

## Introduction

This brochure gives basic information about the cultural requirements for Eucalyptus trees ("Eucs") and its use in gardens or in tubs. Most people are familiar with the well-known E. gunnii, but quite a few other species, suitable for the climate in Northwestern Europe, are almost unknown.

Over the last 20 years nurseries "De Groene Prins" and "Koala" learned a lot about the hardiness and growth speed of various species. An increasing assortment becomes available now from the coldest provenances we could find, i.e. the south facing slopes of the Snowy Mountains in Australia.

Global warming, offering new possibilities for the adventurous gardener, opens new Eucalyptus horizons and we expect that more and more species will be cultivated successfully in the near future.

This booklet tries to fill the gap that most gardening books created. Even in popular gardening magazines very little information about Eucs is offered. Landscapers are usually not familiar with Eucs, but we sincerely hope that this will change soon!

Spring 2018

## What makes Eucalyptus so special

First: It is an evergreen tree, and there are not many of them to choose from in our winter barren country!

2nd: The leaves have beautiful colors from silvery blue to a deep dull or shiny green (like *Eucalyptus vernicosa*)

Many species show a big difference between juvenile leaves and adult leaves. Eucalyptus perriniana for instance has juvenile leaves growing together into one circular leaf encircling the twigs. Adult leaves are completely different, called falcate (=formed as the blade of a sickle) and hanging down.

A 3rd characteristic is the often strong aromatic scent when leaves are crushed, also noticeable during hot and humid weather. Each species smells different but all are definitely recognized as Eucalyptus. Some species are used for their essential oils like *E. citriodora* as an insect repellent and in aroma therapy.

A 4th characteristic is the enormous growth speed. 2 or 3 meters per year for *E. nitens* is not unusual even in temperate climates!

For small or medium sized gardens a few hardy species with a moderate growth speed are available, but pruning may still be necessary after some years. Pruning does not harm the plants. The pruned twigs are used in flower arrangements and in the sauna (and as fodder for Koala Bears)



Eucalyptus gregsoniana with flower buds



Seedlings of *Eucalyptus pauciflora* 

## Maintenance

Eucalyptus needs all the sun there is at our Northern latitude. Full sun is essential! Some species tolerate light shade (*Eucalyptus neglecta* and *Eucalyptus archeri*), in which case the growth slows down considerably. Keep in mind that Eucs, planted against a wall or in front of some trees, will bend towards the light.

Loose, poor soil is good as Eucs are adapted to soils with low nutrients.

Here at the nursery all Eucs grow fairly well on heavy loam. We never fertilize the trees, we only supply them with lava powder which give essential minerals. A good drainage is important; sticky soil needs good drainage at first, and thereafter trees can be planted.

If you grow Eucs in tubs or containers some fertilizer may be necessary however. Especially the not hardy yellow, red and pink flowering species are cultivated in containers when a frost free place is available during the winter.

## Planting

Plant Eucs only as young seedlings; old trees in a container tend to be blown over after some years. Dig a hole slightly larger than the container. Tap the container upside down to release the root ball from the container – don't pull the plant loose as this may damage the roots. Soak the root ball in water before planting and firmly press the soil for a tight contact between the roots and the soil.

The root ball should never dry out in the first year after planting. Stake the tree on windy spots at  $\pm$  30 cm above the soil level.

A good time for planting is April-May, later is possible when you can take extra care during hot and dry periods. In Autumn, a 20 cm thick mulch layer is important to protect the roots.

Protect the young tree during heavy frosts with airy material like reed or fleece or conifer twigs. Do not transplant Eucs after some years – they hate this! – plant Eucs directly on their final spot.

## Pruning

When Eucs have grown too tall, prune them in early spring. If a low bush is required, coppice 20 cm above soil level. *E. gunnii* is often treated like that to force regrowth of juvenile leaves. Within a few weeks new twigs will appear from the swollen bottom of the tree (called the lignotuber). Pollarded at 2 meter the result will be similar to a pollarded willow. For the production of twigs for flower arrangements pollarding is repeated each year.

When Eucs have grown into tall trees with very open crowns, pollarding all branches (like a candelabrum) may be necessary to create a dense crown again after one growing season.

Eucs love full sun. When they receive less sun, their frost hardiness will diminish compared to Eucs grown in full sun.



