



**Australian Pesticides &
Veterinary Medicines Authority**

ADVICE SUMMARY

APPLICATION FOR REGISTRATION OF A CHEMICAL PRODUCT

Product name: NEEMAZAL INSECTICIDE
Applicant: E.I.D. PARRY (INDIA) LIMITED
Product number: 59622
Application number: 36247

Purpose of Application and Description of Use: Registration of an 11.82 g/L Azadirachtin A and B present as 29.55 g/L azadirachta indica extract emulsifiable concentrate product for control of insect pests in ornamentals and in potting soil.

Active Constituent(s): AZADIRACHTIN MANUFACTURING CONCENTRATE

Regulatory Decision:

To grant the application subject to the following conditions:

Standard Conditions of Registration/Approval

1. Containers meet AgVet Code Regulation 18
2. Agricultural products must meet Active Constituents Quality Assurance Requirements
3. Label must contain a Date of Manufacture and Batch Number

For full conditions, refer to http://www.apvma.gov.au/advice_summaries/adv_summaries.shtml.

ADVICE

Australian Government Department Of Health And Ageing, Office Of Chemical Safety

Azadirachta indica extract is in schedule 6 of the SUSDP, except when in schedule 5. It is in schedule 5 when extracted from neem seed kernels using, water, methanol or ethanol in preparations containing 5% or less of total limonoids for agricultural use such as Neemazal Insecticide. No acceptable daily intake (ADI) or acute reference dose (ArfD) has been established.

No toxicological data was submitted with this product application. The existing toxicology database was considered to be adequate for the assessment of the toxicological profile of the product and the establishment of safety directions.

The product has low acute oral, dermal and inhalation toxicity. It is a slight skin and eye irritant, but not a skin sensitiser. In repeat dose studies body weight effects were the most frequent toxicological end points observed.

The main route for exposure is dermal. The product has low dermal toxicity but is a slight skin irritant. The use of gloves will mitigate any skin irritation. Exposure through inhalation is possible but the hazard is low and unlikely to require any exposure mitigation. Once the product is diluted, the hazard posed will diminish significantly. The most concentrated spray contains 0.3% product, which makes the likely risk of skin or eye irritation low. Therefore the personal protective equipment recommended is as follows:

Skin irritation	Gloves (when opening the container and preparing product)
Eye irritation	Nil

The risk during post application activities (such as watering, pruning, handling of cut flowers etc) is mainly associated with dermal exposure. OCS calculated this risk using a specific formula. For Neemazal used on ornamentals, the risk is considered acceptable. Given the low risk a re-entry statement is not required.

Based on the above assessment the following safety instructions will be included on the product label:

Azadirachta indica extract (neem) extracted from seed kernels using water, methanol or ethanol EC 30g/L or less

Will irritate eyes and skin

Avoid contact with eyes and skin

When opening the container and preparing product for use, wear elbow length PVC gloves.

Wash hands after use

After each days use wash gloves

The APVMA considers the above advice acceptable. As a result, the use of this product is not expected to be an undue hazard to the safety of people exposed to it via occupational exposure.

Data relied on to provide the advice

Data No	Data Source*	Author(s)	Title	Date	Data Type	Data Sub-type	Authorising Party	Inherited Application No.
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Nil

Australian Government Department Of Environment And Heritage

The Department of Environment and Water Resources (DEW) undertook an assessment of the data addressing environmental fate and ecotoxicology together with publicly available literature provided by the applicant.

The use of Neemazal insecticide involves application by hand held wand or knapsack spray. Potential environmental risk could arise from direct contact with sprayed formulation, consumption of food sprayed with the formulation or off target spray drift or runoff into waterbodies or onto native vegetation. The proposed maximum rate is 250mL formulation/100L of water with a maximum of 500L of the spray solution applied per hectare (equivalent to 1250mL of Neemazal Insecticide per hectare or 14.8g Azadirachtin A and Azadirachtin B per hectare.

