



## Proposal form to prescribe certain organisms as not new organisms

for the purposes of the Hazardous Substances and New Organisms (HSNO) Act

Send to the Environmental Protection Authority preferably by email [neworganisms@epa.govt.nz](mailto:neworganisms@epa.govt.nz) or alternatively by post to: Private Bag 63002, Wellington 6140

### Name of person or organisation making the proposal

New Zealand Macadamia Society Inc

President: Dr David Clee

With support from Vegetable Growers NZ, Tomatoes NZ, Potatoes NZ (see attached emails)

### Postal Address

New Zealand Macadamia Society Inc

348 Mahurangi West Rd

RD3

Warkworth 0983

### Date

13/4/2017

## Important

If species were not present in New Zealand before 29 July 1998, they are classed as new organisms under the Hazardous Substances and New Organisms (HSNO) Act. As such, they will require HSNO Act approval for propagation or distribution of the organism to occur. Currently, if anyone was to conduct any of these activities without a HSNO Act approval they would be committing an offence under section 109(1) of the Act.

To change its “new organism” status (which means that an organism will not be regulated under the HSNO Act), an organism must be deregulated under section 140(1)(ba) of the HSNO Act, by an Order in Council given by the Governor General prescribing organisms that are not new organisms for the purposes of this Act.

As part of this process, the following form is to be filled in by the person or organisation making a proposal to prescribe certain new organisms as not new organisms.

The information provided in this form will be used in the decision-making process (which is likely to include a public consultation component). Any confidential information must be clearly labelled and included as a separate Appendix.

## 1. Details of the new organism(s) proposed to be prescribed as not new organism(s)

Please complete this section for each organism proposed to be prescribed as a not new organism.

### Name of organism

*Aridelus rufotestaceus* Tobias (Hymenoptera: Braconidae)

### Why do you want to prescribe this organism as “not new”?

Including:

- Is there any information on the economic or environmental impacts of the organism?
- What is the benefit of making this organism “not new”?
- Can these benefits be quantified?
- Can these benefits be achieved by alternative means?

The green vegetable bug (GVB), *Nezara viridula*, the host of the parasitoid wasp, *Aridelus rufotestaceus*, is one of the most serious horticultural pests, damaging a wide range of fruit, nut and grain crops, including maize, tomatoes, potatoes, macadamia, beans, tamarillo. In New Zealand 42 hosts have been recorded (see attached list). It also attacks wild hosts that serve as reservoirs until horticultural crops are available.

In addition, the presence of GVB caught up in harvesting and processing crops can cause tainting of products due to the pungent defensive odour secreted from prominent scent glands.

An estimated 3,000 ha of vegetable crops is sprayed annually for GVB (Stuart Davis, pers comm) predominantly using the insecticides Lambda-cyhalothrin and methamidophos (Rea *et al.* 2003). The latter insecticide is in the process of being withdrawn from use. Insecticides are also used by home gardeners to combat GVB.

Success or otherwise of these insecticides is likely to be dependent on the timing of application as well as on the efficacy of the products themselves (Rea *et al.* 2003).

### Describe the biology of the organism

Including:

- What are the biological characteristics of the organism?
- Where is it found overseas?
- Does it cause a disease?
- Does it have potentially beneficial characteristics?
- What adverse effects could making this organism “not new” have on people or the environment, if any? Can these be quantified?

*Aridelus* spp. are solitary, koinobiont endoparasitoids of heteropteran (Pentatomidae) bugs (Shaw *et al.* 2001). Eggs are inserted into the membranous cervical regions between head and thorax or into the intersegmental areas of the posterior abdominal region of 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> instars of host nymphs. The period from egg insertion (laboratory temperatures) to emergence from the host body of the mature larva takes approximately 25 days. The mature larva

emerges through a hole in the intersegmental membrane between the ultimate and penultimate abdominal segments killing the host. The larva crawls away and spins an oval, white silk cocoon. The pupal stage is around 22 days and the adult life span of the wasp is 210 days (Shaw et al. 2001). Parasitoid survival is significantly reduced at temperatures 30°C and above.

