

Tree damage of unknown origin



No biological factors discovered for damage to tree trunks

The Municipality of Alphen aan den Rijn is committed to developing and maintaining a sustainable, healthy environment. Contributing significantly to this policy are healthy green areas and healthy trees in public spaces.

Currently, trees growing in urban environments in many different countries are suffering from malformations of unknown origin and also appear to be more susceptible to pathogens. At this time, about 35% of all broadleaf trees in public spaces in this municipality's urban regions is affected by these mysterious malformations. Most of these trees are temperate species but some are of Mediterranean origin. Research has shown that one of the contributing factors is the death of cells in the tree's outer layers of cells, but why is this occurring? In any event, the resulting damage is of great concern.

A three-year study into the nature of these phloem nodes, bark striations and bark splitting was conducted by the Wageningen University and Research Centre in the Netherlands. Although these malformations often have their origins in the vicinity of necrotic cells, possible biological causes such as bacteria, viruses, or fungi were not identified. Meanwhile, there is still an urgent need to gain insight into the origins, distribution and severity of the long-term effects of these malformations. What is already obvious, however, is that these trees are displaying cosmetic damage that diminishes their economic value.

It has been postulated that these malformations in the bark are related to the continued increase in electromagnetic fields in the environment or to air pollution. With this in mind, the urgency of this situation with regard to public health and safety as well as economic losses needs to be emphasised.

Representatives from the Wageningen University and Research Centre; the Department of Biotechnology at the Delft University of Technology; TNO Defence, Security and Safety; and the Municipality of Alphen aan den Rijn conducted a pilot study into this problem in 2007 but there is now an urgent need for further research on this topic.

Your support is necessary to ensure that sufficient national and international attention is devoted to this issue.

Municipality of Alphen aan den Rijn

Please let us know if the same problems are occurring in your area by sending an e-mail that includes the species and location of the tree to NvanhetWout@aadr.nl

Descriptions of tree damage of unknown origin

Phloem nodes

During the last three years, many trees have shown an increased development of phloem nodes (small bulbous protrusions on the bark). Despite a three-year study in which the structure and development of phloem nodes were analyzed in detail, the cause has yet to be found. At this time, about 22% of all broadleaf trees in public spaces in the municipality's urban region display these phloem nodes. The study revealed three kinds of phloem nodes, all of which display two similar abnormalities: cell necrosis and growth disturbances.

Bark striations and bark fissures

Bark striations and bark fissures are being found at many trees. Necrosis of the protective layers of dead cells (phellem) at the site of striations is an early sign of injury and prevents normal bark expansion. Once this phellem has disappeared, the tree responds by forming new layers of periderm as fissures develop. With further radial growth, bark fissures become deeper. At this time, about 10% of all broadleaf trees in the municipality's urban environments display bark striations or bark fissures, sometimes in combination with phloem nodes.

Bark degeneration

Bark degeneration develops rapidly in trees in urban regions. The likely cause is the death of cells in the protective outer cell layers of the bark, and the resulting shedding of the periderm. The degeneration of the protective periderm enables lichens, algae and pathogenic bacteria, viruses and fungi to invade the tree trunk. Although no statistics regarding bark degeneration are available at this time, this problem is increasing at a rapid rate. The number of broadleaf trees in the municipality's urban regions that is affected by this phenomenon is estimated to be at least 5%.

