



High nitrate to ammonium ratio in the fertilizer programme favoured potato yield, quality and grower's net income

In South Africa, potatoes are produced on soils low in pH, clay content and organic matter in the Sandveld and Koue Bokkeveld of the Western Cape. These three factors are contributing to conditions unfavourable for high microbial activity, essential for the nitrification of applied ammonium. High ammonium ratios in fertiliser programmes can lead to cation antagonism, ammonium toxicity and low nitrogen use efficiency, contributing to environmental and economic unsustainability.

A field trial was conducted at Sandberg, planted during July 1999. Nine treatment combinations at four replications were used in each trial. The trial was designed to determine the effect of three ratios of ammonium versus nitrate (80:20, 50:50 and 20:80) at three levels of N (170, 260, 350 kg N/ha), on potato yield and quality. The high nitrate treatments yielded highest and at total N-levels 260 and 350 kg/ha, also were the only treatments reaching a specific gravity (SG) above 1,075 kg/m³, as preferred by the processing industry because the SG is used as an estimate of the solids or dry matter content of the tubers. Best results in terms of grower return were achieved when 80% of the required nitrogen was applied as nitrate. A positive net margin above R8 000 ha⁻¹, was only achieved at N-level 350 kg/ha and a 20:80 ammonium vs nitrate ratio (calculated at a price of R11 per 10 kg).