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The Oldest Orange Trees In Containers In Europe
The Origin of Orange Trees at Freÿr

The oldest orange trees at Freÿr come from Lunéville, the "Versailles" of the Duke of Lorraine. It has been said that they were bought from Stanislas Leszczynski (King of Poland since 1704, lived in exile, 1734-1766 Duke of Bar and Lorraine). But it seems more plausible that they were bought from Francis III, the last Duke of the Vaudémont branch.

Indeed, the oldest engraving by Remacle Le Loup, representing the gardens at Freÿr and dating from 1740, depicts a four-winged Renaissance castle, surrounded by two gardens of the same style, located along the Meuse. The gardens consist of a cross with four beds and a fountain in the centre. One discovers further in this engraving that the end of the northern garden had been enlarged with two winter houses, in front of each one three rows of four trees. These 24 trees appear to be fully grown.

Since Stanislas arrived in Lorraine not before 1737, and since Francis III sold whatever was marketable in Lunéville upon leaving Lorraine to marry Maria-Theresa, it is more likely that the trees were bought by the future Emperor Francis I. The gardens at Lunéville were laid out in the early 18th century (1711-1718), but in the engraving by Le Loup the trees appear to be older than 30 years. Hence, the oldest trees in Freÿr are between 300 and 350 years old.

Around 1760-65, the Renaissance garden was transformed into a classic-style garden. A pond was added in front of each winter house and the trees were arranged around both ponds. More trees were planted afterwards. In the 19th and 20th centuries, even younger trees were added, including lemon trees and laurels.

Typology of the original trees

Currently, the oldest trees show an unexpected variety and can be categorised as:

	Meuse-side	Hill-side
Not Grafted		
Squat	8	3
Balanced	3 + 1 (1)	3
Tall Trunk	0	1 + 1 (2)
Grafted		
At the root	1	1
Middle of the trunk	0	1 + 1 (3)
Total	13	11

During the invasion in 1940, the trees were still in the winter house. No one took care of them for some weeks and one tree died of dryness. Another one (1) recovered, but has grown from the surface while the central part of the trunk has grown progressively empty. However it is still alive.

Tree (2) has recently lost its bark progressively and the branches on one side of the trunk. The other side remained healthy until this spring, when two thirds of the remaining branches died. I have been wondering if it was the result of careless spraying of weed-killer. Anyway, since then, I spray weed-killer personally. The head gardener of the Arboretum in Meise rather believes that the tree's decay is due to old age.

Tree (3) has a thinner trunk and is most likely younger. Hence, 23 out of the 24 original trees remain.

The trees as saviours of Freÿr

In 1794, the French armies invaded the Low Countries and imported a regime of terror. The mayor of the neighbouring French city of Givet (17 km) came to loot and burn castles and monasteries. The monasteries of Waulsort (4 km) and Hastière (7 km) as well as the winter residence of the Duke of Beaufort-Spontin at Beauraing (20 km) were damaged. Very nearly the summer residence at Freÿr would have had the same fate.

Indeed, upon arriving in Freÿr in July 1794, the mayor fell in love with the blossoming trees and their perfume. He wanted to seize them and carry them back to Givet on barges, but there were none at hand. While the barges were fetched, the buildings were not burnt. In the meantime, Robespierre lost power in Paris. The population of Givet took to arms and went to Freÿr to arrest its "former" mayor. The trees had saved the place.

Heating of the trees

Until the departure of our last gardener in 1975, each winter house was heated with a coke oven. However, the engraving by Le Loup shows no chimney on the winter houses – a fact corroborated by the examination of the chimneys' bricks, indicating that they were added later, possibly in the 19th century. In winter, the temperature was kept around 7° Celsius. After the last gardener left, the coke ovens were replaced by an automated heating system run by a gas tank. Due to the following oil shock and the enormous costs for gas this heating solution became too expensive.

After consultation with the head gardener of Versailles, where no heating is used in the winter house, it was decided to put two electrical radiators in each winter house and to close the shutters in the case of severe cold. The first winter thereafter, it was minus 20° Celsius and the temperature in the houses fell to 1° Celsius. Replacing windows and doors

Figs. 1, 2 Freÿr, the orange trees

– located only on the Southern façade (the other facades being blind) – with new hermetic ones to eliminate cold drafts, allowed the use of radiators only when it freezes outside.

Watering of the trees

In a diary on how to maintain the trees, my great-grandmother advises: "one bucket per tree and month in winter, one to two (if fairly warm) buckets per tree and day in summer and sprinkling the leaves every day upon dry heat".

After the departure of our last gardener, my mother took over this task and followed the advice of her grandmother, but used a pipe feeding water slowly instead of watering with buckets. It was less tiring. The leaves of the trees turned progressively yellow and later fell off. We lost one middle-aged tree in the third winter after the take-over. Then, we consulted the head gardener of Versailles. He was surprised since in Versailles watering takes place every week in summer and the climate is warmer and dryer than in Belgium! He advised to remove the lateral boards of the containers for some time, so that the earth, which had become like wet concrete, could dry up.

