Research Report 2015

Title of study:

Evaluation of wheat genotypes on medium saline soil under winter frost and terminal heat conditions

Contributors

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ALS	-	Agro-Pastoral and Irrigated
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Rationale

Wheat is the most important food in the Aral Sea Action Site of CRP-DS in Uzbekistan. Salinity, frost and heat are important production constraints. There is limited number of old wheat varieties grown by the farmers in the Action Site. International collaboration between national wheat research program in Uzbekistan and CGIAR Centers ICARDA and CIMMYT have identified a number of high yielding varieties in Uzbekistan under CRP WHEAT activities which could be valuable in replacing old varieties being grown by the farmers in the CRP-DS Action Site in Aral Sea Region in Uzbekistan.

Objectives

1. To evaluate newly released and pipeline wheat varieties in Uzbekistan which could give higher yields to replace the currently grown old varieties in the Action Site
2. To evaluate advanced breeding lines of wheat to identify locally adapted improved germplasm for future release in the Action Site

Experimental details

- There were 211 varieties of wheat evaluated in five field experiments.

Experiment 1: (Table 1)

Number of winter wheat genotypes:	20 (new varieties and final stage germplasm)
Number of replication:	3
Plot size:	10 m^2

Experiment 2: (Table 2)

Number of winter wheat genotypes:	35 (new varieties and advanced breeding lines obtained from CRP WHEAT research in other parts of Uzbekistan)
Number of replication:	1
Plot size:	10 m^2

Experiment 3: (Table 3)

Number of winter genotypes:	40 (advanced breeding materials selected locally from yield trial in 2014)
Number of replication:	1
Plot size:	10 m^2

Experiment 4: (Table 4)

Number of winter wheat genotypes:	116 (International observation nursery)
Number of replication:	1
Plot size:	1.5 m^2

Experiment 5: (Table 5)

Number of spring wheat varieties:	10 (early maturing, heat tolerant lines received from ICARDA, Morocco)
Number of replications:	3
Plot size:	10 m^2

Summary results

Experiment 1 (Table 1)

- Eight winter wheat genotypes superior to the local check (Krasnodar-99) were identified (Table 1, shaded in green color). These superior genotypes produced >10% higher grain yield than the local check, and were comparable to or better than the local checks for other traits.

Experiment 2 (Table 2)

- Six winter wheat genotypes superior to local check (Krasnodar-99) were identified (Table 2, shaded in green color) These superior genotypes produced >10% higher yield than the local check, and were comparable to or better than the local check for other traits.

Experiment 3 (Table 3)

- Four winter wheat genotypes superior to the local check (Krasnodar-99) were identified (Table 3, shaded in green color). These superior genotypes produced >15% higher grain yield than the local check, and were comparable to or better than the local check for other traits.

Experiment 4 (Table 4)

- Twenty six winter wheat genotypes superior to the local check were identified (Table 4, shaded in green color). These advanced breeding genotypes under first year of evaluation in the Action site were selected on the basis of multiple traits including final selection for grain characteristics (size, color, appearance).

Experiment 5 (Table 5)

- Two spring wheat genotypes superior to the local check were identified (Table 5, shaded in green color). These superior genotypes produced >10% higher yield than the local check, and were comparable to or better than the local checks for other traits. These genotypes matured in less than 90 days and their green filling coincided with temperatures >35°C, suggesting their tolerance to terminal heat stress.

Conclusion (Table 6)

- Twenty superior wheat genotypes were identified (Table 6), which possessed high grain yield and satisfactory agronomic characters and were tolerant to one or more of the abiotic stresses (salinity, frost and heat) prevalent in the CRP-DS Aral Sea Action Site in Uzbekistan.

Outcome

- This study identified two new winter wheat varieties Yaksart (Table 1) and Elomon (Table 2) which produced 28 and 13% higher yield than the local check Krasnodar-99. Large scale cultivation of these two varieties would by the farmers would greatly increase wheat productions and improve food security in the Aral Sea region.