*Aridelus* species parasitise shield bugs (Pentatomidae) and are cosmopolitan in distribution. There are around 40 described species in total, 20 of them found in China. The first record of *Aridelus rufotestaceus* in Europe was in Italy in 1998 and it was first found in the USA (Georgia) in 2007 (John Ruberson University of Georgia pers.comm).

This parasitoid wasp is a beneficial biological control agent and will not have any adverse effects on the environment. The wasp continues to spread in the Auckland environs and wider distribution of this insect will reduce insecticide application for control of its host, *Nezara viridula*, in a range of vegetable, fruit and nut crops both in domestic and commercial production systems.

#### **Has the organism formed a self-sustaining population in New Zealand?**

Including:

- Where has population(s) of the organism been found in New Zealand?
- How does this organism spread?

An adult of *Aridelus rufotestaceus* was first found in New Zealand at the University of Auckland Tamaki Campus on 13 March 2010 by research associate Stephen Thorpe. Since then *A. rufotestaceus* has been found regularly in Auckland in the vicinity of the Tamaki Campus (16 January, 5 March, 7 April and 6 June 2013), St John's (4 February 2015), Tamaki Campus (21 March 2015) (Stephen Thorpe pers.comm) and 30 March 2015 ( Jenny Dymock pers.comm ), Titirangi (Wilma Blom pers.comm) and Bethells Beach (Stephen Thorpe pers.comm) in autumn 2016. *A. rufotestaceus* has also emerged from a colony of GVB, collected in Auckland in 2017, and kept in captivity for other research purposes at Plant and Food Research (10 cocoons emerged) at Mt Albert Research Centre.

More recently, there is evidence that *A. rufotestaceus* has dispersed widely from Auckland. In January/February 2018, the parasitoid has been reared from both adults and nymphs of GVB collected in Te Puke, Ruawai and Kamo (Whangarei).

*A. rufotestaceus* has also been reared from the Australasian green shield bug, *Glaucias amyoti* (Dallas) (Hemiptera: Pentatomidae) collected from Auckland (Nicholas Martin pers.comm). *Glaucias amyoti* occurs also in Australia, on Lord Howe Island, and in New Guinea. In New Zealand its life history is closely associated with plants of the genus *Coprosma* (Rubiaceae) (Lariviere 1995).

*Aridelus rufotestaceus* spreads by flying and may also spread in parasitized immature and adult host Pentatomid bugs.

**Is any person attempting to manage, control or eradicate the organism under any Act or is the organism the subject of an enforcement action or action under a civil penalty regime?**

Including:

- If the organism has been part of an official incursion response or other MPI (MAF) response or management activity, describe what happened here including why the response was stood down.

No

**Is there reason to believe that this organism was deliberately imported in contravention of an Act of Parliament? If so, please explain.**

No

**Any other information you wish to include?**

A. Emails from Supporting stakeholders: Horticulture NZ, Tomato Growers NZ, Potatoes NZ.

1) Horticulture New Zealand, 29 March 2017

Hi Jenny

Thank you for your email and information.

Yes this is to confirm Vegetables NZ Inc. and its levy paying members would support the application to EPA to denew this beneficial insect.

Is this all you require

Regards

John

John Seymour

Senior Business Manager

Horticulture New Zealand

Level 4, Co-operative Bank House

20 Ballance Street

Wellington 6011

2) Tomatoes NZ, 31 March 2017

Hi Jenny,

Yes, I confirm Tomatoes NZ's support.

Please keep me updated as to progress, so I can inform our members.

Regards

Helen

Helen Barnes

Business Manager

DDI: 04 470 5666 M. 021 348 948 E: [helen.barnes@hortnz.co.nz](mailto:helen.barnes@hortnz.co.nz) [www.tomatoesnz.co.nz](http://www.tomatoesnz.co.nz)



3) 3 April 2017, Potatoes NZ

Hi Jenny

Thank you for your email and information.

