

# SUMMER WEED CONTROL

## BEST PRACTICE GUIDE

JANUARY 2016



## Aim of this guide

To increase awareness amongst farmers and spray applicators about surface temperature inversions.

To provide a basic best practice guide for the safe and effective application of herbicides in summer.

To minimise the risk of damage to susceptible plants from the off-target movement of herbicides.

## Surface temperature inversions

**Never spray under still or inversion conditions.**

Surface temperature inversions typically begin to form just before sunset and are strongest and deepest at the time of the minimum temperature, usually just after sunrise.

Spray applications conducted at sunset, during the night and up to 90 minutes after sunrise are likely to be affected by a surface temperature inversion.

**You should always expect a surface temperature inversion has formed at sunset and will continue until after sunrise unless one or more of the following has occurred:**

- Continuous overcast weather with low heavy cloud;
- Continuous drizzle or rain;
- Wind speed is greater than 11km/h for the whole time between sunset and sunrise;
- After a clear night, cumulus clouds begin to form;
- Temperature rises from the minimum by at least 6°C.

Note: Local features such as topography, vegetative cover, bodies of water and wind breaks, may influence the development and persistence of inversions.

## Recognising a surface temperature inversion

Visual clues that a surface temperature inversion is likely to be present include:

- Mist, fog, dew or a frost have occurred;
- Smoke or dust hangs in the air close to the surface and moves sideways;
- Cumulus clouds that have built up during the day collapse and flatten out towards the evening.



Fog showing distinct layers of air under inversion conditions. (Photograph by Mary O'Brien)

Surface temperature inversions may exist without any visual indicators.

Other clues to help recognise a surface temperature inversion:

- Wind speed is constantly LESS than 11km/h in the evening and overnight;
- Cool, off-slope breezes develop during the evening or overnight;
- Distant sounds become clearer and easier to hear;
- Aromas become more distinct during the evening.
- Spraying under surface temperature inversion conditions is considered unsafe as the potential for off-target movement is significantly increased.

Sources: Tepper, G. 'Weather Essential For Pesticide Application', July 2014; GRDC Surface Temperature Inversions and Spraying Fact Sheet, August 2013.

## Monitor weather conditions

Weather conditions should be measured and recorded at the site of application and at the start, finish and at least every load during the spray application. Watch for changes in the conditions and if an inversion occurs, stop spraying immediately. Check label requirements for wind speed, buffer zones and other weather parameters.

## Spray timing - Day vs Night

During the day wind is more likely to be turbulent which creates vertical mixing of air. When air is turbulent, it is less likely that a surface temperature inversion has formed. At night, the wind tends to move very differently, there is limited or no turbulence and no vertical mixing of air. At night it is more difficult to predict the direction and distances pesticides may travel.

## Keep accurate spray records

Make and keep detailed records of each spray application. Accurate records are the best way to demonstrate you have complied with the label.

### Minimum records to be made and kept:

- Date, start & finish time of application;
- Location (address & blocks sprayed);
- Full trade names of products & rates per ha;
- Area (ha) & crop/situation or weeds treated;
- Weather conditions (wind speed, wind direction, temperature, relative humidity & delta T);
- Nozzle brand, type, spray angle, flow rate, spray quality and pressure (also record speed when using automatic rate controllers);
- Name, address and contact details of owner & person applying the chemical.

\*Note - Labels & legislation may require additional records to be kept.

## Group I Herbicides

Drift of Group I herbicides, which includes products containing 2,4-D, MCPA, Fluroxypyr and Dicamba, affect susceptible plants such as cotton, grape vines, vegetables, pulses, pastures and native vegetation.

To reduce drift and increase efficacy, users of Group I herbicides should:

- Select products with low volatile formulation;
- Only spray during the day (conditions at night are extremely difficult to predict);
- Avoid spraying:
  - 90 minutes before sunset,
  - during the night and
  - until 90 minutes after sunrise
- Use the coarsest spray quality that will provide efficacy (labels require coarse or larger);
- Only use adjuvants that DO NOT increase the drift potential;
- Operate equipment at speeds and pressures that produce the desired spray quality (check manufacturers chart);
- Do not exceed speeds of 18km/h unless there is excellent boom control;
- Boom height should be maintained to achieve double overlap at the top of the target (top of the weeds or stubble) (eg: 50cm above target for 110° nozzle at 50cm spacing);
- Measure and closely monitor weather conditions before, during (at least every load) and after spraying;
- Read and follow label instructions - every label is different;
- Use smoke/dust generation to help determine if an inversion is present;
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- Utilise weather prediction tools when planning spray operations.

## General Notes:

### Read the label and follow all instructions.

Failure to read and comply with the label may be an offence under state and territory laws.

Legislation pertaining to the use of agricultural chemicals may vary between states, territories and regions. It is your responsibility to ensure you are aware of and comply with these laws.

In addition, you may require a distribution permit, specific accreditation or other approvals when using or purchasing certain chemicals. For advice on the requirements applicable in your area, please contact your relevant state department.

**Queensland** - Biosecurity Queensland: 13 25 23, [www.daf.qld.gov.au/biosecurity](http://www.daf.qld.gov.au/biosecurity)

**New South Wales** - Environment Protection Authority: 131 555, [www.epa.nsw.gov.au](http://www.epa.nsw.gov.au)

**Victoria** - Agriculture Victoria: 136 186, [www.agriculture.vic.gov.au](http://www.agriculture.vic.gov.au)

### Acknowledgements:

Tepper, G. 'Weather Essential For Pesticide Application', July 2014;  
GRDC Surface Temperature Inversions and Spraying Fact Sheet, August 2013.

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This publication was developed in January 2016 and is based on information available at the time of writing. The accuracy of this guide may change as new research becomes available. This document is intended as a guide only. You may need to consider other factors specific to your situation when conducting spray applications.



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