

Study of relationship among several bread making quality assessment indices in hexaploid wheat (*Triticum aestivum* L.) using correlation analysis

G. Najafian

Cereal Chemistry and Tech. Unit, Cereal Research Dept., Seed and Plant Improvement Institute (SPII), Karaj, Iran

Grain quality is an important factor in wheat production and marketing. There are several quality assessment indices which are used by breeders, millers and other industrial sectors to determine the quality of wheat samples. This study was performed in order to compare those assessment criteria and introduce the most descriptive and representative quality index. Generated quality data of 896 bread wheat genotypes evaluated during different successive seasons (7 years) were used to calculate 11 bread making quality indices: thousand kernel weight (TKW), sun pest damage (SD), grain protein content (GP), Zeleny sedimentation volume (ZSV), bread volume (BV), moisture content (MC), grain hardness (GH), flour water absorption (FWA), wet gluten content (WG), gluten index (GI), SDS sedimentation height (SDS). Descriptive statistics for those traits and Pearson correlation coefficients among them were calculated. The indices showing the greatest variation were BV and GI. TKW was negatively correlated to GP, ZSV, BV, FWA and WG. SD was negatively correlated to GP, ZSV, MC, GH, GI and SDS, showing its destructive effect on grain quality, since those key indices were reduced when SD increased. PC was positively correlated to ZSV, BV, MC, GH, FWA, WG, GI and SDS. Since the maximum amounts of almost all those indices favoured good quality, PC should be one of the major quality criteria. ZSV was also positively correlated to MC, GH, FWA, WG and SDS. BV was also

positively correlated to MC, GH, FWA, WG and SDS and negatively to GI. MC was positively correlated to GH, WG and SDS as well. GH showed a positive correlation to FWA, WG and SDS. FWA was positively correlated to WG and SDS. WG was positively correlated to GI and SDS. Finally GI was positively correlated to SDS. Among the evaluated indices PC, ZSV, SDS and GI are more informative. ZSV closely follows PC, therefore it could be replaced with PC. SDS is more informative in comparison to GI and since both are showing gluten strength, SDS is suggested to be used practically. GI varies greatly and is affected by SD. GH is a key factor in determining wheat sample class and should always be measured. Considering all relationships and information extracted by using of those indices, protein content, SDS-sedimentation height and grain hardness were found to be the best and most practical indices in assessment of bread wheat grain quality.

Keywords

bread making quality; hexaploid wheat; SDS sedimentation; gluten index; protein content.

References

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