Quality grain indicators of newly created hybrid lines of winter soft wheat

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Abstract: *It may be concluded based on the results that received from investigations, the amount of gluten in the grain content for AC-2005-C-210,AC-2006-D-21, AC-2006-C-26, AC-2007-D8, AC-2007-D14 lines made up 28-30% in new created hybrid lines in control nursery during the survey, Gluten deformation index (GDI) indicator was 75-80 units, belonging group 1 and manifested the highest quality indicators.*

Key Words: *variety, line, hybrid, selection, control, nursery, transparent, gluten, percent.*

1. INTRODUCTION:

Scientific-research works are being carried out organizing selection process extensively in order to create soft and hard varieties of wheat that produce much grain and respond to industry needs in irrigated condition of the world grain growing [4].

Application a number of measures is a great importance of selection, to increase the amount of plant protein, in particular, wheat protein as well.

To achieve the quality of grain, especially, the quantity of protein and gluten is essential to increase the grain quality at the same time of wheat harvest.

These indicators like ecological and agro technical point are concerned for most respect with the biological and genetic attributes of the variety [5]. Currently, productive indicators of soft and hard winter wheat have been achieved high, but improving technological quality indicators of grain is becoming one of the most important tasks in the irrigated condition. [1] [2]. For this case, several scientific- research works are being performed for improvement of grain quality indicators by the scientists of grain and leguminous crops research institute.

Selection works as with high yield of soft and hard wheat, precocity of grain, resistance to drought and diseases, demandable quality of grain, selection of foreign brought, create new sorts by hybridization are being performed in the grain and leguminous crops scientific institute and its regional branches as well as experimental stations.

In past few years the weather has been changing sharply and as a result of global warming resulted in increasing to produce farm products in most continents of the world.

According to data of FAO, the demand of the world population for agricultural crop proteins was 1,5 times higher, while the needs for meat products increased to 2,5-3 times. Today the plant protein demand of the population is 70%, and 30% are being satisfied for the meat protein.

The influence effects on the winter soft harvest and its yield in the irrigated lands of the republic are from the natural conditions (seasonal precipitation, the drought of the air and soil, soil salinity, improper meliorative state of the land and etc.) besides that in coincidence of the winter wheat to local soil and weather conditions, also not following to the scientific based agrotechnical principles. At present in the second half of (earing-maturation) growth and developing period of the winter grain crops in all irrigated lands face the condition of deficiency of nutrients as well as moisture in the soil also at a time appear critic air temperature (35-40°C).

It is known, when the temperature is +25..30°C, relative humidity is 40-50%, soil humidity is about 50-60%, high fertility and quality can be achieved.

2. MATERIALS AND METHODS:

The research works have been conducted during the 2015-2016s in “Central” experiment field of grain and leguminous crops scientific research institute in Andijan region and in the testing 26 new created hybrid lines were determined in 4 rows, 1 tier, each plot makes up 25 m² and sowing began to start on October 1.

In the nursery under the sowing norm 3-4 mln. germinative seeds were placed in planned plots. The analysis of biometric indicators of new hybrids studied in experiment was carried out in the laboratory of “Plant physiology and grain quality evaluation “ institute.

Phenological observations, evaluation and records in the experiments were implemented on the basis of methodological manuals compiled by Uzbekistan Cotton-breeding research institute, Uzbekistan Plant-growing research institute and Krasnodar agricultural research institute.

Productivity indicators obtained by experiment variants and repetitions and determination indicators of experiment were defined according to dispersion analysis method of B.A. Dospekhov [3].

3. RESULTS AND DISCUSSION:

On the 1st of October were sown 26 hybrid lines selected from F_5, F_6, F_7 hybrid populations nursery which in its turn were selected in 2015 for hybrid lines nursery, after sowing the phenological observations were conducted.

When analyzed the technological quality indicators of the grain, indicator of the grain nature showed average 610-830 g.l, the highest indicator 820-830 g.l for AC-2007-D8, AC-2007-D7, AC-2007-D4, AC-2006-D16 lines, the lowest point was for AC-2006-D-6 line.

These indicators made up average 45.2-65.9 percent in studied populations and the highest point for AC-2007-D-D15,AC-2007-D16, AC-2006-C26, AC-2005-C210, AC-2006-D21 hybrid lines when analyzed the grain transparent of the new hybrids.

