Evaluation of improved lines in preliminary trials

Activity 1: yield trials in lentil.

Title	**:**	Evaluating yield potential of lentil advanced lines in Marchouch and Kfardan
Objectives	**:**	Estimate the yield potential of lentil varieties and select lentil varieties for high performance and phenotypic stability.
Activities	**:**	Continued
Expected outcomes	**:**	High yield lines with beneficial traits including extra earliness, machine harvesting would be identified.
Observations to be taken	**:**	Plant height Height of the lowest pod Phenological traits Yield and yield components
Trials	**:**	Advanced Yield Trial- Large seeded (33 genotypes + 2 improved checks + 1 local check) Advanced Yield Trial – Small seeded (33 genotypes + 2 improved checks + 1 local check) Advanced Yield Trial- Early (33 genotypes + 2 improved checks + 1 local check) Advanced Yield Trial- Machine harvest (33 genotypes + 2 improved checks + 1 local check) Advanced Yield Trial- Micro Nutrient (33 genotypes + 2 improved checks + 1 local check) Advanced Yield Trial – Extra early (33 genotypes + 2 improved checks + 1 local check) Advanced Yield Trial- Drought (33 genotypes + 2 improved checks + 1 local check)
Key outcome	**:**	Marchouch: The crop was not successful due to severe drought during early stage of the crop growth. However, seeds of individual genotypes were harvested and the trial will be repeated in the upcoming cropping season. Kfardan: There were significant genotypic differences in grain yield were found across all the trials conducted in Kfardan 2016. The best performing genotypes over the check variety are presented in Table 1,2,3,4,5, 6 and 7 as below. **Table 1.** The best performing genotypes over the check variety in AYT-LS2016

Designation	Pedigree	Seed yield
x2011s17_20 _ 3	BARIMASUR-6XLIRL-22-46-1-1-1-0	1084
x2011s139_124 _ 9	FLIP97-29LXIG135395	1038
x2011s242_230 _ 3	ILL10801XILL2711	1008

x2011s33_34 _ 32	ILL10731XILL9889	1002
x2011s17_20 _ 2	BARIMASUR-6XLIRL-22-46-1-1-1-0	965
x2011s126_116 _ 21	ILL4400X28509	917
x2011s133_119 _ 4	FLIP97-29LXFLIP97-33L	913
Check	ILL4400	688
Trial mean		790.30
LSD(<0.001 level)		181.78
Heritability		0.74

Table 2. The best performing genotypes over the check variety in AYT-SS2016

Designation	Pedigree	Seed yield
x2011s_246 _ 25	ILL10749XILL3597	1099
x2011s_183 _ 16	ILL7115XILL2585	1090
x2011s_203 _ 2	ILL10749XILL3597	1073
x2011s_192 _ 45	ILL10749XILL7979	1072
x2011s_176 _ 1	ILL4605XILL6024	1062
Check	Check	733
Trial mean		805.57
LSD(<0.001 level)		287.51
Heritability		0.68

Table 3. The best performing genotypes over the check variety in AYT-E 2016

Designation	Pedigree	Seed yield
x2011s_129 _ 13	FLIP96-49LXFLIP97-33L	1178
x2011s_119 _ 25	FLIP97-29LXFLIP97-33L	1163
x2011s_206 _ 26	ILL10800X33109	1141
x2011s_130 _ 1	ILL4402XILL7979	1104
x2011s_129 _ 36	FLIP96-49LXFLIP97-33L	1096
x2011s_129 _ 28	FLIP96-49LXFLIP97-33L	1096
x2011s_122 _ 26	ILL1712XILL10072	1048
x2011s_247 _ 19	LIRL-22-46-1-1-1-0XAKM 302	993
x2011s_172 _ 20	ILL7723XADA'A	978
x2011s_203 _ 2	ILL10749XILL3597	970
x2011s_171 _ 7	Barimusor- 6xL-7713	959
x2011s_138 _ 20	Barimusor 6xILL7979	933
Check	ILL8006	720
Trial mean		893.90
LSD(<0.001 level)		208.08
Heritability		0.79

Table 4. The best performing genotypes over the check variety in AYT-EE2016

Designation	Pedigree	Seed yield
x2013_20 _ 36	BARIMASUR-6XLIRL-22-46-1-1-1-0	1219
x2013_20 _ 7	BARIMASUR-6XLIRL-22-46-1-1-1-0	1193
x2013_20 _ 26	BARIMASUR-6XLIRL-22-46-1-1-1-0	1133
x2013_125 _ 15	FLIP97-34LXFLIP97-33L	1126
x2013_126 _ 54	FLIP97-34LXFLIP97-33L	1119
x2013_21 _ 2	BARIMASUR-6XLIRL-22-46-1-1-1-0	1104
x2013_118 _ 3	FLIP97-29LXFLIP97-33L	1081
x2013_20 _ 3	BARIMASUR-6XLIRL-22-46-1-1-1-0	1052
x2013_175 _ 35	ILL4605XILL6024	1037
x2013_72 _ 28	ILL7978XILL7537	1032
x2013_125 _ 40	FLIP97-34LXFLIP97-33L	1022
x2013_119 _ 14	FLIP97-29LXFLIP97-33L	1007
x2013_82 _ 10	KHAJURA-2XILL5888	1007
x2013_126 _ 5	FLIP97-34LXFLIP97-33L	1007
x2013_126 _ 8	FLIP97-34LXFLIP97-33L	988
x2013_119 _ 24	FLIP97-29LXFLIP97-33L	963
x2013_280 _ 18	Barimusor- 6XILL6994	956
x2013_72 _ 19	ILL7978XILL7537	956
x2013_166 _ 8	ILL4605XILL358	944
x2013_140 _ 1	ILL4404XILL7950	933
x2013_266 _ 2	LIRL-22-46-1-1-1-0XAKM 302	932
x2013_142 _ 15	ILL4605XILL7950	926
Check	Check	681
Trial mean		945
LSD(<0.001 level)		216.24
Heritability		0.78

