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16.1.2023

**Re: Application to reassess the insecticide Actara**

Tēnā koutou katoa,

We ask that you take a precautionary approach and decline this application of increasing Actara applications and maintain the prohibition on applications when plants are flowering.

We are making this submission as interested persons (s:54)

We are happy for our submission to be put online.

We would like to be heard.

THE EPA Actara Neonicotinoid reassessment has been publically notified under the Hazardous Substances and New Organisms Act (HSNO) section 63 (2). This consideration evaluates Actara as if it was a new application under s: 29.

The EPA is charged with avoiding the adverse effects of hazardous substances; with safeguarding the life supporting capacity of the air, water in relation to the sustainability of native and valued introduced flora and fauna soil and ecosystems. (HSNO s: 5, 6, & 7)

1. **Application to increase number of sprays**

Actara contains the active ingredient thiamethoxam, a neonicotinoid insecticide, and is currently approved in New Zealand with strict controls.

The applicant states that the brown marmorated stinkbug is one of the highest-risk biosecurity threats currently facing New Zealand, as it can cause significant damage to many important horticultural crops. It is also a significant social nuisance pest that can adversely impact personal wellbeing. Due to this they are applying for an increase in maximum applications from 4 to 19 in one target area per annum and ask for an exemption on the prohibiting of applications where bees are foraging or on plants that are in flower or likely to flower.

The brown marmorated stinkbug, however, is not in New Zealand. Any approval to increase the application rates from 4 a year to 19 times will endanger the environment, foods, bees and non-target insects.

Actara label shows that thiamethoxam is 25% of the formulation, sodium salt and diatomaceous earth are less that 5% and other ingredients make up 70%. It has been shown that adjuvants increase the efficiency and toxicity of active ingredients. As 70% of the adjuvants are unknown this is unable to be assessed for safety.

Vieira J.L et al (2022) [[1]](#footnote-1) has found evidence that rice stink bugs have become resistant to thiamethoxam. An increase of applications will become a persistent contaminant in the environment as well as destroying beneficial insects but over time resistance will nullify Actara’s effectiveness. Dr Guedes has commented on the EPA application saying “The indicated increase in application is indeed significant and requires careful consideration. “

Syngenta’s Actara SDS sheet spray programme for use in Apples, Kiwi Fruit, potatoes, pears all state that they should only have 1-2 applications per year. [[2]](#footnote-2) The applicant has not produced any reason for this 4.5-fold increase on these plants and whether it would be effective. The generic application is broad and does not limit where, on what and when it can be used.

There is confirmed research on the persistent and toxic effect of Actara’s active ingredient thiamethoxam and its breakdown metabolite clothianidin. Clothianidin is extremely persistent in the environment. Actara’s systemic residues pose a danger to the rhizosphere and ecosystems of organisms in the soil and have the potential to cause unacceptable adverse effects to bees and non-target insects.

Clear specifications are given on restrictions for rotational crops; for cover crop plants must not be grazed for food or feed and all other crops must have a 120day (3 month) plant back interval. These restrictions show that there are persistent residues that have a serious effect on the health of the plant and ecosystems.

Garcia-Valcarcel A.I et al[[3]](#footnote-3) (2022) detected thiamethoxam and clothianidin residues in non-sprayed wildflowers grown alongside neonicotinoid sprayed plants.

Actara will be applied in the warmer months for the year. Paunescu A., *et al* (2022)[[4]](#footnote-4) study on fish and frogs found deleterious effects in warmer weather. New Zealand already has highly endangered frogs and fish any further threat to them could lead to their extinction.

The toxic effects on the environment and pollinator insects have caused it to be banned in the EU. The Commission Implementing Regulation (EU) 2018/785 has severely restricted the use of the insecticide thiamethoxam by only allowing its use in permanent greenhouses or for the treatment of seeds that are to be used only in permanent greenhouses. The resulting crop has to stay within a permanent greenhouse during its entire life cycle. The Authority’s risk assessment for bees and of all the available pertinent information, there is currently no evidence that would allow any outdoor uses for clothianidin and thiamethoxam to be considered as safe for bees. [[5]](#footnote-5)

Health Canada has severely restricted thiamethoxam in field applications. [[6]](#footnote-6) The maximum number of foliar applications of thiamethoxam on potatoes has been reduced to one per year. The labels for products containing thiamethoxam and/or clothianidin will also include new or revised spray buffer zones around freshwater and terrestrial habitats.

