

DIFFERENT LEVELS OF FERTILIZERS' AND FORECROPS' EFFECT ON WINTER WHEATS' RHEOLOGICAL PROPERTIES

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Wheat is one of the most important cereal crops in Hungary, which quality characteristics are affected by many factors. During our experiments in 2017/2018 crop year at Látókép Experimental Farm of University of Debrecen we studied the effect of different forecrops (sweet corn, sunflower) and increased dosages of artificial fertilizers (control, N₉₀+PK, N₁₅₀+PK) on GK Öthalom and Mv Ispán winter wheat genotypes. Wheat's real quality value is expressed during processing, that can be predicted by examining samples with different rheological measurements, like valorigraph, alveograph and promylograph. Using these techniques kneading properties, water absorption, dough's flexibility and strength can be examined.

The main parameters were between 22.73-54.81 (valorigraphic quality number, VQN), 107.80-312.73 (alveographic W) and 31.50-83.25 (promylographic energy), which reflects well the unfavourable year effect of the 2017/2018 growing season. Both levels of artificial fertilizers significantly improved valorigraphic water absorption (WA), VQN and dough-stability (DST), moreover alveographic L and W value. Beside these results, fertilizers increased significantly the valorigraphic dough-development time (DDT); alveographic P/L; promylographic ductility, maximum resistance and energy comparing to the control samples. Applying artificial fertilizers valorigraphic mixing-tolerance (DMT) and dough softening (DS) values were decreased significantly comparing to the control ones. Sweet corn as a forecrop had significantly favourable effect on VQN, DDT, DST, DS and DMT; promylographic ductility; alveographic L value comparing to sunflower. Studying the cultivar effects, that can be stated Mv Ispán had significantly better WA, VQN, DS and DMT value; promylographic ductility resistance, maximum resistance, energy and rate; alveographic P, W and P/L value. Fertilizing x forecrop interaction affected in a significant way the DMT and P/L value. In addition, fertilizing x cultivar interaction had significant effect on alveographic L, promylographic ductility and ratio. Using Pearson's correlation analysis results, fertilizer dosages were in strong positive correlation with VQN and DDT; alveographic L and W. The alveographic W was in strong positive correlation with promylographic energy

($r=0,842^{**}$) and DST ($r=0,863^{**}$), while the L was in medium positive correlation with promylographic ductility ($r=0,744^{**}$).

Summarizing our results, the wheat flour's rheological parameters are significantly affected by fertilizing doses, forecrop and cultivar. In the case of growing wheat for baking use, there is a need to put great emphasis on selecting the right cultivars and agrotechnology practices.