Environmental Protection Authority
Te Mana Rauhī Taiao

APPLICATION FORM
REASSESSMENT

Application Form: HS8 Application for whether there are Grounds for a Reassessment of a Hazardous Substance

under section 62 of the Hazardous Substances and New Organisms Act 1996

Send by post to: Environmental Protection Authority, Private Bag 63002, Wellington 6140
OR email to: HSApplications@epa.govt.nz
Payment must accompany application; see our fees and charges schedule for details.

Applicant:

Vegetables Research and Innovation Board – on behalf of the following eight grower groups and industries:

- Vegetables NZ
- Processed Vegetables NNZ
- Avocadoes NZ
- Citrus NZ
- Foundation for Arable Research
- Dairy Industry NZ
- Onions NZ
- Potatoes NZ

Date: 11/02/2020

APPLICANT CHECKLIST	
Mandatory sections filled out	yes
Appendices enclosed	yes
Fees enclosed	Please invoice
Signed and dated	yes

OFFICE USE ONLY	
Application code	**Date received**
EPA contact	**Fees paid $**
Application version no.	

1. Applicant details

Name: Vegetable Research and Innovation Board
Address: [redacted]
Phone: [redacted]
Fax: n/a
Email: [redacted]

1.2. Contact's details (if different from above).

Same as above

2. Hazardous substance details

2.1. Name of substance (identify the substance as fully as possible).

If more than one substance is involved – for example, the active ingredient and the products – they should all be listed.

Diazinon – active ingredient and associated approvals listed in section 2.2
Fenamiphos – active ingredient and associated approvals listed in section 2.2
Methamidophos – active ingredient and associated approvals listed in section 2.2

2.2. If the substance has been assessed by the authority, list the reference number(s) of the existing approval (from the authority's register).

If more than one substance is involved, for example, the active ingredient and the products, they should all be listed.

HSR#s as in table 1. These crop protection products were reassessed by the EPA in APP201045

Table 1: Approvals for which grounds for reassessment are sought.

Active	Trade names	HSR approval codes
Diazinon	Dianex, Dew 600, Digrub, Gesapon 20G, Zagro Diazinon 600EW, Diazinon 20G, Diazol 800, Diazate	HSR101016, HSR000180, HSR000181, HRS000175, HSR002481, HSR101016
Fenamiphos	Nemacur, Nematak 400EC, Fenafos 400, Canyon	HSR000956, HSR007769, HSR000282
Methamidophos	Metafort 60SL, Methafos 600	HSR000226

2.3. If the substance is covered by Parts XI to XV, list any reference numbers of registrations, licenses etc under the Explosives Act, Pesticides Act, Toxic Substances Act, Dangerous Goods Act or Animal Remedies Act.

Not applicable.

3. Grounds for reassessment

3.1. Please indicate which category applies.
More than one may be relevant.

Has significant new information relating to the effects of the substance become available?
☒ Yes (go to question 3.2)

Has another substance with similar or improved beneficial effects and reduced adverse effects become available?
☐ Yes (go to question 3.3)

Has information showing a significant change of use of the substance become available?
☒ Yes (go to question 3.4)

Has information showing a significant change in the quantity of the substance manufactured or imported become available?
☒ Yes (go to question 3.5)
Other?
☐ Yes (go to question 3.6)

3.2. Provide details of the significant new information relating to the effects of the substance. (Include the date and some of the information.)

Further information? ☒ Yes ☐ No
Commercially sensitive information? ☐ Yes ☒ No
See appendix 1

3.3. Provide details of the information relating to the effects of the new substance (include the date and some of the information). The beneficial and adverse effects of the new substance should be compared with those of the substance.

Further information? ☐ Yes ☒ No
Commercially sensitive information? ☐ Yes ☒ No
n/a

3.4. Provide details of the significant change of use of the substance (include the former use and information on how this change has come about).

Further information? ☒ Yes ☐ No
Commercially sensitive information? ☐ Yes ☒ No
See appendix 1

3.5. Provide details of the significant change in the quantity of the substance manufactured or imported.

Further information? ☒ Yes ☐ No
Commercially sensitive information? ☒ Yes ☐ No
See appendix 1 and CONFIDENTIAL appendix

3.6. Provide details of other reasons requesting a reassessment.

Further information? ☐ Yes ☒ No
Commercially sensitive information? ☐ Yes ☒ No
covered under other sections

3.7. Provide any other information relevant to the request for reassessment.

Further information? ☐ Yes ☒ No
Commercially sensitive information? ☐ Yes ☒ No
See appendix 1

4. Declaration

[redacted] **11/02/2020**

Signature of applicant or person authorised on behalf of applicant **Date**

Name: [redacted] – Vegetable Research & Innovation Coordinator on behalf of the following eight grower groups and industries:

- Vegetables NZ
- Processed Vegetables NNZ
- Avocadoes NZ
- Citrus NZ
- Foundation for Arable Research
- Dairy Industry NZ
- Onions NZ
- Potatoes NZ

Appendix 1 – summary to answer sections 3.2, 3.4 and 3.5
Significant new information relating to the effects of the substances:

The NZ Environmental Protection Authority (EPA) reassessed the group of OP insecticides in 2010 – 2013. This resulted in some active ingredients being given a 10 – 15 year phase out period.

