly hazardous	US EPA: Evidence of non-carcinogenicity for humans		Under review since 2003: Public health, occupational health and safety, environment and residues in food concerns	14	Aloe vera, bananas, citrus, crucifers, cucurbits, carrots, beetroot, onions, celery, sweet potatoes, lettuce, endive, parsnips, grapevines, mushrooms, pineapples, potatoes, strawberries, sugar cane, tobacco, tomatoes, turf, ornamentals
Fenitrothion	Insecticide	Prohibited in EU	Moderately hazardous	US EPA: Evidence of non-carcinogenicity for humans	EU 1; OSF	Under review since 1996: Worker health and safety and environmental concerns	10	Various broad acre and horticultural crops, pastures, stored cereal grain pests, locust and grasshopper
Fenoxycarb	Insecticide	Prohibited in EU		US EPA: Likely to be carcinogenic to humans	EU 2		7	Apples, pears, household pests
Fenthion	Insecticide, Paraciticide, Vertebrate poison	Prohibited in EU	Moderately hazardous	US EPA: Evidence of non-carcinogenicity for humans		Under review since 1994: Public health, occupational health and safety, environmental, food residue concerns Restricted chemical product (vertebrate poison) Spray drift priority list: Human health and environmental concerns	10	Tree and vine crops, post harvest treatments, capsicums, tomatoes, ornamentals, nuisance and public health pests, restricted non-native bird control agent
Fenvalerate	Insecticide, Paraciticide	Prohibited in EU	Moderately hazardous	IARC: Not classifiable US EPA: Evidence of non-carcinogenicity for humans	EU 2; OSF		9	Field crops, pasture, vegetable crops, cattle, horses
Fipronil	Insecticide, Paraciticide, Vertebrate poison	Allowed, with additional provisions to protect honey bees introduced by Directive 2010/21/EU	Moderately hazardous	US EPA: Not likely to be carcinogenic to humans	OSF	Under review since 2003: Toxicity, toxic photo degradation products, occupational health and safety issues, animal safety and the adequacy of label instructions	49	Cats, dogs, seed treatment (canola, sorghum, sunflowers), household pests, turf, grasshoppers, locusts
Fluometuron	Herbicide	Prohibited in EU		IARC: Not classifiable			30	Cotton

Pesticide	Function	EU Status and International Conventions	WHO Classification	Potential carcinogen	Potential endocrine disruptor	APVMA status	No. of registered products in Australia	Examples of registered uses in Australia
				US EPA: Possible human carcinogen				
Glufosinate	Herbicide		Moderately hazardous	US EPA: Not likely to be carcinogenic to humans		Spray drift priority list: Human health and environmental concerns	12	Broadleaf and grass weeds in many crops, forestry, rights of way, industrial areas, GE cotton varieties
Guazatine	Fungicide	Prohibited in EU	Moderately hazardous				6	Citrus, tomatoes, rockmelons
Haloxyfop	Herbicide	Prohibited in EU	Moderately hazardous	US EPA: Probable human carcinogen			28	Grass weeds in grain legume, oilseed crops, lucerne, pastures, seed crops, forestry, bananas, citrus, grapes, pineapples, pome fruit, stone fruit, pyrethrum, tropical fruit, nut crops
Hexaconazole	Fungicide	Prohibited in EU	Slightly hazardous	US EPA: Possible human carcinogen			11	Apples, pears, wine grapes,
Hexazinone	Herbicide	Prohibited in EU	Moderately hazardous	US EPA: Not classifiable as to human carcinogenicity		Nominated for review (Priority 2): Human health and environmental concerns Spray drift priority list: Human health and environmental concerns	42	*Pinus Radiata* plantations, sugar cane, grazing pastures, around agricultural buildings, commercial and industrial areas, rights of way,
Hydramethylnon	Insecticide	Prohibited in EU	Moderately hazardous				18	Household pests (eg ants, cockroaches)
Imazalil	Fungicide		Moderately hazardous	US EPA: Likely to be carcinogenic to humans			20	Postharvest diseases citrus, apples, pears, rock melons, potatoes
Iprodione	Fungicide			US EPA: Likely to be carcinogenic to humans	EU 2; OSF; US EPA (Screen List)		49	Ornamentals, turf, lupins, potatoes, small fruit, berries, grapes, kiwifruit, mandarins, passion fruit, stone fruit, almonds, macadamias, celery, lettuces , strawberries, tomatoe
Lindane (gamma-HCH)	Insecticide	Listed under Rotterdam Convention Listed under LRTAP Subject to an International ban under the Stockholm Convention but Australia is yet to ratify.	Moderately hazardous	IARC: Possibly carcinogenic to humans US EPA: Suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential	EU 1; OSF	Nominated for review (Priority 4)	1	Pineapples
Linuron	Herbicide			US EPA: Possible human carcinogen	EU 1; OSF; US EPA; (Screen List)		11	Wheat, barley, oats, potatoes, carrots, parsnips, coriander seed crops, onions, soybeans, maize, sweet corn
Malathion (maldison)	Insecticide, Parasiticide		Slightly hazardous	IARC: Not classifiable US EPA: Suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential	EU 2; OSF; US EPA (Screen List)	Under review since 2003: Toxicity and human health and safety concerns	25	Ornamentals, apples, pears, citrus, fruit trees, grapevines, stone fruit, cereals, pastures, lucerne, rapeseed, rice, cucurbits, tomatoes, vegetables, grain storage, animal quarters, Eucalpyts, mosquitoes, tobacco

