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Fenthion: Preliminary Review Findings - Summerfruit Australia Ltd Response

Summerfruit Australia Limited (SAL) welcomes this opportunity to provide comment on the May 2104 Fenthion Preliminary Review Findings (PRF). SAL, as the national peak industry body representing the Summerfruit industry, has consulted with industry members potentially affected by the recommendations contained within the Fenthion PRF. An outcome of which are concerns relating to elements of the environmental risk assessments, underpinning the recommended regulatory actions.

Specifically, SAL's primary concerns relate to certain assumptions upon which the environmental risk assessments were based. Consequently, SAL wishes to bring these concerns to the attention of the APVMA and propose alternative scenarios upon which the risk assessments could be based. Further, on the basis of the proposed refinements, SAL asks that if after evaluating the points raised the APVMA determines that the use of fenthion should be deleted, that consideration be given to implementing a managed phase-out in crops for which no dietary intake concerns have been identified, i.e., nectarines and plums¹.

¹ Pre-harvest treatment of plums and nectarines only, with a WHP of 14 days and a maximum of three sprays per crop - Supported use patterns recommendation from a dietary risk assessment perspective. page 19 Fenthion: Preliminary Review Findings Part 2: Food producing uses and revised OHS recommendations.



Review Recommendations

All uses except post-harvest dipping and flood sprays be removed from labels²

The PRF indicates that the environmental assessment determined that fenthion is highly toxic to most organisms and in particular birds and aquatic invertebrates. However, SAL while acknowledging the risk assessments was based on worst-case scenarios believes that through refinement the estimated risks to non-target organisms can be significantly moderated. Outlined below are specific comments relating to the environmental risk assessments and the areas in which SAL believes refinement is possible.

Section 10.2 Application and Use Pattern

10.2.1 Orchards and other fruits

Water volumes: The environmental risk assessment states that “*Normal practice in orchards is to spray to the point of run-off, requiring 1500 - 3000 L/ha of spray solution for mature pome and stone fruit trees*”³. SAL believes that employing the higher water volume results in an exaggerated estimate of environmental exposure. SAL proposes that a more realistic and representative water volume would be 1500 L/ha.

A Victorian DPI survey⁴ found that for stone fruit the median water volume applied was ~1300 L/ha and ranged from 150 L/h to a maximum of 3000 L/ha. The survey also found that the 95th percentile value for stone fruit was 2275 L/ha, supporting SAL contention that applying a value of 3000 L/ha results in a considerable over estimate of water volumes, the resulting predicted environmental concentrations, and in all likelihood would represent atypical grower practice.

² page 23 Fenthion: Preliminary Review Findings Part 2: Food producing uses and revised OHS recommendations

³ Page 58 Environmental chemical review assessment report Fenthion food uses only. Dept of Environment 30 April 2014

⁴ Water rates used in horticulture. A Department of Primary Industries Victoria study. 2012. A Perera. DPI Plant and Chemical Operations



Following consultation with growers, the consensus reached was that a water volume of 1500 L/ha is typical and would be ample for use in fruit fly control. Therefore, SAL proposes that the APVMA consider refining the risk characterization using a water volume of 1500 L/ha.

Application rate: For Summerfruit the key pest is fruit fly and a rate of 75 mL/hL is the critical rate. Utilising this rate and the application volume of 1500 L/ha would result in the amount of fenthion applied totaling 0.619 kg ac/ha. Rather than the 2.47 or 1.57 kg ac/ha which appear to have been the basis for the environmental risk assessments. This would further reduce the predicted environmental concentration and potential impacts on non-target organisms.

The extent to which making such refinements are believed to reduce the estimated environmental risks are outlined below.

11 Risk characterisation

11.1 Agricultural uses – terrestrial

11.1.1 Avian

The Environmental risk assessment estimated fenthion concentrations on various food sources using an application rate of 2.47 kg ac/ha. As indicated above SAL believes a rate of 0.619 kg ac/ha to be more appropriate. Using the 0.619 kg ac/ha value to estimate the predicted environmental concentrations results in the following values:

- 8.25 mg ac/kg (fruit or large insects);
- 60.5 mg ac/kg (grain/long grass);
- 74.25 mg ac/kg (small insects or forage crops)

If the risk quotients for the mallard duck and the bobwhite quail are then recalculated, using the dietary ratios indicated in the environment report, it can be seen that the risk is mitigatable for mallard ducks and while above the threshold of 0.5 for bobwhite quail (Table 1). SAL believes that



such a level is not necessarily unacceptable particularly from the perspective of 20% of the spray reaching the orchard floor and 50% of the diet is treated⁵.

⁵ Page 60 Environmental chemical review assessment report Fenthion food uses only. Dept of Environment 30 April 2014



Table 1 Acute risk to birds at 0.619 kg ac/ha

| Avian species | LC ₅₀ (ppm) | Stone | |
|----------------|------------------------|---------------------------------|--------------------------------|
| | | Q (100% dietary intake treated) | Q (50% dietary intake treated) |
| Mallard duck | 231 | 0.104 | 0.052 |
| Bobwhite quail | 30 | 2.16 | 1.08 |

Consequently, SAL believes that based on the parameters outlined in the Environment Report the current risk assessment has resulted in an overly conservative estimate of acute risk to birds. SAL therefore, advocates a reconsideration of the finding in relation to birds and proposes that risk mitigation measures of limiting fenthion use to the control of fruit fly only and capping the maximum water volume to 1500 L/ha.

