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RELATIONSHIP BETWEEN WHEAT GLUTEN COLOR AND WHEAT QUALITY: PRELIMINARILY RESULTS

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Embrapa Wheat; Embrapa Wheat; Embrapa Wheat; Embrapa Wheat; Embrapa Wheat; Embrapa Wheat;

Wheat genotypes in breeding programs are subjected to an array of quality tests. However, the desirable quality depends on the wheat end-use. In general, for wheat quality evaluation, most of the equipment is expensive, a large amount of sample is used and usually are time-consuming procedures. Wheat quality determination is essential in breeding programs, so any method able to use a small amount of sample, in a simple way, will be of a great use. The objective of this study was to investigate the relationship between wheat gluten color and other wheat quality parameters, aiming to verify the possibility to use gluten color analysis as an indicator of wheat quality, especially for genotype selection. Forty wheat cultivars with different quality characteristics were experimentally milled. Official methods for wheat quality evaluation were used, employing colorimeter (CIEL*a*b* system), glutomatic, alveograph, farinograph and grain hardness equipment. Samples showed significant differences among each other, especially samples with high (clearer) and low (darker) gluten brightness (L^*) corresponding to wheat cultivars with weak and strong gluten strength, respectively. The results oscillated in a wide range of values for all parameters evaluated: experimental milling (55-71%); brightness flour, L^* (91.03-95.38), flour a^* value (-0.83-0.39), and flour b^* value (5.01-10.2); gluten index (49-100), wet gluten (20-40%), and dry gluten (6-13%); gluten L^* (56.97-82.05), gluten a^* value (-0.39-4.50), and gluten b^* value (17-29); deformation energy, W (124-467x10⁻⁴J), tenacity/extensibility ratio (0.38-2.53), and elasticity index, le (0-77%); grain hardness, GH (23-89); water absorption, WA (49-63 %), dough development time (2-22min), stability time (3-25min), and mixing tolerance index (11-84FU). Wheat gluten L^* was positively correlated with le ($r=0.63$) indicating that the stronger the cultivar is ($>le$), the clearer the gluten color is. Flour and gluten b^* values were positively correlated with GH ($r=0.95$ and 0.80 , respectively) suggesting that yellow flour and gluten were obtained from wheat with stronger texture. These results suggest that gluten color analysis can be used as a good quality indicator and that it is possible to use this parameter to determine wheat quality in a first moment. Besides that, gluten analysis could also be officially performed by manual method, and colorimeter is one of the cheapest equipment used for wheat quality evaluation.