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# Breeding for Rice Grain Quality in Egypt

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Grain quality characteristics are considered to be one of the most important objectives of the rice breeding programme in Egypt. Breeding for grain quality aims to meet the demands of the local consumer as well as those of some foreign markets. Recently a grain quality laboratory has been established at the Rice Research & Training Centre (RRTC), Sakha, Kafr El-Sheikh, to evaluate the breeding materials for most of the quality characters. These characters are: grain appearance (grain shape and translucency), milling characters (hulling, milling and head rice percentages), and cooking and eating characteristics (kernel elongation, gelatinization temperature, gel consistency and amylose content).

## I – Demands of grain quality characters for the local market

- ❑ The Egyptian consumers prefer short and translucent grains, high kernel expansion, soft gel consistency and low to medium amylose content;
- ❑ The Egyptian millers prefer high milling outturn and a low breakage percentage.

## II – Steps for the selection for grain quality characters

Breeding materials included in the pedigree nursery and yield trials are exposed to selection for grain quality characters as follows:

- ❑ F3 generation: grain shape and appearance;
- ❑ F4 generation: grain shape and appearance for the selected plants and all characters for the selected lines;
- ❑ F5-n generation: all characters for the selected lines;
- ❑ Yield trials: all characters.

## III – Grain quality characters of the promising lines

Grain quality characters of the entries in final and regional yield trials are presented in *Tables 1 and 2* respectively. The tables show that most of the entries are processing acceptable grain quality characters, so for hulling (80%), milling (70%), gel consistency (80 mm), and amylose content (18%) are concerned.

Among the entries of the final yield trial (1993) only Giza 175 and IR 25571-31-1 are possessing unacceptable grain quality characters such as low gel consistency (30-40 mm) and high amylose content (29%).

**Table 1. Grain quality characters of entries in the final yield trial, Sakha (1993).**

N°	Variety/Strain	Grain type	Hulling (%)	Milling (%)	Gel consistency (%)	Amylose content (%)
1	Giza 171	Short	81.8	72.9	83.9	18.7
2	Giza 176	Short	79.5	70.4	83.2	18.9
3	Giza 181	Long	77.1	70.4	72.3	19.3
4	Giza 175	Short	77.7	70.4	32.4	28.8
5	GZ 4255-6-3	Short	77.4	69.4	81.7	17.1
6	GZ 4255-6-4	Short	78.1	70.3	79.0	17.4
7	GZ 4255-9-1	Short	78.2	70.3	74.9	17.2
8	GZ 4255-11-3-1	Short	78.1	69.9	80.8	16.9
9	GZ 4386-34-3	Short	81.1	71.0	84.6	18.4
10	GZ 4122-23-4-2	Short	80.8	72.1	81.8	18.2
11	GZ 4120-205-2	Short	82.0	73.2	77.5	19.3
12	IR 25571-31-1	Long	78.5	70.8	40.5	29.1

**Table 2. Grain quality characters of entries in the regional yield trial, Sakha (1993)**

N°	Pedigree	Grain length	Hulling (%)	Milling (%)	Gel consistency (mm)	Amylose (%)
1	Giza 171	Short	81.03	72.90	100.00	18.03
2	Giza 176	Short	79.40	70.60	100.00	18.90
3	Giza 181	Long	78.50	71.50	76.00	19.30
4	Giza 175	Short	78.40	71.60	29.00	24.40
5	Giza 172	Short	80.40	72.40	100.00	19.30
6	IR 28	Long	78.80	71.40	100.00	27.40
7	GZ 1368-S-5-4	Medium	77.30	71.40	92.00	28.4
8	GZ 4256-1-1	Short	78.20	71.30	85.30	17.20
9	GZ 4294-10-4	Short	80.20	72.50	77.70	20.40
10	GZ 4300-2-3-1	Short	76.50	70.00	86.60	17.80
11	GZ 4305-7-1-1	Short	80.80	72.50	92.30	20.40
12	GZ 4316-7-1-1	Short	78.40	70.40	78.70	18.50
13	GZ 4327-5-1-2	Short	78.80	70.70	84.00	18.80
14	GZ 4462-10-2-2	Short	79.30	71.00	78.00	20.03
15	GZ 4681-5-2-1	Short	79.90	70.60	93.80	21.30
16	GZ 4255-6-3-2	Short	78.30	70.80	82.70	18.50
17	GZ 4255-6-4-1	Short	77.50	69.90	73.50	18.20
18	GZ 4256-1-1-1	Short	78.70	71.10	76.30	18.20
19	GZ 4256-1-1-2	Short	78.70	71.50	87.70	18.80
20	GZ 4256-3-1-1	Short	77.40	70.50	74.00	18.50
21	Milyang 77	Short	75.10	69.10	73.50	18.80
22	IRI 392	Short	82.70	73.80	73.30	20.60
23	Suweon 359	Short	77.20	70.60	66.30	20.90
24	Yeengdog 5	Short	80.50	71.50	68.30	20.40
25	TKY 1014	Short	78.50	71.10	81.70	19.09
26	TKY 1024	Short	75.70	66.70	89.00	18.50