ANIC
australian nut industry council

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30 March 2018

Enquiries
Australian Pesticides and Veterinary Medicines Authority
PO Box 6182
Kingston ACT 2604

Email: enquiries@apvma.gov.au

Dear Sir/Madam,

RE: Spray Drift Risk Assessment Manual Public Consultation

This submission is in response to the public consultation paper from the Australian Pesticide and Veterinary Medicines Authorities SPRAY DRIFT RISK ASSESSMENT MANUAL (the MANUAL) and associated attachments.

The Australian Nut Industry Council is a federation of the seven Australian tree nut producing industries – Almonds, Chestnuts, Hazelnuts, Macadamias, Pecans, Pistachios and Walnuts. The Australian tree nut industry is valued at close to $1 billion at farm gate and is Australian horticulture's largest export industry. In the last 15 years there has been a substantial increase in the hectares devoted to nut growing in Australia. The industry is currently undergoing its second largest expansion in its short history.

The responses contained within this submission are based on an independent review of the material released by the AVPMA for public consultation by Dr Jorg Kitt. Dr Kitt is an expert in conventional chemical control, biological control and IPM strategies for agricultural weeds, pests and diseases. He is regarded as an expert in the field of adjuvant technology, especially in the interaction of adjuvants with pesticides and spray equipment.

Executive Summary

The Australian tree nut industry supports the move from standard buffer zones to custom buffers zones and advisory buffer zones based on risk assessment. As the SDRAT does not adequately address vertical sprayers, tree and vine crops have no way to apply a risk assessment approach to potentially reduce buffer zones from the worst-case scenarios on the label. This is not workable for the sector.

To this end, as a matter of priority, the AVPMA should support the development of spray drift guidelines to support the generation of custom deposition curves for vertical spraying.

The Spray Drift Risk Assessment Tool (SDRAT) should be developed and made available to industry, with additional resources allocated to it as necessary.

The Australian tree nut industry believes there is more work required to confirm and implement relevant and appropriate spray drift models for the vertical sprayer sector. While the process to date has made an important contribution to developing

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the risk assessment models, there is a lot more work required to understand risk assessment for tree industries.

In the absence of any validated current spray drift models to calculate accurate deposition curves for vertical tree and vine sprayers, we would accept that the German deposition curves are an improvement compared to the current situation. However, it is noted the use of the German plotted field data does not adequately account for differences in crops. E.g. spray requirements and considerations for a 2m high tree are vastly different to those required for an 8-10m high tree. This should be addressed as a matter of priority between the AVPMA and industry.

The case studies contained on the Manual on chemical rates in vertical spraying indicate that the APVMA needs to put more effort into the understanding of tree spraying if they want to regulate the amount of drifting chemical more precisely.

ANIC would also like to see from the AVPMA greater information and science around what other drift reduction technologies might be adopted. There needs to be greater consideration as to how horticulture can do this efficiently and effectively. Currently, the AVPMA largely leaves this up to industry.

Specific feedback on a range of issues contained within the publications out for comment is detailed below.

The methodology used to determine regulatory acceptable levels (RAL's) and to use standard scenarios and deposition curves that define worst-case scenarios and are used to generate on-label spray drift buffers.

The Australian tree nut industry supports the move to custom spray drift assessment deposition curves.

For ground boom sprayers and aerial application, the APVMA has powerful, scientifically proven and very well predicting models that allows the calculation of accurate deposition curves and no-spray buffer zones. Applying a worst-case scenario on the label is in the interest of the public, and in the long run, in the interest of the industry as well. However, there is no need to go unrealistically far with this approach, for example, using the 90th percentile as standard. Without the proposed new scenario (i.e. the risk assessment tool) to allow the user to refine the no-spray zone based on the risk to the particular situation to be sprayed, the current worst-case buffer areas would be considered as unfair to the grower and as an overprotection of the off-targets.