The proposed use is not likely to present either an acute or dietary risk to birds ingesting residues on plants or insects. Risk to fish, aquatic invertebrates or algae from spray drift is expected to be acceptable. Data to evaluate the risk to aquatic plants were not presented and some effect on this species cannot be ruled out but is possibly unlikely given the mode of action of azadirachtin and the low likelihood of significant aquatic exposure occurring under the proposed use pattern.

Because azadirachtin A and B are readily soluble, there is a potential for both to enter aquatic habitats as a result of dissolution in runoff from treated land. However modeling based of 5% of the applied active constituents being carried in runoff into an off-site waterbody showed there was acceptable risk to fish, aquatic invertebrates and algae.

Consistent with the insecticidal nature of azadirachtin, some adverse effects on honey bees and some beneficial non-target insects and insect predators may occur. Therefore the following statement on the label was included:

‘Dangerous to bees. DO NOT spray any plants in flower while bees are foraging’

With respect to effects on to non-target vegetation, phytotoxicity data were not presented to allow assessment of risk from spray drift or runoff. However, the proposed use of Neemazal is not expected to result in significant off-target phytotoxicity in non-target plants as a result of the use of hand held wands or knapsack sprayers with the expectation that the spray quality will be essentially coarse droplets with limited drift potential.

The instructions on the label are appropriate for this product. If used according to label instructions, the product does not represent an unacceptable risk to non-target plants, animals and the environment.

Data relied on to provide the advice

Data No	Data Source*	Author(s)	Title	Date	Data Type	Data Sub-type	Authorising Party	Inherited Application No.
3288	S	DF Hein et al	Neem activity against microorganisms: Azadirachtin A in bacterial and fungal agar diffusion tests	1998	Environment Fate	Biodegradation Soils	Applicant	
3286	S	W Klein	Test Report- Biodegradation of Azadirachtin A: Manometric Respirometry Test	1999	Environment Fate	Biodegradation Soils	Applicant	
3287	S	E. Masser	Expert evidence on the putative microbial degradation of NeemAzal	1998	Environment Fate	Biodegradation Soils	Applicant	
3285	S	W Klein	Effect of NeemAzal on the respiration activity of activated sludge	1998	Environment Fate	Biodegradation Soils	Applicant	
3289	S	W. Klein	Test Report- Biodegradation of NeemAzal: Manometric Respirometry Test	1998	Environment Fate	Biodegradation Soils	Applicant	
3290	S	W. Klein	Test Report- Biodegradation of NeemAzal: Manometric Respirometry Test	1999	Environment Fate	Biodegradation Soils	Applicant	
3291	S	G Lenz	Final Report 94 50 41 389 D Testing the Ready Biodegradability of NeemAzal-T/S in water by the Closed Bottle Test according to OECD Guideline 301 D	1995	Environment Fate	Biodegradation Water	Applicant	
3292	S	H Werle	Determination of Ready Biodegradability of NeemAzal Closed Bottle Test according to OECD Guideline 301 D	1998	Environment Fate	Biodegradation Water	Applicant	
3293	S	H Werle	.	1998	Environment Fate	Biodegradation Water	Applicant	
3294	S	H Werle	Report - Direct Phototransformation study (Quantum Yield) in purified water OECD Draft Test Guideline, Part A, 'Direct Phototransformation' NeemAzal	1995	Environment Fate	Biodegradation Water	Applicant	