Table 1. Comparative performance of experimental lines and local check of winter wheat evaluated on medium saline soil and winter frost condition in Chimbay, Uzbekistan in 2014-2015 growing season

Entry no.	Name / selection	Grain yield (t/ha)	%Local check	1000-kernel weight (g)	Days to heading	Days to maturity	Plant height (cm)
2	Yaksart	6.57	128	43.77	218	249	87
16	10AYTIR-9014	6.57	128	43.27	215	252	77
19	Victoriya	6.37	124	43.73	219	252	83
20	Kiriya	6.35	124	43.5	218	248	80
4	14IWWYTIR-15	6.02	117	43.3	218	250	84
10	14IWWYTIR-29	5.80	113	44.2	215	250	83
18	11AYTIR-9026	5.76	112	43.3	218	255	88
7	14IWWYTIR-24	5.67	111	42.2	214	252	77
8	14IWWYTIR-27	5.63	110	42.3	217	253	83
14	14IWWYTIR-40	5.45	106	40.5	216	248	76
3	Kirac66	5.38	105	43.9	217	254	89
11	14IWWYTIR-32	5.35	104	42.9	219	257	96
12	14IWWYTIR-37	5.33	104	43.1	216	253	84
6	14IWWYTIR-23	5.32	104	44.0	217	257	75
17	11AYTIR-9014	5.13	100	44.3	218	254	91
1	Krsnodar-99 (Check)	5.13	100	42.5	217	249	77
15	UZ-11CWA-14	5.07	99	43.4	217	253	69
13	14IWWYTIR-39	4.95	97	43.4	215	254	78
9	14IWWYTIR-28	4.84	94	43.1	218	254	82
5	14IWWYTIR-20	3.75	73	42.6	218	257	82
	LSD0.05	1.11		2.2	2	3	9
	CV (%)	12.1		3.0	0.6	0.7	6.8

Table 2. Agronomic performance of new varieties and advanced breeding lines winter wheat on medium saline soils, under winter frost condition in Chimbay, Karakalpakstan, Uzbekistan in 2014-2015 growing season

Entry	Variety or cross	Grain yield (t/ha)	% check	1000-kernel weight (g)	Days to heading	Days to maturity	Plant height (cm)
5	KR14-9824	7.068	122	40.3	248	280	95
10	KR13-9011	6.948	120	42.7	242	283	90
15	KR13-6044	6.758	117	45.3	248	279	90
9	KR13-9004	6.638	115	44.0	245	282	95
30	UZ14-UgP-21	6.582	114	47.4	246	282	97
40	Elomon	6.534	113	44.0	248	280	87
2	KR14-9815	6.368	110	42.8	243	275	80
31	KR12-19FI-198	6.288	109	42.6	248	280	90
13	KR13-9048	6.242	108	42.0	249	283	90
22	KR13-IWWYRRN-11	6.208	107	44.2	248	281	91
3	KR14-9819	6.120	106	46.2	240	278	75
23	KR13-9807	6.096	105	42.0	242	282	76
4	KR14-9820	6.076	105	42.0	239	276	80
7	KR12-08	6.062	105	44.1	247	283	88
32	UZ14-1	6.06	105	44.2	244	285	77
16	KR13-6063	5.784	100	42.0	244	279	90
38	Krosnodar-99 (Check)	5.780	100	42.7	246	279	86
35	UZ14-4	5.766		40.0	247	277	88
14	KR13-6035	5.706		46.6	243	280	89
37	Yaksart	5.396		42.5	246	283	77
36	UZ14-5	5.344		42.7	246	277	85
25	UZ14-UgP-6	5.256		42.0	243	276	87
27	UZ14-UgP-10	5.130		44.2	245	280	85
34	UZ14-3	5.108		38.0	248	280	90
33	UZ14-2	5.096		45.1	247	277	90

