Proceedings of the LXV SIGA Annual Congress
Piacenza, 6/9 September, 2022
ISBN: **978-88-944843-3-5**

Poster Communication Abstract – 5.50

INVESTIGATING THE ROLE OF GRF4 IN BARLEY SEED SIZE DETERMINATION

MICA E.*, CROSATTI C.*, GAZZETTI K.*, GUERRA D.*, BATTAGLIA R.*, CATTIVELLI L.*

*) CREA Research centre for Genomics & Bioinformatics

yield, barley, genome editing, miR396, GRF

Growth Regulating Factor 4 (GRF4) is part of a small family of plant specific transcription factors involved in organ growth and elongation. Recent studies in rice and bread wheat highlight the involvement of GRF4 in seed size and weight regulation, but also in nitrogen assimilation and carbon fixation, thus making it an interesting target for breeding purposes.

In the present study, we investigated the role of the homolog of rice GRF4 in barley. This gene is expressed during inflorescence development, with a peak corresponding to the first phases after pollination, then decreasing as kernels develop. As expected, we validated GRF4 as target of miR396 in flowers after pollination. To explore the molecular function of GRF4, we have set up an experimental plan to produce both grf4 mutant lines, generated with a CRISPR/Cas9 approach, and GRF4 over expressing lines.

We have identified three independent lines, over expressing GRF4, producing longer seeds, with an increased seed length ranging from 30% to 50%, whose phenotype was conserved in the progenies. These lines show other pleiotropic phenotypes such as a delayed flowering time and a decreased spike fertility. We are on the process of phenotyping the genome edited mutants, to confirm the role of GRF4 in seed length determination as well as in other aspects of plant growth.

Acknowledgments

This work was supported by Italian Ministry of agriculture through the BIOTECH project.