Image analysis to calibrate French Bean (Phaseolus vulgaris L.) pods

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Résumé en anglais	Bean pod caliber is an important breeding criterion in the development of new French bean cultivars. Grading is manually performed with workers passing pods through a sieve with holes of different diameters. Each hole corresponds to a grade. Then, pods are weighed and a grade is given based on weight. This size grading is very tedious. Moreover, there is an inter- and intra-variability between workers, and the number of characteristics measured is limited. A new automatic method based on image analysis has been performed. It permits in a limited time, to extract and calculate different pod characteristics such as length, diameter and curvature. It offers the possibility to store images that could be helpful for traceability, and requires less labour than the current manual system. A correlation between the surface of pods and weight has been found, allowing the program to directly separate into grades based on weight. An acquisition chain has been installed and an image analysis program has been developed to calculate the different characteristics. The validation of the program has been performed on more than 150 batches of different cultivars of French and butter bean pods during 2008 and 2009. In this paper, the image analysis system is described. Results obtained with the new system are explained and compared to the manual system.
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