The eight grower groups and industries listed above wish to apply for grounds for reassessment of the compounds listed in section 2.2. These compounds are of critical importance for control of the following pests in production of the crops listed below:

Table 2: Critical uses of Diazinon, Fenamiphos and Methamidophos

Active	Trade names	Critical uses	Labelled pests
Diazinon approvals expire 01 July 2028	Dianex, Dew 600, Digrub, Gesapon 20G, Zagro Diazinon 600EW, Diazinon 20G, Diazol 800, Diazate	pasture, cereals, forage brassica, seed crops (grass, clover and vegetables), bean, pea, leafy vegetables (except	leaf curling midge, aphids scale, mealy bug, leafroller, thrips, grass grub, whitefly, springtails, army worm, DBM, caterpillars, lucerne flea, porina, carrot rust fly

Active	Trade names	Critical uses	Labelled pests
		lettuce), outdoor tomato, carrot, parsnip, avocado, mandarin, orange	
Fenamiphos approvals expire 01 July 2023	Nemacur, Nematak 400EC, Fenafos 400, Canyon	potato, carrot and parsnip	nematodes
Methamidophos approvals expire 01 July 2023	Metafort 60SL, Methafos 600	maize, sweetcorn, onion, potato, kumara, outdoor tomato, vegetable brassicas (brussels sprouts, broccoli, cabbage, cauliflower)	aphids, tuber moth, TPP, caterpillars, weevils, black beetle, DBM, fruit worm, caterpillars, corn ear worm, GVB, thrips *sweetcorn and maize grain in Gisborne and Waikato North - related to dry weather and only used on average once every 3 seasons to control GVB*

The only aspect of these approvals that grower groups and industry are seeking to be reassessed is the timing of the phase outs that are currently in place. This grounds for reassessment application is made to the EPA on the basis of:

- significant new information relating to the effects of these 3 OPs
- unavailability of alternatives
- information showing a significant change of use of these OPs (i.e. that they have been restricted as a result of the decision made by MPI as a result of ADI calculations in 2015) and less product is being used in NZ – see confidential appendix 1.

As 2023 approaches, the first phase out deadlines are looming for two of these actives (Methamidophos and Fenamiphos). When these phase-out periods were initially decided, industry informed the EPA that if alternatives to the most critical of these compounds have not become available then growers would be forced to seek to have the timing of these phase outs revisited. Unfortunately the phase-out periods have not proved long enough to find alternatives for Diazinon, Fenamiphos, and Methamidophos (Note: in the case of Fenamiphos, one new active has been registered but it does not provide complete efficacy, having only a suppression label claim rather than a control one, on the range of crops required, to enable Fenamiphos to be replaced). Also, this product is a single mode of action – putting nematodes at risk of developing resistance if growers were to solely reply on only one product.

The EPA's decision-making committee noted in section 14.8 their 2013 decision on these compounds that:

"*there is currently a fine balance between the benefits and the adverse effects for several of the substances in the reassessment application… The Committee anticipates that there is the potential for the specific benefits currently possessed by these substances to decline with the development of alternatives. When this occurs the risks of these substances are likely to outweigh the benefits."*

As the anticipated development of alternatives that the committee envisaged in 2013 has not resulted in successful identification of viable alternatives for these compounds, these substances' benefits still outweigh their risks, and the eight grower groups and industries consider that there are grounds to reassess these approvals and allow further time for alternatives to be developed.

That efficacious alternatives are not as available as the decision-making committee in 2013 envisaged is directly relevant to section 62 (2) (a) of the Act, "significant new information relating to the effects of substances". The beneficial effects of these substances are less easily discovered in alternative compounds that the decision-making committee believed in 2013. The rarity of these beneficial effects constitutes significant new information. Based on this and the committee's recognition of the significant benefits of these substances in 2013, we consider that revisiting of the phase-out periods is warranted and that grounds exist for reassessing these approvals via a modified reassessment.

Industry is seeking an extension to the phase out periods for each of these actives by 10 years.

At least one NZ registrant per active has indicated continued support for these products for crucial uses. Supply of these products will likely stop a few seasons prior to their phase out date (ie the first of these being 2023) to enable stock to be completely cleared. With the current phase out timings, it is likely that Fenamiphos and Methamidophos will be unavailable to growers within the next 2 years without efficacious alternatives available.

