

Agriculture and Climate Change- Adapting Crops to Increased Uncertainty (AGRI 2015)

## Investigation of the stress tolerance of winter wheat genotypes under natural rain-fed and irrigated conditions

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### Abstract

Drought around the world is one of the most important yield reducing factor. From the cross of winter wheat varieties (Plainsman V x Mv Magma) doubled haploid (DH) population was created consisting of 174 lines to investigate the drought tolerance of the genotypes exposed to two treatments; natural rain-fed and well-watered conditions in the field.

The object of the experiment was to determine the yield production capacity of the DH lines under natural rain-fed conditions and to compare the effect of changes in the yield components due to irrigation. After ripening, the wheat plants were harvested from both treatments. The plant height, the length of last internode, number of spikelets, seed number, seed weight on the main stem; the number of reproductive tillers, seed number and weight per plant was determined.

The effect of irrigation was investigated on the morphological parameters and yield properties which changed due to well watered conditions in the wheat plants. Averaged over the DH lines, the heading date was significantly affected by irrigation. Irrigation significantly increased all the morphological parameters. Not only the average, but also the minimum and maximum values increased significantly for spikelet number, reproductive tiller number and plant height. Changes in the morphological parameters resulted in significant alterations in the yield components. The irrigation significantly increased the total grain number per plant, the thousand kernel weight and the grain yield averaged over the DH lines.

The results showed that the morphological parameters and yield components can still be some of the most effective features to estimate the tolerance of wheat in response to stress factors. This project was supported by the János Bolyai Research Scholarship of the Hungarian Academy of Sciences and the project DROPS (EU-FP7 No. 244374).

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