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Durum wheat (Triticum turgidum spp. durum, cultivar Senatore Cappelli) production systems effects on grain and flours functional properties under Mediterranean conditions

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The main goal of organic farming is the "production of high quality products". Integrity and vital quality of products should be preserved along the entire production chain. In order to evaluate the effect of organic vs. conventional production systems on durum wheat phenolic acids and antioxidant activity open field experiment has been carried out. During the whole process chain from field to fork, there are various factors influencing the quality of the end product. Organic production should rely on genotypes with high nitrogen use efficiency, disease and pest resistance, weed competitiveness and tolerance especially under Mediterranean conditions. In this study, production systems differed according to the practices and inputs applied to manage the soil fertility and plant protection. In conventional system, synthetic fertilizers and pesticides were used. Whereas, in the two organic systems, cow manure with fertilizers and temporary intercropping with fava bean (Vicia faba) and fertilizers were used to manage soil fertility. Biopesticides were used for plant protection for organic systems. One treatment without inputs was used as a control in order to evaluate environmental site and cultivar effect. Quantity of free, free and conjugated and bounded phenolic acids were evaluated in relation to overall quality and production systems. In addition, antioxidant capacities of each fraction by different assays were assessed. The organic production method assured higher overall quality in paricular functional properties compared to the conventional one. Therefore, understanding the functional links between production systems variables and physiological responses is essential to improve and standardize the quality of organic durum wheat products.

Keywords: organic farming, soil fertility management, phenolic acids, antioxidant activity.