

How Fertilization Helps to Save Water

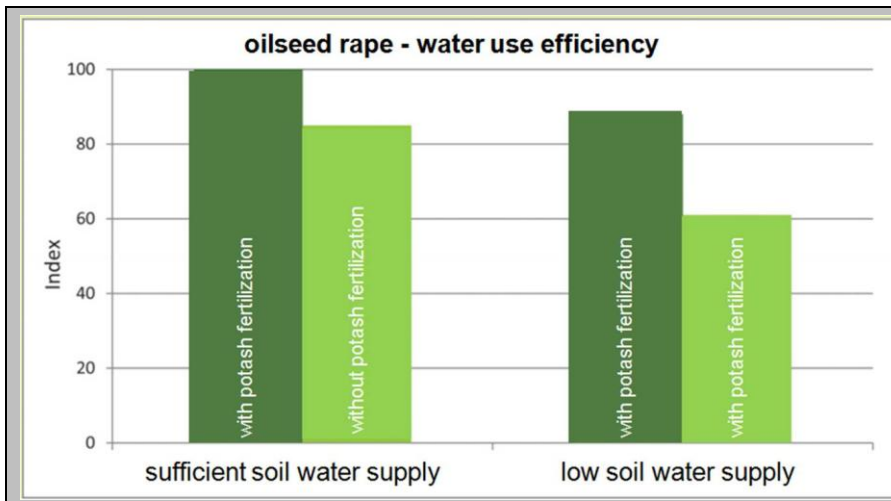
Climate change and global population growth mean that more food has to be produced with fewer resources in the future. Water is one decisive production factor. And: Growing climate oscillation and more frequent periods of aridity and drought will increase water-related conflicts already existing today.

It is not commonly known, however, that potash fertilization according to the demand of crop and soil helps to save water in agriculture, as uptake and transportation of water in plants strongly depend on potash availability.

Potash in particular helps plants to regulate water discharge via their leaves, and when there is a lack of this important nutrient, plants will grow more slowly and they will wilt faster. Water which is available to plants cannot be used to the full extent in case of potash deficiencies, as part of this water will evaporate unproductively instead of being used for plant growth.

The phenomenon was investigated by Justus-Liebig-University, Giessen, Germany, in oilseed rape, with rape yielding 15 % less even with optimum water supply when potash²⁾ was missing. The effect was even stronger under dry conditions.

In 2010, about 5.7 million tons of oilseed rape were harvested on almost 1.5 million hectares³⁾. On this basis, FNL made the following calculation: Without the use of potash fertilizers, the total yield would have been reduced by about 900,000 tons⁴⁾. If farmers tried to compensate for the lack of potash, about 200,000 hectares of additional land would be needed. The theoretical total area of then 1.7 million hectares would need an additional 14 billion hectolitres of water⁵⁾ compared to the present area of 1.5 million hectares with sufficient potash supply.



Source:

Auf den Klimawandel reagieren. André Fritz, Justus-Liebig-Universität Giessen. Pflug & Spaten 2/2010⁶⁾. Figure: FNL

¹⁾ Information based on a press release by ilu in March 2011.

²⁾ See figure.

³⁾ Winter rape: grown on 1,469,500 ha, yield 37 tons/ha, total harvest 5,740,500 tons. Source: Statistisches Bundesamt.

⁴⁾ Calculation FNL. Assumption: In the fiscal year 2010, the average water supply of soils equalled 60 % of max. water storage capacity. Assumed average yield: 33 tons/ha. All yields indicated with a lack of potash just show a tendency with regard to the function of this nutrient but may not be taken as precise forecast!

⁵⁾ Water use estimates refer to average precipitation needed by oilseed rape (assumption: 650 mm/y. Source: Proplanta).

⁶⁾ „Sufficient soil water supply“ refers to a water supply covering 60 % of the max. water storage capacity of the soil, low water supply refers to 30 %. The Index-values refer to the water use efficiency in gram dry matter per litre.