

**ORIGINAL PLANTING on the NEW  
DUTCH WATERLINE and the  
GREBBELINE**  
*Martijn Boosten*

While many forts today are overgrown with trees and bushes, many were in fact deliberately planted and carefully managed. This article explores these plantations. **Martijn Boosten** is a consultant in Forest Management and Afforestation with *Stichting Probos*; this article first appeared in *Saillant* (2009, No. 1), the *Journal of the Stichting Menno van Coehoorn* and the article appears here by kind permission of the author, and Editor **Jan de Vries**.

**Introduction**

It is often thought that forts and other parts of the New Dutch Waterline (NDW) and Grebbeline (GL) were originally bare. Nothing could be further from the truth. In the heyday of the Waterline (roughly 1880 to 1925) the forts and other parts of this fortified line were planted with trees and bushes according to an ingenious system. Along the GL too, between 1793 and 1806 attention was paid to installing planting from a military point of view. Parts of this historic planting are still recognisable today in the luxuriant growth of trees and bushes on the forts and works. With 'conservation through development' as a starting point, some hard work is presently ongoing on the redistribution and recognisability of the NDW. The province of Utrecht has set out, in the development programme 'The Grebbeline above Water', important steps for the restoration and management of the cultural and historical legacy of the GL. On both the Lines, regular intervention will have to take place within the planting. To be able to take carefully considered decisions based on information on the ecological and recreational value of the planting, reliable information on the historical situation is essential. The Probos Society has carried out two studies on this subject in 2007 (quick scan), whereby, on the basis of archive research, study of the literature and field trips, the historic planting of the Lines has been brought into focus.

This article gives a short summary of the most important results of these studies.

(Note: The study of the planting of the NDW was carried out for the NDW Project Office. The study of the planting of the GL was carried out for the province of Utrecht. The reports of the results of the studies (quick scan) can be downloaded from the website of the Probos Society [www.probos.nl](http://www.probos.nl))

**Planting on fortifications**

Even in the 16<sup>th</sup>, 17<sup>th</sup> and 18<sup>th</sup> centuries French and German fort engineers spoke of the defensive significance of planting on and around fortifications. For example, the German fort engineer Daniel Speckle advised, in his Handbook *Architectura von Vestungen* (1589) the planting of 'young hawthorns' on fortifications to serve as a barrier against intruders, and in other handbooks detailed descriptions were given for the laying out and use of planting for cover and protection. These ideas on planting on forts and fortifications were still current at the end of the Napoleonic era at the beginning of the 19<sup>th</sup> century.

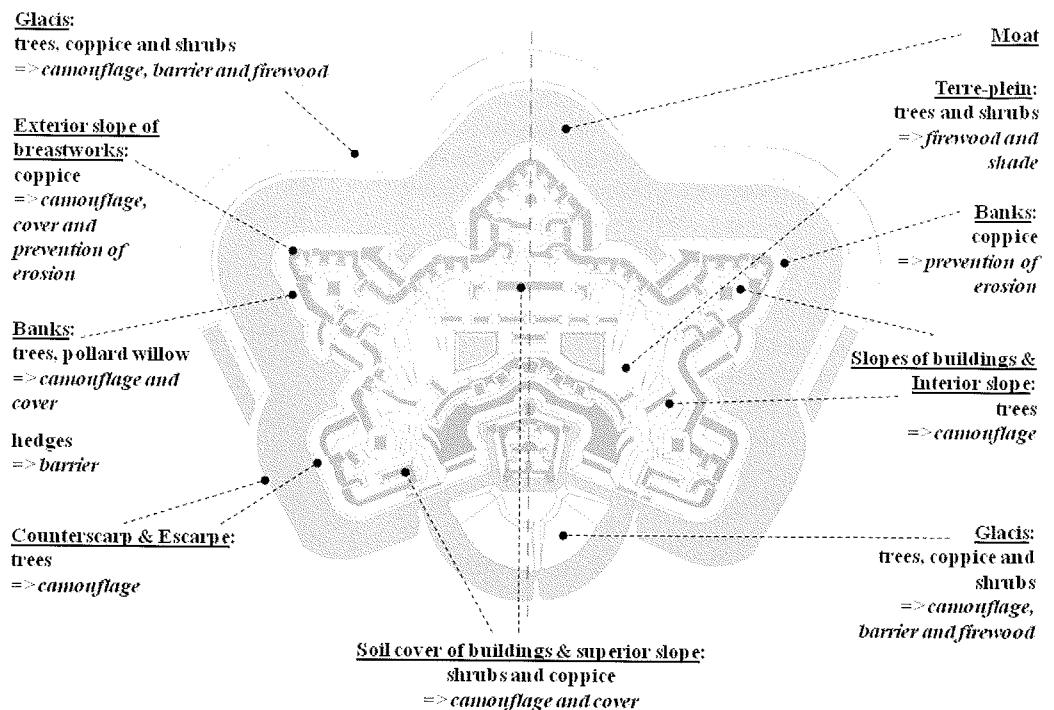
**NEW DUTCH WATERLINE**

**Plans for planting**

King William I's engineer officers, in the early days of the United Kingdom of the Netherlands (1815), still shared the French views on the establishing and upkeep of planting on fortifications and the forts built in the first period of the NDW (1815 to 1826) were provided with plantings of trees and bushes. About 1821 Fort Vossegat itself housed a military tree nursery but after this attention to planting temporarily decreased.