Table 5. The best performing genotypes over the check variety in AYT-MH 2016

Designation	Pedigree	Seed yield
x2011s_200 _ 13	ILL10801XILL7950	1093
x2011s_176 _ 1	ILL4605XILL6024	1073
x2011s_199 _ 9	ILL10801XILL7979	1065
x2011s_243 _ 12	ILL10750XILL6994	1024
x2011s_200 _ 10	ILL10801XILL7950	1014
Local check	Check	722
Trial mean		834.01
LSD(<0.001 level)		224.08
Heritability		0.74

Table 6. The best performing genotypes over the check variety in AYT-DT2016

Designation	Pedigree	Seed yield
x2011s_119 _ 26	FLIP97-29LXFLIP97-33L	1207
x2011s_172 _ 34	ILL7723XADA'A	1067
x2011s_125 _ 23	FLIP97-34LXFLIP97-33L	963
x2011s_206 _ 58	ILL10800X33109	947
x2011s_223 _ 6	ILL10800XILL7201	921
x2011s_195 _ 4	ILL10750XILL7950	904
x2011s_111 _ 26	ILL8007XILL759	904
x2011s_123 _ 36	ILL1712XILL10072	889
x2011s_163 _ 9	ILL4402XILL5588	881
x2011s_204 _ 51	ILL10750X33108	875
x2011s_119 _ 23	FLIP97-29LXFLIP97-33L	871
Local check	Check	637
Trial mean		802
LSD(<0.001 level)		235.05
Heritability		0.69

Table 7. The best performing genotypes over the check variety in AYT-MN 2016

Designation	Pedigree	Seed yield
x2011s_163 _ 15	ILL4402XILL5588	1259
x2011s_126 _ 60	FLIP97-34LXFLIP97-33L	1167
ILL6821	ILL6821	1139
x2011s_97 _ 20	ILL5883XILL10750	1117
x2011s_125 _ 36	FLIP97-34LXFLIP97-33L	1116
x2011s_198 _ 33	ILL10801XILL7979	1094
x2011s_97 _ 17	ILL5883XILL10750	1083
x2011s_192 _ 45	ILL10749XILL7979	1066
x2011s_54 _ 14	ILL8595XILL10741	1058
x2011s_118 _ 21	FLIP97-29LXFLIP97-33L	1011
x2011s_278 _ 1	ILL975XILL10657	1003
x2011s_89 _ 25	ILL5883XILL8	979
x2011s_118 _ 12	FLIP97-29LXFLIP97-33L	955
x2011s_176 _ 31	ILL4605XILL6024	937
x2011s_110 _ 13	ILL8007XILL759	904
x2011s_72 _ 44	ILL7978XILL7537	904
x2011s_115 _ 22	ILL975X28505	879
x2011s_175 _ 1	ILL4605XILL6024	831
x2011s_172 _ 25	ILL7723XADA'A	817
x2011s_63 _ 7	ILL3796XILL4605	816
x2011s_82 _ 3	KHAJURA-2XILL5888	793
x2011s_244 _ 9	ILL10800XILL4637	786
Check	Check	539

		Trial mean		862.10
		LSD(<0.001 level)		242.14
		Heritability		0.81

Activity 2 : Preliminary yield trials in Faba bean

Title	**:**	Evaluating yield potential of faba bean advanced lines.
Objectives	**:**	Estimate the yield potential of varieties, select faba bean varieties for high performance and forward to advanced yield trials.
Activities	**:**	Continued
Expected outcomes	**:**	High yield lines with beneficial traits including extra earliness, machine harvesting would be identified.
Observations to be taken	**:**	Plant height Height of the lowest pod Phenological traits Yield and yield components
Trials	**:**	Preliminary Yield Trial- for disease resistance and mechanical harvesting- 40 genotypes, two checks with three replication Preliminary Yield Trial –drought tolerant faba bean. 40 genotypes, two checks with three replication Preliminary Yield Trial- heat lines. 40 genotypes, two checks with three replication Preliminary Yield Trial- Large seed types. 40 genotypes, two checks with three replication Preliminary Yield Trial- low tannin trials t (37 genotypes + 2 improved checks + 1 local check) Preliminary Yield Trial – orobanche resistance (40 genotypes + 2 improved checks + 1 local check)
Results		Six preliminary yield trials were conducted at Terbol station Lebanon in Alpha design with three replications. The following traits were recorded: Days to flowering, days to maturity, plant height, and number of nodes until first pods, Grain yield and hundred seed weight. Significant differences among genotypes was presented in (Table 1). Selected lines showed superior yield 10% above the control. **Table 1: Variance analysis performed for detecting significance differences of genotypic variation in agronomic, expressed as P-value in all trials.**

Trial name	NG	Number of selected lines	DFLR	DMAT	PTHT	NNFP	Gyha	HSW
Large seeds	15	5	0.001	0.001	NA	0.05	0.001	0.001
Low tannin	20	10	0.001	0.001	0.05	0.05	0.001	0.001
Machine harvest-diseases	40	20	0.001	0.001	0.001	0.05	0.01	0.001

Heat tolerance	24	12	0.001	0.727	0.397	0.297	0.001	0.001
Orobanche lines	40	20	0.001	0.001	0.001	0.001	0.001	0.001
Early and Drought	40	20	0.001	0.001	0.05	NA	0.001	NA

DFLR: days to flowering; DMAT, days to maturity; PTHT, plant height, number of nodes up to first pod (NNFP), GYha, Grain yield per ha, HSW: hundred seed weight.