Poster Abstract – A.26

TUSCANY BEANS LANDRACES, ON-LINE IDENTIFICATION FROM SEEDS INSPECTIONS BY IMAGE ANALYSIS AND LINEAR DISCRIMINANT ANALYSIS

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Biodiversity has contributed in many ways to the development of human culture and the protection of biodiversity is one of the most important targets for the humanity. Therefore it is important to safeguard and to exploit agricultural biodiversity in order to produce and sell peculiar products for high and characteristic quality which are property of specific regions of a country. The long tradition of *Phaseolus* coltivation in Italy has permitted the evolution of many landraces which are adapted to microclimates in restricted growing areas and these landraces warrant a good production. Therefore a matter of primary importance his to evaluate, characterize and protect the native germplasm and in this connection it is necessary to find different parameters as morphological and molecular in order to get a "market card" for landraces bean.

The first step must be seed identification and it is important to implement repeatable and quick automated method to identify and classify seeds. The determination, by an image analysis system, of parameters as size, shape, colour and texture of seeds represent a non-destructive method to differentiate landraces. In this case, the mechanic vision field, for instance, image analysis algorithms implemented by classification statistical methods, is useful for automatic seed identification since artificial vision system is more accurate and efficient in measuring the seed parameters than inspectors with high experience.

We have realised a macro Bean-mcr to determine parameters referring both colour and size of entire seeds and peculiar spots in beans using an image analysis library KS-400 V 3.0 (C. Zeiss, Germany).

The parameters measured in this way, 26 quantitative variables, allowed to realize a statistic classifier, able to discriminate 100% samples of training set and 98.92% of test set that is eleven different Tuscany bean landraces.