

## HEALTH STATUS OF FORESTS

Since the early 1980s, deterioration phenomena have been observed in European forests, particularly in Central Europe: defoliation of trees and discolouration of foliage indicate poor forest health, caused by a combination of natural and anthropogenic factors.

### Rising defoliation for deciduous and coniferous trees

Since 1985, the *ICP Forests*<sup>1</sup> monitoring programme has been publishing assessments of the effects of air pollution on European forests, based on parameters such as defoliation (loss of leaves and needles) and discolouration (degradation of the colour of leaves and needles). Wallonia has been participating since 1989 via an annual phytosanitary inventory<sup>2</sup>.

Between 1989 and 2015, deciduous trees suffered gradual degradation, with a significant increase in defoliation in 2009. In 2015, the percentage of inventoried deciduous trees with abnormal defoliation<sup>3</sup> was 40%. With regards to coniferous trees, the large proportions of trees with abnormal defoliation in the early 1990s (important windfall and bark beetles attacks) were probably overestimated. In 1998, a correction was made to the methodology. The percentage of coniferous trees with abnormal defoliation then showed a relative stability around 15% but two successive peaks followed in 2010 (29%) and 2014 (34%) before dropping again to 17% in 2015. For the main species, the average defoliation percentages clearly show an increasing trend despite annual fluctuations.

With regard to discolouration, following a peak of 15% in 2003, the percentage of abnormally discoloured trees<sup>4</sup> has decreased in both deciduous and coniferous trees. Starting in 2008, the rate continued to fall for coniferous trees to as low as 6% in 2015; for deciduous trees on the other hand, the rate rose again and fluctuated between 15-20% between 2012 and 2015.

### Cumulative effect of natural and anthropogenic factors

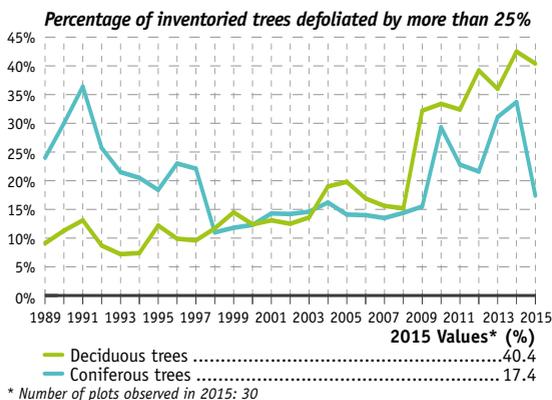
The meteorological conditions (drought, high temperatures, frost and wind), the development of pests (bark beetles in beech or spruce, and defoliating caterpillars in oak) and the intensity of fruiting (this consumes a large part of the tree's resources) explain most of the interannual variations. The underlying problem is mainly attributed to nutritional disturbances due to the natural chemical poverty of many soils. In some cases, these effects are exacerbated by air pollution (ozone<sup>5</sup> and acidifying and eutrophying pollutants<sup>6</sup>).

### Favourable forestry practices

In addition to the fight against air pollution<sup>7</sup>, adapted forestry management measures imposed by the Forestry Code (*Code forestier*) (Decree of 15/07/2008) for public forests must make it possible to mitigate the phenomenon: an adaptation of tree species to local conditions<sup>8</sup> (with emphasis on natural regeneration<sup>9</sup> and the use of local ecotypes), the promotion of mixed and irregular stands<sup>9</sup> that are more resistant to climatic and biological stress, maintenance of forest remains in order to avoid soil depletion.

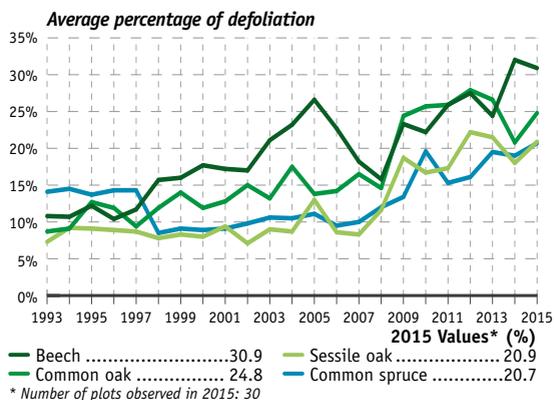
<sup>[1]</sup> <http://icp-forests.net> | <sup>[2]</sup> This network is however disappearing as more and more plots (sampling units) and trees have been exploited. A parallel monitoring is carried out by the Walloon Observatory of Forest Health. → FFH Focus 1 | <sup>[3]</sup> Trees with more than 25% of foliage lost | <sup>[4]</sup> Trees with more than 25% of leaves discoloured | <sup>[5]</sup> → AIR 7 | <sup>[6]</sup> → FFH 4 | <sup>[7]</sup> → AIR Focus 3 | <sup>[8]</sup> Based on the species ecology file and afforestation guide | <sup>[9]</sup> → FFH 3

Fig. FFH 2-1 Defoliation of forest stands in Wallonia (phytosanitary inventory network)



SOERW 2017 – Source: SPW - DG03 - DNF (phytosanitary inventory)

Fig. FFH 2-2 Defoliation of the main forest species in Wallonia (phytosanitary inventory network)



SOERW 2017 – Source: SPW - DG03 - DNF (phytosanitary inventory)