3295	S	L Passemier	Summarizing discussion and evaluation of the behaviour of NeemAzal in water	1998	Environment Fate	Biodegradation Water	Applicant	
3299	S	R Tross	Degradation, transformation and metabolism of NeemAzal-T/S in soil	1995	Environment Fate	Field Dissipation Soils	Applicant	
3300	S	H Kleeberg	Test Report- Degradation of Azadirachtins and identification of metabolites in soil	1999	Environment Fate	Field Dissipation Soils	Applicant	
3296	S	R Tross	Adsorption/desorption	1996	Environment Fate	Mobility Adsorption/Desorption	Applicant	
3297	S	R Tross	Leaching of NeemAzal-T/S in Soil	1995	Environment Fate	Mobility Adsorption/Desorption	Applicant	
3298	S	H Kleeberg	Computer simulation of the leaching of Azadirachtin using PELMO 3.00	1999	Environment Fate	Mobility Leaching Potential	Applicant	
3305	S	R Tross	Effects of NeemAzal-T/S in water: fish	1998	Environment Toxicology	Aquatic Organisms Acute	Applicant	
3310	S	R. Tross	Summarizing discussion and evaluation of the possible effects of NeemAzal and NeemAzal-T/S in aquatic systems	1999	Environment Toxicology	Aquatic Organisms Acute	Applicant	
3306	S	B.V. David	Acute toxicity study of NeemAzal T/S (1% Azadirachtin) to fresh water fish (common carp)	1996	Environment Toxicology	Aquatic Organisms Acute	Applicant	
3304	S	W Klein	Effects of NeemAzal on Daphnia magna acute immobilisation test and reproduction test	1999	Environment Toxicology	Aquatic Organisms Acute	Applicant	
3309	S	T. Tross	Effects of NeemAzal-T/S in water: bacteria	1999	Environment Toxicology	Aquatic Organisms Acute	Applicant	
3303	S	B Grunert	NeemAzal-T/S - Acute Daphnia Immobilisation Test	1996	Environment Toxicology	Aquatic Organisms Acute	Applicant	
3307	S	B Grunert	NeemAzal-T/S - Acute Toxicity Fish Test	1996	Environment Toxicology	Aquatic Organisms Acute	Applicant	
3308	S	B Grunert	NeemAzal-T/S - Algal Inhibition Test	1996	Environment Toxicology	Aquatic Organisms Acute	Applicant	
3315	S	W. Klein	Effects of NeemAzal on Fish: Full Life Cycle Test with the zebra fish, Danio rerio	1999	Environment Toxicology	Aquatic Organisms Other	Applicant	
3316	S	W. Klein	Critical Evaluation of the NeemAzal Content in solutions used for the study Effects of NeemAzal on Fish: Full Life Cycle Test with the zebra fish, Danio rerio (GLP Code:TRF-001/4-60)	1999	Environment Toxicology	Aquatic Organisms Other	Applicant	
3314	S	W. Klein	Effects of NeemAzal on Fish: Full Life Cycle	1999	Environment	Aquatic Organisms	Applicant	

			Test with the zebra fish, <i>Danio rerio</i> Test Period: Early life stage test (until day 37)		Toxicology	Other		
3312	S	A. Schmitz	Effects of NeemAzal-T/S on fish: prolonged toxicity test (28-day study) with the rainbow trout <i>Oncorhynchus mykiss</i>	1999	Environment Toxicology	Aquatic Organisms Short-term	Applicant	
3313	S	P Scroder and M Kahnert	Effects of NeemAzal-T/S in water: other organisms	1996	Environment Toxicology	Aquatic Organisms Short-term	Applicant	
3311	S	R. Tross	Effects of NeemAzal and NeemAzal-T/S in water: discussion of 21-day exposure of <i>Daphnia magna</i> Straus	1999	Environment Toxicology	Aquatic Organisms Short-term	Applicant	
3282	S	Muhlen et al	Final Report Assessment of the Side Effects of NeemAzal T/S on Honeybees (<i>Apis mellifera</i>)	Nov-94	Environment Toxicology	Non-target Invertebrates (terrestrial) Bees	Applicant	
3283	S	Anon	Neemazal T/S 1.2 EC and Safety to Beneficials	1996	Environment Toxicology	Non-target Invertebrates (terrestrial) Bees	Applicant	
3284	S	K Naumann and M Isman	Toxicity of a Neem (<i>Azadirachta indica</i> A. Juss) Insecticide to Larval Honey Bees	Jul-96	Environment Toxicology	Non-target Invertebrates (terrestrial) Bees	Public	
3324	S	W. Muhlen et al	Assessment of the Side Effects of NeemAzal - T/S on Honeybees (<i>Apis mellifera</i> L) Laboratory test	1994	Environment Toxicology	Non-target Invertebrates (terrestrial) Bees	Applicant	
3325	S	D. Hansch and A Bathelt	Testing of the effects of NeemAzal-TS on earthworm <i>Eisenia fetida</i> in the laboratory	1994	Environment Toxicology	Non-target Invertebrates (terrestrial) Earthworms	Applicant	
3326	S	R. Tross	Information and studies concerning the influence of NeemAzal-T/S on earthworms	1998	Environment Toxicology	Non-target Invertebrates (terrestrial) Earthworms	Applicant	
3330	S	T. Tross	Possible effects of the application of NeemAzal-T/S on beneficial insects	1997	Environment Toxicology	Non-target Invertebrates (terrestrial) Other	Applicant	
3331	S	D Klenner	Testing of NeemAzal-T/S on larvae of the Ladybird <i>Coccinella septempunctata</i> L. Laboratory test	1995	Environment Toxicology	Non-target Invertebrates (terrestrial) Other	Applicant	
3332	S	D. Klenner	Testing of the effects of NeemAzal-T/S on <i>Poecilus cupreus</i> L. (Coleoptera, Carabidae) in the laboratory	1995	Environment Toxicology	Non-target Invertebrates (terrestrial) Other	Applicant	