Yes this is to confirm Vegetables NZ Inc. and its levy paying members would support the application to EPA to denew this beneficial insect.

Is this all you require, or do you need something on letterhead?

Regards

Justine Croft

Finance and Admin Manager

Potatoes New Zealand Inc

Ph: 021-2399-674



B. Lists of hosts for the green vegetable bug, *Nezara viridula*.

Table: Host plants of the Green vegetable bug, *Nezara viridula* (Hemiptera: Pentatomidae) from Plant-SyNZ database (12 October 2016). The reliability score shows the quality of evidence for the host association (1-10, 10=high) – compiled by Dr Nicholas Martin

Common name(s)	Scientific name	Family	Reliability Index	Biostatus
African lily	<i>Agapanthus praecox</i> Willd.	Agapanthaceae	10	naturalised
Columbine	<i>Aquilegia</i> sp.	Ranunculaceae	6	unknown
Beet, Beetroot, Fodder beet, Mangels, Mangold, Silver beet, Sugar beet, Swiss chard	<i>Beta vulgaris</i> L.	Amaranthaceae	10	naturalised
Bitou bush, Boneseed, Higgin's curse, Jungle flower, Salt bush	<i>Chrysanthemoides monilifera</i> (L.) T. Norl. subsp. <i>monilifera</i> (L.) T. Norl.	Compositae	9	naturalised
Citrus	<i>Citrus</i> sp.	Rutaceae	7	unknown
Spider flower	<i>Cleome</i> sp	Cleomaceae	7	cultivated
Kaka beak, Lobster claw, Parrot's beak, Kōwhai-ngutu-kākā	<i>Clianthus punicens</i> (G.Don) Sol. Ex Lindl.	Leguminosae	10	endemic
Cotoneaster, Rockspray	<i>Cotoneaster</i> sp.	Rosaceae	7	naturalised
Carrot, Wild carrot	<i>Daucus carota</i> L.	Umbelliferae	10	naturalised
Fennel, Sweet fennel	<i>Foeniculum vulgare</i> Mill.	Umbelliferae	10	naturalised
Soya bean, Soybean	<i>Glycine max</i> (L.) Merr.	Leguminosae	10	cultivated
Shrubby haloragis, Toatoa	<i>Haloragis erecta</i> (Banks ex Murray) Oken	Haloragaceae	10	endemic
Ragwort, Saint James' wort, Tansy ragwort	<i>Jacobaea vulgaris</i> Gaertn.	Compositae	10	naturalised
French lavender, Toothed lavender	<i>Lavandula dentata</i> L.	Labiatae	10	naturalised
Broadleaf privet, Tree privet	<i>Ligustrum lucidum</i> W.T.Aiton	Oleaceae	10	naturalised
Chinese privet, Small-leaf privet	<i>Ligustrum sinense</i> Lour.	Oleaceae	10	naturalised
Macadamia, Macadamia nut, Queensland nut	<i>Macadamia</i> sp.	Proteaceae	7	naturalised
Dog's mercury,	<i>Mercurialis annua</i>	Euphorbiaceae	9	naturalised

