Technological and visual characteristics of rye grain.

Luzev V.S, Ustinova L.V., Meleshkina L.E., Vajtanis M.A., Golik A.B., Garsh Z.E.

The Altai State Technical University. Grain Storage and Processing Department
Russia, Barnaul

Statement of a question

There was an object in view to lead the comparative analysis of technological and visually determined features of seven rye brands that were obtained from Germany (Ascari, Rasant, Fernando, Picasso, Recrut, Walet) and two brands from Altai territory. Following technological characteristics were defined: number of falling, density of grain, weight of 1000 grains. From visual characteristics were defined: grains distribution on length and width, reflective ability in RGB channels.

Methods

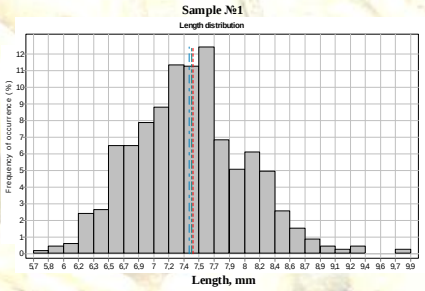
Visual features were measured by means on the image analysis system developed by authors. This system represents the hardware-software complex consisted of a personal computer, a flatbed scanner and a color printer. The complex allows to define visual characteristics of grain and products of its processing. The technique of the image analysis represents some predetermined sequence of actions (image preprocessing; image thresholding, segmentation and objects detection; extraction of the color and morphological features namely length, width, perimeter, area and shape factors; objects classification), finally resulting in reception of quantitative image characteristics that may be used for visual grain quality assessment.

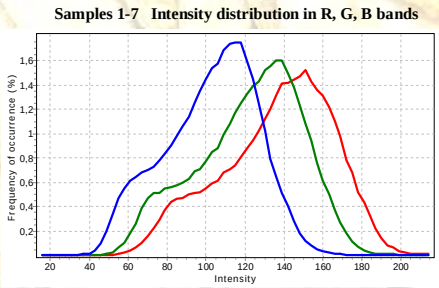
Number of falling measured with PCHP-3 device. The PCHP-3 principle of action is based on Hagberg-Perten measurement of "Falling Number" method (international standards ICC 107, ISO 3093-82 and ГОСТ 27676-88).

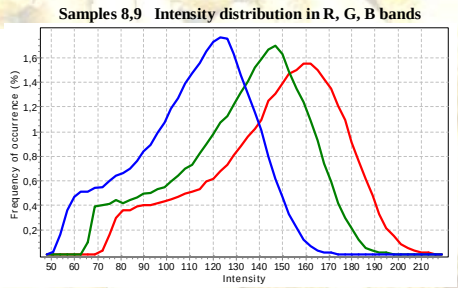
Results

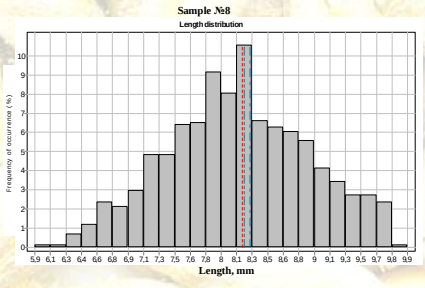
The final table of results

N	Sample	Length, mm	Width, mm	R mean intensity, units of the scanner	G mean intensity, units of the scanner	B mean intensity, units of the scanner	Fallig Number, s	Weight of 1000 grains, g	Density, g/sm^3
1	Ascari	7,5	3	136	122	103	103	27,8	1,394
2	Rasant	7,8	3,1	136	123	104	97	32	1,369
3	Fernando	7,8	3,1	178	124	104	99	32,3	1,299
4	Picasso	7,9	3,1	136	123	104	83	31,6	1,323
5	Recrut	7,9	3,1	135	123	104	94	31,7	1,347
6	Walet	7,9	3,1	133	126	107	80	32,1	1,42
7	No data	7,7	3,2	136	122	102	164	31,4	1,387
8	Ordinary of Altai 1	8,2	3,1	145	131	110	113	29,4	1,406
9	Ordinary of Altai 2	8,2	3,1	146	132	111	86	28,2	1,357









Resume

In the Russian samples heterogeneity of color from cream up to dark brown with a greenish shade is revealed.

Activity of enzymes of the grain which have been grown up in Germany and in Altai territory equally high, that is reflected by low size of number of falling in the investigated samples.

Under dimensional characteristics and density the investigated samples essentially do not differ, distinctions are observed only in weight of thousand grains in favour of Germany on 1-2 grams.

References

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The contact information: Russia, Altai territory, Barnaul, pr. Lenin, 46. Ph. (385-2) 26-04-51, 36-84-76