3323	S	K. Drescher	Effect of NeemAzal-T/S on the anthocorid predator <i>Orius majusculus</i> REUTER	1995	Environment Toxicology	Non-target Invertebrates (terrestrial) Parasites	Applicant	
3321	S	C. Kuhner	NeemAzal-T/S: Acute toxicity to the aphid parasitoid, <i>Aphidius rhopalosiphii</i> (Hymenoptera, Aphidiidae) in the laboratory.	1996	Environment Toxicology	Non-target Invertebrates (terrestrial) Parasites	Applicant	
3322	S	C. Hapke et al	NeemAzal T/S for the control of different fruit and hop aphids and the influence of NeemAzal T/S on the visit frequency of ants to treated aphids	1996	Environment Toxicology	Non-target Invertebrates (terrestrial) Parasites	Applicant	
3320	S	C. Kuhner	Final report- NeemAzal-T/S: Determination of side-effects on the aphid parasitoid, <i>Aphidius</i> spp (Hymenoptera, Aphidiidae) using an extended laboratory test.	1997	Environment Toxicology	Non-target Invertebrates (terrestrial) Parasites	Applicant	
3317	S	C Khuner	Final report- NeemAzal-T/S: Assessment of side effects on larvae of the hoverfly, <i>Episyrphus balteatus</i> DEG (Diptera, Syrphidae) under semi-field conditions.	1997	Environment Toxicology	Non-target Invertebrates (terrestrial) Predators	Applicant	
3319	S	M. Mironova	Experiments on the effect of NeemAzal-TS on <i>Tetranychus urticae</i> , <i>Trialeurodes vaporariorum</i> and <i>Encarsia formosa</i>	1995	Environment Toxicology	Non-target Invertebrates (terrestrial) Predators	Applicant	
3318	S	P. Hermann et al	Effects of different NeemAzal formulations on larvae of the green lacewing <i>Chrysoperla carnea</i> Steph. (Neuroptera, Chrysopidae) in laboratory and semi-field.	1996	Environment Toxicology	Non-target Invertebrates (terrestrial) Predators	Applicant	
3329	S	B. Lang	Effects on the activity of soil microflora according to BBA Guideline VI, 1-1 (1990) NeemAzal-T/S	1995	Environment Toxicology	Non-target Invertebrates (terrestrial) Soil Micros	Applicant	
3328	S	R. Tross	Summarizing discussion and evaluation of the behaviour of NeemAzal-T/S in soil	1999	Environment Toxicology	Non-target Invertebrates (terrestrial) Soil Micros	Applicant	
3327	S	C. Kliche-Spory and H. Kleeberg	Risk assessment of mould growth in NeemAzal and its formulation NeemAzal T/S	1999	Environment Toxicology	Non-target Invertebrates (terrestrial) Soil Micros	Applicant	
3301	S	AJ Johnson	NeemAzal Technical Acute Oral Toxicity (LD50) to Bobwhite Quail	1995	Environment Toxicology	Vertebrates Acute	Applicant	

3302	S	AJ Johnson	NeemAzal Technical Dietary Toxicity (LC50) to the Bobwhite Quail	1996	Environment Toxicology	Vertebrates Acute	Applicant	
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External Efficacy Reviewer

The proposed product is for control of aphids, two spotted mites and whitefly in ornamentals, and fungus gnats in potting soil.