Deposition curves

When it comes to tree spraying the APVMA classifies a large amount of very different spray machinery simply as vertical sprayers. There is no sophisticated model around that can predict accurately deposition curves and therefore buffer areas for vertical sprayers. Instead the APVMA is suggesting the use of three trial data curves generated in Germany (German data curves) to predict deposition curves. These curves are categorised as:

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1. Foliated canopies up to 2m height,

2. Foliated canopies above 2m height and

3. Non-foliated canopies above 2m height.

This is certainly not a very sophisticated scientific approach, but with a lack of any other tools the APVMA has at this time to improve the situation for vertical sprayers, we would agree in principle to this approach. The curves for the foliated trees and vines are very similar to EXTREMELY COARSE or COARSE deposition curves in broadacre.

However, as the SDRAT does not adequately address vertical sprayers, tree and vine crops have no way to apply a risk assessment approach to potentially reduce buffer zones from the worst-case scenarios on the label. This is not workable for the sector.

Drift reducing technologies

The APVMA is not very specific in terms of which DTRs are likely to be implemented into models, or timeframes, and leaves the initiatives largely up to industry. While, to a degree, that is understandable it shouldn't be so difficult to give indications like

'recent publications such as '*Spray Drift Mitigation Offered By Barriers - a Literature Review*' by Gary Dorr and Nicholas Wood show great promise to utilize hedges or shade cloth as DTRs to reduce buffer zones'.

For many growers, who, for whatever other reasons are thinking of installing shade clothes, e.g. bird damage, sun burn etc., this may well be the final incentive to go ahead with the investment.

Spray drift data guidelines to support the generation of <u>custom</u> deposition curves.

This is one of the main suggestions in the AVPMA consultation paper. This topic is discussed in relative brevity and vaguely in the MANUAL. It describes the sort of information that will be relevant to customize a deposition curve by using Drift Reducing Technology (DTR) and what trial methods may be used. The AVPMA needs to work with industry to identify a range of DRT and how they can be recognised to customize deposition curves that have the best possible fit to field data. This may need several trials, and possibly involve the use of already existing overseas data.

Chemical rates in vertical spraying

The amount of chemical used has obviously a lot to do with the amount that can drift. In Australia, horticultural rates are given in ml or g/100L. This has the advantage that the applicator is using the exact concentration the manufacturer wants used to achieve efficacy. However, the grower still needs to achieve the right dose on the leaf, which requires the correct amount of water. The label is vague and specifies to use the dilute volume, to spray to the point of run-off. The more water put out the more chemical used, and the more potential drift. This is one of the greyest areas in the industry.

The German data curves work on a percentage of the initially sprayed amount. This is a kg/ha or L/ha equation. The Australian grower has to transform the rate/100L into

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rate/ha. They must use the dilute Volume to calculate. The APVMA, unless otherwise stated on the product label, proposes to use defaults for their calculation (page 20, MANUAL).

APVMA Suggested Dilute Rates (Foliated)		
Crop Type	**< 2m**	**> 2m**
Vines and Fruiting Vegetables	1000 L/ha	
Pome Fruit or Stone Fruit or Almonds		1500 L/ha
Mango or Avocado		2000 L/ha
Citrus or Tree Nuts (other than Almonds)		4000 L/ha
All Other Crops		2000 L/ha

Taken from page 20 of the MANUAL

These new suggested dilute rates are better than the existing rates. However, this approach is not workable. No grower would use the same amount of water on a 3 m high Macadamia tree compared to a 10 m high tree. And no grower would use 4,000 L/ha anyway. In Citrus, application volumes change according to the type of pesticide used. Grapevines in the Riverland, or Table grapes would often get 2,000L/ha. Mangoes are often sprayed with 1,000 L Dilute. The Almond industry is getting older and the trees getting taller, needing more water.

This table can only be related to the fact that there are only 3 standard German curves, < 2 m, > 2m foliated and < 2 m non-foliated. It is clear that the APVMA has not the tools to be precise in the case of vertical sprayers.

On page 61 of the MANUAL the APVMA document gives an example that further demonstrates that the understanding of the need for tree crops is not as good as their efforts in broadacre.

