

South Australian initiatives to reduce herbicide spray drift damage

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Summary Spray drift from herbicide application is undesirable for food security, environmental, human health and economic reasons. Jurisdictions across Australia have been implementing actions for many years in an attempt to reduce incidents of spray drift. South Australia has responded to industry and community concern about spray drift incidents in recent years with several measures to support the State's priority of premium food and wine from our clean environment.

Recent actions include: changing State regulations (2013) to mandate record keeping and minimum training requirements for use of eight specified Group I herbicides, development of a State Code of Practice (2013) for summer weed control, and distribution of the Code of Practice through resellers to growers across the State, ongoing engagement and consultation with industry and auditing of chemical users.

These actions appear to be having a positive impact by reducing the frequency of reports of spray drift in South Australia.

Keywords Spray drift, 2,4-D, summer weed control.

INTRODUCTION

South Australia (SA) is well known for its Mediterranean climate which supports a reputable wine industry that contributes \$1.7 billion to the State's economy (PIRSA 2014). Broadacre agriculture is also an important industry to the State, with a farm gate value of \$2.5 billion in 2013 (PIRSA 2013). Within SA, there are several regions where these two industries coexist, such as the Riverland, Clare and Barossa Valleys. Summer weed control is an important aspect of broadacre production systems, but can present a significant problem for adjacent viticultural production if spray drift occurs.

Spray drift events occur because of a number of complex factors, including weather conditions, timing, equipment, droplet sizes, user education and herbicide formulations (Commonwealth of Australia 2002). The risk of damage to vines and other horticultural crops is greatest when broadacre farmers use Group I herbicides (such as 2,4-D, MCPA, dicamba, triclopyr, picloram, clopyralid and fluroxypyr) between September and April to control summer weeds near grape

growing and horticultural regions. Many broadleaf crops are sensitive to Group I herbicides but the major risk in SA is damage to grapevines.

Off-target damage from spray drift has been a widespread issue in SA on several occasions, most notably during the summers of 2003/04, 2004/05, 2007/08, 2008/09 and 2011/12 (Kelly and Feuerherdt 2011). Based on grower estimates from reported incidents in the Riverland region in 2003/04 and from both the Clare and Riverland regions in 2004/05, damage to grape production was conservatively estimated at \$350,000–\$400,000 per year (PIRSA 2005).

The Australian Pesticides and Veterinary Medicines Authority (APVMA) has also recognised the problems that Group I herbicides, specifically 2,4-D formulations, can cause. Since 2006 there have been nationally regulated restrictions on use of high volatile forms of 2,4-D, and labels also have to include statements aimed at reducing the risk of droplet drift, e.g. the products must only be used when the wind speed is more than 3 km h⁻¹ and less than either 15 or 20 km h⁻¹, depending on the product and the application method.

However, these national actions are only a part of the solution. To address industry and community concerns SA has implemented several additional initiatives including a strong focus on education as well as changes to the State chemical use regulations to minimise future off-target damage.

METHODS

The Rural Chemicals Operations (RCO) group of Primary Industries and Regions South Australia (PIRSA) is responsible for control of agricultural chemical use in SA, including education and regulation activities. RCO is responsible for administering the *Agricultural and Veterinary Products (Control of Use) Act 2002* in SA.

After the 2003–05 widespread spray drift incidents, targeted extension activities were conducted in the Clare Valley and Riverland regions to primary producers and agricultural chemical resellers. Activities included direct mail outs, distribution of educational material and organisation of spray drift workshops and field days.

Extension activities were also implemented after the 2008/09 spray drift events. However, there was still spray drift damage to grapevines in the Clare Valley during 2010/11, at a comparable level to damage in 2008/09, and it was recognised that a more proactive approach was required to address the issue.

In November 2011 RCO engaged Rural Solutions SA to investigate the issues surrounding recent wide-spread drift events and to provide a basis for future policy direction for summer weed control. This report recommended that legislative change as well as education were appropriate strategies to address the issue.