1. **Effects on Honeybees and Bumble bees.**

The call to remove the prohibition on Actara applications where there are flowering plants is irresponsible and dangerous to pollinator insects especially bees and will have the possibility of endangering a whole industry.

Thiamethoxam is linked to serious toxicity causing death to bees. Land Care Research has identified many New Zealand insects and birds that play an important role in pollination.[[7]](#footnote-7) The applicant has not submitted any research on the effects of Thiamethoxam on native insects especially as it has been found native bees are the main pollinators of New Zealand indigenous flora. This lack of data is a threat to indigenous pollinators and all the adverse effects of this increase must be taken into account when considering this application.

## Bees also feed on early morning water or “guttation” droplets or plant exudates. It has been found that neonicotinoids are present at toxic levels in “guttation droplets” causing neurotoxicity and inability to find their way home. These have been linked to bee colony collapse.

Dr Scott Elias, Institute of Artic and Alpine Research University of Colorado, study[[8]](#footnote-8) on Plight of Bumblebees found that the biggest pesticide threats to bumblebees are posed by the two neonicotinoids, thiamethoxam and clothianidin both active and breakdown products of Actara. The study has stated:

*“Neonics and their metabolites are highly effective in disrupting the transmission of nerve impulses by binding to acetylcholine receptors in the central nervous system of insects. Substantial doses lead to paralysis and death. Due to their stability and their solubility in water, neonic insecticides can accumulate and persist in the environment for several years. This has become problematic for pollinators, as they can be exposed via contaminated pollen and nectar of numerous flowering crops and wildflowers, as well as water. “* (p. 14)

## Mörtl M., *et al* (2019) study on weeds growing next to thiamethoxam sprayed plants have detected residues of the neonicotinoid.[[9]](#footnote-9)

Tosi and Neih (2017) found that Thiamethoxam poses a serious danger to worker bees by altering their activity, affecting their motor functions and movement.[[10]](#footnote-10)

Coulon et al (2018) research found that Thiamethoxam increased mortality to bees.[[11]](#footnote-11)

Wang et al (2022) found that Thiamethoxam was highly toxic to honeybees due to slow detoxification. When combined with certain fungicides there was acute toxicity due to a synergistic effect causing oxidative stress, impaired immune response, shortened lifespan, cell death, and slow detoxification by the bee metabolism. [[12]](#footnote-12)

Liu et al (2018) recorded a 9-day half-life of thiamethoxam in strawberry and the residue of its metabolite clothianidin gradually increased from 0.55 to 11 μg within 30 days.[[13]](#footnote-13)

The Pesticide Action Network Bee Decline & Pesticides Fact sheet records that the LD50 for bees is 0.004μg for Clothianidin and 0.005μg for Thiamethoxam when ingested orally. The residues found in the strawberries for bees show that these residues would have severe toxic effects leading to high mortality.

**Alternative Solutions**

The EPA in 2018 has approved a parasitic wasp as a bio control for BMSB if it is detected in the country.[[14]](#footnote-14)

Parasitic wasps lay their eggs inside the egg, immature or adult stage of another insect commonly called its *host*. Eggs of these wasps then hatch, leaving the larval wasp which resembles a maggot to consume the contents of the host egg. After consuming the host, parasitic wasps complete their development within the host and later chew their way out and emerge as adult wasps. As the wasps often are attracted to the food sources as BMSB they are able to parasitize the bugs.

The EPA Decision regarding BMSB in Appendix 1 states

*Controls 1. Trissolcus japonicus (T. japonicus) may only be released when a brown marmorated stink bug (BMSB, Halyomorpha halys) incursion is detected and only at the location of the incursion in accordance with the provisions of the Response Readiness Plan. The approval can only be used by the approval user.*

This approval could be extended to other growers under the same controls.