Eucalyptus perriniana

#### Flowers

Hardy Eucs for the climate in NW European countries all have white or creamy white flowers. In some species flowering is overwhelming; a good source of honey and attractive for bees. Species with red, yellow or pink flowers unfortunately are not hardy in NW Europe and only suitable as tub plants. Hopefully in the future hardy hybrids with colored flowers will appear – maybe wishful thinking – but crosses between gunnii and sideroxylon might produce such hybrids.

Heavy pruning or coppicing prevents flowering; if you use Eucs for the harvest of twigs you cannot expect flowers.



Eucalyptus debeuzevillei flowering



Eucalyptus coccifera flowerbuds



Flowering Eucalyptus leucoxylon var. Rosea

### What means "winter hardy"?

A plant is called "winter hardy" when it survives our winter. However, a plant surviving winters on our west coast (i.e. Zeeland) with mild temperatures is not necessarily hardy enough to survive inland in a more or less continental climate (i.e. Twenthe)! Winter hardiness is connected to climate zones. True tropical plants cannot survive in European gardens.

Various levels of winter hardiness exist:

A plant tolerating light frosts only (until -5°C) is in Holland and neighbouring countries a tubplant; even when it survives in gardens against a warm wall of a poorly insulated house with extra winter protection. (\*)

A plant tolerating moderate frosts only (until -10°C) is considered as half hardy. In warm protected city gardens such plants may grow well, but under less favorable conditions winter protection is essential for such plants. (\*\*)

A plant tolerating severe frosts (until -15°C) is hardy in coastal areas but requires extra protection inland against severe winter weather.

A plant tolerating extreme frosts (until -20°C) is considered as hardy in the Netherlands although some winter damage may occur at less favorable places. (\*\*\*\*)

A plant tolerating even worse frosts is considered as fully hardy. (\*\*\*\*)

Another important aspect of winter hardiness is the duration of a freeze in combination with the wind. For example: A Eucalyptus that can withstand temperatures down to -20°C without wind may still be damaged by moderate freezing weather in combination with strong NE wind. This effect is known as freeze-drying. When such extreme weather conditions occurs (like in March 2018), protection with hessian or reed mats will help the tree to survive. (usually forst-damaged Eucs will regrow from the base in spring)

Other aspects influencing the winter hardiness of plants – in order of importance -:

- Drainage of the soil: on bad draining soils plants may lose their resistance to frosts ;
- Age: young plants are more vulnerable than old, settled Eucs;
- Location: sun loving plants lose winter hardiness as they receive less sun and more shade;
- Accumulation of below-zero temperatures: See Image 1 for more detailed information;
- The speed at which frost enters: sudden frost is much more dangerous than gradually falling temperatures that allows plants to anticipate on.
- Wind: at windy locations the "wind-chill"-effect may affect Eucs (see Table 2) causing extra dehydration;
- Nutritional status: malnourished plants are less frost resistant just as over-nourished plants;
- Provenance: Eucs from high altitude like 1800 m altitude will tolerate much more frosts than Eucs from lowland area's.
- First winter? In their first winter after planting Eucs are not yet fully settled, thus more vulnerable. When Eucs have survived their first winter, their hardiness increases over the years. However: two succeeding extreme winters are sometimes lethal.

# Among a bunch of Eucalyptus seedlings differences in frost tolerance can be substantial!

In our country selection based on hardiness has not yet been done. We still depend on propagation with seed from the wild, as rooting of cuttings is difficult (except for *E. gunnii* 'Azura'). Therefore it is a good idea to plant several seedlings of a kind to increase the chance for better hardiness. Ask us for availability of seeds or seedlings (ÿoungplants in trays f.i.) when you want to plant many trees of one species. To increase the chance to select 'super hardy' individuals, plant at least 100 trees.

*E. gunnii* ssp. Divaricata is almost extinct in the wild, seeds are still available from the very last trees, and a new gene pool is necessary for conservation of this hardy, beautiful subspecies.

Conscientious nurseries are fully aware of the importance of good seed provenance. The best source for seeds are trees from high altitude locations where extreme frosts may occur. Some high planes in the Snowy Mountains of Australia are home to the very hardiest snow-gums. Seedlings from these trees show full hardiness in our test garden, surviving even 22°C of frost.

However, young trees still need some protection from severe freezes.

**Image 1.** Hellman numbers show the <u>severity of a particular</u> <u>winter</u>. Add up all 24 hours' day average temperatures from November 1st (preceding year) up till March 31 (current year) as far as they are below zero. Use the absolute value. The difference between the South West and the North Eastern part of the Netherlands is remarkable!