Pesticide	Function	EU Status and International Conventions	WHO Classification	Potential carcinogen	Potential endocrine disruptor	APVMA status	No. of registered products in Australia	Examples of registered uses in Australia
Mancozeb	Fungicide			US EPA: Probable human carcinogen	EU 1; OSF		77	Field crops, fruit, ornamentals, turf, vegetables
MCPA	Herbicide		Moderately hazardous	US EPA: Not likely to be carcinogenic to humans		Nominated for review (Priority 3): Environmental and human health concerns. Spray drift priority list	215	Turf, wheat, oats, barley, cereal rye, triticale, linseed, pastures, home gardens
Mecoprop	Herbicide		Moderately hazardous	US EPA: Suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential		Spray drift priority list: Environmental concerns	12	Turf
Mercuric chloride	Fungicide	Listed under Rotterdam Convention	Extremely hazardous	IARC: Possibly carcinogenic to humans	OSF (Mercury)	Review completed 1992 *Soil monitoring to be undertaken to confirm that soil mercury levels do not exceed background levels	2	Sugar cane
Metaldehyde	Molluscicide	Prohibited in EU	Moderately hazardous	US EPA: Suggestive evidence of carcinogenic potential		Nominated for review (Priority 2): Human health concerns	34	Snails and slugs
Methamidophos	Insecticide	Prohibited in EU Listed under Rotterdam Convention (600g/L formulation and higher)	Highly hazardous		US EPA; (Screen List)	Under review since 2002: High acute and chronic toxicity, delayed neurotoxicity	4 *(2 products at 580g/L)*	Brassicas, capsicums, lupins, ornamentals, peaches, peanuts, potatoes, tomatoes
Methidathion	Insecticide	Prohibited in EU	Highly hazardous	US EPA: Possible human carcinogen	US EPA; (Screen List)	Under review since 2002: Toxicity, worker safety, residue and dietary risk concerns	5	Orchards, sub tropical crops, vegetables, cereals, pastures, forage crops, cotton, rice, sunflowers
Methiocarb	Molluscicide		Highly hazardous	US EPA: Not classifiable as to human carcinogenicity		Under review since 1995: Public health, occupational health and safety, residues, and the environment	5	Snails and slugs
Methomyl	Insecticide		Highly hazardous	US EPA: Evidence of non-carcinogenicity for humans	EU 2; OSF; US EPA (Screen List)	Nominated for review (Priority 1): Human health and residue concerns	24	Cereals, fruit, legumes, cotton, duboisia, hops, oilseed crops, tobacco, potatoes, vegetables, pastures, peanuts, ginger, fly bait
Methyl bromide	Mixed function pesticide	Prohibited in EU Listed under Montreal Protocol, Australia committed to a total phase out for horticultural uses by 2005		IARC: Not classifiable US EPA: Not likely to be carcinogenic to humans	EU 2	Review completed in 2007	24	Fumigant and soil sterilant for critical use exemptions, quarantine and pre-shipment
Mevinphos	Insecticide	Prohibited in EU	Extremely hazardous	US EPA: Not likely to be carcinogenic to humans	EU 2	Review completed 2002 Restricted chemical product	2	Brassicas (cabbages, cauliflower, broccoli), Brussels sprouts
Molinate	Herbicide		Moderately hazardous	US EPA: Suggestive evidence of		Under review since 2003: Toxicological, occupational	5	Rice