Industry do not regard Prothiofos and Terbufos, the other compounds which are due to be phased out in 2023 as critical use and are agreeable with the current phase-out period.

The introduction of new insecticides onto the NZ market is extremely slow. This is due in part to the nature of chemical research in that discovery of insecticide actives that display the desired properties takes many years of research. Given the importance of these compounds to production in the industries making this application,

To provide context of the lack of alternatives and discovery of new chemistry, below is a summary of the new insecticide actives registered in NZ in the last 5 years. These data were obtained by searching ACVMs register database[1] on 04 December 2019 for insecticide registrations between 01 January 2014 and November 2019. This shows there have been only five new actives registered in the last 5 years.

Table 3: New insecticide active ingredients registered in NZ over the last 5 years

Ingredient	year
Distillates (petroleum), hydrotreated light and middle paraffinic	2014
Sulfoxaflor	2014
Bacillus firmus (Strain I-1582)	2016
Mineral oil (light and heavy)	2016
Flonicamid	2017

Three of these have 'non-chemical' MOA, these being petroleum and mineral oils as well as *Bacillus.* Unfortunately, other products with the same mode of action as these were already registered in New Zealand, so their registration does not assist growers with resistance management. This leaves the two other insecticides (sulfoxaflor and flonicamid).

- The sulfoxaflor (Transform) label carries limited claims. These are for wheat, barley, field cucurbits excluding pumpkin and winter squash, fruiting vegetables excluding sweet corn and mushrooms, leafy vegetables, brassica and root and tuber vegetables and forage brassica. There are no fruit claims and no claims for many of the minor vegetable crops and pasture uses that regard the use of the three supported OPs as critical. There are also a number of pests that are controlled by the

[1] https://eatsafe.nzfsa.govt.nz/web/public/acvm-register

above OPs that are not listed as controlled by sulfoxaflor on the product label. This greatly limits the use of this product as an alternative to one or more of these OPs for many growers represented in this submission. Further, growers need a suite of actives to rotate for resistance management.

- Flonicamid, whilst registered in 2017, has not been made commercially available in the NZ market and so is not available as an alternative to growers.

Grower group, industry and crop protection company registrants' efforts to identify and register efficacious alternatives have been unsuccessful. Particularly in light of the NZ EPA's impending SP reassessment, which may further limit grower options for insect control, the current phase out timings present a risk to NZ's horticultural and agricultural security, as well as growers' abilities to protect their crops adequately. Potato production, for example, would be significantly more vulnerable to zebra chip infections vectored through Tomato/Potato Psyllid. Another example is pasture production systems which are highly reliant on diazinon for control of grass grab which, if uncontrolled, presents a significant economic cost to growers.

Industry has made numerous attempts to find alternative control tools in order to replace these compounds. This includes biological control agents (which have not successfully established)[2] as well as testing traditional synthetic compounds (which have generally proved to lack the necessary level of efficacious control – especially during seasons of high pest pressure)[3]. A number of potential biopesticides have also been trialled however these have failed to demonstrate the required level of control in some instances[4]. In other cases there are still issues with maintaining viability of the active ingredient when applied, and the ability to scale up production that prevent their being viable alternatives for producers to use in place of these three organophosphates[5]. The Vegetables Research and Innovation (VR&I) Board can provide the final reports from the Vegetable Agrichemical Strategy years 2013-2018 to the EPA confidentially as evidence of the lack of success in finding alternatives to these three critical compounds.

Extending the lifetimes for these approvals by a further 10 years will provide more time to enable viable alternatives to be discovered and developed. There is reason to believe that within this additional requested timeframe, success may be more likely achieved than in the last 10 years. The Ministry for Primary Industries has approved an application from a large number of growing industries including many making this application for a Primary Growth Partnership, *"A lighter Touch"*. This 7-year joint venture between the horticulture, arable and wine industries and MPI will facilitate the introduction of biopesticides, biological control agents and new-age agrichemicals into integrated crop protection programmes along with agroecological principles.

New technologies for crop protection.