Image 1 – Hellman numbers of the harsh winter 2009/2010

Important: the frost effect on plants depends not only on temperature, but also on wind. The windchill effect defines -as an example- that 6 Beaufort wind in combination with -2°C affects evergreen plants as much as -12°C without wind!! Not only watch the thermometer - be aware of the wind as well as to find the real effect!

Wind (Beaufort)											
2	8	6	4	2	0	-2	-4	-6	-8	-10	-12
3	7	5	3	1	-2	-4	-6	-8	-11	-12	-15
4	6	4	2	-1	-4	-6	-9	-10	-13	-15	-18
5	4	2	-1	-4	-7	-10	-13	-15	-18	-21	-23
6	3	1	-2	-6	-9	-12	-15	-17	-20	-23	-27
7	2	-1	-4	-8	-11	-14	-18	-19	-23	-27	-31
8	0	-3	-5	-9	-13	-16	-19	-22	-26	-30	-34
Temperature (°C)=	≕+8	+6	+4	+2	0	-2	-4	-6	-8	-10	-12

**Table 1.** Example: 10 degrees of frost combined with windforce 5 Beaufort equals 21 degrees of frost without wind. The effect on humans is just as bad, and is called **'windchill'**.

After severe freezes when you are in doubt whether your Eucalyptus is dead or not, be patient. Often recovery from the base (from the so called 'lignotuber') happens as a surprise. On the other hand: sometimes a seemingly alive tree appears to die after hot weather in late spring. But even in that case the tree sometimes recovers from the lignotuber. When a small scratch with your nail of the bark shows underlying green tissue, the tree will likely recover. But when the tissue has a grey or brown color, the tree is dead <u>above</u> the spot where you removed a tiny bit of bark.

### Eucalyptus as a tubplant

Eucalyptus is most happy when planted on a very sunny spot in your garden. Nevertheless it is possible to grow Eucs in containers or tubs and place them on a terrace. Please take into consideration that:

- Plants in containers are far more vulnerable to frosts compared to plants in the soil, where roots receive warmth from the earth; protect the container to keep roots above 0°C
- Fast growing Eucs need pruning to reduce the height, and as a consequence flowering is unlikely to happen
- Some Eucs flower at a young age like *Eucalyptus pulverulenta* ssp. " Baby Blue" or *Eucalyptus sideroxylon*
- It is sometimes difficult to keep Eucs in containers in good condition during the winter. A glasshouse is advisable but keep your Eucs outside as long as weather permits.
- Place the container plant on a water bowl during hot weather, when Eucs drink a lot
- Supply some fertilizer (low in Nitrogen) and lava powder to keep the tree in good condition

## Frost resistant species

SPECIE	HARDI NESS	HEIGHT	GROWTH_ SPEED	CONTAI NER		
aggregata	30101010	medium	moderate		Wet soil	
amygdalina	ž	low	slow			
archeri		medium	fast			
camphora		Low/medium	rather fast		Wet soil	
cinerea	÷	medium	fast			
citriodora	¥	tall	moderate			
coccifera		medium	moderate			
dalrympleana	***	tall	fast			
debeuzevillei	****	medium	Slow/mod.			
delegatensis		tall	moderate			
ficifolia	¥	low	moderate			
glaucescens		medium	moderate			
globulus ssp, maidenii	¥	tall	very fast			
gregsoniana	***	low	slow			
gunnii ssp divaricata	*****	medium	fast			
lacrimans	*****	medium	moderate			
leucoxylon	*	low	moderate			
macarthurii	*0*0*	tall	fast			
mannifera ssp elliptica	****	medium	moderate			
neglecta	30101010	medium	moderate			
nicholli	**	medium	Slow/mod.			
nitens	**	tall	Very fast			
nitens x	301010	Not available	_			
perriniana						
niphophila		low	slow			
parvula	****	medium	fast			
pauciflora ssp pauciflora	****	medium	moderate			
perriniana	30000	medium	Very fast			

pulverulenta	***	low,spreading	slow		
rubida	<b>NONON</b>	moderate	moderate		
sideroxylon	*	low	moderate		
stellulata	2000	moderate	slow		
subcrenulata	30404C	tall	moderate		
torquata	*	low	slow		
urnigera	*****	moderate	moderate		
vernicosa	*o+o+c	Very low	slow		
viminalis	3006	Very tall	fast		



#### Eucalyptus grower Mary Rouw

www.eucalyptuskwekerijkoala.nl

## www.degroeneprins.nl

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