Pesticide	Function	EU Status and International Conventions	WHO Classification	Potential carcinogen	Potential endocrine disruptor	APVMA status	No. of registered products in Australia	Examples of registered uses in Australia
				carcinogenicity, but not sufficient to assess human carcinogenic potential		health and safety and environmental concerns		
Myclobutanil	Mixed function pesticide, Fungicide	Prohibited in EU	Moderately hazardous	US EPA: Evidence of non-carcinogenicity for humans	US EPA (Screen List)		31	Apples, pears, strawberries, roses and ornamentals
Omethoate	Insecticide	Prohibited in EU	Highly hazardous		EU 1	Under review since 2004: Toxicology, occupational health and safety, residues and trade	13	Pastures, cereals, oilseed, legumes, lucerne, cotton, apples, bananas, citrus, lupins, onions, pears, potatoes, ornamentals, fruit, vegetables (home garden)
Oxadixyl	Fungicide	Prohibited in EU	Moderately hazardous	US EPA: Possible human carcinogen			3	Cucurbits, lettuce, onions, grapevines
Paclobutrazol	Plant regulator, Herbicide	Prohibited in EU	Moderately hazardous	US EPA: Not classifiable as to human carcinogenicity			28	Turf, mango, stonefruit, apple
Paraquat	Herbicide	Prohibited in EU	Moderately hazardous			Under review since 1997: Occupational health and safety and environment risks. Spray drift priority list: Human health and environmental concerns	73	Bananas, orchards and vineyards, rice, pasture, seed crops, lucerne, hay freezing, peanuts, potatoes, vegetables, sugar cane,
Parathion-methyl	Insecticide	Prohibited in EU Listed under Rotterdam Convention (EC at or above 19.5% AC and dusts 1.5% AC)	Extremely hazardous	IARC: Not classifiable	EU 2; US EPA (Screen List)	Under review since 1996: Worker health and safety, environmental risks, including high toxicity to bees. Spray drift priority list: Human health and environmental concerns	5	Cotton, cruciferous forage, citrus, pome and stone fruit, grapevines, tobacco
Pendimethalin	Herbicide		Moderately hazardous	US EPA: Possible human carcinogen			39	Turf, various crops eg wheat, barley, peas, cotton, sunflowers, canola, vegetables, maize, onions, sugar cane
Permethrin	Insecticide, Mixed function seed treatment, Parasiticide	Prohibited in EU	Moderately hazardous	IARC Not classifiable US EPA: Likely to be carcinogenic to humans	EU 2; OS; US EPA (Screen List)	Nominated for review (Priority 3): Human health, environment and residue concerns	544	Household pests, dogs, horses, sheep, seed treatment, wood preservative, commercial and industrial, various crops
Phorate	Insecticide	Prohibited in EU	Extremely hazardous	US EPA: Evidence of non-carcinogenicity for humans		Nominated for review (Priority 2): Human health concerns	7	Cotton, ornamentals, vegetables (carrots, onions, cabbage, broccoli, cauliflower, Brussels sprouts, potatoes, tomatoes)
Phosmet	Miticide		Moderately hazardous	US EPA: Suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential	US EPA (Screen List)	Nominated for review (Priority 4): Human health concerns	3	Cereals, lucerne, pasture, seed crops
Picloram	Herbicide			IARC: Not classifiable US EPA: Evidence of non-	EU 1	Nominated for review (Priority 3): Human health and	58	Barley, canary grass, oats, triticale, wheat, linseed, non-crop areas,

