

DENDROCHRONOLOGICAL RECORD OF A TREE RESPONSE TO AIR POLLUTION EFFECT

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Tree rings in their growth process accumulate all information about environmental changes and therefore become the natural monitors. Extraction and application of tree rings information give us an opportunity not only estimate the climatic conditions dynamic in the past, but assess the changeabilities in each forest stand due to air pollution effects on forest.

The dynamics of annual radial increment in *Vaccinio-myrtillus*, *Myrtillus* and *Oxalidoso - myrtillus* type spruce and pine stands growing at a distance of 8-12 and 13-24 km from Jonava "Achema" plant has been ascertained. Variations in annual radial and volume increment due to negative local pollution during 28 years have been estimated.

It was found out, that permanent negative impact of pollutants on pine and spruce stands growing in the vicinity of Jonava "Achema" has emerged in the second five-year period of pollution (1973-1977). The greatest damage on stands was observed in 1977-1981. In this period the greatest deviations of radial increment from the control were noticed (increment losses). This can be explained by constant negative impact of industrial pollutants, which in 1976-1979 was especially heavy and coincided with an extremely unfavourable climatic background. At that time increment in pine stands growing in the zone of intensive pollution comprised only 60-75%, while in spruce stands - 50-70% from the increment in control stands in the same year.

In 1986-1988 increment changes of conifers remained at the level of 1980-1982. In 1989-1995 a tendency of recovery and reduction in increment losses is observed.

An increased proportion of late wood in annual rings of severely damaged conifers was ascertained, as compared to other damage groups and the control.

Average annual (over 28 years of pollution) volume increment losses in 60-year-old pine stands made up $2,66\text{m}^3/\text{ha}$, while in spruce stands of the same age - $3,06\text{m}^3/\text{ha}$.

Studies on pine and spruce crown defoliation as well as on their radial increment correlations have showed that radial increment on the territory of background pollution are inversely proportional to the degree of defoliation: the increment of severely defoliated trees (60-80%) is the least, while the increment of relatively sound and less defoliated trees (0-10% and 20%) is the greatest. With greater age increases the defoliation of trees and its impact on radial increment decrease is more pronounced.