Annual mercury	L.			
Black passionfruit, Purple granadilla, Purple passionfruit	<i>Passiflora edulis</i> Sims	Passifloraceae	10	naturalised
Banana passionfruit	<i>Passiflora</i> sp. 'banana passion fruit'	Passifloraceae	7	naturalised
Dwarf bean, French bean, Garden bean, Green bean, Kidney bean, Pole bean, Snap bean, String bean	<i>Phaseolus vulgaris</i> L.	Leguminosae	10	cultivated
Field pea, Garden pea, Snow pea	<i>Pisum sativum</i> L.	Leguminosae	10	naturalised
English plantain, Lamb's tongue, Narrow-leaved plantain, Rib-grass, Ribwort, Ripple grass	<i>Plantago lanceolata</i> L.	Plantaginaceae	10	naturalised
Nectarine, Peach	<i>Prunus persica</i> (L.) Batsch.	Rosaceae	10	naturalised
Coastal five finger, Houmāpara, Houpara, Houparapara, Kokotai, Oho, Parapara, Whauwhau	<i>Pseudopanax lessonii</i> (DC.) K. Koch	Araliaceae	10	endemic
Asian pear, Nashi	<i>Pyrus pyrifolia</i> (Burm.f.) Nakai	Rosaceae	10	cultivated
Australian fireweed	<i>Senecio bipinnatisectus</i> Belcher	Compositae	9	naturalised
Fireweed	<i>Senecio esleri</i> C.J.Webb	Compositae	9	naturalised
Common groundsel, Groundsel	<i>Senecio vulgaris</i> L.	Compositae	10	naturalised
Bullibul, Bullibulli, Kangaroo apple, Pōpopo, Poroporo, Poroporotanguru	<i>Solanum aviculare</i> G.Forst.	Solanaceae	10	non-endemic
Tamarillo, Tree tomato	<i>Solanum betaceum</i> Cav.	Solanaceae	10	naturalised



Velvety nightshade	<i>Solanum chenopodioides</i> Lam.	Solanaceae	10	naturalised
Apple of Peru, Peruvian apple, Tomato	<i>Solanum lycopersicum</i> L.	Solanaceae	10	naturalised
Flannel leaf, Kerosene plant, Tobacco weed, Wild tobacco tree, Woolly nightshade	<i>Solanum mauritianum</i> Scop.	Solanaceae	10	naturalised
Black nightshade, Blackberry nightshade, Garden huckleberry, Pōporo, Poroporo, Raupeti, Remuroa	<i>Solanum nigrum</i> L.	Solanaceae	10	naturalised
Potato, Hīwai, Huiwaiwaka, Kapana, Mahetau, Parareka, Parate, Rīwai, Taewa, Taewha	<i>Solanum tuberosum</i> L.	Solanaceae	10	naturalised
Common sow thistle, Sow thistle, Milky thistle, Pororua, Pūhā, Pūwhā, Rauriki	<i>Sonchus oleraceus</i> L.	Compositae	6	naturalised
Wandering Jew, Wandering Willie	<i>Tradescantia fluminensis</i> Vell.	Commelinaceae	10	naturalised
Mullein	<i>Verbascum</i> sp.	Scrophulariaceae	7	unknown
Purple top, South American vervain, Tall verbena	<i>Verbena bonariensis</i> L.	Verbenaceae	10	naturalised
Hebe, Shrub speedwell, Veronica, Speedwell, Koromiko	<i>Veronica</i> sp.	Plantaginaceae	6	endemic
Maize, Mealy, Sweet corn, Kānga, Kōpakipaki, Paratē	<i>Zea mays</i> L.	Gramineae	10	naturalised

## 2. References (if applicable)

Larivière, M.-C. (1995) Cydnidae, Acanthosomatidae, and Pentatomidae (Insecta: Heteroptera): systematics, geographical distribution, and bioecology. *Fauna of New Zealand* 35, 112 pages. (ISSN 0111-5383; no. 35). ISBN 0-478-09301-2. Published 23 November 1995.

J.H Rea, P.J Cameron, S.D.Wratten, S.I. Davis, J.R.Sedcole, R.B. Chapman (2003). Evaluation of insecticides for the control of Green vegetable bug, *Nezara viridula* L (Hemiptera: Pentatomidae) on sweet corn, *Zea mays* L in New Zealand. *International Journal of Pest Management* 2003: 49 (2)

Scott R. Shaw, Gianandrea Salerno, Stefano Colazza and Ezio Peri (2001). First record of *Aridelus rufotestaceus* Tobias (Hymenoptera: Braconidae: Euphorinae) parasitizing *Nezara viridula* nymphs (Heteroptera: Pentatomidae) with observations on its immature stages and development. *Journal of Hymenopteran Research* 10(2):131-137.