Additionally, in genetics and the understanding of plant defence mechanisms is driving the discovery of new technologies to control plant pests and diseases. RNA interference (RNAi) is emerging as a unique technology for crop protection[6]. RNAi is a natural regulatory mechanism that plays critical role in plant

[2] Chhagan A., Jamieson L.E., Charles J.G, Redpath S., Griffin M. (2013) Importation of the candidate biocontrol agent *Encarsia* iris against Australian citrus whitefly (*Orchamoplatus citri*) and colont establichment in containment. *Plant and Food Research.*
[3] P. J. Workman, G. P. Walker and S. Winkler (2007). Incidence and control of thrips on outdoor lettuce at Pukekohe. *New Zealand Plant Protection*, 60: 42-49
[4] C. M. Ferguson, D. M. Barton, L. A. Harper, J. Swaminathan, C. Van Koten and M. R. H. Hurst (2012) Survival of *Yersinia entomophaga* MH96 in a pasture ecosystem and effects on pest and non-target invertebrate populations. *New Zealand Plant Protection*, 65: 166-173.
[5] Mansfield, S., Chynoweth, R. J., Hurst, M. R., Noble, A., Zydenbos, S. M., & O'Callaghan, M. (2017). Novel bacterial seed treatment protects wheat seedlings from insect damage. *Crop and Pasture Science*, *68*(6), 527-533.
[6] Mitter, N (2019) Sustainable crop protection: BioClay technology to deliver RNAi. Plenary 8. Australasian Plant Pathology Society Conference, 25-28th November 2019,Melbourne Australia.

growth, development and host defence, and has proved to be a powerful strategy to engineer plant disease resistance against viruses, viroids, nematodes, insect pests and fungi in plants.

In the last decade significant advances have been made related to the use of this technique in the management of insect pest and plant diseases. This approach does not require genetic manipulation of the plant (non-transformative) and exploits natural plant mechanisms whereby nanoparticles of biological active ingredients (double stranded RNA (dsRNA)/small interfering RNA (siRNA)) can be sprayed onto crops. Delivery strategies that are currently being researched include foliar sprays, trunk injection, irrigation, drip irrigation, seed coat, baits, and powder or granules for soil applications[7]. Once on the leaf surface or in the plant, dsRNAs/siRNAs can move directly to target pest cells (e.g., insects or pathogens) or can be taken up indirectly by plant cells to then be transferred into the pest cells. This approach has attracted considerable attention due to its feasibility, low cost, specificity, and having nil residues compared to traditional crop protection approaches. It is anticipated that the application of this technology will progress rapidly from the research laboratory to field applications over the next 5 to 10 years and could reduce or replace the use of chemical pesticides.

A summary of research efforts to identify alternatives has been included as a second confidential appendix.

Information showing a significant change of use of the substances:

In 2015, the Ministry for Primary industries reassessed a range of organophosphate and carbamate products as a result of the revised ADI's from the EPA's 2013 reassessment (APP201045). This included significant revisions for approvals containing diazinon, fenamiphos and methamidophos[8].

Off-label use was prohibited for diazinon fenamiphos and methamidophos, and a large number of crop and pest control label claims were removed. For diazinon, this included the removal of kiwifruit, grapes, tamarillos, lettuce, onions, beans, cabbages, stonefruit, cauliflower, sweetcorn, brassicas, apples and pears. For fenamiphos, claims for use on kiwifruit, Lucerne, kumara and roses were removed. A range of claims including control of pests in snap beans and indoor tomatoes were removed from methamidophos labels.

The removal of these claims is indicative of a significant change in how these substances are used in NZ, and the relative quantities in use. In addition to this, methamidophos has been identified as an important biosecurity tool in the event of a Brown Marmorated Stink Bug (BMSB) incursion. BMSB was not a widely known biosecurity risk in 2013 when the EPA reassessed organophosphates but is now recognized as one of the biggest potential threats to horticulture. If approvals for methamidophos do not exist, then it will not be possible to obtain this product it in a timely manner to mount an effective biosecurity response to an incursion to enable fast and efficacious eradication. BMSB is increasingly being found at the border of NZ and if it was to enter, MPI would need an efficacious control tool to eradicate before it was to devastate NZs horticulture industries[9]. This is a key concern for growers as BMSB would feed on crops and would cause a large amount of crop damage as well as issues with export countries if BMSB was unable to be controlled. It is therefore consistent with the principles and matters relevant to the purpose of the Act (Sections 5 and 6) for the decision-making committee to conclude that grounds exist for the reassessment of these three compounds.

[7] Cagliari, D., Dias, N. P., Galdeano, D. M., dos Santos, E. Á., Smagghe, G. and Zotti, M. J. 2019. Management of Pest Insects and Plant Diseases by Non-Transformative RNAi. Frontiers in Plant Science. 10, 1319. DOI: 10.3389/fpls.2019.01319.
[8] Ministry for Primary Industries (2015). Organophosphate/Carbamate Reassessment ACVM Information Paper. Accessed: https://www.mpi.govt.nz/dmsdocument/10253/send
[9] www.biosecurity.govt.nz/importing/vehicles-and-machinery/requirement-documents-for-importing-vehicles-machinery-or-parts/brown-marmorated-stink-bug-requirements/

Information showing a significant change in the quantity of the substances:
Please refer to confidential appendix.