Phenotyping of *Brassica napus* genotypes for resistance to drought

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Rapeseed (*Brassica napus* L.) is one of the most recently domesticated major crop species, and due to intensive breeding has become the most important oilseed crop in Europe concerning production. However, modern varieties are based on a relative small subset of the available genetic diversity. Therefore, the project of the Pre-Breed Yield consortium aims at estimating the genetic diversity present in oilseed rape on the phenotypic and genotypic level as the base for a directed improvement of yield and yield stability.

In this respect drought as one of the most serious production constraints worldwide came into focus in rape seed breeding. In the subproject at JKI respective rapeseed genotypes are evaluated for drought tolerance in rain-out shelter trials and in parallel a high throughput screening system is established. The project contributes to the characterization of genetic resources and their use in breeding programs as well as to adapting crops to the changing climate.

In 2011, the first rain-out shelter trial was conducted and growth chamber experiments for the establishment of a high throughput screening system were started.

53 genotypes were analysed for drought stress reaction by examining six indicator traits. In growth-chamber trials induced osmotic stress conditions were applied with PEG6000 at a concentration of 40% and wilting stress on leaf discs and whole leaves. First results for *relative water content* (RWC) and *chlorophyll content* (CC) point out significant effects (P≥0,001) of induced stress relative to the control treatment. RWC performance decreases significantly under wilting conditions for 24h and differences between genotypes were observed. The analysis of physiological traits like *membrane stability* (MSI) and the accumulation of *proline* and s*oluble sugars* as factors contributing for *osmotic adjustment* under drought stress are in progress. Results of a pre-trial indicate also striking alterations of these traits under induced drought conditions. Based on this, correlations of these traits to the results on agronomic performance obtained in the rain-out shelter trials will be calculated.