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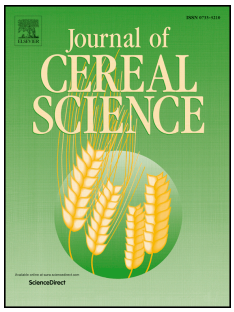

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Defining associations between grain yield and protein quantity and quality in wheat from the three primary production regions of South Africa

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ABSTRACT

Grain yield and baking quality are the primary selection parameters in wheat improvement. Often breeding programs are faced with conflicting interests as grain yield and grain protein content are generally negatively associated. The objectives of this study were firstly to determine associations between grain yield and flour and grain protein content, and loaf volume of cultivars from the irrigation region, rainfed summer rainfall region and rainfed winter rainfall region in South Africa,. The second and primary objective was to determine associations between grain yields of the cultivars, classed into high, medium and low grain yield, with soluble and insoluble polymeric and monomeric protein fractions. Cultivars were tested at two locations and two seasons for each production region. Environment had a large influence on yield and quality characteristics. Few negative correlations were identified between grain yield and flour and grain protein content with the only significant negative correlation occurring in the lowest yielding group of the irrigation cultivars. Grain yield and loaf volume were highly significantly correlated in the high yielding cultivar group of the rainfed summer rainfall region. Correlations between grain yield and soluble and insoluble

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