From about 1879 there appeared numerous planting plans with detailed planting maps of pretty well all the NDW forts. Various inventories can be found in the archives in relation to the state of planting and lines of sight (and specifications) for the upkeep of the planting. From 1896, for example, we have *General provision for planting concerning cover on forts*.

Planting on and around forts and fortifications had in principle three chief functions: cover and visibility shield, barrier, and supply of timber for use.



*Schematic rendering of planting forms and functions as these appear on forts in the NDW*

**Cover and visibility shield**

In the NDW the command of the area in front was of great importance. For this, large clear spaces were required so that the defenders had a good field of fire and an open

target area but at the same time forts and other fortifications had to have cover; the Waterline had as it were to rise in the landscape.

Tall planting (particularly trees) on the berms and talus inside and outside the fort took care of the cover. The attacker was thus hindered from assessing the effect of his artillery fire. Moreover, the planting had to conceal from sight the guns that were emplaced in the fort. For this shoot-willow and Canadian and Italian poplar were often used while pollard-willows on the inner berms served for cover. One of the sources mentions *Pollard willows on the inner berm, over which the guns fired...only have significance insofar as they make sharp outlines blurred as it were, and thereby in particular hinder observation of what shows above the firing crest*. In the laying out of planting in front of the guns, they took care that their own guns were unhindered by the planting and could fire freely. Preference was for trees with light crowns and thin pliant twigs, so that their own projectiles did not get caught up in the branches and explode prematurely or go off course.

In the fort, planting behind the guns was to provide a dark frayed screen, so that the guns did not stand out against a pale background and the contours of the fort were rendered vague. Preference was for trees and bushes of dark foliage such as elm. It was further recommended that planting should be of types with a similar external appearance (shape of leaf and colour) so that the different planted areas were indistinguishable from each other. Moreover, individual trees rising too high above the fort should be avoided, to preclude betraying the fort's position from far off. Inside the forts bushes and shrubs were planted for cover and visibility shield. A species much used because of its inconspicuous flowers is the Virginian cherry (*Prunus virginiana*).



*Extensive vegetation at Fort Rijnauwen today (Photo: Titia Blom. See also colour page 25)*

Close avenues or rows of trees of, for example, native oak, between the various fortifications served for extra cover. The exact position of the works could thus not easily be determined by the enemy. Through the planting of access roads round the forts, the drawing up or moving of military personnel and materiel was hidden from sight.

### Formation of a barrier

The planting of hedgerows, hedges and other woody plants on forts was seen as a worthwhile alternative to wooden screens and palisades. Living hedges were never so subject to decay as wooden constructions and needed changing less often; it was also thought that hedges were less quickly shot to pieces by enemy artillery fire than wooden palisades.

On the berms along the ditches of forts, hawthorn hedges were generally planted as an obstacle to attackers. Other appropriate hedge species are blackthorn, gorse and robinia while the planting of coppices of, for example, ash, alder and maple on the area in front of the fort served as a barrier.

[Footnote: Coppice: commercial forestry method whereby trees, at intervals of some years, are cut back to ground level, after which new shoots spring up again from the stump]. According to fort experts, their roots also formed an obstacle 'not to be underestimated' against enemy mines and trenches.

### Timber for use

In time of investment or siege, the trees within the fort could provide the besieged with vital timber. Coppice wood could be used as firewood or for wickerwork and gabions; wood from tall trees could serve as construction timber or for cover, palisading or planking.

### Other uses

Planting had another function; to hold together the earth piled up at the ramparts of the fort and so prevent collapse; for the same reason grass was also sown. Willows protected the banks of the ditches from caving in while large trees such as horse chestnuts provided shade for sentry boxes, etc.

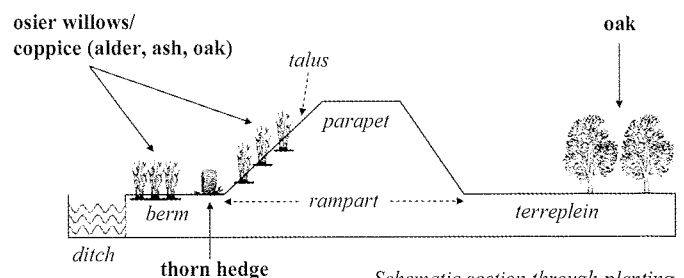
### Planting goes out of service

During WWI (1914-1918) it was clear that because of different methods of warfare the need for planting had greatly decreased. With the advent of aircraft for example, the cover effect of planting on forts dwindled, so planting now received less attention and economy was increasingly applied to upkeep. After 1945 the NDW, and with it also the planting on forts belonging to this Line, finally lost its military function.