Pesticide	Function	EU Status and International Conventions	WHO Classification	Potential carcinogen	Potential endocrine disruptor	APVMA status	No. of registered products in Australia	Examples of registered uses in Australia
				carcinogenicity for humans		environmental concerns		commercial and industrial areas
Piperonyl butoxide	Insecticide	Prohibited as plant protection product		IARC: Not classifiable US EPA: Possible human carcinogen	EU 2; US EPA (Screen List)		319	Cats, dogs, household pests, commercial stored products pests, restaurants, public service areas, offices, hotels, bottling plants
Pirimicarb	Insecticide		Moderately hazardous	US EPA: Likely to be carcinogenic to humans			13	Fruit crops tree and vine, vegetables, ornamentals, broad acre crops
Prochloraz	Fungicide	Prohibited in EU	Moderately hazardous	US EPA: Possible human carcinogen	EU 2		8	Tropical fruits, pineapple, sugar cane, mushrooms, lettuce, proteas, violas, turf
Profenofos	Insecticide	Prohibited in EU	Moderately hazardous	US EPA: Evidence of non-carcinogenicity for humans		Nominated for review (Priority 1): Human health concerns	11	Cotton
Propachlor	Herbicide	Prohibited in EU	Moderately hazardous	US EPA: Likely to be carcinogenic to humans	US EPA; (Screen List)		2	Maize, sorghum, sweet corn, vegetables
Propanil	Herbicide	Prohibited in EU	Moderately hazardous	US EPA: Suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential	EU 2		5	
Propetamphos	Parasiticide	Prohibited in EU	Highly hazardous	US EPA: Not likely to be carcinogenic to humans		Review concluded 2009 Sheep Ectoparasiticide review	3	Sheep blowfly strike dressing
Propiconazole	Fungicide, Mixed function pesticide		Moderately hazardous	US EPA: Possible human carcinogen	US EPA (Screen List)	Nominated for review (Priority 1): Spray drift risks human heath and environmental concerns	57	Bananas, barley, oats, peanuts, perennial ryegrass, pineapples, stone fruit, sugar cane, oats, wheat, mushroom trays and beds
Propoxur	Parasiticide	Prohibited in EU	Moderately hazardous	US EPA: Probable human carcinogen			5	Dogs, cats
Prothiofos	Insecticide	Prohibited in EU	Moderately hazardous				2	Bananas, vegetables, table grapes, pears,
Pyraclofos	Parasiticide	Prohibited in EU	Moderately hazardous				2	Sheep
Pyridaben	Miticide	Prohibited in EU	Moderately hazardous	US EPA: Evidence of non-carcinogenicity for humans			3	
Quizalofop	Herbicide	Prohibited in EU	Moderately hazardous	US EPA: Not classifiable as to human carcinogenicity			31	Broadleaf vegetables and crops
Rotenone	Insecticide, Mixed function pesticide, Parasiticide	Prohibited in EU	Moderately hazardous	US EPA: Evidence of non-carcinogenicity for humans		Nominated for review (Priority 2): Human health	13	Vegetables, ornamentals, dogs, cats
Simazine	Herbicide, Algacide	Prohibited in EU	Unlikely to present acute hazard	IARC: Not classifiable US EPA: Not likely to be carcinogenic to humans	EU 2; US EPA (Screen List)	Nominated for review (Priority 2): Environmental, human health	90	Swimming pools, dams, tanks, troughs, commercial and industrial areas, TT canola, faba beans, asparagus, berry fruits, citrus, almonds, hops, gladioli, apples, pears, roses, vineyards, chickpeas,

