

## Frost

This year we have experienced some unusually cold weather, with some plants that we consider frost hardy turning brown or turning to mush.

The Australian Plant Society defines a light frost as down to about  $-2^{\circ}$  to  $-3^{\circ}$ , a moderate frost as down to  $-4^{\circ}$  to  $-5^{\circ}$  and a heavy frost as below  $-6^{\circ}$ . For us, forecast temperatures of  $4^{\circ}$  or less on a clear night will nearly always result in frost in some spots in our garden.

During a frost, plant cells freeze and shrink, with the water in them freezing and rupturing the cell walls in a rapid freeze, or moving out into the surrounding spaces, where it forms ice crystals. If the ice thaws after a short time, the water moves back into the cells and there will be little or no damage. If there is a longer period before the frozen water moves back, the cells dry out and desiccate, and the plants are damaged with 'frost burn'. Damage also occurs if thawing is too rapid, putting the cell walls under pressure, which can happen when frozen tissue is exposed to strong sunshine. Lightly sprinkling water on frosted plants before the sun hits them can warm and thaw them at a slower rate.

The three forms of frost are: hoar frost – the moisture in the air has formed ice crystals which look feathery and white on plants; rime – water already on the plants from dew or fog freezes creating an icy look; and black frost – no apparent white frost but the plants turn black from freezing conditions. Black frost warnings on roads in the Castlemaine area alert drivers to slippery conditions when the road surface appears to be fine.

Temperatures in the garden are colder at ground level and warmer closer to buildings, paving and bodies of water such as tanks and ponds. Frost tends to gather at the bottom of a slope and in valleys. Overhanging trees, neighbouring shrubs and buildings can provide physical protection from frost. Observing and noting the 'frost tendency' of different parts of your garden can help you plant less frost hardy plants in appropriate spots.

Plants that generally need frost protection are indoor plants, tropical plants, spring blooming plants such as azaleas, rhododendrons and fruit trees in blossom, citrus, tender bulbs such as dahlias, geraniums, succulents and some ground covers. Common sense, reading plant labels, researching and checking out the gardens in your district will help you to choose climate appropriate plants.

Some ways to protect plants from frost include taking plants indoors and moving pots under shelter. Protect plants in the garden by covering with a thick layer of mulch, dropping a container over small plants, and draping blankets, sheets and shade cloth over the top of larger plants. It is best if the frost cover reaches down to the soil, so it can trap heat. Take the covers off in the morning.

Bare, moist, compact soil absorbs heat and releases it at night much better than mulched areas. Organic mulch can act as a protection if it is raked back before a forecast frost, allowing the soil to absorb heat, and replaced just before the frost, to hold in the heat. Mulches of stones will naturally give out heat at night. Liquid potassium fertiliser and sprayed-on diluted 'worm wee' or seaweed products can help to promote thicker, more resilient cell growth, helping to make some plants more resilient.

It helps to water plants, particularly potted plants, before the frost, because water in the soil will help to keep it warmer. The warmth the soil gives off will provide some temperature modification for the lower leaves and, while the top may be damaged, the plant can survive. Extra water in the plant cells also helps, since it keeps the plant warmer and helps prevent desiccation.

The good news is that many plants can bounce back. They will be able to regrow from the roots, or send out new leaves. Delay pruning off damaged leaves until after the last frost because they will provide some protection and you do not want to stimulate tender new growth. On larger plants, prune

once new growth shows you which parts have been irreparably damaged. Some plants that look like they have died can recover if pruned nearly to the ground, but make sure you don't prune below the graft on grafted plants.

Happy gardening, Christine Windle, Garden Gate of Inverleigh Nursery, 0403 267 286

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