Page 61 - Case Study Vertical Sprayer for Insecticide 500 g ac/L Product					
Crop	Pest	Label	Dilute Rate	Product	Active
		Product rate	APVMA	Rate	Rate
Pecans, Macadamias	Yellow Peach Moth	200mL/100 L	4000	8 L/ha	4000g ac/ha
Apples, Pears	LBA, Codling Moth	100-200mL/100 L	1500	1.5-3 L/ha	750-1500 g ac/ha

Maximum label active constituent application rate is 1100g ac/ha = 2.2 L product/ha

According to the default dilute tree rates from page 20 the trees would need 8L insecticide/ha for Macadamias and Pecans and 1.5 to 3 L/ha for Apples and Pears. However, the label allows only a maximum per ha rate of 2.2 L/ha because of potatoes (For horticultural horizontal crops it is common to use 10 or 11 times the /100L rate as /ha rate because it works on 1,000-1,100 L/ha horizontal dilute). Anyway, it is unlikely that an Australian label would restrict the water volume to such a degree below the tree dilute volume. The case study then points out that the downwind no-spray zone for aquatic situations is 60 m. But it is difficult for the reader to follow as they can't determine how much water actually has been used.

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On page 64 is the same story. A macadamia tree (APVMA dilute of 4,000L/ha) can only be sprayed with 2,000 L/ha according to the label). No manufacturer will put such a statement on a label.

In summary, it appears that the APVMA needs to put more effort into the understanding of tree spraying if they want to regulate the amount of drifting chemical more precisely.

On label spray drift instructions

Labels are getting longer and more complicated. Many users may overlook the fine print, including DO NOT statements. This includes obvious statements such as DO NOT allow bystanders to get in contact, DO NOT cause unacceptable impact .., DO NOT cause contamination …

While all of these statements may be legally necessary, the label looks uninviting. The APVMA may have a higher success rate of growers regularly referring back to labels if there was an outstanding executive summary for Spray Drift Restraints. Below is a simple example of the type of summary that might be beneficial. That can of course be extended, depending on complexity.

Key Spray Drift Restraints - For more details read text below				
Sprayquality not smaller than	**Windspeed**	**Environmental Condition**	**Aerial TAS only**	**Spray Record**
COARSE	3-15 km/h	NO Inversion	NO Aerial	MUST

Downwind Bufferzones for Ground Booms					
Product Rate L per ha	**Mandatory Bufferzone**			**Advisory Bufferzone**	
	Bystander areas	**Natural aquatic area**	**Pollinator areas**	**Vegetation area**	**Livestock area**
2 L/ha	**NA**	**NA**	**NA**	**40 m**	**40 m**

followed by detailed text …

Spray Drift Risk Assessment Tool and Spray Drift Management tools that allows chemical users to refine these realistic worst-case risk assessments based on their own circumstances and recalculate buffer zones distance accordingly.

For ground boom and aerial applicators this is the most exciting part of the proposal because they will be able to reduce the buffer areas according to their own circumstances, reducing product rate, reducing wind speed, increasing droplet sizes, etc. It provides incentives for better management, provides flexibility and the use of the final website (SDRAT home) should make it easy – providing it is easy to navigate around. Simplicity and ease of use will be the key issue.

For vertical tree sprayers it does not look that exciting because there is no model to change parameters easily. There are two areas the APVMA can improve on, however. Currently, the proposal for the worst-case scenario works on the maximum water rate in tree crops. Since the label rate is given in product/100L this implies using the

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maximum product rate, regardless of orchard characteristics. This is nonsense, as already discussed (especially the suggested Dilute Volumes in the MANUAL (page 20)). The idea, which was clearly accepted by the APVMA, to give a per 100L label rate was to allow for versatility in orchards. For example, a 3m high macadamia canopy with 10 m row spacing has a dilute volume of 750 L/ha, a 10 m high canopy with 10 m row spacing 2,500 L/ha. Yet, the APVMA default proposal is 4,000 L/ha. For the calculation of product/ha, which determines the deposition curve and buffer zone, the 3 m high trees would be forced to calculate with a more than 500% higher rate than what they are actually using. Even the 10 m high trees would be forced to use a 60% higher rate.

The APVMA assumes that sprayers are calibrated. That includes using the right dilute rate. Therefore, in the spirit of the /100 L rate, the proposal should allow flexibility for different orchard situations. Below is a table that would provide this label flexibility by using different water rates.

