

The genes involved with the amount of protein in wheat



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Abstract

GPC genes, the genes that determine the amount of protein that the wheat produces. This genes is the main regulator of the genes. This research searched the DEGs in the available count data of research on the count data of GPC genes^[1].

Results

In figure 1 we can see a vulcanoplot with all de DEGs that have been found. The dots represent the DEGs. The red dots however represent the significant DEGs that have been found. These important DEGs, 772, are processed to be filtered to get the most important DEGs. These can be found in figure 2. This figure is a heatmap containing the most import DEGs with a p value < 0.005, and a fold change of >= 1. This heatmap shows that there are 22 genes very important.

Materials & Methods

This research is done on triticum aestivum (wheat). This research is done using the available count data. This data is divided into 2 groups, the wild type, which has 3 samples, and the RNAi GPC group, which has 4 samples. The data that was used is count data of the samples. This data was processed using R. First the data was filtered on having counts of more than 3, meaning every count with a count value lower than 3 was removed. After this filtering the fold change was calculated. The DEGs were found using edgeR with a threshold p value of < 0.05.

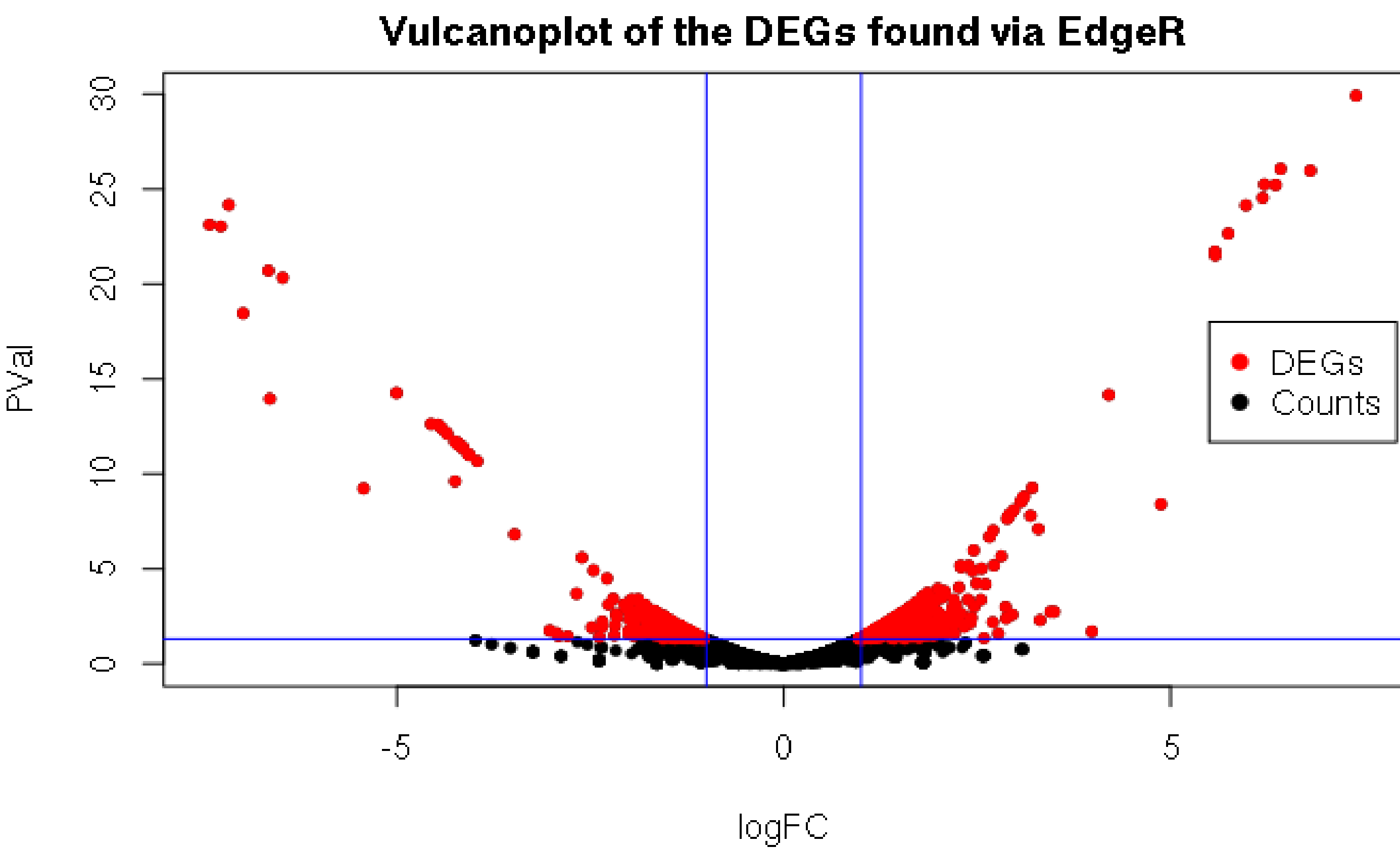


Figure 1: Vulcanoplot of the DEGs found via EdgeR on count data from “the effect of the down regulation of GPC genes on the wheat transcriptome during monocarpic senescence”.

