

Unseasonal woes for UK Christmas trees

Dr Terry Mabbett takes a look at that strictly seasonal commodity – the Christmas tree. Highly susceptible to extreme weather events in the run up to the one and only annual marketing period, heavy snow and/or waterlogged fields can hold up or even prevent harvesting, which in turn can disrupt any subsequent marketing.

LIKE all other conifers, Christmas trees require planting, feeding and protection, the only difference being that Christmas tree conifers for the mainstream domestic market are harvested after only five to eight years of good growth and development, whereas timber trees and foresters have around ten times that duration to play with.

2018 was the year when Christmas tree growers were cruelly reminded how their crops, like any others, are at the mercy of weather extremes occurring during any of the four seasons with potential consequences for planting schedules; tree seedling establishment, growth and development; and canopy quality. More critically so because Christmas trees have little commercial leeway to compensate for any lost growth and quality in form, colour and foliar integrity and quality – factors with the capacity to make or break this unique commodity.

2018: ONE TO REMEMBER – OR FORGET

With January long gone and the last trees of Christmas 2017 safely recycled, growers up and down the country felt the force of the 'Beast from the East', with an extended period of extreme cold and snow. Conifer species from which Christmas trees have been created, including Norway spruce, Nordmann fir, noble fir and Fraser fir, can normally cope with low temperature conditions. If occurring months earlier, in the run-up to 2017 harvesting, it would have been welcomed because an end-of-year cold snap is known to 'fix' the foliage, helping to prevent premature post-harvest needle drop.

However, this extreme, cold-weather event which proved too long to be regarded as a

'snap', came precariously late in the day, starting in late February and extending through March. Such late-winter and early-spring weather events often come down from the north or north east to affect Scotland and northern England, leaving us soft southerners sympathising with Scotland but remaining largely unscathed. Not this time, though; the cold blast blew in from the east to affect the length and breadth of the land from Dundee to Dover.

Southern growers are not accustomed to such late cold weather events, nor are their trees equipped to cope, because during a normal year late February is bud dormancy breaking time. Growers ready to plant this year's consignments of seedling trees were suddenly forced to delay planting into the last days of spring, which subsequently proved a no-win situation due to the soon-to-arrive extreme heat and drought of June and July. What's more, the Christmas tree grower's entire stock is composed of relatively young trees, with few if any much older than eight years of age – excepting growers specialising in large trees like the one which stands outside 10 Downing Street. Younger trees are clearly more susceptible to damage, whether from extreme high or low temperature, with little commercial leeway to cope with even one year's poor extension growth. When you have only six or so years to provide a marketable tree, even one bad year is a disaster.

When harvesting trees for timber, it doesn't

Extreme low temperature and deep snow cover affecting harvesting are the most usual weather-related restrictions on Christmas trees. (Picture courtesy BCT&A.)



really matter what the foliage looks like. In contrast, what the canopy looks like in size, shape, colour, density and integrity (degree of damage) is everything for the Christmas tree. And also whether damage is caused directly by the weather, or indirectly by, for instance, drought-triggered insect and mite pest explosions.

PLANTING PATTERNS FOR CHRISTMAS TREES

To get an overall picture of Christmas tree planting patterns and schedules, then, where better to turn to than the industry which supplies the planting material – the forest tree nursery sector. David Gwillam, owner of Prees

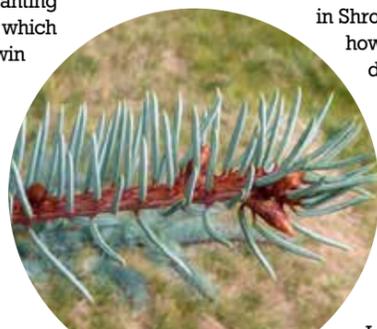
Heath Forest Nurseries at Whitchurch, in Shropshire, told Forestry Journal

how there are essentially two distinct patterns of tree planting carried out by the country's Christmas tree growers.

First is by growers establishing trees on a new site. Planting will typically take place at any time from early November through to April.

In most cases growers will go for an earlier, rather than later, planting – unless the site is especially exposed to the elements, when they may delay planting until spring.

Second is the case of a cleared site where growers are restocking after cutting trees for the previous Christmas market. Planting may start in January and thereon at any time through the remaining winter period and into spring,



Leaves may be far too prickly and sharp for the Colorado blue spruce to be widely accepted as a Christmas tree.

although the classic old saying 'better late than never' certainly didn't apply to Christmas tree planting this year.

Growers who left planting until spring, for whatever reason, were confronted first with frozen ground and subsequently saturated soils caused by well above average rainfall in March and April for most areas. By the time trees were in the ground we were only weeks away from the searing heat of June and a rapidly developing drought. There were widespread reports from around the country of drying and shrinking ground opening up planting slots and exposing roots to the hot June and July sun.

SPECIES RESPONSE TO HEAT AND DROUGHT

"The biggest casualty appears to have been noble fir," said David Gwillam, describing the experience of one Christmas tree grower in Wales who lost 90 per cent of the trees he had planted this year in early spring (end of March). "He usually grows Fraser fir which he buys from me but this year he decided to try noble fir. He is reverting to Fraser fir and is already looking to place orders for 50,000 trees," said David.

"Noble fir is one of the more difficult trees to grow at the best of times and has now shown itself to be one of the more, if not the most, drought-susceptible conifer used to supply the Christmas tree market," said David. He added how this was the experience at his own nursery where noble fir seedlings including those with two to three years of growth were hardest hit.

All our Christmas tree conifers, excepting English/Scots pine (*Pinus sylvestris*) with its niche northern market, are exotics, so where better to look for a performance profile



Abies grandis (grand fir) is one of the true firs recorded with 'fireweed-fir' rust disease.