11.1.3 Bees

SAL acknowledges that the risk to honey bees from direct application of fenthion is high. However, at the nominated application rate of 0.619 kg ac/ha SAL believes that the risks would be significantly reduced. Nevertheless, SAL agrees that more explicit warning statements are desirable. As a result SAL believes that an additional restraint would be to limit cover spray applications to post-flowering only. This would have the added benefit of ensuring there would be no foliar residues with which foraging bees could come into contact.

11.2 Agricultural uses - aquatic

11.2.2.3 Orchard/Air-Blast Spray Drift

As for the risk assessment for birds, SAL believes that the aquatic risks identified should also be re-assessed from the perspective of 0.619 kg ac/ha and a water volume of 1500 L/ha. A provisional re-calculation of predicted environmental concentrations values for stone fruit, using 0.619 kg ac/ha, resulted in a significant reduction in the estimated risk quotients (Table 2), but at levels which would still be considered problematic for pink shrimp at distances of less than 300 m.

Table 2 Risk quotients for spray drift from airblast sprayers in stone fruit orchards at 0.619 kg ac/ha

| Normal (Stone fruit trees) 0.619 kg ac/ha | | |
|---|---|---|
| Distance metres | Risk Quotients (Q) | |
| | <i>Daphnia magna</i> EC ₅₀ = 5.2 (µg/L) | pink shrimp EC ₅₀ = 0.11 (µg/L) |
| 10 | 0.379 | 17.909 |
| 20 | 0.212 | 10.029 |
| 60 | 0.070 | 3.295 |
| 100 | 0.038 | 1.791 |
| 200 | 0.015 | 0.716 |
| 300 | 0.009 | 0.430 |

However, if aqueous photodegradation and sediment adsorption/desorption factors are applied⁶, the estimated predicted environmental concentrations for fenthion are reduced considerably. After allowing for the mitigating factors and using initial concentrations of fenthion (55% and 40%) after one day, the risk quotient determinations, based on a rate of 0.619 kg ac/ha, indicate that for pink shrimp distances beyond 100 m from the sprayed area pose significantly reduced risk and are no longer problematic for *Daphnia* (Table 3).

Table 3 Risk quotients for spray drift from airblast sprayers allowing for 1 day aquatic photodegradation and sediment adsorption

| Normal (Stone fruit trees) 0.619 kg ac/ha | | | | |
|---|---|-------|---|-------|
| Distance metres | Risk Quotients (Q) | | | |
| | <i>Daphnia magna</i> EC ₅₀ = 5.2 (µg/L) | | pink shrimp EC ₅₀ = 0.11 (µg/L) | |
| | 55% | 40% | 55% | 40% |
| 10 | 0.21 | 0.152 | 9.9 | 7.164 |
| 20 | 0.12 | 0.085 | 5.52 | 4.012 |
| 60 | 0.04 | 0.028 | 1.8 | 1.318 |
| 100 | 0.021 | 0.015 | 0.99 | 0.716 |
| 200 | 0.008 | 0.006 | 0.39 | 0.287 |
| 300 | 0.005 | 0.004 | 0.24 | 0.172 |

Key: Dark shading is Q > 0.5; light shading = 0.1 ≤ Q ≤ 0.5

⁶ Pages 69-70 Environmental chemical review assessment report Fenthion food uses only. Dept of Environment 30 April 2014



SAL therefore proposes that use could be allowed where applications can be made in situations that a more than 100 m from aquatic and or wetland areas.

SAL also believes that greater consideration needs to be given to the development and practical application of buffer zones. SAL suggests that the application of other risk management options such as employing vegetative buffer zones of unsprayed crop rows or tree wind-breaks should be contemplated. Particularly, as the use of wind-breaks has been shown to significantly reduce drift by up to 70-90% from orchards (Van de Zande *et al.*, 1999 and Walklate, 1999)⁷.

Conclusion

For the reasons outlined above SAL believes that the risk characterisation and resultant regulatory recommendations contained in the PRF have overestimated the level of risk posed by fenthion use in nectarine and plum orchards. SAL suggests that the APVMA should seek further refinement of the risk assessments and give consideration to alternative risk management options. While acknowledging the level of uncertainty associated with such calculations and that such refinements are unlikely to mitigate all risks entirely SAL asks that if after considering this response the APVMA confirms that the use of fenthion in nectarines and plums should be deleted, that consideration be given to implementing a managed phase-out, based on the proposed directions for use as per the Attachment 1.

SAL also suggests that the APVMA should consider engaging with industry to discuss the development of practical risk mitigation measures that can be readily adopted and integrated with current fruit fly management practices. For example, specifying a maximum water volume and rate per hectare as a regulatory requirement, i.e., labelled⁸, and provide a range of drift mitigation options, e.g., buffer zones or wind-breaks.

⁷ Van de Zande *et al.* 1999. Drift measurements in the Netherlands as a basis for differentiation of risk mitigation measures. Walklate J.P. 1999. Drift reduction by vegetation. In Workshop on Risk Assessment and Risk Mitigation Measures, Sept 1999. Federal Biological Research Centre for Agriculture and Forestry, Biology Division, Braunschweig, Germany.

⁸ A label statement could read "Apply no more than 1.125 L/ha in a maximum spray volume of 1500L/ha."



Attachment 1

Proposed Directions for Use

| Crop | Pest | Rate | Critical Comments |
|----------------------|---|------------|---|
| Nectarines and plums | Queensland fruit fly Mediterranean fruit fly | 75 mL/100L | DO NOT apply in water volumes greater than 1500 L/ha DO NOT apply more than 3 sprays per crop Use for post-flowering applications only. |

Withholding periods:

Do not harvest for 14 days after application.

Protection of wildlife, fish, crustaceans and environment

DO NOT apply within 100 meters of a downwind aquatic and wetland area including agricultural ponds or surface streams and rivers.