The Rodale Institute, USA, organic field management of the brown marmorated stink bug has successfully managed them by catch crops grown in buffer zone around fields. [[15]](#footnote-15)

Neilson et al (2016) found planting catch crops of sunflower and sorghum were highly attractive to the BMSB. These plants have a 5-week flowering period that coincided with the peek activity of the BMSB.  They found that these crops with other supports like flaming was an effective management tool for BMSB. [[16]](#footnote-16)

**In Summary**

We ask that this application is declined in light of overseas prohibitions and rulings regarding the toxicity of Actara’s active ingredient and

1. The lack of information on the adverse effects of increased applications
2. There is no information on the reason for the increase of applications when flowering on the valued native ecosystems, water and insects.
3. No information on the economic costs of losing pollinators.
4. There is no information on the time it takes for resistance to build up.
5. There are no data on the residue risks to consumers, workers and applicators.
6. Actara does not have the information on any possible adverse effects on the environment, soil, pollinators or water from the increase of applications.
7. Actara data sheet specifies only 1-2 annual applications for control.
8. The is no long-term data that increasing the applications is effective as a control of BMSB
9. There is strong evidence on Thiamethoxam and metabolite clothianidin’s toxicity leading to chronic immune, neurological symptoms and mortality to bees.
10. Accumulated toxicity in water and guttation droplets
11. Systemic persistent toxic exudates destroy ecosystems
12. The EU has banned the use of Thiamethoxam and Clothianidin due to their effects on bees and pollinator insects
13. Health Canada has only approved Thiamethoxam and Clothianidin in glasshouse situations.
14. Management methods are available
15. Alternative solutions are available if an incursion occurs.
16. The EPA has approved a parasitic wasp for use in an outbreak.

Nga mihi,

Jon Muller

Secretary GE Free NZ in Food and Environment

Cc: Claire Bleakley

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2. <https://www.syngenta.co.nz/product/crop-protection/insecticide/actara> [↑](#footnote-ref-2)
3. García-Valcárcel, A.I., Campos-Rivela, J.M., Hernando Guil, M.D. *et al.* Neonicotinoid contamination in wildflowers collected from citrus orchards in a northwestern Mediterranean Region (Spain) after tree foliar treatments. *Environ Sci Pollut Res* **29**, 53482–53495 (2022). <https://doi.org/10.1007/s11356-022-19331-7> [↑](#footnote-ref-3)
4. Paunescu, A.; Soare, L.C.; Fierascu, I.; Fierascu, R.C.; Mihaescu, C.F.; Tofan, L.; Ponepal, C.M. Ecotoxicological Studies on the Action of Actara 25 WG Insecticide on Prussian Carp (*Carassius gibelio*) and Marsh Frog (*Pelophylax ridibundus*). *Toxics* **2022**, *10*, 114. https://doi.org/10.3390/ toxics10030114 [↑](#footnote-ref-4)
5. <https://data.consilium.europa.eu/doc/document/ST-13901-2022-INIT/en/pdf> [↑](#footnote-ref-5)
6. https://www.realagriculture.com/2021/03/health-canada-introduces-new-restrictions-but-backs-off-proposal-to-ban-two-main-neonics/ [↑](#footnote-ref-6)
7. https://www.landcareresearch.co.nz/tools-and-resources/education/pollination/ [↑](#footnote-ref-7)
8. Scott A. Elias S., (2022) Plight of the Bumblebees, Editor(s): Dominick A.DS., Goldstein M.I, Imperiled: *The Encyclopedia of Conservation,* Elsevier, pp.549-565, ISBN 9780128211397, https://doi.org/10.1016/B978-0-12-821139-7.00240-3. [↑](#footnote-ref-8)
9. Mörtl M., Darvas B., Vehovszky A., Győri J. & Székács A. (2019) **Contamination of the guttation liquid of two common weeds with neonicotinoids from coated maize seeds planted in close proximity** *Sci. Total Environ*., 649, pp. 1137- 1143. [10.1016/j.scitotenv.2018.08.271](https://doi.org/10.1016/j.scitotenv.2018.08.271) [↑](#footnote-ref-9)
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    [↑](#footnote-ref-14)
15. <https://rodaleinstitute.org/science/articles/managing-the-brown-marmorated-stink-bug-organically/> [↑](#footnote-ref-15)
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