Norway spruce, the UK's 'old favourite' Christmas tree, coped relatively well during the heat and drought of summer 2018 says David Gwillam.

in relation to climate and weather than the respective native ranges?

According to David, one of the best-performing and seemingly drought-unaffected conifers was Norway spruce, the UK's 'old favourite' in Christmas trees. With an essentially Scandinavian and Baltic natural range, it was overtaken some years ago by Nordmann fir, with a native range in the Caucasian Mountain region. "Nordmann fir recorded a patchy performance under this year's drought conditions but overall did not fare too badly," said David. Drought tolerance of Norway spruce is widely recorded, especially so in North America where it is widely grown, including as a Christmas tree. The National Christmas Tree Association in the USA, while acknowledging the tree's poor needle retention unless cut fresh and properly watered, describes canopy colour as fair to excellent.



Nursery-grown and newly-planted noble fir fared badly in the heat and drought of summer 2018. Beds of noble fir at Prees Heath Forest Nurseries seen here in better days (late September 2014), following summer 2014 with above average rainfall and no extended hot, dry weather.

And there you have it. At a time when all predictions are for a warming UK climate with milder and wetter winters but much hotter and drier summers, do we really need the extra cold tolerance, or want the high sensitivity to drought, of inherently difficult to grow conifers like noble fir? Or should we take another look at Norway spruce?

"With regard to the beds of seedling trees at my nursery, any reaction to drought appears to mirror reports from the field, with noble fir suffering the most, including those plants well established and growing on into their second year," said David. "Nordmann fir proved to be the toughest, much better surviving species; no bad thing since it monopolises the UK Christmas tree market."

I was particularly interested to know how Colorado blue spruce had fared, having seen many good-looking beds of this conifer at Prees Heath Forest Nurseries. Blue spruce has been increasingly touted as a tree of the future for the UK Christmas tree market. "Despite being 2-3 years old, my blue spruce beds did not fare well," said David. Perhaps surprising since the bluish colour is due to the presence of epicuticular waxes on the needles (reducing transpiration and water loss), which reflect specific wavelengths of light with more wax meaning more blue colouration.

David says the bottom has recently fallen out of the once increasing blue spruce market for Christmas trees, despite the tree's symmetrical canopy, attractive blue-green foliage and the good reputation of container-grown trees to take well in the garden after the Christmas period. "In my opinion the foliage is far too prickly for blue spruce to become a universally popular Christmas tree," said David.

TREE OF THE MONTH

OUT IN THE FIELD

So what did the country's Christmas tree growers have to say about their experiences during the 2018 planting and growing season? BCTGA secretary Harry Brightwell said it was the young crop (trees under 2-3 years) that was quite badly affected. Consequently he foresaw a market very similar to 2017 with wholesale prices for six-foot Nordmann fir trees coming in at £17-£18. Reports coming in during July 2018 suggested significant losses of first-year-growth trees, running into tens of thousands of trees per farm, accounting for between a quarter to one third of a grower's entire stock; and from areas of the UK like Lancashire and Wales not normally associated with severe summer drought conditions. If true, a shortage of home-grown marketable trees could be felt in 2023 and for several years thereafter. Some growers were taking a few crumbs of comfort in lack of rain and slower growth meaning tree leaders were typically shorter which would help with overall tree appearance.

DROUGHT AND DISEASE

Every cloud usually has a silver lining, with this year's plus being fewer fungal infections and less foliar disease. Not universally so,

though, following reported increases in one of the more peculiar pathogens of Christmas tree conifers, ironically not directly to do with the conifer host.

The fungal pathogen is *Pucciniastrum epilobii*, causing a disease known as 'fireweed-fir rust', one of those peculiar 'Puccinia-type' basidiomycete fungi that require two completely different plant hosts to complete the life cycle. The main host is a group of weed species belonging to the evening primrose family, with the 'alternate' hosts as various *Abies* species (true firs). This group of weed plants, commonly known as 'willowherbs,' include *Epilobium hirsutum* (great or hairy willowherb) and *Epilobium montana* (broad leaved willowherb), but includes another called *Chamaenerion angustifolium* (rose-bay willowherb or 'fireweed') which is a potentially pernicious problem for tree nurseries and plantations.

The clue to its importance in this respect resides in the name 'fireweed'. This otherwise attractive plant with cerise-coloured flower spikes comes up en masse wherever a fire has been burning, which on forest nurseries is all too often these days.

Reports suggest there was a failure to control 'fireweed' in some locations, thus allowing the disease to develop on weed

growth, with spores infecting fir trees to cause foliar disease symptoms and needle damage. The likely reason is that herbicide application was pointless, indeed potentially dangerous, for young trees given the dry state of the soil. Fireweed-fir rust is a problem in many parts of the world including North America and Australasia, with *Abies grandis* and *Abies nordmanniana* among the species recorded as susceptible to this rust disease.

Conspicuous by its absence as a talking point at least is CSNN (current season needle necrosis), thought to be caused by periods of prolonged high humidity in 'high summer' depressing transpiration; specific fungal pathogens then take advantage of the weakened leaf tissue to cause necrosis.

Mid-summer heat in the UK is often accompanied by very high humidity, but not to the same degree this year. The situation with arthropod pests, especially sucking pests such as aphids and mites, is a completely different kettle of fish because dry atmospheric conditions and soil drought invariably exacerbate infestations. Regular rainfall washes a proportion of insects and mites off of the foliage, and enables continual plant growth to buffer the loss of water, nutrients and food to sucking pests, compensating for any tissue damage caused.



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