After some thinking, we first reckoned that my great-grandmother, knowing the nonchalance of her gardeners, had advised an overdose, but that did not fit with her character for precise control of everything. Here is a first explanation: Water thrown in one shot from a bucket with shower effect is much better than the same amount of water sprayed slowly via a pipe, choking the earth. A second explanation is given later under the pruning paragraph.

Anyway, we learned the lesson and reduced watering to as much as the water would penetrate fast into the earth, adjusting the dose to each tree. We preferred to underwater (which was easily detectable: the leaves started shrinking) to react afterwards, rather than to over-water and discover much later that the leaves were turning yellow.

Fruits

We had plenty of blossoms, up to 300 per tree. They had to be removed manually, one by one, to avoid wounding the tree. This had to be done so that the trees did not become exhausted by having to feed the blossoms growing into fruits. My great-grandmother, who kept pruning the blossoms during summer time until she was in her nineties, used them for orange teas, marmalade and sweets. Having less time, we pruned both the leaves and the blossoms in September at the same time which had become buds in the meantime.

Things had to change after two winters of flooding of the winter houses by the Meuse, in December 2003 (1 meter) and early 2005 (1.8 meter). In the following years, the number of blossoms decreased drastically and was limited to the internal part of the trees. Additionally, thorns began to appear on the outer parts of the trees. The Agricultural School of Gembloux explained this phenomenon. The containers had been standing in the water of the Meuse, which was loaded with fertilisers washed up by the heavy rains. This resulted in the leaves growing to a size much bigger than before. Consequently, there was a drastic reduction in the number of blossoms.

Due to the fact that fertilisers had not been in use yet, this phenomenon was unknown at the previous heavy flooding of 1925. Gembloux proposed to add chemicals to neutralise the phosphates. Otherwise it would take up to 50 years (until the next flooding) to disappear. We did not act, but

noticed that upon potting a tree with new earth, the phenomenon was decreasing.

Pruning and fungicide

Our last gardener, a worker without gardening experience, pruned the hedges almost up to the trunks and applied the same method to the orange trees in September, all the more because at the end of summer the leaves were loaded with a dark and sticky layer caused by greenfly. The trees wintered with all the leaves which had grown during the summer removed and plenty of unscarred cuts. After his retirement, first my father and later I followed the same procedure. In the early 1990s, we noticed that upper branches were decaying at the end of the winter and that the trees had difficulties to revitalise.

An assistant from the Agricultural School of Gembloux diagnosed fungus penetrating through open cuts and blocking the sap. The remedy was to apply anti-fungicides three times (October, January and April): on the roots a mixture of water, Topsin M and Proplant and on the trunks and the leaves a mixture of water, Topsin M and Mirage 45 E. It helped somehow as did the treatment of the largest cuts with vegetable oil and the spraying of Confidor 200 SL against greenfly.

The head gardener of the National Arboretum in Meise introduced an effective and simple remedy: "In September, prune only the most overshooting new branches because the tree does not start wintering after a surgical operation. In May, when the sap comes back, prune what is necessary but not more." Furthermore, to avoid being tempted to prune leaves blackened by greenfly, the Head Gardener advised to spray water mixed with Summer Oil on the leaves to grease them in order to keep greenfly from fixing itself on the leaves. This was a more natural way than a chemical mixture like Confidor.

The results are outstanding. The trees have far more leaves and have regained their bowler hat shape. With more leaves, they need more water – precisely the amount indicated by my great-grandmother!

Features of containers used at Freÿr

The containers at Freÿr are still basically made of wood and hence in contrast to the 19th century variety to be seen in many classical gardens, where the structure is of cast iron and the sphere at the top of each pole has an oval shape. The size of the containers was standardised to one cubic meter by my father, Architect F. Bonaert. Before, some containers had been slightly bigger or slightly smaller.

Each one-meter-high pole (with a section of 0.11 m by 0.11 m) is connected to each of its two neighbouring poles by two planks of 0.78 m in length. The lower plank, 0.15 m above the ground, has a section of 0.18 m vertically and 0.05 m horizontally. The higher plank, 0.85 m above the ground, has a section of 0.12 m vertically by 0.04 m horizontally. Between these two planks is a movable board, applied against the earth and held by one bar, one end of which is fixed to one pole, the other end falling into a hook fixed to the neighbouring pole.

A board is pierced with two horizontal rods (one at ⅓ of the total height, the other at ⅔) to reinforce the board and to avoid its warping caused by the humidity gradient between the inner part facing wet earth and the outer part which is dried by air.

A piece of an iron in L-shape is fixed to the bottom of each pole (0.23 m above the ground) and to its two lower planks, while the foot of each pole is encircled by an iron square.

Along two opposite lower planks, the iron in L-shape is fixed to each plank. These two L's support horizontal planks constituting the bottom of the container.

