



instinct^{and}
reason

Spray equipment and behaviour benchmark survey

October 2018

www.instinctandreason.com



SYDNEY

Level 1, 420 Elizabeth
Street, Surry Hills

NSW, 2010 Australia

+61 (2) 9283 2233

LONDON

Suite 1,
7 Ridgmount Street

WC1E 7AE United Kingdom

+44 (0) 203 355 4454

CANBERRA

103/ 11 Trevillian Quay,
Kingston

ACT, 2604 Australia

+61 (2) 6231 0350

Executive summary

Off-target spray drift has a major environmental and economic impact across the Macquarie Valley, yet reported instances are relatively low. The research was designed to provide baseline data to develop an understanding of spray equipment, practices and attitudes of farmers towards spraying in the Macquarie Valley.

The survey data was collected using an online survey of approximately 10 minute duration, shared by the SOS Macquarie Valley group through social media, resellers and known contacts. In addition a paper-self complete version of the survey was available if required / preferred and the SOS Macquarie Valley group facilitated data collection at the Field Day held at Trangie on 6th September 2018. The key qualification criteria for the survey was that respondents were involved in spraying and living in the local area. Property owners comprised nearly half of those surveyed but all participants played an active role in spraying.

Key results for spraying behaviours included:

- Most spraying is occurring for summer fallow and winter crops
- Spraying IS occurring at 'risky' times –around half indicated that last summer 'some of' or 'most of' their spraying occurred between 10 / 11pm – sunrise (49%) and in the early morning just after sunrise (60%) - concerning
- 77% driving and spraying at a speed of greater than 16km/h - concerning
- 10% sprayed when Delta T was above 12 - concerning
- 19% didn't think about the Delta T when spraying - concerning
- Just 6% spraying when the wind speed is below 4km/h – a good result
- 3 % spraying when wind speed is above 20km/hr – a good result
- At least 23% sprayed when the temperature was over 30 degrees - worrying
- 9% using a nozzle finer than 02 - worrying
- For some, spraying is likely to occur even when conditions are not recommended for spraying. Delta T above 12 is the 'rule' most broken, and in practice, 19% claim not to think about Delta T.
- The 'rule' most adhered to is 'not spraying when an inversion has formed', with just 4% likely to spray in this condition.

Influences on spraying behaviours included...

- Sprayers use clues from nature. This is the most popular method for determining the presence of a temperature inversion, with 20% of those surveyed using this approach alone and 78% within their repertoire
- Concern for their neighbour's crop is the key driver to stopping spraying. Fear of litigation and concerns about long term access to chemistry are also motivating, more so than proximity to an organic farm and public pressure. The potential threat of loss of access to chemistry is only a moderate deterrent

- Time pressure is the biggest barrier to stopping spraying in adverse conditions

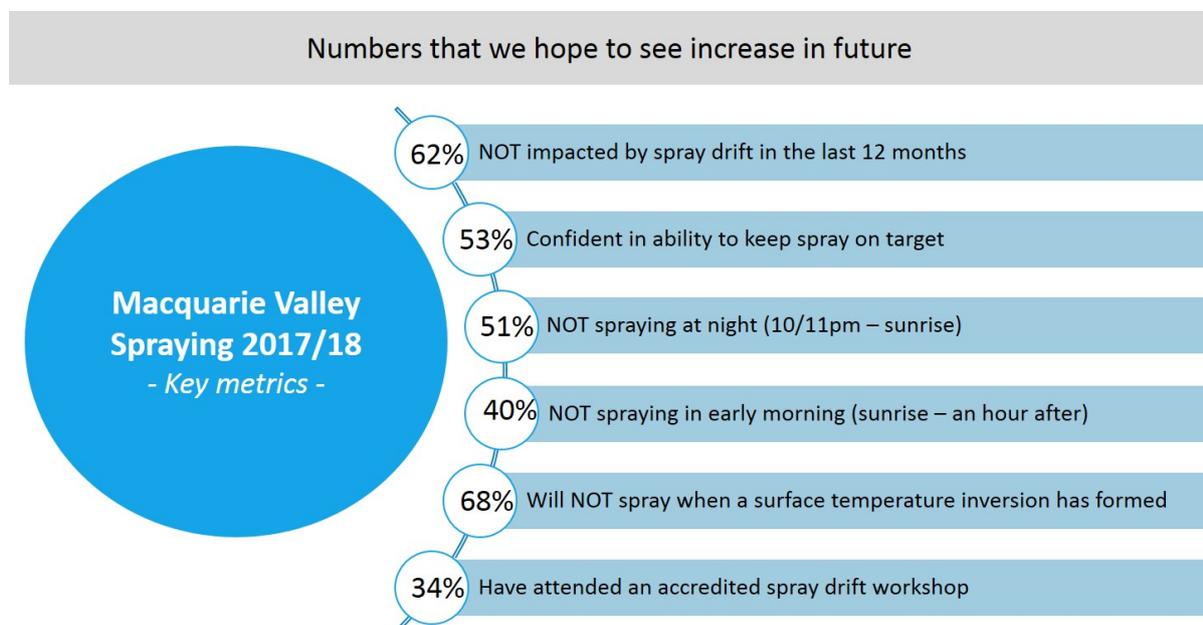
Is there a problem?