26	UZ14-UgP-8	5.072		46.5	246	280	79
28	UZ14-UgP-14	5.070		43.2	247	279	99
18	KR13-6129	4.932		45.3	247	280	85
17	KR13-6088	4.792		44.1	248	284	98
29	UZ14-UgP-15	4.730		43.7	247	280	100
6	KR14-9829	4.596		42.3	246	281	69
12	KR13-9046	4.302		42.0	247	277	93
39	Chillaki	4.212		41.9	246	277	70
1	KR14-9812	4.108		38.7	246	281	97
24	KR13-9830	3.688		38.0	244	285	82
19	KR13-IWWSRRN-25	3.680		46.1	248	278	88
21	KR13-IWWSRRN-46	3.278		44.9	245	281	78
8	KR12-18	3.204		41.6	245	280	80
20	KR13-IWWSRRN-26	2.236		42.5	248	282	85
11	KR13-9026	0.992		44.2	248	280	75
	Mean	5.233		43.1	245	280	86
	Minimum	0.992		38.0	239	275	69
	Maximum	7.068		47.4	249	285	100
	Standard error of mean	0.208		0.34	0.37	0.389	1

Table 3. Agronomic performance of locally selected winter wheat genotypes on medium saline soils, under winter frost condition in Chimbay, Karakalpakstan, Uzbekistan in 2014-2015 growing season

Entry number	Name/Selection/Cross	Grain yield (t/ha)	%check	1000-kernel weight (g)	Days to heading	Days to maturity	Plant height (cm)
4	POLOVCHANKA/PEHLIVAN	7.12	139	44.8	212	254	100
3	SHARK/F4105W2.1//QT6258 /3/SHARK/F4105W2.1	6.88	134	45.1	213	257	102
2	Yaksart	6.33		44.0	216	254	90
11	Yaksart	6.29		43.1	219	248	78
37	CO07 W245	6.25	122	40.0	216	251	89
20	Yaksart	6.20		42.9	215	247	83
7	WEEBILL1/NALIM-3//GALLYA-ARAL1	6.01	117	45.8	220	256	105
8	JCAM/EMU//DOVE/3/JGR/4/THK/5/BOEMA	5.84		42.0	217	254	103
6	POLOVCHANKA/PEHLIVAN	5.79		42.0	217	255	99
9	NWT/3/TAST/SPRW//TAW12399.75/6/VEE/TSI//GRK/3/NS55.03 /5/C126.15/COFN/3/N10B/P14//P101/4/KRC67 TCI 001504-030YE-030YE-5E -0E	5.76		44.0	219	249	88
5	JCAM/EMU//DOVE/3/JGR/4/THK/5/BOEMA	5.67		45.7	216	256	95
38	TURKOAZ	5.63		40.0	217	254	90
31	Tanya	5.44		41.5	215	249	70
23	OK07214	5.36		46.4	218	248	79
28	NOTA	5.29		38.0	218	247	70
34	PROTON	5.29		44.0	216	251	82
36	BYRD	5.28		42.0	212	255	103
10	OSTROV	5.27		38.0	218	251	80

1	**Krasnodar 99 (Local Check)**	**5.12**		**42.3**	217	254	**85**
19	Krasnodar 99	5.00		42.8	217	255	87
16	F06659G6-1	4.82		44.4	217	251	79
17	F06659G10-1	4.79		44.0	216	254	78
14	F06522G1-1	4.76		40.9	218	248	77
24	OK09634	4.75		40.0	220	248	80
35	CIM/BOG12//412	4.73		46.7	221	250	84
18	F07098G1	4.69		44.1	216	253	75
12	F06325G1-	4.66		48.0	217	249	75
39	Tanya	4.48		42.0	215	248	88
29	ALVD*2/7/VEE/CMH77A.917//VEE/6/CMH79A.955/4/AGA/3/4*SN64/CNO67//INIA66/5/NAC	4.18		34.0	218	249	75
27	GROM	4.16		44.2	217	248	76
32	KALYM	4.13		36.0	214	251	83
13	F06325G1-2	4.06		40.0	219	247	76
25	LEBED	4.00		44.9	220	255	78
15	F06580G2-1	3.98		40.0	219	250	75
26	YUMPA	3.98		38.0	218	253	88
30	DMITRY	3.98		34.7	219	255	80
33	MOSKVICH	3.81		42.0	216	248	90
22	Yonbosh	3.78		46.0	219	250	80
21	Tanya	3.70		38.0	217	249	80
40	Yonbosh	3.49		45.1	217	254	90
	Mean	5.02		42.2	217	251	85
	Minimum	3.49		34.0	212	247	70
	Maximum	7.12		48.0	221	257	105
	Standard error of mean	0.1		0.5	0.3	0.5	1.5