A combination of field trial data and published information were provided in support of this application. Results from greenhouse and field trials, both overseas (Greenhouse trials in USA, Sudan, Germany, Austria, Turkey, Switzerland, India, Sri Lanka, Czech Republic and Russia) and in Australia (New South Wales (NSW) and Victoria), have demonstrated adequate control of aphids whitefly, and two spotted mites, in floriculture and ornamentals. Trial results demonstrated the product would also be efficacious for control of fungus gnats in potting soil. In order to achieve control of the proposed pests, multiple applications were required. The following statement ‘Applications every 7 to 10 days and 3-5 application has been included on the product label.

The methodologies used in all trials were considered appropriate and the trial designs were mostly randomized blocks, which were appropriate. Suitable control treatments were included.

Whitefly

The control obtained by using Neemazal at 1mL/L, 2mL/L and 3mL/L during trials on juvenile and adult whitefly was statistically equivalent to those results obtained by conventional insecticides such as imidacloprid or endosulfan. Neemazal was tested on various crops including glasshouse tomatoes and gerbera’s, Cape mallow plants (USA), and poinsettias.

Two spotted mite

Neemazal provided control (>95%) of two-spotted mite at the rate range specified on the label (200mL to 300mL) in glasshouse trials, which was statistically equivalent to industry standards such as imidacloprid and endosulfan.

Aphids

Australian trials demonstrated that Neemazal gave control (>95%) of Green peach aphid (*Myzus persicae*) and cotton aphid (*Aphis gossypii*) at rates between 150mL/L to 250mL/L of water.

Thrips

The data provided did not demonstrate efficacy of this product to control thrips. To control juvenile Western Flower Thrips up to 5 applications were required. Adult thrips were not controlled after 5 applications. Based on this information the proposed use on thrips was not supported and the applicant removed the use from the label.

Fungus gnats

The trials provided demonstrated that the proposed product reduced Fungus gnat populations equally to similar currently registered products tested against at the proposed label rate, when applied as a soil drench in greenhouse trials.

Phytotoxicity in a few susceptible plant species was observed and recorded during trials. These include maidenhair ferns, African violets and poinsettia's. To mitigate the risk of phtotoxic effects occurring the following statements are included on the product label; 'Trials on sensitive plants such as ferns, poinsettia's and African violets have resulted in crop damage. Minor phytotoxic effects have occurred in other species, therefore testing in a small area is recommended before spraying.

Overall the data are satisfactory with experimental conditions representative of the intended use of the product, and adequate trial design and analysis. The data support the claim to control two-spotted mite, whitefly and aphids in floriculture and ornamentals and fungus gnats in potting soil.

Data relied on to provide the advice

Data No	Data Source*	Author(s)	Title	Date	Data Type	Data Sub-type	Authorising Party	Inherited Application No.
3276	S	R. Smith	Greenhouse evaluation of sequential Azadirachtin applications for Aphid control	2002	Efficacy and Safety	Efficacy	Applicant	
3261	S	H. El Shafic	The use of neem products for sustainable management of homopterous key pests on potato and eggplant in the Sudan	27-Aug-01	Efficacy and Safety	Efficacy	Applicant	
3277	S	J. Price	Evaluate AZA-Direct for efficacy against fungus gnats in potted ornamentals	22-Jan-03	Efficacy and Safety	Efficacy	Applicant	
3263	S	M. Parrella	Compare activity of GWN-1535 with conventional standards against silverleaf whitefly, melon aphids and leafminers in the greenhouse	25-Jan-00	Efficacy and Safety	Efficacy	Applicant	
3278	S	R. Hale	Evaluate crop safety of Aza-Direct 1.2% EC on various ornamental plantings	3-Jun-02	Efficacy and Safety	Efficacy	Applicant	
3265	S	A.A. Baber	Control of silverleaf whitefly on poinsettia under greenhouse conditions, summer 1999	6-Jan-00	Efficacy and Safety	Efficacy	Applicant	
3279	S	K. Muzyk	To evaluate AZA-Direct for crop response in woody ornamentals	22-Jan-02	Efficacy and Safety	Efficacy	Applicant	
3267	S	M.K. Mironova	Effect of NeemAzal-T/S on Tetranychus urticae Koch	1997	Efficacy and Safety	Efficacy	Applicant	
3280	S	C. Skimina	Observe plant response after four weekly	2-Jul-01	Efficacy and Safety	Efficacy	Applicant	