Pesticide	Function	EU Status and International Conventions	WHO Classification	Potential carcinogen	Potential endocrine disruptor	APVMA status	No. of registered products in Australia	Examples of registered uses in Australia
								strawberries, pastures, lupins,
Tebuconazole	Mixed function seed treatment Fungicide		Moderately hazardous	US EPA: Possible human carcinogen	US EPA (Screen List)		69	Seed dressing wheat, barley, oats, bananas, peanuts, cereal crops, beans, peas, onions, papaw, pyrethrum, ryegrass
Tebuthiuron	Herbicide	Prohibited in EU	Moderately hazardous	US EPA: Not classifiable as to human carcinogenicity			10	Tea tree, grazing land
Terbufos	Mixed function pesticide	Prohibited in EU	Extremely hazardous	US EPA: Evidence of non-carcinogenicity for humans		Nominated for review (Priority 2): Environmental, human health	5	Bananas, maize, sorghum, sweet corn, wheat, peanuts, sunflowers, barely
Tetraconazole	Fungicide		Moderately hazardous	US EPA: Likely to be carcinogenic to humans			2	Grapevines
Thiacloprid	Insecticide		Moderately hazardous	US EPA: Likely to be carcinogenic to humans			2	Apples, pome fruit, stone fruit
Thiobencarb	Herbicide	Prohibited in EU	Moderately hazardous	US EPA: Not classifiable as to human carcinogenicity		Nominated for review (Priority 2): Environmental, human health and residues concerns	2	Rice
Thiodicarb	Insecticide	Prohibited in EU	Moderately hazardous	US EPA: Probable human carcinogen		Spray drift priority list: Human health and environmental concerns	7	Brassica, cotton, maize, sweet corn, pulses, tomatoes, tobacco
Thiram	Fungicide, Antifouling		Moderately hazardous	IARC: Not classifiable US EPA: Not likely to be carcinogenic to humans	EU 1; OSF	Nominated for review (Priority 2): Environmental, human health and residues concerns	26	Turf, bowling greens, golf greens, grapes, pome fruit, seeds, stone fruits, strawberries, vegetables, ornamentals, crops, boats
Triadimefon	Fungicide	Prohibited in EU	Moderately hazardous	US EPA: Possible human carcinogen	EU 2; OSF; US EPA (Screen List)		36	Wheat, barely, peas, curcurbits, grapevines, sugar cane, azaleas
Triadimenol	Mixed function seed treatment, Fungicide		Moderately hazardous	US EPA: Possible human carcinogen	EU 2; OSF		41	Brassica vegetables, cucurbits, grapevines, papaws, sugar cane, seed dressing (wheat, barely, oats), turf
Trichlorfon	Insecticide, Parasiticide	Prohibited in EU	Moderately hazardous	IARC: Not classifiable US EPA: Multiple Descriptors, likely to be carcinogenic to humans at high doses, not likely to be carcinogenic to humans at low doses	EU 2	Nominated for review (Priority 1): Environmental, human health and residues concerns	12	Canola, cereal crops, grass seed crops, legumes, linseed, lupins, lucern, maize, rice, pasture, safflower, sorghum, tobacco, avocado, grapevines, guava, macadamia, pawpaw, passionfruit, pome fruit, stone fruit, fish aquariums
Zeta cypermethrin	Insecticide, Parasiticide		Highly hazardous	US EPA: Possible human carcinogen	EU 2		8	Cabbages, cauliflowers, Brussels sprouts, kale, kohlrabi, Chinese cabbage, turnips, winter cereals, cotton, faba beans, field peas, lupins, maize, sorghum, soybeans, sunflowers, sweet corn, tobacco, and tomatoes
Zineb	Fungicide,	Prohibited in EU	Unlikely to	IARC: Not classifiable	EU 1; OSF	Nominated for review (Priority	4	Boats, turf, beans, bananas, beets,

Pesticide	Function	EU Status and International Conventions	WHO Classification	Potential carcinogen	Potential endocrine disruptor	APVMA status	No. of registered products in Australia	Examples of registered uses in Australia
	antifouling		present acute hazard			2): Environmental, human health and residues concerns		carrots, cauliflower, cabbages, celery, cucurbits, egg plant, onions, peas, crucifers, snow peas, sugar snap peas, peppers, potatoes, ornamentals, strawberries, tobacco, tomatoes
Ziram	Fungicide		Moderately hazardous	IARC: Not classifiable US EPA: Suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential	EU 2; OSF	Nominated for review (Priority 2): Environmental, human health and residues concerns	4	Apples, grapes, pears, stone fruit, celery, roses