Table 4. Performance of winter wheat genotypes evaluated on medium saline soil under frost prevailing conditions in Chimbay, Uzbekistan in 2014-2015 crop season

Plots	Name / Cross	DHD	DMT	GFP	PHT	Grain yield (t/ha)
1	BEZOSTAYA	217	256	39	100	2.34
2	SERI	220	259	39	73	1.33
3	SULTAN95	226	257	31	105	6.11
4	KATIA1	218	255	37	90	7.01
5	KONYA	219	256	37	85	5.32
6	Krasnodar-99 (Local Check)	220	255	35	83	7.29
7	KAMBARA1/KALYOZ-17	221	254	33	95	10.94
8	KAMBARA1/KALYOZ-17	219	256	37	93	870
9	BEZ/NAD//KZM(ES85.24)/3/F900K/4/AEG	229	258	29	115	6.91
10	MV PALMA/GK KALAKA//MVPALMA/FATIMA/3/SAULESKU #26/PARUS	218	255	37	90	7.08
11	MV14-2000//GUN91/MNCH	220	252	32	88	4.94
12	87-461 A 63-555/4/ERIT58-87//KS82W409/SPN/3/KRC66/SERI	221	253	32	105	6.75
13	87-461 A 63-555/4/ERIT58-87//KS82W409/SPN/3/KRC66/SERI	227	257	30	115	6.36
14	90-1004 A 31/MERCAN-1	219	252	33	88	4.53
15	MLT/TI//HAWK/3/RINA-6	218	251	33	98	4.03
16	SAULESKU #44/TR810200//IZGI	218	259	41	75	5.89
17	TJB68-251/BUC//SMUT1590-165/3/KS7866-15/ORS8425/4/NE87U119/CHAM6//1D13.1/MLT	217	257	40	100	7.75
18	KRASNODAR/FRTL/6/NGDA146/4/YMH/TOB//MCD/3/LIRA/5/F130L.1.12	224	260	36	113	7.42
19	YUBILEINAYA75/3/AGRI/BJY//VEE/4/SAULEAKU#26/PARUS	220	252	32	85	7.71
20	YUBILEINAYA75/3/AGRI/BJY//VEE/4/SAULEAKU#26/PARUS	220	257	37	84	6.92
21	BURBOT-4/3/OMBUL/ALAMO//MV11	221	253	32	80	5.62
22	SONMEZ/EXCALIBUR	219	255	36	83	6.42
23	SONMEZ/6/TAM201/4/BL/AU/3/AGRI//HYS/7C/5/F134/71/NAC	221	258	37	85	8.46
24	8229/OK81306//BLUEGIL-13/3/PYN/2*BAU	231	253	22	107	7.44