38% of those surveyed have experienced damage to crops / pasture / other areas in the past 12 months due to off target spray drift and this happens just under once a year to those who experienced it. There was very high awareness that inversions encourage extensive spray drift. In contrast, windy weather is believed to have a more localised impact on spray drift.

In addition sprayers told us:

- Around 1 in 2 (53%) feel 'very confident' in their ability to keep spray on target. Just 3% do not feel confident and these are all Property Owners.
- Improved technology is the most popular proposed approach for increasing confidence in spraying. More training and better information from local advisors are also popular among those rating themselves as 'somewhat confident', more so than among the 'very confident'.
- Agronomists or Crop Consultants are the main source of information for both the very and somewhat confident sprayers. The very confident sprayers are also more likely than the somewhat confident to be using a combination of sources.
- Accredited chemical training accounted for most training (90%), with workshops hosted by leading experts also popular. None felt they had enough experience that they didn't need any training.

The future state would see improvements to the following metrics:



Summary

In summary the results showed that:

- Risky spraying practice occurred in the past year
- **Time of day** is the key 'best practice rule' being broken. 49% and 60% of those surveyed indicated that at least some of their spraying, if not all, took place at night-time (defined as between 10 - 11pm – sunrise) and in the early morning (sunrise to an hour after), times when extreme caution is advised. This could be associated with the popularity of Delta T less than 12,
 - → We don't know why this occurred – this is something to explore further.
 - **Driving speed** is often higher than recommended, with 77% claiming they typically drive at 17-29km/h.
 - → Although boom heights and other factors were not explored here, there is perhaps a need to clarify best practice around driving speed
 - **Delta T:** The majority typically spray when Delta T is below 12 (which perhaps contributes to high levels of night time spraying). 2 in ten claim to not think about Delta T when spraying
 - → A need to explore and clarify / realign the Delta T message
 - Spray practice is perhaps best with regards to **wind speed**, with 6% at most spraying outside guidelines. This may be due to awareness of wind speeds being linked to spray drift, something that is relatively easy to conceptualise

Recommendations

Work with the knowledge of inversion layers and ensure all sprayers know when an inversion layer forms as the problem lies when they think it only might be present

- Not spraying when an inversion has formed appears to be the 'rule' most adhered to but education is needed to reinforce this behaviour as an **inversion** deters 68%, i.e. around 2 in 3, from spraying. Just 4% indicate that they are likely to spray during this condition. However, around 25%, or 1 in 4, indicate 'unlikely' rather than 'will not spray'... it suggests many still would.
- → Explore why spraying is 'unlikely' rather than 'will not happen' during an inversion
- **Potential for an inversion to form**, as opposed to an inversion has formed, sees a slightly greater proportion of participants prepared to risk spraying. 10% are very / likely to spray at this time, and just 35% are not...
- → At what point does spraying stop relative to an inversion actually forming, and is the window of minimizing spray drift missed?
- Time pressure is the key barrier to best practice, driving around 8 in 10 to spray in riskier conditions. Labour availability drives around 3 in 3 to do so, and contractor availability drives around 2 in 10.
- → Explore opportunities to come together to alleviate these pain points

Promote the reasons to stop (provide check list and consequences) to make it easier

- **Concern for a neighbour's crop** is more effective at deterring spraying in adverse conditions than fear of litigation.
- → Are growers working together to coordinate spraying activity, and if not, could they?
- Concern about **long term access to chemistry** – the threat on the table currently – has little or no impact on around 1 in 2.
- → Is this message (access to chemistry) clear enough and cutting through? Or is it simply not appealing? A need to explore this

Willingness to learn is high so undertake greater education activities on a regular basis

- While confidence in ability to keep spray on target stands at 53%, the vast majority (97%) are interested in activities aimed at improving this. Of the ideas tested, most popular were improved technology and more training.
 - Proceed with further learning activities, and ideally measure satisfaction from each in particular 'have you learned anything new / useful' etc.