Leaf area development and biomass growth of maize with different phosphorus fertilization

Status
Completed

Duration
04.2019 – 12. 2019

Description
The influence of different phosphorus fertilization levels and fertilization placements on the growth of maize plants was investigated in a greenhouse experiment and a field trial. In the greenhouse experiment, both above and below ground biomass growth was strongly restricted by P deficiency. This was manifested, among other things, in a smaller leaf area and fewer leaves per plant. Together with the lower rate of photosynthesis, the reduced assimilation area led to lower dry masses of all plant organs compared to the fertilized plants. In this experiment it could not be conclusively clarified whether the rate of photosynthesis or the assimilation area is more crucial in limiting plant growth. In addition, differences in some parameters were observed between varieties. For example, the variety Ronaldinio, which was described as stress-tolerant, showed smaller differences between the fertilization levels in the leaf area and had higher root dry masses compared to the variety Ricardinio. No clear results could be obtained in the field trial. The plants with placed Phosphorus-fertilization only tended to have a larger leaf area than those with broadly spread Phosphorus-fertilization. Findings from other studies that placed Phosphorus-fertilization increases the yield could therefore not be confirmed. Therefore, further research is needed to check whether differences in plant growth are ultimately reflected in the yield.

Involved persons
Student: Philipp Deppermann

First examiner: Prof. Dr. agr. Simone Graeff-Hönninger

Second examiner: ??

Supervision: Prof. Dr. agr. Simone Graeff-Hönninger, Dr. Sebastian Munz, M.Sc. Filippo A