

This is the script for episode 128 of **The Alternative Kitchen Garden Show**, on Frost
<http://emmacooper.org/podcast/akg128-frost>

Written by, recorded by and copyright Emma Cooper, 2011.

"Hello and welcome to episode 128 of the Alternative Kitchen Garden. I'm Emma, and I am recording this episode just before Christmas, and although the weather here has not been very wintry I thought I would talk about frost and the effect it has on gardens.

Everyone who gardens in a temperate climate recognises frost and the damage it can do to plants; the first and last frost dates of the gardening season are a very useful piece of information to have to hand, and many gardeners plan their entire gardening year around them. There are several online sites where you can look up the frost dates for your location, if you don't already have them.

But what is frost? Well, it's the solid deposition of water vapour from saturated air. Surfaces cooled to below the dew point collect frozen droplets of water from the air, which can form into beautiful patterns.

Negative effects

Like us, plants are full of water and when frost causes that water to freeze, the plant's cell walls are damaged - leading to blackened and limp foliage. Frost damage can be made worse by sunny mornings, when the sunshine leads to a rapid thaw.

Cold weather kills tender plants; hardy plants die back and regrow in spring although evergreens look much the same, they stop growing.

Hardy plants have a defence against frost and can withstand bad weather. Some of them accumulate sugar or other chemicals in their cells to act like anti-freeze. Others rely on their bark for insulation, and some can allow the liquid in their cells to supercool so that it remains liquid below the normal freezing point - but that process takes a few days, and those plants can be caught out by sudden frosts. Plants adapted to arctic conditions may remove all liquid from their cells, so that dehydration prevents frost damage.

If the soil freezes, hardy plants will find it hard to take up water and can die from drought. Frost can also cause soil to 'heave' upwards, with newly planted plants being the most likely to need firming back in.

To help hardy plants survive the winter, avoid applying nitrogen fertilizer late in the year when it encourages soft and sappy growth that will be more tender. New growth is also more likely to be tender, so avoid pruning hard in autumn. A potash feed can help plants produce mature and hardy growth.

Late spring frosts can kill blossom and prevent a fruit crop, but problems with frost can be minimised by looking at the topology of your garden. Frost pools at the lowest points, creating frost pockets - avoid planting these areas with plants damaged by frosts. You may also be able to allow frost to flow out of your garden, by removing the barriers that hold it in.

Positive effects

Although it can be very damaging to plants, frost and winter weather are also considered to be an essential part of many temperate climates, and indeed frost has some benefits.

Some plant flavours are affected by frost - the two most notable are parsnips and sloes, which are both sweeter after a frost, although the effect can be replicated by storing them in the freezer for a while.

The first frosts are a trigger for oca plants that encourages them to form larger tubers - if the weather allows, it is best to leave harvesting oca tubers until a couple of weeks after the foliage has been killed by frost. 2011 has been a good year for oca in the UK, with the mild autumn weather and late frosts allowing them plenty of time to form tubers.

Some fruit trees, notably apples and pears, require a period of winter chilling if they are to produce good crops of fruits. The amount of winter chill necessary differs in different varieties, and is one factor in why local varieties often fair better. The information is usually only used by commercial growers, though; on a domestic scale the difference in yield after a warm winter would be less of an issue.

The arrival of the cold weather is my reminder that it's time to plant the garlic, which also appreciates a period of winter cold - although there are varieties that can be planted in late winter or very early spring in places where winter conditions are not suitable.

And under the soil, frost helps with the cold stratification of seeds. Many seeds, particularly tree seeds and plants that have not been intensively cultivated, remain dormant until chemicals in their seed coats have been broken down by cold weather - it's how they arrange to germinate in spring when conditions are more conducive to successful growth. In some plants, stratification requirements are more complicated; some species need a longer cycle of periods of cold and warmer weather to trigger germination.

In traditional gardening methods, frost is used as a way of helping to break down clods of heavy clay soils into a fine 'tilth' for spring sowing. Winter digging opens up the soil and allows the action of frost to break down lumps. However, on lighter soils winter weather can cause considerable damage, and in no dig gardening the soil is kept covered all winter - whatever the type of soil. Soil organisms do the digging work and keep the soil in good condition.

