Poster Abstract – B.08

QUALITY ASSESSMENT OF SICILIAN DURUM WHEAT STORAGE CENTERS : EVALUATION OF VITREOUS, STARCHY AND SHRUNKEN KERNELS USING AN IMAGE ANALYSIS SYSTEM

VENORA G., GRILLO O., SACCONE R.

Stazione Sperimentale di Granicoltura per la Sicilia, Via Bouganvillea 20, 95041 Caltagirone (Italy)

vitreousness, shrunken kernels, image analysis, quality, Triticum durum

The proportion of vitreous kernels in a sample is an internationally recognized specification determining the value of durum wheat (*Triticum durum* Desf.). Vitreous kernels are mostly related to protein content, that affects the cooking quality of pasta. Vitreousness and amount of shrunken kernels are visually assessed during the grading process. It is subjective and tedious.

A machine vision system was developed to determine percentage of vitreous, starchy, piebald and shrunken kernels in a approximately 100 seed samples, using a trans-illuminated image of one layer of not singulated kernels (in bulk) acquired by a digital camera. Classification models were developed with stepwise Linear Discriminant Analysis, as well as an on-line Bayesian classifier integrated with image analysis system. The overall correct classification in Starchy classifier was high (around 98 %) in the Training set, realised choosing 6500 seeds, following the Linear Discriminant Analysis classification, of 30 Italian cultivars harvested in 2005 in three localities. An independent Test set was constituted by samples collected in 30 Sicilian Storage Centers in the 2007 harvest season, overall classification was 96 %. For Shrunken classifier the 95.27% of Training set and 99.58 % of Test set was correctly classified. The image analysis system were more reliable than inspectors who validated the system, both for the same samples measured many times and in different moments.

References:

Symons, S.J., Schepdael L. Van, Dexter, J.E., 2003. Measurement of hard vitreous kernels in durum wheat by machine vision. Cereal Chemistry 80(5), 511-517.

Venora G., Grillo O., Shahin M.A., Symons S.J., 2007a. Identification of Sicilian landraces and Canadian cultivars of lentil using image analysis system. Food Research International 40, 161-166.

Venora G., Grillo O., Ravalli C., Cremonini R., 2007b. Tuscany beans landraces, on-line identification from seeds inspection by image analysis and Linear Discriminant Analysis. Agrochimica, LI(4-5), 254-268.