

## Using fungicides correctly



### Fungicides

The successful cultivation of many intensively-grown crops requires regular use of fungicides to ensure the production of disease free produce. A knowledge of fungicides and their properties is essential for effective disease control.

### Identify the problem

Before using any fungicide you need to identify the problem. Do not guess what the disease is. Obtain an accurate identification and the recommended, as well as registered, control measures from a professional practitioner.

NSW DPI operates a Plant Health Diagnostic Service at several locations across the state; however samples can be deposited at all NSW DPI offices.

### Plan ahead

Diseases can attack plants at all stages of growth. Information about the major plant diseases is available for most commonly grown crops. There are also pest and disease management guides available for some perennial fruit crops. These can be used to develop a spray program for your own operation.

In some districts, spray warning services are available for certain crops so you only need fungicides when necessary, which also ensures their optimal use.

Spray calendars are not available for annual crops such as vegetables and cut flowers but it is

beneficial to gather information on the diseases likely to occur from preplanting to postharvest and develop your own spray program.

### Types of fungicides

Fungicides can be divided into protectant and specific types. Protectants are the older type and include copper and sulfur based products. Chemicals such as mancozeb, zineb and thiram are also in this group. They form a protective film on the plant surface and inhibit the germination of fungal spores. They will not eradicate established infections and have no systemic activity. They act by inhibiting several chemical reactions in the fungus and usually have a broad range of activity.

Specific type fungicides are so called because they act on one specific chemical reaction in the fungus. Specifics can have curative and systemic action but their protective abilities are generally less than the protectants. Specifics are often used in association with disease warning services to eradicate infections after a forecast infection period has occurred.

### Resistance to fungicides

Resistance problems have occurred with some specific type fungicides because the fungus is able to bypass the one specific chemical reaction affected by these fungicides.

Resistance to benzimidazoles (e.g. benomyl) dicarboximides (e.g. iprodione), some ergosterol biosynthesis inhibitors and acylamines (e.g. metalaxyl, furalaxly) have been reported in



Australia for diseases such as *Btrytis*, brown rot and powdery and downy mildews. Before incorporating fungicides from this group in a spray program make sure that a resistance problem is not likely to occur. Resistance to protectant fungicides is usually not a problem because they act on several chemical reactions within the fungal cells, making it difficult for the fungus to develop resistance.

### **Mixing and alternating fungicides**

Where resistance to specific fungicides is likely it is good practice to apply a protectant fungicide either as a tank mix or as an alternate application in the spray program.

Protectants are usually best applied as whole season sprays, while specifics are best used during periods of peak infection.

With specific fungicides, where possible, it is best to rotate between different chemical groups to decrease the problem of resistance.

### **Coverage**

For good disease control, ensure that when you apply a fungicide you cover all plant surfaces thoroughly. Although some fungicides are claimed to be systemic, the rate of movement into the plant is limited so good protection requires thorough spraying of all surfaces including under the leaves.

In many cases, poor disease control can be traced to poor coverage due to poor technique, faulty equipment or crowded plantings. High volume application provides better coverage in some situations than lower volume methods.

### **Timing and target**

Accurate timing of fungicides is essential to ensure satisfactory control of diseases. For example, control of peach leaf curl requires a fungicide application at early bud swell. Fungicides applied too early or too late give poor control.

Some diseases such as target spot of tomato can attack the leaves, stem and fruit, so effective control requires coverage of all plant surfaces.

### **Management can help**

Many fungal diseases need extended periods of wetness to infect plants, so any management practices that reduce the period of wetness minimise the disease risk and make fungicides more effective.

To minimise disease risk from fungus, avoid overhead irrigation, water only when rapid drying of leaves will follow, and provide plenty of space between plants to allow good air movement through the plant canopy.

### **Further information**

Croplife Australia has publications on fungicides, including a list of fungicide groups and resistance management strategies available at:

[www.croplifeaustralia.org.au](http://www.croplifeaustralia.org.au)

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