

# Treatment of Bleeding Canker in Horse Chestnut Trees

## Report Boxmeer Council, The Netherlands 2007

### Preamble

On the 4th of October 2007, by order of Boxmeer City Council Public Amenities Department, the Chief Councillor, Mr. B. Moeskops and Mr. J. van Dinter; Allicin-treecare has conducted an intermediate status assessment, in the presence of the above named persons, for 20 Chestnut Trees in the Museumlaan in Overloon.

The treatment of these trees by Allicin-treecare and the visual damage caused by the Bleeding Canker is the reason for this assessment.

The purpose of the assessment is primarily the initial verification of the effect of the treatment and confirmation of the state of the trees in the present situation. The secondary purpose, with reference to the location where the trees are situated, is a review of the management process and formulation of conditions to protect the trees which follows the reconstruction work of the Museumlaan several years ago.

### Situation

It concerns 20 fully grown Chestnut Trees (*Aesculus hippocastanum*), the trees stand in a row along the road with houses on both sides. They are elegant, have well developed crowns and trunks and are unusually uniform in their appearance. The trunks have a diameter of 60 to 70 cm measured at a height of 130cm from ground level, they are estimated to be around 55 years old..

To assess the state of the trees, the development of shoots, size, colour and density of the leaves has been taken into consideration. The condition is good. During the assessment attention has been paid to any symptoms which point to damage by insects, bacteria and fungi.

Examples of damage due to these causes in a further stadium can be holes, splits or cracks, whereby Cambium rupture, also branches weakened at their point of attachment. This can lead to snapping branches and easy wind damage. These developments were not found.

Special attention was paid to the bleeding wounds which indicate that the disease is Bleeding Canker. In this case all the trees had a light to moderate infection, which in time can lead to reduced resistance and the aforementioned problems. No aggressive parasitic fungi were found (*Ganoderma*. *Zwammen*), which when extensively present can cause wood rot.

### Bleeding Canker Disease

There is world-wide scientific consensus that the cause of Bleeding Canker in Chestnut trees is the bacteria *Pseudomonas Syringae*. This view is confirmed by the Botanic Diseases Department of the Dutch Ministry of Agriculture, Nature and Food Quality as well as the Task Force *Aesculaap*, based in The Netherlands, based on their own research.

No where in the world, until now, has a substance been available that can effectively help trees overcome this disease. Conventional treatment methods such as spraying etc, with whatever preparation, have been found to be ineffective. Now, there is a new substance and an injection method (patent pending) available which can be considered as a real breakthrough in the fight against this disease. The product, Diallylthiosulfide, has been known since ancient times but was unstable, three years ago the product became available in stabilised form in very high concentrations until more than 5000 p.p.m. (patent nr: WO 03/024437).

The product has been researched and tested by TNO, Quality of Life department section Microbiology. The research report is attached and proves that in the correct concentration, the bacteria is completely killed.

Research carried out through the Botanic Diseases Department of the Dutch Ministry of Agriculture, Nature and Food Quality confirm this conclusion. The graphs are attached.

Field tests have shown that treatment with this product using the injection method give the desired result.

Diallylthiosulfide is made from natural plant material. It is produced without the use of chemicals, is completely biodegradable and is safe for humans and the environment. A SKAL declaration has been given for the product and it may be legally used.

Diallylthiosulfide production is carried out under BS and ISO standards 9001:2000, registration number: GB12977.

Diallylthiosulfide is produced using garlic grown according to European GAP (Good Agricultural Practice) standards and contains no GMO's (genetically modified organisms).

Consultation is taking place at present with the Dutch Ministry of Agriculture, Nature and Food Quality regarding the treatment method.

#### Evaluation - six weeks after treatment

Treatment took place on 22nd and 23rd of August 2007. Evaluation took place on the 4th of October 2007, judging the effects of this particular treatment after six weeks is precarious. The purely scientific proven bactericidal and fungicidal method is directed at influencing the micro-organism. In spite of the short six week period, verifiable perception showed that the bleeding wounds had dried up and were hard. Remarkably the sap had worked through to the outer surface by means of it's own vascular system. Clearly this shows healing of the damaged vascular system in the youngest rings and the cambium. Although these confirmed results appear to be premature, they are further confirmed by a relevant comparative test situation:

On 17th July, 2007, Dhr. Dinter of Boxmeer Council, indicated an infected Chestnut tree at approximately 1 kilometer distance from the Museumlaan where the treated Chestnut trees are situated. On the 4<sup>th</sup> of October 2007, this comparable tree still had the clearly present very sticky (not hard), dripping, resin like exacerbating substance (Chestnut blood), as originally found on the trees in the Museumlaan. Therefore reduction in the disease symptoms of the treated Chestnut trees cannot be assigned to the influence of temperature or weather conditions.

## Management Aspects

During the annual inspection attention should be paid to any symptoms showing the development of Bleeding Canker, for example typical marks on the bark or breaking open of the bark through death of the Cambium. First symptoms of infection should be treated through injection with Diallylthiosulfide, using the same method for after treatment has also been found to be beneficial.

Bleeding Canker is contagious, it should be noted that the disease is easily transferred. During pruning the tools should be sterilised after each pruning activity, so that the chance of transfer of the disease through the tools is minimal. Replanting at a location where a diseased Chestnut has been removed is also futile.

Lastly, relevant to this subject, I would like to make a remark concerning the damage caused by the moth *Cameraria ohridella* known as the Horse Chestnut Leaf Miner. This problem is difficult to combat and can spread rapidly, certainly by favourable weather during the growing season. To reduce the risk, it is recommended to remove and destroy fallen leaves where the Leaf Miner survives during the winter.

## Tree Protection Precautions and Conditions

Establish a zone around the tree of at least 3 meters, measured from the hart of the tree to the circumference. Within this zone disturbance of the ground should be prohibited.

Avoid storage or transport of materials within this zone.

As necessary, install structures to protect the tree trunk against collision damage caused by parking cars or alternatively implement rules to avoid occurrence.

## Steps to improve the growing location

Various scientific researches into Bleeding Canker of Chestnut trees show no direct connection between the disease and the quality of the growing location. The disease proliferates in a diversity of growing situations with varying soil types and sub terrain. Generally speaking it can be said that a tree in a good growing location has better condition and vitality and therefore has a higher resistance against diseases and other damaging factors.

Apply an organic mulch layer in the zone around the tree. The organic mulch layer activates life in the soil and can quite quickly be broken down into nutrients for the tree.

Actions designed to improve aeration by drilling etc, should be absolutely avoided as root damage and worsening of the tree's condition is the result.

Lastly, Bleeding Canker in Chestnut trees can occur at any moment in spite of taking precautions. The only adequate approach must be purely scientific as I have endeavoured to show this in this report. The anti fungal properties of Diallylthiosulfide are, as far as I can ascertain, not relevant in your situation, and are therefore not further taken into consideration.

Drs. J.W.Bok