In November 2011 PIRSA developed a Code of Practice (COP) for summer weed control in consultation with the Mid-North Spray Drift Committee, a local industry committee formed in 2011 to address spray drift issues affecting the Clare Valley. This COP was distributed to agricultural chemical resellers across the state. It has since been updated in September 2012 and September 2013 and redistributed at these times. The COP is not a legal document, but an educational tool to promote current best practice and focuses on weather conditions and spray timing.

RCO has always had an educational role. In April 2012 the position of Education and Liaison Officer was refilled and the new appointee focused on community consultation about proposed changes to the *SA Agricultural and Veterinary Products (Control of Use) Regulations (2004)* and promoting awareness about Group I herbicide use.

In July 2012 and February 2013, consultation was undertaken with focus groups in key areas of the State about the proposed changes to the regulations.

In September 2012 audits were conducted of 29 Group I herbicide users in the northern mallee and mid north areas of SA to obtain information about their herbicide management practices and monitor compliance with legislative requirements.

In September 2013 the Regulations were amended to require all users of specified Group I herbicides to hold a statement of attainment for a prescribed qualification, and keep accurate and complete records of use for a minimum of two years. The new regulations aim to target spray drift by addressing the lack of understanding that users may have regarding equipment and effects of climate, while the requirements for record keeping will underpin government audits and investigations and validate compliance with best practice.

In March 2014, audits were conducted of eight users of Group I herbicides in the northern mallee region of SA to check their understanding of, and compliance with, the regulatory changes. Audits will also be undertaken with users in the Barossa region of SA in June 2014.

RESULTS

Audit results Audits conducted in early 2014 provide some preliminary results regarding the regulatory changes introduced in September 2013. All properties had kept spray records, but not to the standard required by the Regulations. Seven of the eight users had completed the necessary training as prescribed by the Regulations. User understanding of the factors that contribute to spray drift risk was reasonable but none of the respondents identified inversion layers as one of the factors that they would have to consider before spraying.

Spray drift reports In 2011/12 there were no significant spray drift events in the Clare Valley, but there were several reported from the Riverland.

In the 2012/13 summer there were no reports of off-target damage in any grape growing regions of the State. However, there was also very little summer rainfall which reduced the need for summer weed spraying in broadacre production systems.

In the 2013/14 summer there have also been no reports of off-target damage in any grape growing regions of the State. In mid-February 2014 there was a significant rainfall event across most of SA, which resulted in large scale herbicide applications to control subsequent weed germination.

DISCUSSION

Off-target damage from Group I herbicides is a long-standing problem in SA where different agricultural industries coexist. In the last ten years, all of the major grape growing regions in SA that adjoin agricultural land have experienced Group I herbicide damage at various times. Off-target drift, and resulting herbicide residue levels, are unacceptable for Australian winemakers trying to break into the Chinese market which has a zero tolerance for 2,4-D in wine, or for those seeking organic status.

PIRSA has been active for over ten years in trying to prevent spray drift incidents through extension activities and chemical trespass investigations.

However, previous efforts in extension and investigation activities did not reduce the occurrence of spray drift events to an acceptable level. Industry stakeholders became a significant driver in addressing the issue. The Mid North Spray Drift Committee brought together agricultural and grape producers from that region to develop a solution to the problem, and saw education, not regulation, as the solution. The Code of Practice is a result of this industry initiative.

The Government of SA also recognised that education is critical, but not the only tool available. Through extensive consultation with stakeholder groups, the

regulations controlling use of agricultural chemicals were changed, taking into consideration cost and compliance issues for chemical users and PIRSA. Prior to the regulation changes, there were no mandatory training requirements for primary producers in SA for use of Group I herbicides, although many have undertaken farm chemical user training voluntarily. Lack of understanding of safe and effective herbicide application is a key contributing factor to spray drift events. Mandating training requirements through legislation was not seen as imposing unreasonable cost on the user, and was outweighed by the potential benefits of improved application practices.

Audits completed six months after the legislative changes came into effect suggest that there is still work required to do to increase user awareness of the regulations, and to ensure compliance with the changes.

South Australia aims to promote premium food and wine from a clean environment. Off-target damage from incorrect use of herbicides does not align with this vision. It is still too early to conclude whether the initiatives taken over the last few years have measurably reduced off-target damage caused by Group I herbicides but results obtained so far are promising.

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