25	EXPRES/BONITO-36//SAULESKU #26/PARUS	217	253	36	90	6.83
26	EXPRES/BONITO-36//SAULESKU #26/PARUS	220	255	35	85	7.52
27	KUPAVA/BURBOT-4//PYN/2*BAU	219	256	37	86	8.26
28	KK8514.1.1/ALPU01//DORADE-5	220	254	34	75	7.12
29	KK8514.1.1/ALPU01//DORADE-5	219	253	34	80	7.93
30	KS940786-6-7/BONITO-36//TASICAR	220	252	32	93	7.27
31	T67/X84W063-9-45//K92/3/GUN91/MNCH/3/IZGI	218	251	33	91	7.62
32	ZARGANA-3/4/JING411//PLK70/LIRA/3/GUN91/5/ORKINOS-1	230	257	27	117	8.02
33	SHARK/F4105/W2.1//AUS4930.7/2*PASTOR/3/ORKINOS-1	221	252	31	90	5.69
34	ALTAY 2000/3/AUS GS50AT34/SUNCO//CUNNINGHAM/4/SONMEZ	220	250	30	77	5.44
35	ALTAY 2000/3/AUS GS50AT34/SUNCO//CUNNINGHAM/4/SONMEZ	221	250	29	88	4.85
36	TASICAR*2/3/AUS GS50AT34/SUNCO//PASTOR	219	252	33	88	6.17
37	GUN91/MNCH*2//T-2003	219	252	33	88	5.54
38	GUN91/MNCH*2//T-2003	220	251	31	97	5.48
39	AUS4930 5.3/SPEAR DH#43//2*SONMEZ	220	254	34	115	3.42
40	BEZOSTAYA	220	252	32	93	5.95
41	AGRI/NAC//ATTILA/3/NE93496/4/TRANCA-4	219	256	37	84	5.79
42	TSAPKI/FARMEC	220	255	35	90	3.74
43	DORADE-5/3/SHI#4414/CROW//GK SAGVARI/CA8055	220	255	35	72	7.12
44	BONITO-36//ID800994.W/FALKE	221	257	36	77	7.87
45	MRS/CI14482//YMH/HYS/3/RONDEZVOUS/4/ABI86*3414/X84W063-9939-2//KARL92	224	256	32	84	4.94
46	ATTILA/BABAX//PASTOR/3/KIRIK	220	259	39	78	5.02
47	C-75-5/3/AGRI/NAC//KAUZ	220	253	33	81	5.59
48	KS82W422/SWM754308//KS831182/KS82W422/3/KS82W409/SPN/4/AGRI/NAC//KAUZ/3/1D13.1/MLT	219	252	33	85	5.75
49	ID800994.W/KAUZ/4/CASKOR/3/CROC_1/AE.SQUARROSA9(224)//OPATA/5/ID800994.W/KAUZ	222	258	36	80	3.47
50	AGRI/NAC//ATTILA/3/NE93496/4/TRANCA-4	219	254	35	87	3.66
51	AGRI/NAC//ATTILA/4/TAST/SPRW//ZAR/3/ATAY/GALVEZ87	220	255	35	75	3.36

52	TAM200/PASTOR//TOBA97/7/ZCL/3/PGFN//CNO67/SN64/4/SERI/5/UA. 2837/6/ATTILA/3*BCN	220	254	34	80	5.72
53	ES14/SITTA//AGRI/NAC/3/MV18-2000/4/PYN/BAU	220	252	32	82	5.05
54	WEEBILL 1 //VORONA/KAUZ	220	256	36	80	5.58
55	SOYER/BONITO-36	220	255	35	90	8.01
56	N87V107/BETTY//ZARGANA-3/4/TAST/SPRW5/ZAR/3/ATAY/GALVEZ87	219	255	36	83	7.42
57	GUN91MNCH/4/TAST/SPRW//ZAR/3/ATAY/GALVEZ87	220	257	37	82	5.29
58	INTENSIVNAYA//PBW343*2/TUKURU	220	256	36	78	3.25
59	INTENSIVNAYA//PBW343*2/TUKURU	221	259	38	80	4.51
60	INTENSIVNAYA//PBW343*2/TUKURU	224	254	30	84	3.65
61	SOYER/BONITO-36	220	252	32	88	5.22
62	ALPU01/4/338-K1-1//ANB/BUC/3/KIRGIZ	220	256	36	70	5.05
63	ATTILA/BABAX//PASTOR/3/KIRIK	220	255	35	71	6.43
64	KS82W422/SWM754308//KS831182/KS82W422/3/KS82W409/SPN/4/G RISET-4	220	255	35	84	5.16
65	PYN/BAU/4/ORPIC/3/PASTOR//MUNIA/ALTAR 84	220	257	37	88	7.37
66	WEEBILL 1 //VORONA/KAUZ	219	256	37	85	5.53
67	PRL/2*PASTOR//N566/OK94P597 (OK03522)	220	259	39	76	6.28
68	MV PALMA/GK KALAKA//MVPALMA/FATIMA/3/SAULESKU	220	253	33	75	7.40
69	ATTILA*2/PASTOR//OK95553/OK92403 (OK03318)/3/KS970274	221	252	31	79	5.34
70	WEEBILL 1 //VORONA/KAUZ	224	258	34	84	5.61
71	ZANDER-44/DAGDAS94	220	256	36	98	7.86
72	SPARTANKA//PBW343*2/KUKUNA	220	259	39	80	6.31
73	SERI.1B*2/3/KAUZ*2/BOW//KAUZ/4/NALIM-3/5/ATAY/GALVEZ87	219	253	34	87	4.22
74	PBW343*2/KUKUNA//ATAY/GALVEZ87/3/ATAY/GALVEZ87	222	252	30	88	6.70
75	OR 943576/KS920709	219	258	39	88	4.35
76	87-461 A 63-555//SAULESKU#26/PARUS3/3AGRI/NAC//ATTILA	220	251	31	87	8.29
77	NACIBEY	218	253	35	90	5.83
78	MADEN	219	253	34	78	6.07
79	RUMELI	220	252	32	77	1.04