Table notes

Pesticide

Pesticide refers to the active ingredient registered by the Australian Pesticides and Veterinary Medicines Authority (APVMA), as listed on their Registered Chemicals Product Database PUBCRIS. See www.apvma.gov.au

EU Status and International Conventions

In 1993 the European Commission started a Community-wide review process for all active ingredients used in plant protection products (agricultural products) within the European Union, which is now complete. The evaluation, marketing and use of pesticides (herbicides, insecticides, fungicides etc.) in plant protection in the Community are regulated under Council Directive 91/414/EEC. This Directive lays out a comprehensive risk assessment and authorisation procedure for active substances and products containing these substances.

The review of existing pesticides has led to the removal from the market of pesticides which cannot be used safely. Of some 1,000 active substances on the market in at least one Member State before 1993, 26%, corresponding to about 250 substances, have passed the harmonised EU safety assessment. The majority of substances (67%) have been eliminated because dossiers were either not submitted, incomplete or withdrawn by industry. About 70 substances failed the review and have been removed from the market, because the evaluation carried out did not show safe use with respect to human health and the environment.

In Table 1 "Prohibited in the EU" means the pesticide is not included in Directive 91/414/EEC and is therefore prohibited in the EU.

The EU Pesticides Database of active substances can be found at http://ec.europa.eu/sanco_pesticides

Rotterdam Convention

The *Rotterdam Convention* entered into force on 24 February 2004. The Convention creates legally binding obligations for the implementation of a Prior Informed Consent (PIC) procedure. PIC is an early warning system about all bans and severe restrictions on pesticides. Pesticides that have been banned by two countries in two regions of the world, under criteria in the Convention, are entered on a PIC List, and importing countries must indicate whether they allow or prohibit import. Exporting countries must ensure compliance. Annex III currently lists 40 chemicals including 29 pesticides, four severely hazardous pesticide formulations and 11 industrial chemicals. Australia is a signatory and ratified the Convention in 2004. See www.pic.int

Convention on Long-range Transboundary Air Pollution (LRTAP)

The *Convention on Long-range Transboundary Air Pollution* of the UN Economic Commission for Europe covers chemicals that travel long distances. A 1998 Protocol formed the basis of the Stockholm Convention. The aim of the Convention is that Parties shall endeavour to limit and, as far as possible, gradually reduce and prevent air pollution including long-range transboundary air pollution. Australia is not a participant.

Montreal Protocol on Substances that Deplete the Ozone Layer

The Protocol sets out a mandatory timetable for the phase out of ozone depleting substances. This timetable has been under constant revision, with phase-out dates accelerated in accordance with scientific understanding and technological advances. Australia has ratified all amendments to the Protocol and implements it obligations through the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989* (Cth).

The Stockholm Convention on Persistent Organic Pollutants

The object of *Stockholm Convention* is to protect human health and the environment from persistent organic pollutants (POPs). POPs include the organochlorine pesticides: DDT, endrin, dieldrin, aldrin, chlordane, toxaphene, heptachlor, mirex and hexachlorobenzene. Many of these pesticides were used in Australia. The Convention sets out the actions to be taken by Parties to reduce and where feasible, eliminate releases of byproduct POPs chemicals. Australia ratified the Convention on 20 May 2004 and became a Party on 18 August 2004. The Australian Government has developed Australia's National Implementation Plan (NIP), which outlines the actions that Australia will take to meet its obligations. The NIP also sets out the roles and responsibilities of Australian governments, the Environment Protection and Heritage Council (EPHC) and other ministerial councils in the management of chemicals in Australia. See http://www.environment.gov.au/settlements/chemicals/international/pop.html

WHO Classification

In 2009, the World Health Organisation (WHO) released a document on the *Recommended Classification of Pesticides by Hazard and Guidelines to Classification.* The majority of the classifications are made on the acute oral and dermal toxicity LD_{50} value to the rat. See www.who.int/ipcs/publications/pesticides_hazard_2009.pdf

NB. For the purposes of developing this table, only pesticides with WHO Class 1a, Ib and II were selected. Occasionally another class is included because the pesticide has been prohibited in the EU.

