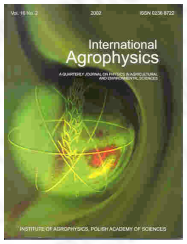
International Agrophysics
Polish Journal of Soil Science
Acta Agrophysica
Instytut Agrofizyki

International Agrophysics
General information
Issues
Search



International Agrophysics
publisher: Institute of Agrophysics
Polish Academy of Sciences
Lublin, Poland
ISSN: 0236-8722

vol. 22, nr. 3 (2008)

previous paper back to paper's list next paper

Particle size characterization using fraunhoffer diffraction and milling performance of maize

(get PDF)

Le Deschault de Monredon F.[1], Chaurand M.[1]

[1] Institut National de la Recherche Agronomique, I.N.R.A., BP 1627,44316 Nantes Cedex 03, France

[2] Institut National de la Recherche Agronomique, I.N.R.A., 2 place Viala, 34060 Montpellier Cedex 01, France

vol. 11 (1997), nr. 4, pp. 257-264

abstract Twenty-six samples of hybrid maizes (ROSSO flint maize, VOLGA dent maize, DEA and MONARQUE flint-dent maizes) were dry-milled and separated into fractions. The milling yield was determined. Particle size was measured by mechanical sieving for grits, and by laser diffraction for coarse and fine semolina and flours. Bimodal particle size distributions of fine semolina and flours were analyzed as a function of mode size and proportion. Despite inherent variations in culture conditions, differences were apparent between VOLGA and the three other hybrids. The principal mode was characteristic of the fraction considered, without clear varietal differentiation. Analysis of the secondary mode of fine semolina and flours showed that it was principally due to particles similar in size to starch granules (14 to 17/*m), VOLGA particles being smaller than the others. The relative "weight" of the secondary mode was greater with VOLGA than with the three other maize types. The small differences observed between DEA and the ROSSO and MONARQUE hybrids were not significant. A technological behaviour index is proposed: the calculated quantity (g) of very fine particles constituting the secondary modes of fine semolina and flours (per 1 g of ground maize). This index is inversely correlated with the yield of grits (r=0.913 for the 26 samples), and may therefore prove useful in the cultivation and processing of maize.

keywords maize, varietal selection, milling, fractionation, particle size distribution