Soft wheat genotypes with acceptable biscuit functionality are classified within the “básico” wheat class, according to the Brazilian Department of Agriculture resolutions. Although the biscuit flour constitutes only 11% of the Brazilian wheat flour market, it is an expanding market, mainly due to the consistent growth of biscuits sales. The objective of this study was to identify soft wheat cultivars with improved manufacturing quality for the biscuit and cracker industry. A database was compiled originally with 76 entries with field and milling quality lab parameters from the year 2008 to 2010 crop seasons. The solvent retention capacity test (SRC, AACC 56-11) was used to evaluate functionality for end use applications and to select wheat cultivars for production of flour for biscuit and cracker manufacturing, along with alveograph, gluten and farinograph analysis. The cultivars BRS UMBU, CAMPEIRO, CD 105, CD 115 and CD 120 were classified as “básico” wheat class. Differences in solvent retention capacity were observed among wheat classes. For the sucrose SRC, the “básico” cultivars had an average value of 98.9, while the “pão” had 108.7 and “melhorador” had 109.0, indicating that flour of soft “básico” were more adequate for the biscuit industry. Significant positive correlations between SRC and wheat milling quality parameters were observed in these years: SRC water and alveograph tenacity (0.67), SRC water and farinograph water absorption (0.75) and SRC latic acid and farinograph stability (0.61). Soft wheat genotypes with adequate biscuit functionality were identified and these cultivars are available for the Brazilian wheat growers.