Potential carcinogens

International Agency for Research on Cancer (IARC)

The WHO International Agency for Research on Cancer's *Monographs* identify environmental factors that can increase the risk of human cancer. These include chemicals, complex mixtures, occupational exposures, physical agents, biological agents, and lifestyle factors. Since 1971, more than 900 agents have been evaluated, of which approximately 400 have been identified as *carcinogenic*, *probably carcinogenic*, or *possibly carcinogenic* to humans. See www.monographs.iarc.fr

U.S Environmental Protection Agency (US EPA)

The United States Environmental Protection Agency

(US EPA) Office of Pesticide Programs provides a list* of pesticides evaluated for carcinogenicity by EPA's Pesticide Program through to August 2009. In evaluating and describing the potential carcinogenicity of a pesticide, EPA's Pesticide Program follows the Agency's Guidelines for Carcinogen Risk Assessment (see http://epa.gov/cancerguidelines for more information).

The Health Effects Division of the Pesticide Program performs an independent review of all the available evidence to determine the carcinogenic potential of pesticides. The results of the independent review are peer-reviewed by the Cancer Assessment Review Committee. *The list is called the *"Office of Pesticide Programs List of Chemicals Evaluated for Carcinogenic Potential"* and can be obtained by email from lormand.mary-jean@epa.gov

Potential endocrine disruptors

The endocrine system is a complex network of glands, hormones and receptors. It provides the key communication and control link between the nervous system and bodily functions such as reproduction, immunity, metabolism and behaviour. An endocrine disrupter is a substance or mixture that alters function of the endocrine system and consequently causes adverse health effects in an intact organism, or its progeny, or (sub)populations. The main evidence suggesting that exposure to environmental chemicals can lead to disruption of endocrine function comes from changes seen in a number of wildlife species. Effects suggested as being related to endocrine disruption have been reported in molluscs, crustacea, fish, reptiles, birds and mammals in various parts of the world.

European Union (EU)

The European Union has a *Strategy for Endocrine Disruptors* with a list of substances suspected of interfering with the hormone systems of humans and wildlife. In Table 1 "Category 1" indicates there is at least one study providing evidence of endocrine disruption in an intact organism. "Category 2" means the potential for endocrine disruption. See http://ec.europa.eu/environment/endocrine/documents/sec_2007_1635_en.pdf

Our Stolen Future (OSF)

Our Stolen Future is a book published in 1997 by Dr Theo Colborn, Dianne Dumanoski and Dr John Peterson Myers, which documents research into chemicals which interfere with hormones. The authors have also set up a website www.ourstolenfuture.org which is regularly updated with developments in research and policy on endocrine disrupting chemicals (EDCs). The OSF list of EDCs is referenced and can be found at http://www.ourstolenfuture.org/Basics/chemlist.htm

United States Environmental Protection Authority (US EPA) (Screen List)

The United States Environmental Protection Authority has a *Final List of Initial Pesticide Active Ingredients and Pesticide Inert Ingredients to be Screened under the Federal Food, Drug, and Cosmetic Act.* The Final List of Chemicals for Tier 1 Screening in the Endocrine Disruptor Screening Program was selected on the basis of exposure potential only and it should not be construed as a list of known or likely endocrine disruptors. See http://www.epa.gov/endo/pubs/final_list_frn_041509.pdf

Number of Registered Products in Australia

Formulated pesticide products are registered by the APVMA and listed on the Registered Chemicals Product Database PUBCRIS. PUBCRIS also includes the registered 'active ingredient' as a product. The number of products registered therefore includes both formulated products and active ingredients. See www.apvma.gov.au

APVMA Status

Chemical Review Program

The APVMA has powers to conduct reviews of registered chemicals. The Chemical Review Program can reconsider the registration of agricultural and veterinary chemicals in the marketplace if potential risks to safety and performance have been identified. A review may be initiated when new research or evidence has raised concerns about the use or safety of a particular chemical or product. Reviews may focus on one or more areas of concern including environmental safety, worker safety, public health, residues or trade, or less commonly, may consider product efficacy.