80	SERI	220	258	38	70	5.93
81	CROC_1//AE.SQUARROSA(224)OPATA	221	256	35	87	10.00
82	KS92WGRC-25	224	259	35	84	2.51
83	SPN/MCD//CHAMA/3/NZR/4/ALD/SNB*2/5/RSK/CA8055//CHAM 6	220	253	33	82	1.50
84	SPN/MCD//CHAMA/3/NZR/4/ALD/SNB*2/5/RSK/CA8055//CHAM 6	220	252	32	80	2.96
85	SPN/MCD//CHAMA/3/NZR/4/ALD/SNB*2/5/GASCOGNE	220	253	33	70	7.26
86	SPN/MCD//CHAMA/3/NZR/4/ALD/SNB*2/5/GASCOGNE	220	252	32	71	1.49
87	F-GY54//KEA/GHK*2/3/RSK/CA8055//CHAM 6	220	258	38	84	2.70
88	FLN/ACC//ANA/3/PEW/4/F12.71/COC//CNO79*2/5/RSK/CA8055//CHAM 6	219	256	37	85	2.38
89	CMH79A.955/4/AGA/3/4*SN64/CNO67//NIA66/5/NAC/6/CMH83.2517/7/RSH/8/ZRN	220	253	33	82	1.87
90	CMH79A.955/4/AGA/3/4*SN64/CNO67//NIA66/5/NAC/6/CMH83.2517/7/RSH/8/ZRN	221	252	31	80	3.45
91	CMH79A.955/4/AGA/3/4*SN64/CNO67//NIA66/5/NAC/6/CMH83.2517/7/RSH/8/ZRN	224	253	29	70	2.67
92	QUDS*3/MV17	220	252	32	71	3.21
93	SPN/MCD//CAMA/3/NZR/4/ALD/SNB*2/5/OPATA*2/WULP	219	253	34	80	8.76
94	SPN/MCD//CAMA/3/NZR/4/ALD/SNB*2/5/OPATA*2/WULP	220	253	33	81	6.70
95	OWL*2/7/T.SPH/2*H.567.71//CMH77.93/3/2*CMH79.959/5/T.SPH/2*H567.71//CMH77.931/3/CMH79.959/4/CM	219	252	33	78	7.55
96	ALMT*3/7/VEE/CMH77A.917//VEE/6/CMH79A.955/4/AGA/3/SN64*4/CNO67//NIA66/5/NAC	220	258	38	80	4.59
97	ALMT*3/7/VEE/CMH77A.917//VEE/6/CMH79A.955/4/AGA/3/SN64*4/CNO67//NIA66/5/NAC	218	256	38	89	4.17
98	ZRN*2//AZADI/CMH79.959	230	259	29	91	5.19
99	MV-PANTALIKA	221	253	32	88	2.45
100	MV05-13	220	252	32	70	3.57
101	BEZOSTAYA	221	253	32	97	3.02
102	SERI	220	253	33	88	5.42
103	SULTAN95	219	256	37	101	9.46