## GREBBELINE

### Laying and upkeep of planting

The original Grebbeline was constructed between 1742 and 1806. In the first years after construction, its forts and works were most probably covered only with turf sods. Between about 1793 and 1816 it was actually specified by the War Department that forts should be planted with trees and hedges. The planting consisted chiefly of oak coppice on the higher drier ground, and coppice of ash, alder and willow (osier) on the lower wetter soil. Coppice planting was present on the berms and talus (of the ramparts) of the forts and works.



*Schematic section through planting forms as these appear on the forts and works of the Grebbeline*

At Fort aan de Buursteeg oaks were also planted on the terreplein. It is known that at the hornwork on the Grebbe (near Rhenen) thorn hedges were planted on the berms. The other parts of the forts and works were covered with grass sods.

After the GL was downgraded to an outpost of the NDW in compliance with the Fortress Act of 1874, large scale planting was carried out on the works of the NDW, on the basis of a circular from the War Department, but not on the GL. When the GL was given up as a fortification in



*View from the Heimenberg of the hamlet of Grebbe and the hornwork on the Grebbe dam (17 July 1750, Jan de Beijer. Het Rondeel Museum Civic Collection, Rhenen). In this drawing, made some years after the construction of the hornwork, planting is yet to be seen.*

### Careful maintenance

After the laying of planting, much attention was paid to upkeep. In the specifications of the War Department from 1793-1806 comprehensive definitions were given of how the planting was to be maintained. The coppice was to be regularly checked by contractors, and missing or dead trees were replaced. In one estimate of 1806 the following was specified: *The contractor shall maintain in proper condition wood growth along the whole Line and standing on berms of the works, and similarly in due time to clear off all dead wood, untidy mess and harmful vermin, and besides, to treat as it should be treated taking care that all dead or failing sections in due time on each occasion...* The hedges had to be pruned annually and cleared of weeds and vermin, and dead parts of the hedge replaced. In addition, branches and shoots were plaited back through the hedge *for strengthening the thorns.*

1926, planting lost its military significance. From 1939 the GL, now under the name Vallestelling (and later Pantherstellung) again took on a military function but planting really had no further purpose.

### Function of the planting

From the above, it appears that the War Department, at the end of the 18<sup>th</sup> and beginning of the 19<sup>th</sup> century (and to a lesser extent up to about 1858) attached importance to the maintenance of plantings which had an important military function. In the sections of archives that we have found, more sporadic mention was made of the specific functions assigned to coppices and hedges. It is known that the osiers served to consolidate the berms and talus, and helped prevent caving in of ditch banks through water action, and other coppice no doubt had other functions; as in the NDW, the coppice served to keep together the earth ramparts which were, through the presence of coppice, less vulnerable to damage from artillery; coppice also supplied some cover against enemy fire and served as a living barrier against attackers. Coppice roots formed an obstacle to enemy miners and sappers. It is unlikely that coppice, as on the NHW, was planted for cover, a function rarely assigned to planting from the second half of the 19<sup>th</sup> century. Thorn hedges served as a living barrier against possible attackers.



*Alder along the banks of the ditch of the Battery on the Schalmwijk (Photo: Martijn Boosten)*

### Aftermath of the military planting

In the period 1809-1846 the Line was in the hands of the Department for Roads and Waterways and most probably the planting present during this period was not maintained from a military point of view. In the period immediately following (1843-1866) some improvements and extensions were carried out on the Line. In a circular of 1858 concerning the leasing out of buildings, land and water of the GL, it was registered that oak, ash, alder and willow coppice on the works on the GL must be maintained by the tenants. From this it can be deduced that the War Department still attached importance to the maintenance of coppice, but no further investment was made in them.

### Conclusion

From the research carried out by Probos, it appears that planting on and round the forts of the NDW in its heyday (1880-1925) had an important military function. Tree and shrub varieties were planted in various formations (avenues, coppice, hedges, tall trees and pollard willows), and intensively maintained. On the GL during a relatively short period (1793-1806) much attention was paid to the planting and maintenance of coppice, tall trees and hedges on the forts and other works.

A large part of the forts and other sections of the NDW and the GL are today covered with trees and bushes. The original plantings have to a great extent vanished or been subsumed in the rest of the growth but in many places it is still possible to make out the remains of the original planting or forms of planting. Many of the varieties of trees and bushes that grow on the forts today correspond with the varieties originally planted. Hence today's planting on the forts represents great cultural and historical value. Translation by *Margaret Pinsent* ♣