

## **Report on a pot experiment to compare the water demand of new spring barley varieties under varying N-fertilization**

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The effect of varying irrigation water supply and at the same time variation in the quantity of N-fertilizer and the kind of N-fertilizer (nitrate, ammonium) was investigated in a pot experiment with four spring barley varieties. Besides the dose of deionised irrigation water, which was given by an automatic watering system, the characters 'yield', 'dry-matter-production per L H<sub>2</sub>O', 'N-content' and 'N-uptake' were compared with regard to grain and straw.

The character 'yield' was predominantly positively affected by increasing doses of irrigation water or N-fertilization. However, the specific productivity of one litre irrigation water was inversely reduced with an increasing application rate. Following high ammonium fertilization in conjunction with a short supply of irrigation water, depressions were found with 'Alexis' and 'Streif' due to severe soil acidification. Altogether, the variety 'Marthe' showed the most favourable grain-to-straw ratio and had even with reduced water supply the best values of productivity and the highest N-uptake in the grain.

A final soil test showed a clear acidifying effect of ammonium fertilization and due to that decreasing amounts of plant-available phosphorus in the soil. Due to high nutrient uptake following increasing N-fertilization, the K-soil-content clearly declined. However, the Mg-soil-content was decreased with nitrate fertilization but increased with ammonium fertilization. A varietal effect on soil nutrient contents could not be found.