Negative growth responses have commonly been associated with sole ammonium nutrition in most plant species. The results presented here suggest a lack of nitrate rather than sole ammonium nutrition as causal factor for inhibitory growth, and by extension relative growth rate (RGR). To test this hypothesis, tomato (*Lycopersicon esculentum* Mill.) variety Money Maker was cultured in Hoagland nutrient solution. Plants were grown under 24°C/20°C, 250 to 350 µEm⁻²s⁻¹ light intensity, and 60% relative humidity. Nitrogen treatments consisted of ammonium/nitrate or nitrate/urea mixture. In either nitrate/urea or nitrate/ammonium treatments, nitrate concentrations were: 0, 10, 100 or 200 µM, 1.0, 1.5 or 2.0 mM and the other part was made of ammonium or urea as follows: 2 mM, 1990, 1900, 1800 µM, 1.0, 0.5, 0 mM. Prior to this, a minirhizotron experiment supplied with Arenosol with nitrogen supplied as nitrate or ammonium (stabilized with DIDIN as nitrification inhibitor) was conducted. In minirhizotrons, ammonium-treated plants had low rhizosphere pH with poor root elongation and poor plant growth, while nitrate treatment led to rhizosphere alkalinization and better plant growth. In the nutrient solution, the inhibitory effects observed with sole ammonium were alleviated by addition of nitrate. Similar trends were replicated with urea in terms of RGR and shoot growth. The SPAD (measure of chlorophyll content) increased with nitrate concentration in ammonium/nitrate mixture, but a reversal of this was observed with urea/nitrate mixture. Other than being a nutrient and osmotica, nitrate may be important in promoting growth as a signal molecule, through phytohormonal (cytokinin and abscissic acid) transduction cascade. In present experiment, nitrate concentration within 100-200 µM domain, although apparently low, could already illicit RGR and SPAD reading comparable to 2 mM. This has practical relevance in situation where ammonium is the main source of nitrogen in the market.