

# Effect of nitrogen fertilisation rates on the content of fatty acids, sterols, tocopherols and phenolic compounds, and on the oxidative stability of walnuts

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## ABSTRACT

The influence of nitrogen (N) fertilisation on the content of lipids and phenolic compounds in walnut kernels (cv. Chandler) has studied for three consecutive growing years. Moreover, a new technique (OXITEST) was set up to analyse the oxidative stability of the kernel directly from the whole sample. Significant differences in the fatty acid composition were observed, and linoleic acid was the main fatty acid present. N fertilisation reduced the oleic acid content relative to the control. High amounts of N increased the linoleic acid content and reduced the linolenic acid content. On the other hand, the control and the lower N fertilised samples had the highest levels of n-3 fatty acids. Comparing control and fertilised samples, there were no statistical differences in the sterol and tocopherol compositions (with the exception of  $\alpha$ -tocopherol). With regard to phenolic content, N fertilisation had a significant negative effect on the phenolic compounds in walnut kernel samples. The OXITEST technique confirmed that the oxidative stability of kernels was related to the fatty acid composition and the PUFA (polyunsaturated fatty acid) content.

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