Now, I have always been told that a mild winter means higher populations of pests the following year - giving harsh winter weather the silver lining of reducing pest populations. I imagine the situation is actually far more complicated. Although harsh weather may kill off some pests, it will also kill off some of their predators, and it would be hard to predict which population would have the upper hand come spring.

2011 in review

That's a quick overview of frost and the effects it can have on gardens. If you have anything to add to the discussion then you can send me an email to

akgpodcast@gmail.com, leave a comment on the show homepage at <http://emmacooper.org/podcast>, or come and find me on Facebook and Twitter.

2011 is coming to an end now, and it has been an eventful year here in my garden. In early spring, Pete helped me make a new raised bed, and we used it to grow an impressive crop of salad potatoes that we are still eating our way through. Pete also tackled the problems I had been having with rain water collection and storage, and created what we fondly refer to as Butt City (<http://emmacooper.org/blog/butt-city>). Butt City even has its own aqueduct, and if you'd like to see pictures they're on the blog and I will add a link to them in the show notes for you.

Pete also collected some unwanted recycle bins, essentially deep plastic crates, and created a herb garden which - for the main part - is thriving. He's also responsible for adding pineberries to the garden, and I hope they will crop well next year.

With all of the new containers and the new bed, the garden became a bit cluttered, and with a very dry growing season, watering became a tedious task - even with the Butt City improvements. By mid-summer the garden was becoming a jungle, and the plum tree attracted a lot of wasps. Late-night pruning raids were necessary to remove the offending branches and reduce the risk of being stung while tending to the chickens. The plum tree, which has never been productive, is therefore going to be removed this winter. The cherry tree will join it, as only the garden birds get to enjoy its fruit, and it is always a target for blackfly.

We're in the middle of a redesign to solve the clutter and the watering issues. Three of my raised beds, made with concrete blocks, are being dismantled and spread out. The result will be a much larger planting area that is lower; the idea is to plant as much as possible into the soil where it can access its own water supply. I had been moving towards more perennials in the garden, and this is the next logical step. By spring time I hope to have the new garden planted up; but this is only the first part of the redesign so there will be more on that next year.

I have had lots of lovely garden-related experiences this year. I was lucky enough to revisit the RISC roof garden in Reading, which is looking as lovely now as when I first saw it back in 2007. I also saw the new Exotic Garden at Garden Organic Ryton, shortly before its official opening, and it looks like it will be a fun space to visit in future years. The latest news from Garden Organic is that they will be adding an 'Exotic Collection' to the Heritage Seed Library in 2012, to help spread plants such as the dudhi, amaranth and shark's fin melons throughout the UK.

I spent time in Wales visiting permaculture smallholdings, and closer to home spent a long day learning to make charcoal in Harcourt Arboretum. The fruits of my labours will fuel our barbecues next summer, and I have some biochar fines to enrich the garden soil. Most recently, a trip to the Oxford University herbarium fuelled an entire week of blog posts about inspiring botanical treasures.

On a personal note, my new website went live in June this year, and I hope you've all had a chance to visit and enjoy the new and far more readable layout. Pete has my endless gratitude for putting the new site together; he's already planning some improvements for the new year.

The book that I blogged in summer, *The Peat-Free Diet*, will be published as an ebook in the first quarter of 2012; it will be followed by other books in due course. There is more information about my forthcoming book projects on the website. I hope to record most, if not all of them, as audiobooks as well - although I have no timescales for that at the moment. The plan is to continue blogging and podcasting throughout 2012, so do let me know if there are topics you would like me to cover.

I am lining up some new and exciting plants (at least, they are new and exciting to me!) for the 2012 garden, as well as looking forward to the reappearance of some old favourites. By all means write in and let me know your 2011 successes or failures, and the plans you have for your garden in 2012.

In the meantime, it only remains for me to thank you all for listening, and to thank the AKG Correspondents and everyone else who has contributed to the show in 2011. Happy holidays everyone, and I will be back with you in the New Year!"