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Integrated wheat production - traceability and manufacturing quality

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Grain production chains are increasingly moving towards product differentiation and market segmentation. More specifically, agricultural products require either some form of segregation or full-scale identity to keep them apart from commodities. In the wheat products chains, commercialization of differentiated products favors certification, considering that homogeneous lots can be supplied in accordance to specific requirements. Wheat grain lots can be segregated according to class of cultivars, harvest conditions or parameters related to technological quality. Integrated production (IP) involves adoption of best agronomic management practices aiming to more sustainable farming, improved manufacturing quality, safer products, and economic viability. IP protocols comprise: recommendations about best agricultural management practices, proper post-harvest management, an agrochemical safer products list, field and post-harvest records. These make up check-lists for evaluation of conformity to certification awards. Aiming at contributing to the competitiveness of the Brazilian wheat production, Embrapa Trigo jointly with other institutions is working to validate guidelines for integrated wheat production (IWP). A validation study involving the following stages is underway: 1) protocol implementation at two pilot units, namely Cooperativa Integrada, situated in Londrina, state of Paraná and Cotrijal, located in Não-Me-Toque, state of Rio Grande do Sul; 2) segregation of wheat lots in accordance to manufacturing technological quality; and 3) development of a traceability system for wheat lots. IWP norms derived from previous knowledgement, including field and post-harvest steps. Field recommendations include improved cropping practices, integrated pest management, harvest, and transport. Post-harvest recommendations were described as cleaning, drying and pest management. In addition, there are general objectives focusing on building management skills, conservation of natural resources, labor rights, and other legal aspects of traceability and certification. The cultivars grown in a wheat-producing region were previously selected, in order to get more homogeneous lots. The quality and safety of wheat grain lots were monitored by means of lab analysis to determine manufacturing technological parameters and presence of mycotoxins. Information regarding management were collected in the field and at post-harvest records, and were stored in a database. An interface was built to retrieve information from this database, enabling access to a full description of product characteristics. In the 2007 season, the IWP study involved 105 growers, a total 2,101 ha, and a harvested amount of seven thousand tons. The lots were segregated according to the following characteristics: one cultivar, "BRS 220", of the Bread Wheat Class, that produces yellow flour for pasta production; and the cultivar "Fundacep Raízes", also of the Bread Wheat Class, with white flour for bread manufacturing. Lab analyses confirmed that flour color and gluten strength met the standards of the Bread Wheat Class. In one production region, environmental conditions favored decrease production and contamination by mycotoxins. The levels of contamination exceeded the limits allowed for human consumption, according to European regulations, for deoxynivalenol (1,335.10 $\mu g\ kg^{-1}$), and zearalenone (143.00 $\mu g\ kg^{-1}$). So far, the main benefits of the project were liquidity and extra price paid for segregated wheat lots. Concerning the milling process, there were better yield and flour quality, therefore providing more opportunities for sales and increasing the market share of the companies involved in the study.