Gluten amount in grain content made average 21-30%, the highest point was 29-30% in AC-2005-C210, AC-2006Д21, AC-2007-Д1, AC-2007-Д8-9 lines, the lowest indicator was 21-22.8 % in AC-2007-Д2, AC-2005-C19, AC-2007-C5 lines. GDI (Gluten deformation index) indicator was average 75.0-120 units, its quality indicator was observed in the 1-group AC-2005-C210, AC-2006-Д21, AC-2006-Д1, AC-2006-C26, AC-2007-Д8, AC-2007-Д14 lines. In the nursery AC-2006-Д89, AC-2006-C23, AC-2007-Д1, AC-2007-Д4, AC-2007-Д6, AC-2007-Д9, AC-2007-Д10, AC-2007-Д13 lines belonged to II-group. The lines studied in experiment AC-2005-C19, AC-2005-C136, AC-2006-Д14, AC-2006-Д12, AC-2006-Д6, AC-2006-Д18, AC-2007-Д2, AC-2007-Д3, AC-2007-C5, AC-2007-Д7, AC-2007-Д11, AC-2007-Д15 belonged to III-group (Table).

Table

Technological quality of the grain of new created hybrid lines (in 2016)

№	Lines	Grain nature, g/l	Transparency,%	Gluten amount, %	Gluten deformation index (unit)	Group
1	AC-2005-C210	810	65,2	29.0	80,5	I
2	AC-2005-C19	610	50,5	21.2	105,5	III
3	AC-2005-C136	690	47,5	-	105	III
4	AC-2006-Д8-9	800	60.0	26,0	95	II
5	AC-2006-Д14	720	60.0	27.0	105	III
6	AC-2006-Д21	710	65.0	29.0	80	I
7	AC-2006-Д12	620	50,5	24,0	105,5	III
8	AC-2006-C23	820	57.0	28,0	85	II
9	AC-2006-Д6	610	53.0	-	120	III
10	AC-2006-Д18	640	51.0	-	115	III
11	AC-2006-C26	760	65,5	27.5	80	I
12	AC-2007-Д1	810	55,3	29.0	90	II
13	AC-2007-Д2	650	45,2	21.0	120	III
14	AC-2007-Д3	670	50,2	23.0	120	III
15	AC-2007-Д4	820	55,8	28.0	90	II
16	AC-2007-C5	690	57,2	22,8	115	III
17	AC-2007-Д6	810	54,5	30.0	90	II
18	AC-2007-Д7	680	53,9	22.0	105	III
19	AC-2007-Д8	820	50,9	30,0	75	I
20	AC-2007-Д9	830	56,2	29.0	85	II
21	AC-2007-Д10	805	61,3	27.0	95	II
22	AC-2007-Д11	670	63,5	-	115	III
23	AC-2007-Д13	780	63,7	29.0	90	II
24	AC-2007-Д14	800	58,7	28.0	80	I
25	AC-2007-Д15	680	65,7	24.0	120	III
26	AC-2007-Д16	820	65,9	29.0	90	II

4. CONCLUSION:

According to analysis results, grain nature of studied hybrids on technological quality indicators showed average 610-830 g.l., the highest indicator 820-830 g.l. was observed in AC-2007-Д8, AC-2007-Д7, AC-2007-Д4, AC-2006-Д16 lines.

Grain transparence indicators of studied hybrid lines showed 45.2-65.9% in the experiment. This indication was higest in AC-2007-Д15, AC-2007-Д16, AC-2006-C26, AC-2005-C210, AC-2006-Д21 hybrids.

Gluten amount of new hybrids studied in experiment was average 21-30%, the highest indicator made 29-30 % in AC-2005-C210, AC-2006Д21, AC-2007-Д1, AC-2007-Д8-9 lines, while the lowest one 21-22.8 % was observed in AC-2007-Д2, AC-2005-C19, AC-2007-C5 lines.

By GDI indicator AC-2005-C210, AC-2006-Д21, AC-2006-Д1, AC-2006-C26, AC-2007-Д8, AC-2007-Д14 lines belonged to I-group. In the nursery AC-2006-Д89, AC-2006-C23, AC-2007-Д1, AC-2007-Д4, AC-2007-Д6, AC-2007-Д9, AC-2007-Д10, AC-2007-Д13 lines belonged to II-group.

According to research results hybrid lines with complete high indicators were sown in nurseries for testing competitive varieties.

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