

[Back](#)

Agricultural and Food Science - abstract



Vol. 16 (2007), No. 4, p. 407-420

SALO, TAPIO, ESKELINEN, JUHA, JAUHIAINEN, LAURI, KARTIO, MIRJA,
Reduced fertiliser use and changes in cereal grain weight, test
weight and protein content in Finland in 1990-2005

Keywords nitrogen, phosphorus, fertiliser use, barley, oat, wheat, rye,
quality, trend,

Abstract

Since 1995 the Finnish Agri-Environmental Program has set limits for nitrogen (N) and phosphorus (P) fertiliser application rates in agriculture. The decrease in N and P fertiliser recommendations, and especially the decrease in N and P amounts applied in practice, has raised the question of whether N and P application rates are too low to produce high quality yields. The test weight, 1000 grain weight and protein concentrations measured in 1990–2005 by the Cereal Inspection Unit of the Finnish Food Safety Authority were analysed against soil type, location and NP fertiliser data. The purpose of this study was to document and statistically analyse changes in fertiliser use, important quality factors and the connection between fertiliser use and grain quality of spring barley (*Hordeum vulgare* L.), oats (*Avena sativa* L.), winter rye (*Secale cereale* L.) as well as spring and winter wheat (*Triticum aestivum* L.). Applications of N and P fertiliser, test weight and 1000 grain weight have decreased in Finland since 1990-1994. Protein content began to decrease in 1995–1999, but then increased in 2000–2005. The statistical analysis showed that reduced N application rates are associated with lower test weight, 1000 grain weight and grain protein concentration. In addition, low P application rates were associated with reduced 1000 grain weight and protein concentration in some instances, although protein concentration also increased in winter wheat grain. The magnitude of grain quality reduction was not solely explicable through N and P application rates. During the observation period many other factors changed in Finnish cereal production and, for example, the decrease in cereal prices, increase of reduced tillage and low investments in drainage and liming could have been associated with decreased grain quality.

Contact tapio.salo@mtt.fi

[[Full text](#)] (PDF 131 kt)

Update 11.3.2008.

Source: MTT's Publications database [Afsf](#)