Bufferzones for Vertical Orchard Sprayers, foliated, above 2m					
Water Volume L per ha	**Mandatory Bufferzone**			**Advisory Bufferzone**	
	Bystander areas	**Natural aquatic area**	**Pollinator areas**	**Vegetation area**	**Livestock area**
up to 500 L/ha					
501-1000 L/ha					
1001-1500/L/ha					
1501-2000 L/ha					
2001-3000 L/ha					
3001- 4000 L/ha					
Bufferzones for Vertical Orchard Sprayers, non foliated, above 2m					
Water Volume L per ha	**Mandatory Bufferzone**			**Advisory Bufferzone**	
	Bystander areas	**Natural aquatic area**	**Pollinator areas**	**Vegetation area**	**Livestock area**
up to 500 L/ha					
501-1000 L/ha					
1001-1500 L/ha					
1501-2000 L/ha					
2001-3000 L/ha					
3001- 4000 L/ha					
Bufferzones for Vertical Orchard Sprayers, foliated, below 2m					
Water Volume L per ha	**Mandatory Bufferzone**			**Advisory Bufferzone**	
	Bystander areas	**Natural aquatic area**	**Pollinator areas**	**Vegetation area**	**Livestock area**
up to 500 L/ha					
501-1000 L/ha					
1001-1500L/ha					
1501-2000 L/ha					

Alternatively, since product/100L must be transformed into product/ha anyway the table could also use product rates, which would give even more flexibility in case of a range of product rates on the label.

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Bufferzones for Vertical Orchard Sprayers, foliated, above 2m					
Product rate	Mandatory Bufferzone			Advisory Bufferzone	
L or gg per ha	Bystander areas	Natural aquatic area	Pollinator areas	Vegetation area	Livestock area
up to 500 g/ha					
501-1000 g/ha					
1001-1500 g/ha					
1501-2000 g/ha					
2001-3000 g/ha					
3001- 4000 g/ha					
4001-6000 g/ha					
6001- 8000 g/ha					

Bufferzones for Vertical Orchard Sprayers, non foliated, above 2m					
Product rate	Mandatory Bufferzone			Advisory Bufferzone	
L or kg per ha	Bystander areas	Natural aquatic area	Pollinator areas	Vegetation area	Livestock area
up to 500 g/ha					
501-1000 g/ha					
1001-1500 g/ha					
1501-2000 g/ha					
2001-3000 g/ha					
3001- 4000 g/ha					
4001-6000 g/ha					
6001- 8000 g/ha					

Bufferzones for Vertical Orchard Sprayers, foliated, below 2m					
Product rate	Mandatory Bufferzone			Advisory Bufferzone	
L or kg per ha	Bystander areas	Natural aquatic area	Pollinator areas	Vegetation area	Livestock area
up to 500 g/ha					
501-1000 g/ha					
1001-1500 g/ha					
1501-2000 g/ha					
2001-3000 g/ha					
3001- 4000 g/ha					

Another way to allow a reduction in buffer areas for aquatic areas is to allow the 15 cm default depth to be increased to 60 cm.

Both approaches can be done still using the German standard curves.

Interim measures prior to an interactive web-based tool being available

ANIC is concerned that the worst-case scenarios will be set on the label, the development of the web-based SDRAT will be delayed and that the APVMA will not have sufficient resources to handle interim permits. In this event, industry will be stuck with the worst-case scenario for a while. This is less relevant to vertical sprayers, as the SDRAT cannot accommodate them at the moment anyhow.

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Conclusion

It is evident that the AVPMA's expertise lie in broadacre agriculture, supported by sound modelling that is enabling tools such as the SDRAT. The SPRAY DRIFT RISK ASSESSMENT MANUAL is an excellent publication for the broadacre sector, with the predominance of ground boom sprayers and aerial application for chemical/pesticide application. It does not, unfortunately, sufficiently address vertical sprayers, which are of particular interest to the Australian Nut Industry Council and the Australian horticultural sector.

ANIC supports the approach of moving to a risk assessment approach, however at this time, with what is being offered, it is clear that tree and vine enterprises have no way to apply a risk assessment approach to potentially reduce buffer zones from the worst-case scenarios on the label. Additionally, there are complications with proposed changes in other areas, based on a lack of understanding of how the industry actually works. We would encourage the AVPMA to undertake further work to truly understand the full implications for vertical spraying prior to any new regulations being released.

We are pleased to speak to you about any of these points.

Yours sincerely,

Chaseley Ross

Executive Officer