Phloem nodes



Name of tree : Ash
Site : Manchester, England

Phloem modes



Name of tree : Plane Tree
Site : The Hague, The Netherlands

Phloem nodes



Name of tree : Holly
Site : Rotterdam, The Netherlands

Phloem nodes



Name of tree : Maple
Site : Nursery in the Netherlands

Phloem nodes



Name of tree : Honey Locust
Site : Rotterdam, The Netherlands

Phloem nodes



Name of tree : Oak
Site : Margraten, The Netherlands

Phloem nodes



Name of tree : Wingnut
Site : Utrecht, The Netherlands

Phloem nodes



Name of tree : Olive
Site : Nursery in the Netherlands

Phloem nodes



Name of tree : Alder
Site : England

Phloem nodes



Name of tree : Apple
Site : Asperen, The Netherlands

Phloem nodes



Name of tree : Tulip Tree
Site : Dieren, The Netherlands

Phloem nodes



Name of tree : Horse Chestnut
Site : Houten, The Netherlands

Bark striations



Name of tree : Sweet Chestnut
Site : Alphen aan den Rijn, The Netherlands

Bark striations



Name of tree : Cherry
Site : The Hague, The Netherlands

Bark striations



Name of tree : Maple
Site : Gulpen, The Netherlands

Bark striations



Name of tree : Ornamental Pear
Site : Alphen aan den Rijn, The Netherlands

Bark striations



Name of tree : Cherry
Site : The Hague, The Netherlands

Bark striations



Name of tree : Common Lime Tree
Site : Alphen aan den Rijn,
The Netherlands

Bark striations



Name of tree : Alder
Site : The Hague, The Netherlands

Bark striations



Name of tree : Plane Tree
Site : Alphen aan den Rijn, The Netherlands

Bark striations



Name of tree : Service Tree
Site : Lopik, The Netherlands

Bark striations



Name of tree : European Hornbeam
Site : Alphen aan den Rijn,
The Netherlands

Bark striations



Name of tree : Birch
Site : Alphen aan den Rijn,
The Netherlands

Bark striations



Name of tree : Manchurian Cherry
Site : Alphen aan den Rijn,
The Netherlands

Bark fissures



Name of tree : Plane Tree
Site : Alphen aan den Rijn, The Netherlands

Bark fissures



Name of tree : Sweet Chestnut Tree
Site : Nursery, The Netherlands

Bark fissures



Name of tree : Elm
Site : Alphen aan den Rijn, The Netherlands

Bark fissures



Name of tree : Plane Tree
Site : Alphen aan den Rijn, The Netherlands

Bark fissures



Name of tree : Maple
Site : Alphen aan den Rijn, The Netherlands

Bark fissures



Name of tree : Ash
Site : Alphen aan den Rijn, The Netherlands

Bark fissures



Name of tree : Ash
Site : Wouw, The Netherlands

Bark fissures



Name of tree : Katsura Tree
Site : Alphen aan den Rijn,
The Netherlands

Bark fissures



Name of tree : Maple
Site : Alphen aan den Rijn,
The Netherlands

Bark fissures



Name of tree : European Hornbeam
Site : Alphen aan den Rijn,
The Netherlands

Bark fissures



Name of tree : Oak
Site : Alphen aan den Rijn,
The Netherlands

Bark fissures



Name of tree : Beech
Site : Leersum, The Netherlands

Bark degeneration



Name of tree : Ash
Site : Houten, The Netherlands

Bark degeneration



Name of tree : Oak
Site : Alphen aan den Rijn, The Netherlands

Bark degeneration



Name of tree : Service Tree
Site : Alphen aan den Rijn, The Netherlands

Bark degeneration



Name of tree : Elm
Site : Alphen aan den Rijn, The Netherlands

Bark degeneration



Name of tree : Mayflower
Site : Alphen aan den Rijn,
The Netherlands

Bark degeneration



Name of tree : Silverbell
Site : Alphen aan den Rijn,
The Netherlands

Bark degeneration



Name of tree : Common Lime Tree
Site : Bleiswijk, The Netherlands

Bark degeneration



Name of tree : Narrowleaf Ash
Site : Alphen aan den Rijn, The Netherlands

Bark degeneration



Name of tree : Ash
Site : Alphen aan den Rijn,
The Netherlands

Bark degeneration



Name of tree : Service Tree
Site : The Hague, The Netherlands

Bark degeneration



Name of tree : Ash
Site : Alphen aan den Rijn,
The Netherlands

Bark degeneration



Name of tree : Dawn Redwood
Site : Ter Aar, The Netherlands

