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20.9 POTENTIAL OF THE HYPERSPECTRAL IMAGING TO DETERMINE DOCKAGE AND FOREIGN MATERIALS IN GRAIN

Chiara Cevoli, Angelo Fabbri, Giovanni Molari

Department of Agricultural and Food Sciences (DISTAL) – Bologna University
Corresponding author:chiara.cevoli3@unibo.it

The amount of material other than grain is an important quality parameter in grain products. High quality means supply the grains without damage (healthy grain) by insects or fungi but also without undesirable contaminants including foreign materials and dockage.

Dockage is any material mixed with wheat which can be removed using specified cleaning units, and foreign material is anything that is not wheat and that remained in the wheat after the removal of dockage using proper cleaning procedures.

In recent years, hyperspectral imaging has proven to be effective in grain quality inspection. The aim of this study was to evaluate the potential of the application of the hyperspectral imaging (400-1000 nm) to determine the foreign materials and dockage (stones, chaff, insect, broken kernels and insect-damaged kernel) in three type of grain: corn, wheat and millet seeds. A specific set-up was developed and the solar illumination (lighting source) was used.

The work was divided in two steps: i) definition of the contaminate spectra; ii) on the base of the spectra identified in the previous step, the different foreign materials and dockage were discriminated in mixture of grains and contaminates. Different classification algorithms were tested and the best classifications were obtained by using the vector angle classification or absolute difference methods.

Proposal for poster.