

# Agricultural and Food Science - abstract



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MUSTONEN, LEO,  
**Yield formation and quality characteristics of early potatoes during a short growing period**

**Keywords** yields, early potato, nitrates, nitrogen fertilizers, cultivars, sugar content,

## Abstract

The effects of nitrogen fertilization on the yield and quality of early potato (*Solanum tuberosum* L.) were studied at MTT Agrifood Research Finland during 1996–1997. Cultures were harvested at three times. The experimental layout was a split-split-plot with harvest times as main plots and nitrogen fertilization and potato cultivars as the subplots. The fertilizer rates were 60 and 120 kg N ha<sup>-1</sup> and the cultivars tested were Timo, Gloria and Van Gogh. The harvest times were 57–62, 70–75 and 85–90 days after planting. Application of nitrogen increased canopy development and increased leaf area of the stands. At early harvest the tuber yield of all cultivars receiving the higher nitrogen application increased by 3.0–6.2 t ha<sup>-1</sup>. The highest yielding cultivar was Timo. At last harvest, the higher nitrogen treatment increased yield by 3.0–6.2 t ha<sup>-1</sup>. The highest yielding cultivars were Timo and Van Gogh. The dry matter content of tubers was very low, 13.8–17.2%, at the first harvest and the higher nitrogen application reduced dry matter content by 0.3–1.0%. The highest fertilizer application resulted in the largest tuber size. Nitrogen application, however, affected the quality of potatoes by decreasing the dry matter content. The nitrate content in tubers increased significantly with increasing level of nitrogen. The range of nitrate content in tubers fluctuated between 13 and 189 mg kg<sup>-1</sup> fresh weight showing good controlling of nitrate values. Harvesting time affected sucrose content and the reducing sugar content in tubers, but nitrogen fertilizer did not change the sugar content of tubers. As tuber yield and quality during a short growing period were affected mainly by intercepted radiation, methods to increase tuber yield should focus on reducing the time to emergence, improving haulm growth after emergence and increasing the leaf area index.

**Contact** [leo.mustonen@mtt.fi](mailto:leo.mustonen@mtt.fi)

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