



Recommendations for 2,4-D use 2009

PIRSA Biosecurity - Rural Chemicals

Experiences from damage to grapevines at Clare, 2008-2009

Overview of incident

Symptoms of 2,4-D herbicide damage to grape vines were detected across the Clare Region following widespread use of herbicides for summer weed control during December 2008 and January 2009.

A significant summer rainfall event in mid-December stimulated weed growth. Phenoxy herbicides such as 2,4-D and triclopyr (eg Garlon®) were commonly used to control summer weeds.

Damage to Vines

Visible symptoms of 2,4-D damage include rapid distorted growth of leaves, predominantly of new shoots and growing tips. Triclopyr has a similar volatility to 2,4-D Low Volatile Ester (LVE) and causes similar physical symptoms.

While the majority of growers only experienced some leaf damage, two grape growers reported yield reductions of up to 30% and another did not harvest the most affected area. Other growers reported lighter canopies that may have contributed to increased sunburn on fruit, and a number of growers also reported brittle stems and growth setback.

PIRSA Investigation

PIRSA conducted around 30 detailed interviews and a postal survey of 200 broad acre growers to understand the products used and weather conditions following spray events that may have contributed to the damage.

It was not possible to determine specific spray events or products responsible for the damage. Given the widespread spraying that occurred from late December to the end of January, it is possible that a number of spray events on different days contributed to damage in different parts of the district.

The surveys did reveal some practices that had a greater potential to contribute to spray drift, and these are addressed in this fact sheet.

These guidelines summarise PIRSA's knowledge to date. Observing these guidelines and existing label requirements should minimise the chances of 2,4-D drift from spray operations.

Analysis of weather data (wind speed, direction, temperature, humidity) from the Clare recording station indicate that conditions for spraying were unsuitable on most mornings and every afternoon through January. Conditions were favourable on around 50% of nights, when wind was present above 3km/h. On some nights, winds were viable, from calm to 10km.h at different times.

A strong temperature inversion was also likely to be present on January 4, 5, 6 and 19, with a moderate inversion on the 13th. Spray events on these days may have had a higher chance of contributing to damage.

Night Spraying

Many farmers believe they are doing the right thing by using low volatile ester (LVE) formulations at night, when the temperature has dropped. However, volatilisation can still occur if the temperature rises above 28° C the following day.

While night spraying at cooler temperatures has some benefits, the risk of drift can be higher if a temperature inversion is present, which can trap fine droplets in the atmosphere, or if wind is not present to settle spray droplets onto the target.

Guidelines for 2,4-D use during summer

Do not use HVE for summer weed control

The use of High Volatile Esters is prohibited between 1 September and 30 April.

This has been a legal requirement since 2006. Many companies no longer supply HVE, (such as Estercide 800[®]), which include ethyl ester, butyl ester and isobutyl ester forms of 2,4-D.

If using HVE between May and August, observe a buffer distance of at least 1.5km to sensitive crops and observe other label directions for use.

LVE and triclopyr

Avoid using if hot weather is forecast

Use only when forecast maximum temperature for at least the next day will not exceed 28°C. These products can volatilise for several hours after application if the temperature rises above 28°C. LVE products (such as Estercide Xtra 680[®]) include ethyl hexyl or iso-octyl ester formulations of 2,4-D. Triclopyr is also known as butoxyethyl ester.

Amine formulations

Use in preference to LVE if hot weather is forecast

All 2,4-D amine formulations are practically non-volatile, and are unlikely to drift though volatilisation when the temperature exceeds 28°C. Amines are still subject to droplet and micro droplet drift.

Spraying at night

Be aware of potential problems

More favourable conditions (temperature, delta T, wind speed) often occur at night, but a temperature inversion may be present which can trap fine droplets. Following a hot day, plants may still be stressed resulting in reduced efficacy. LVE and triclopyr can volatilise and drift if the temperature exceeds 28°C the following day.

Temperature inversion

Avoid spraying if a temperature inversion may be present

Temperature inversions may occur at night and early morning, when warmer surface air is trapped by a layer of cool air above. This condition prevents vapour and fine droplets from dispersing and they may travel significant distances with air currents.

Temperature during application

Avoid spraying during high temperatures.

In high temperatures, plants are more likely to be stressed and be less susceptible to herbicides. Fine spray droplets of all products will evaporate more readily into micro droplets and can drift.

Delta T

Avoid spraying when delta T is greater than 10.

Delta T is the difference in temperature between wet and dry bulb temperature and can be measured using a Kestrel meter or similar. Delta T should ideally be between 2 and 8, and not greater than 10. Delta T greater than 10, indicates low humidity that will decrease the life of droplets potentially reducing efficacy. It is possible that fine droplets will evaporate allowing micro droplet drift and consequent damage.

Nozzles

Use nozzles that produce coarse or very coarse droplets.

This is label requirement for all 2,4-D products. Air induction nozzles are recommended.

Wind

Spray when the wind is between 3 and 15 km/hr.

This is a label requirement. Wind should also be blowing away from sensitive crops. Some wind is necessary to assist droplets to the target. Winds at night can vary in strength, sometimes dropping out completely for a few hours.

Buffers

Observe buffer distances from sensitive crops.

Over summer, LVE should not be sprayed within 1km of vines and amine should not be sprayed within 100m of vines. Spray when the wind is blowing away from these crops.

Record keeping

Keep records for all spray operations.

Purchase and use a spray diary to record information, which should include start and finish times, temperature, relative humidity, wind speed and direction before, during and after spraying, as well as product and rate used, type of nozzle, pressure and ground speed.

Read the label

Always read and follow label directions.

The information is there to help you use the product properly. Label information is updated and may have changed.

Further Information:

Contact PIRSA Biosecurity - Rural Chemicals on 08 8226 0528
or see these fact sheets at www.pir.sa.gov.au/factsheets

- How to Avoid Spray Drift
- Control of Summer Weeds
- 2,4-D Products – Restrictions on Use

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