



Bacterial community responses to Soil-injected liquid ammonium nutrition and effect of temperature on barley (*Hordeum vulgare* L.) grain yield formation

By Charles Mboya Matoka

Cuvillier Verlag Feb 2008, 2008. Taschenbuch. Book Condition: Neu. 208x144x15 mm. Neuware - Injection of concentrated liquid ammonium nutrition into soil is an agricultural practice aimed at mitigating nitrogen losses. In Germany, it is referred to as controlled uptake long term ammonium nutrition (CULTAN) technique. In many soils, nitrate is mobile because as an anion, it is not bound to negatively charged surfaces of clay minerals or organic soil compounds. In contrast to phosphate, it is not specifically adsorbed. Nitrate fertilization may thus result in leaching and presents a potential environmental hazard. Ammonium ions, on the other hand, may be unspecifically bound to negatively charged surfaces or even fixed in inter-layers of 2:1 clay minerals. Following the injection of concentrated liquid ammonium into soil, ammonium is the predominant N nutrition form suggesting its stability in soil. After 30 days, though ammonium persisted in the soil, its concentration had drastically decreased. Unspecifically bound ammonium may be exchanged and readily oxidized to nitrate by nitrifying bacteria. Bacterial community occurrence within the perceived toxic ammonium injection-zones facilitated transformation of ammonium to nitrate. This resulted into a rapid reduction of ammonium due to microbial as well as crop uptake. Along side the reductions in...



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