104	KATIA1	220	259	39	85	7.83
105	KONYA	221	254	33	80	8.35
106	LOCAL CHECK	224	252	28	82	8.37
107	MV35-13	220	256	36	74	10.62
108	F06521GP3	220	255	35	75	6.23
109	F06393GP10	219	255	36	75	7.81
110	F02150G6-102	222	257	35	72	8.87
111	F05906G1-101	219	256	37	78	533
112	F08034G1	220	256	36	80	896
113	F08347G8	218	259	41	75	870
114	F06325G1-2INC1	219	254	35	80	605
115	F06476G5-1INC1	222	252	30	77	717
116	F07115G1-INC1	219	256	37	80	718

Table 5. Performance of spring wheat genotypes evaluated on medium saline soil under terminal heat conditions in Chimbay, Uzbekistan in 2015

Variety / Selection	Pedigree	Grain yield (t/ha)	%check	Days to heading	Days to maturity	Plant height (cm)
Kr-SpR2014-21	Angi-2/Hubara-3	5.550	121	56	89	84
KrJ-SpR2015	Qimma-12/Pastor-6//Qimma-12	5.160	112	55	88	82
Kr-SpR2014-22	Kauz 'S'/Florkwa-1//Goumria-3	4.863		52	84	80
Janub-Gavhari	Check 1	4.600		51	85	78
Edgor	Check 2	4.163		53	85	81
Kr-SpR2014-8	Karawan-1/Tallo 3//Regrag-1	4.050		51	84	75
Kr-SpR2014-9	Tevee-1/Shuha-6//Massira	3.993		54	87	82
Kr-SpR2014-10	Shuha-7/Shuha-14/3/Altar 84/A. sq. (Taus)//Opata	3.977		49	82	71
Hazrati Bashir	Check 3	3.600		54	88	67
Kr-Sp-2010-59	Check4	3.253		48	82	80
$LSD_{0.05}$		0.818		10	9	19
CV (%)		11.1		10.7	6.2	14.5

Table 6. Superior genotypes selected from winter and spring wheat yield trials conducted on medium saline soil under frost conditions in Chimbay, Uzbekistan

S.N.	Reference entry number	Name / selection	Grain yield (t/ha)	%Local check	Reference	Growth habit
1	2	Yaksart-CK2	6.57	128	Table 1	Winter
2	16	10AYTIR-9014	6.57	128	Table 1	Winter
3	19	Viktoria	6.37	124	Table 1	Winter
4	20	Kiriya	6.35	124	Table 1	Winter
5	4	14IWWYTIR-15	6.02	117	Table 1	Winter
6	10	14IWWYTIR-29	5.8	113	Table 1	Winter
7	18	11AYTIR-9026	5.76	112	Table 1	Winter
8	7	14IWWYTIR-24	5.67	111	Table 1	Winter
9	16	KR14-9824	7.07	122	Table 2	Winter
10	33	KR13-9011	6.95	120	Table 2	Winter
11	2	KR13-6044	6.76	117	Table 2	Winter
12	28	KR13-9004	6.64	115	Table 2	Winter
13	38	UZ14-UgP-21	6.58	114	Table 2	Winter
14	4	Elomon	6.53	113	Table 2	Winter
15	4	POLOVCHANKA/PEHLIVAN	7.12	139	Table 3	Winter
16	3	SHARK/F4105W2.1//QT6258 /3/SHARK/F4105W2.1	6.88	34	Table 3	Winter
17	37	CO07 W245	6.25	122	Table 3	Winter
18	7	WEEBILL1/NALIM-3//GALLYA-ARAL1	6.01	117	Table 3	Winter
19	Kr-SpR2014-21	Angi-2/Hubara-3	5.55	121	Table 5	Spring
20	KrJ-SpR2015	Qimma-12/Pastor-6//Qimma-12	5.16	112	Table 5	Spring