On the other two lower planks, two iron pieces in T-shape connect one plank with the other. Each T is attached to the middle of the plank at ⅓ of its length. They support the bottom of the container.

Until 1975, oak was used. It was later replaced by teak, which was less expensive and thought more resistant. Since the price for imported wood increased, we have used oak again.

The difference between oak and teak is not so much the wood than its quality. With poor oak, a container breaks into pieces within 15 years. With poor teak, it is the same, except that teak does not break into pieces but carbonises and loses its strength. With good wood, a container lasts around 25 years and over 30 with extremely good wood. The inner parts of the containers were painted with lead-iron minium. As this product became prohibited, we had to change to the less effective linseed oil.

Usually, the breaking of a container starts at the boards, then at the lower planks and their L-shaped reinforcements and finally at the poles and their feet. Today, a deficient board is replaced by maritime plywood.

Improvement of the containers

Christine Herman, architect, Head of the Heritage Maintenance Department (Walloon Region), Louis Schokert, architect (Schockert Architect Bureau) and Nathalie de Harlez B. A. examined the problem of improving the durability of a container. The cost of the study was fully supported by the Walloon Region and the realisation of five containers was sponsored with up to 60 %.

The new containers have kept the typical external design and structure, but have been enlarged slightly (1.05 m instead of 1.00 m). This is to allow a better protection of the internal wooden parts and hence to prolong their durability. Also, the know-how transmitted by the family was recorded by the Heritage Maintenance Department in various drawings.

The project started with a study of the existing containers and the currently weak spots. High-quality oak is used instead of lower industrial quality, which was previously used. The external fittings are of wrought iron instead of rolled iron. Only the internal parts are made of rolled iron. Currently, wooden and iron parts remain painted in white (although iron parts should be painted in black). Improvements to the structure have been applied by metal reinforcements inside the container and by substituting the wooden floor by an iron grid. The water along the lateral boards, planks and poles drains off better, so that the wooden parts will not stay humid and become ventilated instead. This has been performed via an internal filter and draining cover, which is supposed to enhance the durability of those weak spots. The new container model has been patented.

Moving of the trees

Moving the trees back and forth between the winter houses and the garden has also improved through time. Before the Second World War, a heavy wooden car was used. The car was placed beside the tree, which was then tilted and put on two feet. Next, some wooden rods were placed at a slant from the ground under the container up to the car. Finally, some wooden rods were laid transversally on that slant under the container, on which the container was then rolled on to the car, like the Egyptians moved heavy stones.

A new lighter steel car was designed after the war, so that it was possible to turn it around under the tilted container, which was then lowered down on the car. The car was narrow enough so that the middle part of the container could rest on it, high enough so that the feet of the container hung outside the car in the vacuum without touching the ground (which would have hindered moving the container). Nevertheless the height of the car had to be quite low: otherwise it would have prevented its turning under the tilted up container.

Fig. 3 Freÿr today

The tilting operation weakened the container and reduced its durability by ¼ compared to its current value. But avoiding rolling up the container had increased its life expectancy by ¼ with respect to the previous "Egyptian" method. Afterwards, different varieties of tractor or Schaeffer used a fork passing under the cast and lifting it by means of two opposite lower planks resting on the fork. The wooden car was pulled by horses, the steel one by a tractor.

Due to a warmer climate, the trees are brought into the garden already on 1 May (15 days earlier than before) and similarly the trees are also moved to the winter houses around mid-October (15 days later than before).

Changing containers and fertilisers

One of the winter houses has a drum in its attic around which a rope is wrapped. This rope can be lowered and attached to the trunk of a tree to lift it while changing its container. Before that, the four boards are removed and a layer of 0.10 m of earth is taken away from the lateral sides, roots included. Then, one has to check that holes are provided at the bottom of the new container to ease the flow of water. The water is drained further by putting pieces of brick at the bottom of the container. After that, sulphur is spread on the sides of the earth to protect the roots from vermin. The tree is lowered into the new container, which is filled on its four sides with a mixture of arable earth, heather earth, and compost, all of which is tamped.

It has been suggested by the Arboretum of Meise that we simply use compost for rhododendrons. Earlier, sheep droppings mixed with water were used as fertiliser between the changing of the lateral earth, which happened while potting (at that time, roughly every 15 years). With the last gardener, fertilisers were not used anymore, although the period between potting had increased due to the improved moving method. So it was no surprise that the first advice of the Arboretum of Meise was on fertilisers: cow manure and mineral salts (ASEF). This has been applied for two years and has proved to be outstanding. The trees have become lusher than ever before.

So far, the roots' network has not become too dense between potting. However, that may change with the new containers and a longer durability. It may require an intermediary refreshing of earth.

Conclusion

It is said that orange trees are delicate. Considering what they have gone through at Freÿr, you start doubting such a statement. Hopefully, the trees will still live on for a while. However, as they approach their fourth century of existence, no one can forecast their future.

PICTURE CREDIT

All pictures by Auguste de Decker