

## Using Vegetative or Artificial Barriers to Minimise Off-target Movement of Chemicals

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### **Legislation**

The *Agricultural and Veterinary Products (Control of Use) Act 2002* came into operation in August 2004.

The General Duty under this Act requires persons using chemicals to take all reasonable and practical measures to minimise contamination of land, animals or plants outside the target area, and to minimise harm to human health and the environment. There are a number of factors that chemical users need to consider in taking reasonable measures, including weather conditions, label directions, the type of chemical used, sensitive areas surrounding the application site and method of application. This General Duty requirement can be enforced by PIRSA with a Compliance Order that specifies actions that must be carried out by chemical users. A compliance order could specify requirements for wind speed and direction deemed suitable for spraying.

It is not necessary for councils to place conditions on Development Approvals relating to matters addressed under this Act.

### **Changes to Agricultural Chemicals Labels**

The Australian Pesticides and Veterinary Medicines Authority, which is the national registration authority for agricultural chemical labels is currently preparing buffer (separation) distance statements to be prescribed on labels. Compliance with these distances will be mandatory under legislation.

### **New Spray Application Technology**

Recent machinery developments for viticulture and perennial tree crops have made rapid advances in minimising spray drift (and reductions in associated noise levels).

PIRSA supports on site workshops and demonstrations with growers to improve awareness of improvements available in spray technology.

### **Buffers**

A buffer can be a separation distance, a vegetative barrier or an artificial barrier.

Vegetated or artificial barriers are just one component of a suite of measures to minimise the potential conflict between intensive agricultural activities and sensitive receptors.

Some general considerations associated with primary production enterprises can include:

- Dust, from machinery/vehicle operations
- Noise, emanating from the above plus livestock and spraying
- Smoke/smell, from burning off
- Lights and noise, during hours of darkness
- Odour, from organic manure(s) and some spraying activities

Benefits of vegetative buffer belts include productivity gains from improved crop and livestock shelter, reducing noise and dust levels and, hopefully, minimising complaints from concerned neighbours. Other considerations could include lowering water tables and increased aesthetic values.

Buffers are not a substitute for good spray management practices. They will not reduce pesticide vapour drift or odour.

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## **Factors that need to be considered in the use of vegetative buffers include:**

### **Potential to Create Frost Pockets**

This can be of concern, especially in undulating country, with restriction to air flow. Deciduous vegetation may be a better consideration in some situations, usually having less foliage in the season when frosts mainly occur.

### **Potential Bushfire Hazard**

When space is limited and vegetation is too close to dwellings/sheds etc, this risk has to be considered. The risk can be modified to some degree by choice of species and evergreen vs. deciduous vegetation.

### **Neighbour Considerations**

There can also be concerns with potential disputes on boundaries with vegetation overhang, shading and invasive tree roots.

### **Correct Choice of Vegetation**

The time taken for vegetation to grow to a size where it will be effective as a barrier obviously has to be considered. Choose species that are suitable for the site, rainfall and soil type. While all vegetation will burn, some species are less flammable than others.

### **Artificial Barriers**

Recent research work conducted in South Australia has shown that artificial barriers constructed of purpose-designed mesh netting are equivalent to vegetative barriers.

These may be worthy of consideration in some situations. Local government regulations would have to be considered, as would aesthetic considerations.

### **Ownership and Ongoing Maintenance**

As a general statement experience shows, where vegetation is planted on rural enterprises as part of a multi-faceted approach to drift management, that maintenance of the vegetation is less of a problem.

However, with most rural/urban interface situations, where the urban developer undertakes the planting(s) experience shows that maintenance issues arise.

Interstate experience shows that, where corporate bodies have legal responsibility for maintenance, the vegetation maintenance is improved.

### **Loss of Production from Land Used as a Buffer**

This is a problem, especially in rural/urban interface areas where relatively high-value intensive agricultural enterprises are located and isolated dwellings are common.

The effectiveness of a buffer is increased if more than one row of vegetation is used to counter uneven growth or death of individual plants. However, wide buffers are neither necessary nor practical in many situations and are also wasteful of land.

### **Development Site Planning**

Consideration needs to be given to the layout of intended plantings, taking into account such things as topography, prevailing winds, water bodies and drainage lines. If a sensitive receptor is in close proximity, orientation of rows parallel to the receptor, if possible, may assist with spray risk management.

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## **Field Study – Natural and Artificial Barriers**

A field study was conducted (May 2009 – Adelaide Hills), to evaluate the effectiveness of natural and artificial barriers in vineyards for reducing spray drift exposure from two types of sprayer. There was a difference in drift potential between the two sprayers and the two barriers. In agreement with previous studies, the natural vegetation barrier afforded slightly higher drift reduction than the artificial barrier at near-field distances, with a slight increase in deposition at a distance of 20 x barrier height. Additional research was recommended to evaluate the effects of additional parameters such as canopy type, meteorological conditions and application practices on drift, with and without protective barriers.

### **Summary**

There are a complex range of variable factors to be considered in the separation distance between dwellings and rural enterprises.

Some of these issues are:

- Agricultural enterprise
- Pesticide characteristics
- Frequency of application
- Proximity of environmentally sensitive areas: houses, schools, recreation areas, water bodies and adjacent non-compatible agricultural enterprises
- Topography, climate and water run-off

Thus the dimensions and design of an effective buffer between land being used for agriculture and a sensitive receptor will be dependent on the effect to be ameliorated and local conditions. There is no "one size fits all". Forty metres is a prudent distance to maintain between a dwelling and land used for agriculture. Ref. *Queensland Department of Natural Resources (1997) Planning Guidelines – Separating Agricultural and Residential Land Uses*

This distance allows for the planting of a robust vegetative buffer immediately or in the future. It also allows for a 20 metre CFS guidelines fire protection zone from a dwelling and access space along the boundary for maintenance and neighbour considerations.

With current PIRSA legislation and chemical user training programs, many concerns by local government planners (previously addressed by the use of Conditions on Development Application Approvals) can now be discarded.

However, good planning decisions should assist to minimise problems with agricultural activities.

PIRSA can provide Local Government (and other stakeholders) with advice on specific issues pertaining to Development Applications.

Vegetative buffers are one component of a suite of measures to minimise the potential for conflict between intensive agricultural activities and sensitive receptors. However, there are a number of factors to be considered with their use.

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