Restricted Chemical Products

Products declared to be restricted chemical products (RCPs) can only be used by an "authorised person". The relevant Australian State or Territory authority determines who may be considered as an "authorised person" based on advice from the APVMA following a risk assessment of the chemical product. Australian State and Territory authorities implement the RCP scheme through their respective control-of-use legislative frameworks by authorising persons to access RCPs once they have successfully completed the relevant training, and/or other requirements. There are currently 14 chemicals where all or certain uses of the products have been declared to be restricted. See www.apvma.gov.au/products/restricted.php

Priority List for Spray Drift Label Reviews

The APVMA has committed to assessing and updating the labels of all currently registered products subject to spray drift regulation to include comprehensive instructions for managing spray drift risk. The APVMA has begun this process with pesticides listed in the *Priority List for Spray Drift Label Reviews.* These initial pesticides have been selected based on their hazard characteristics, their amounts of use and their involvement in adverse incidents. The areas of concern that have resulted in the pesticides being placed on the priority list are: human health concerns (bystander health and/or occupational health & safety); environmental concerns including damage to crops; and, residues and trade concerns. See http://www.apvma.gov.au/use_safely/spray_drift/priority_list.php

Endnotes

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[iv] European Commission 2005, *Review report for the active substance endosulfan*, SANCO/4327/2000-rev.2

[v] EU 2001, Decision No 2455/2001/EC of the European Parliament and of the Council of 20 November 2001, amending Directive 2000/60/EC, *Official Journal of the European Communities* L331/1, December 15, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2001:331:0001:0005:EN:PDF

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[xi] APVMA 2010, *Chemicals in the News: Endosulfan*, http://www.apvma.gov.au/news_media/chemicals/endosulfan.php

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[xvii] Ibid.

[xviii] European Commission 2008, *Review report for the active substance diuron*, SANCO/2184/2008 rev 3

[xix] Ibid.

[xx] National Registration Authority 2000, *NRA Review of Chlorpyrifos, Interim Report*, Volume 1, http://www.apvma.gov.au/products/review/docs/chlorpyrifos_summary.pdf

[xxi] APVMA 2009, *Chlorpyrifos: Preliminary Review Findings Report on additional Residues Data*, http://www.apvma.gov.au/products/review/docs/chlorpyrifos_prf_sep09.pdf

[xxii] US EPA 2002, *Interim Reregistration Eligibility Decision for Chlorpyrifos*

[xxiii] ***US EPA 2010, New Limits on Pesticide Uses Will Protect Salmon,*** http://www.epa.gov/pesticides/reregistration/chlorpyrifos

WWF-Australia

WWF-Australia is part of the WWF International Network, the world's largest and most experienced independent conservation organisation. It has close to five million supporters and a global network active in more than 100 countries.

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by:

- conserving the world's biological diversity;
- ensuring that the use of renewable natural resources is sustainable; and
- promoting the reduction of pollution and wasteful consumption.

National Toxics Network

The **National Toxics Network (NTN)** is a community based network working globally to ensure a toxic-free future for all. NTN supports communities involved in hazardous waste management, pesticide pollution, industrial chemical pollution and environmental health issues. NTN committee members are involved in a range of national advisory bodies including the Hazardous Waste Reference Group, the Stockholm Stakeholders Reference Group, the National Industrial Chemicals Notification Assessment Scheme, Community Engagement Forum and the Australian Pesticides and Veterinary Medicines Authority Community Consultative Committee. NTN is the Australian focal point for the International POPs Elimination Network (IPEN) and a member of the NGO delegation to the POPs Review Committee which is the UN scientific committee assessing new POPs' nominations. NTN participates in the Strategic Approach to International Chemical Management and is part of the NGO delegation to the negotiations for a global Mercury treaty.