Automatic Rice classification and grading using image processing

DESIGNED & DEVELOPED AT
CSIR-CSIO
SECTOR 30, CHANDIGARH

Rice Certification Requirements & Current Status

- *National Supply Chain for 'Grade-A and Common Rice':*
  - *Procuring Agencies: FCI and State level Food Departments*
  - *Co-operative supply & Marketing Agencies: Markfed, Hafed*
  - *Rice Sellers / 'Mandi's*

- *Export requirements seek **absolute rice dimensions** and accumulative stringent percentages of broken and undesirable items.*
- *Basmati Rice for Export/Consumers in India: Limited certifying requirement, met by internationally certified companies such as SGS India and Geo Chem India.*
- *The sorting machines work at seller's premises for 100% inspection.*
- *CSIR-CSIO's system is a **sample based imaging system** for buyers as well as sellers. It presently meets export/superior quality requirement by including moisture test.*
- *National requirements seek percentages of sound, damaged and other defined refractions of rice*
- *National testing requirements are met by 'Grain Labs' associated at each level, that conduct tests manually and visually as per BIS standards*
- *FCI/Co-operative agencies have sophisticated testing Labs at numerous locations throughout the country*

CSIR-CSIO's Approach and Features

- *Calibration of the scanner output using standard colour strips*
- *Rice grain analysis of its shape, size and colour in RGB & HSI space*
- *Grain-wise measurements and histogram*
- *Rule and Neural networks based classification*
- *Output in percentage by weight of sound grains and other defined refractions like damaged, broken, discoloured, chalky, foreign matter etc.*
- *Images and database of various varieties*
- *Storage of knowledge from BIS Standards*
- *Remote sample image submission through internet and obtaining certified analysis reports*

Rice Classification System

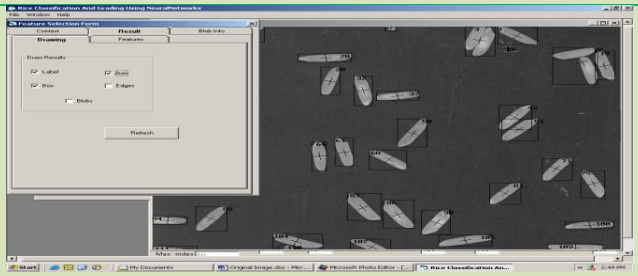
Method of sampling of food grains as communicated by Govt. of India vide letter No. 8-6-2005-S&I dated 1.9.2005

Particulars	(Common & Grade-A)
Analysis	BIS No. IS : 4333 (Part-I &II) 1967 and terminology for food grains IS : 2813-1995 as amended from time to time.
Sampling	BIS No. IS:14818-2000

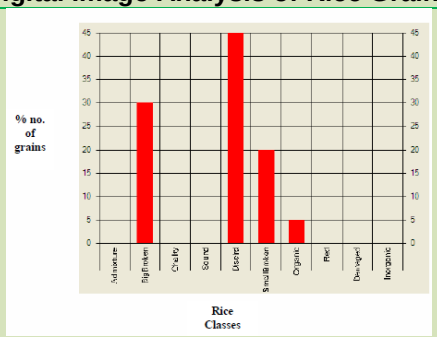
Image Acquisition of Rice Grains

Social Impact of this technology

- Manual tests (as per BIS No. IS : 4333-1967 and IS:2813-1995 terminology for food grains) take more than 30 minutes of manual labour. The developed system does it in few seconds.
- Manual tests are time consuming, hence do not allow sufficient 'repetition' of tests, thus leading to unreliable reporting.
- Cost to the user is low as the system utilizes a standard office scanner and computer. There may only be some licensing fee.
- Can be customized to suit testing for export requirements as well as for domestic supply as per BIS standards and existing governmental regulations.
- Will lead to increased transparency in the testing procedure among various public and private agencies.
- Server-based system with complete 'knowledge and data', can test images sent over the internet, thus enabling a national '*uniform procurement specifications and uniform testing*'.
- A national testing platform will enable all prospective users from the entire country to test their rice samples more frequently as per their requirement and obtain uniform certified reports.



Digital Image Analysis of Rice Grains



Rice grain grading results in graphical format

Please Contact for Your Requirements:

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