			applications at 24 and 48 fl oz/100 gallons					
3269	S	R. Pavela	The effect of commercial botanical insecticides from <i>Azadirachta indica</i> on <i>Tetranychus urticae</i> in Czech Republic	17-Sep-03	Efficacy and Safety	Efficacy	Applicant	
3281	S	K. Muzyk	To evaluate AZA-Direct for crop response in annual bedding plants	22-Jan-02	Efficacy and Safety	Efficacy	Applicant	
3271	S	F. Sances	Efficacy of GWN-1535 1.2% EC against insect pests of Broccoli	15-Apr-01	Efficacy and Safety	Efficacy	Applicant	
3260	S	S. Goodwin	Evaluation of Neemazal T/S 1.2 EC (AzaMax) for the control of key pests of ornamental and greenhouse vegetable crops	5-Jul-02	Efficacy and Safety	Efficacy	Applicant	
3273	S	S. Goodwin and M Steiner	Improvements to biological control systems and development of biorational chemicals for integrated pest management in greenhouse vegetables.	30-Jun-03	Efficacy and Safety	Efficacy	Applicant	
3334	S	P. Cole	Evaluation of AzaMax (NeemAzal T/S 1.2EC) for the control of Western Flower Thrips (<i>Frankliniella occidentalis</i>) and Greenhouse Whitefly (<i>Trialeurodes vaporariorum</i>) on ornamentals.	Aug-05	Efficacy and Safety	Efficacy	Applicant	
3275	S	J. Arburester and M. Mitchell	Azadirachtin formulations for efficacy on rose aphids	2002	Efficacy and Safety	Efficacy	Applicant	
3333	S	D. Rae	Evaluation of Azamax for control of Twospotted mites in roses	31-Aug-05	Efficacy and Safety	Efficacy	Applicant	
3264	S	K.A. Patterson	To evaluate GWN-1535 for whitefly control in greenhouse ornamentals	18-Feb-00	Efficacy and Safety	Efficacy	Applicant	
3274	S	J. Arburester and M. Mitchell	Azadirachtin for the control of rose aphid on Circus Rose	2002	Efficacy and Safety	Efficacy	Applicant	
3270	S	M. Parrella	To evaluate the efficacy and crop safety of GWN-1535 plus various surfactants and tank mixes against melon aphids on chrysanthemums	5-Aug-01	Efficacy and Safety	Efficacy	Applicant	
3272	S	F. Bollhalder	NeemAzal T/S against <i>Myzus persicae</i>	1997	Efficacy and Safety	Efficacy	Public	
3268	S	K. Hiisaar et al	The effect of NeemAzal T/S on the mortality of mite <i>Tetranychus urticae</i> Koch and some insects- <i>Aphis gossypii</i> Glov. and <i>Thrips tabaci</i> Lind	2000	Efficacy and Safety	Efficacy	Applicant	
3262	S	LR Rodriguez	Efficacy of GWN-1535 against greenhouse whitefly <i>Trialeurodes vaporariorum</i> on nursery ornamentals	Nov-99	Efficacy and Safety	Efficacy	Applicant	

3266	S	B. Rao et al	2002 PBI Gordon Azatrol Greenhouse Mite Trial	2002	Efficacy and Safety	Efficacy	Applicant	
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* *S* = Data submitted with the application

I = Data inherited (that is, referenced) from another application