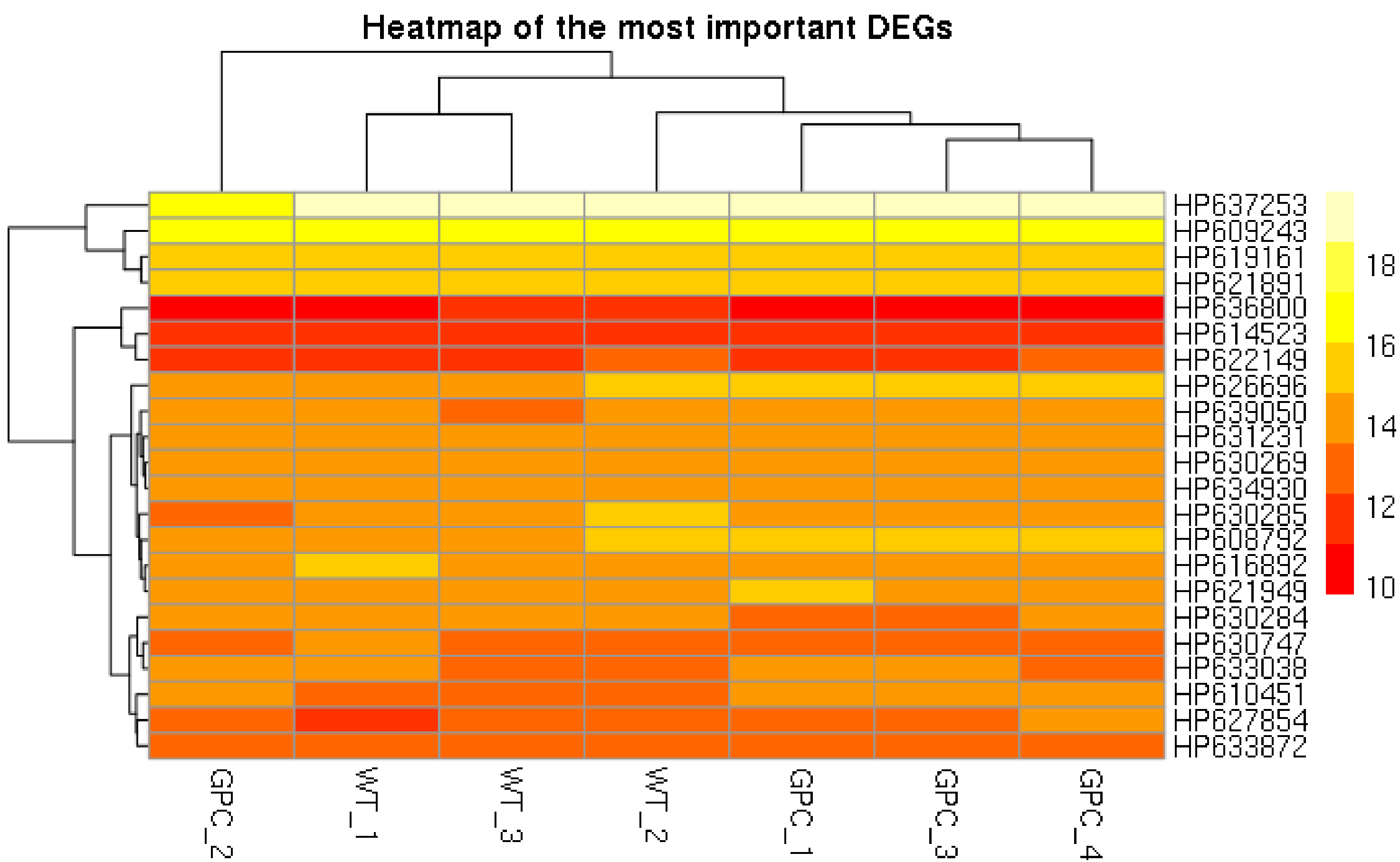


Figure 2: Heatmap of the most important DEGs found in the count data from “the effect of the down regulation of GPC genes on the wheat transcriptome during monocarpic senescence”. Filtered with a P value <= 0.005 and a FC of >= 1

Conclusion

The results give a clear image of the result of RNAi research to the GPC genes in wheat, the DEGs found in the wheat transcriptome are regulated by the GPC genes. This conclusion can be used to find a use of promoting this genes to give a higher protein content in the wheat. This higher protein content gives a higher quality of wheat that is used to make bread. After all, we need to increase our crop quality to feed the world.

References

GEO dataset number: GSE25759
^[1] Effect of the down-regulation of the high Grain Protein Content (GPC) genes on the wheat transcriptome during monocarpic senescence:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3209470/>

