

Autumn colour in Pukekura Park and Brooklands

George Fuller

Because there are very few trees native to New Zealand that drop their leaves over winter, our forest colour is predominantly a verdant green monochrome. Therefore, if a tree drops its leaves in winter it is fairly safe to assume that it is not a New Zealand native. Deciduous trees and shrubs are characteristic of the native flora of the temperate zone of the northern hemisphere.

Factors which enhance the development of autumn colour are clear sunny days, cool nights, increased differential between day and night temperatures, dry autumn conditions, and injury to sap flow in a limb or in the trunk. Factors which threaten longevity of autumn colour are high winds and heavy rainfall.

New Plymouth boasts a mild, equable climate with reliable rainfall, limited extremes of heat or cold, and prevailing northerly and westerly winds which are quite often salt-laden. These are all negative factors when it comes to initiation and retention of autumn colour. Put simply, New Plymouth is a disappointing area to view such colour. Despite this, a few tree and shrub species can be relied upon to perform well here.



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Trees that shed their leaves do so as a means of survival over a very unfavourable season embracing coldness, wetness, perhaps wind, and certainly long periods of low light intensity. Colouration in autumn has two major sources. Chlorophyll (green) in most plants masks other similar “plastid” pigments, notably carotenes (orange-red) and xanthophylls (yellow). As autumn weather begins to induce leaf senescence, chlorophyll is the first type of pigment to decompose because it no longer has a function, thereby unmasking the yellows and oranges. There is also another source of colour. The “flavinoid” pigments of flavones (orange) and anthocyanins (red/purple) are associated with cell sap and are formed from excess sugars. As night temperatures drop in autumn the translocation of sugars from the leaves down to the trunk and roots is inhibited, resulting in a build-up, thus enhancing the production of flavinoid pigments. The greater the extremes between day and night temperatures (often accompanied by bright sunny days), the richer the colours, helping to explain the brilliance of autumn colours in deciduous trees growing in the central and eastern North Island and areas east of the Southern Alps in the South Island.



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In New Plymouth we have to be content with a very limited range of trees that can be relied upon to give good autumn colour. For example, oak, beech, birch, lime, sycamore, elm, larch, and poplar are only a dingy reminder here of their brilliant counterparts in the above regions - unless one is excited by shades of brown! The nearest location for a reliable feast of rich autumn colour is undoubtedly the arboretum at the entrance to the Te Wera forest on SH43 inland from Stratford. It is readily accessible and well worth a visit between mid-April and early May. Very notable there are Dawn Redwood (*Metasequoia glyptostroboides*) and Swamp Cypress (*Taxodium distichum*) which can be breathtaking when at their best.



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The following are the main trees in Pukekura Park and/or Brooklands that afford the most reliable autumn colour: Maple (*Acer* spp.); Ginkgo (*Ginkgo biloba*); Honey Locust (*Gleditsia triacanthos*); Wonder Tree (*Idesia polycarpa*); Liquidambar (*Liquidambar styraciflua*); Tulip Tree (*Liriodendron tulipifera*); Dawn Redwood (*Metasequoia glyptostroboides*); Tupelo (*Nyssa sylvatica*); Cherry (*Prunus* spp. and cultivars); and Swamp Cypress (*Taxodium distichum*).

Abstract:

Factors which influence initiation, retention and degree of autumn colour are outlined in relation to the deciduous trees and shrubs to be found in Pukekura Park. Three photographs taken by David Medway are indicative of the best autumnal coloration to occur in the Park. Explanations are given as to the effect of seasonal changes on park foliage. Some or all of the following factors manipulate autumn colour from year to year: Decomposition of leaf chlorophyll and subsequent unmasking of plastid pigments, day and night temperature differentials, sap flow, inhibited translocation of sugars from the leaves to the trunk, and the interplay of other climatic conditions upon various shrubs and trees. Particular species offering the most reliable autumn hues in such a temperate climate are listed.

Keywords:

Pukekura Park, Brooklands Park, George Fuller, autumn colours, deciduous trees, fall, seasonal botanical changes, leaf drop, New Plymouth, autumn scenes in New Zealand, leaf senescence, trees in autumn, onset of winter.