

MEL5437: Deliverable: Improved lines of lentil with 90 days maturity

1. Activity: Preliminary Screening Nursery (PSN) of lentil.

Title	:	Preliminary Screening Nursery (PSN) of promising lines for uniformity				
Objectives	:	To evaluate selected plant progenies for uniformity, performance and stability				
Activities	:	Continued				
Observations to be taken	:	Phenological traits, uniformity, Yield and yield components				
Materials and methods	:	1254 single plant progenies were evaluated un-replicated trials in Terbol.				
Key outcome	:	Evaluation results showed significant genetic variability for days to flowering (101 to 118) and maturity (140-156) (Attachment: MEL-F07) and selected 300 early maturing promising lines without segregation for visual traits for further evaluation in preliminary yield trials.				

2. Activity: Preliminary yield trials in lentil and chickpea.

Title	:	Multi-environment evaluation of advanced lines
Objectives	:	To evaluate advanced lines for their yield potential and stability
Activities	:	Continued
Observations to be taken	:	Plant height, Height of the lowest pod, Phenological traits, Yield and yield components
Materials and methods	:	<p>Preliminary Yield Trial- Large seeded (33 lines + 2 improved checks + 1 local check)</p> <p>Preliminary Yield Trial – Small seeded (33 lines + 2 improved checks + 1 local check)</p> <p>Preliminary Yield Trial- Early (33 lines + 2 improved checks + 1 local check)</p> <p>Preliminary Yield Trial- Machine harvest (33 lines + 3 checks)</p> <p>Preliminary Yield Trial- Micro Nutrient (33 lines + 2 improved checks + 1 local check)</p> <p>Preliminary Yield Trial – Extra early (33 lines + 2 improved checks + 1 local check)</p> <p>Preliminary Yield Trial- Drought (33 lines + 2 improved checks + 1 local check)</p> <p>In chickpea, 343 elite lines were evaluated in PYT</p>

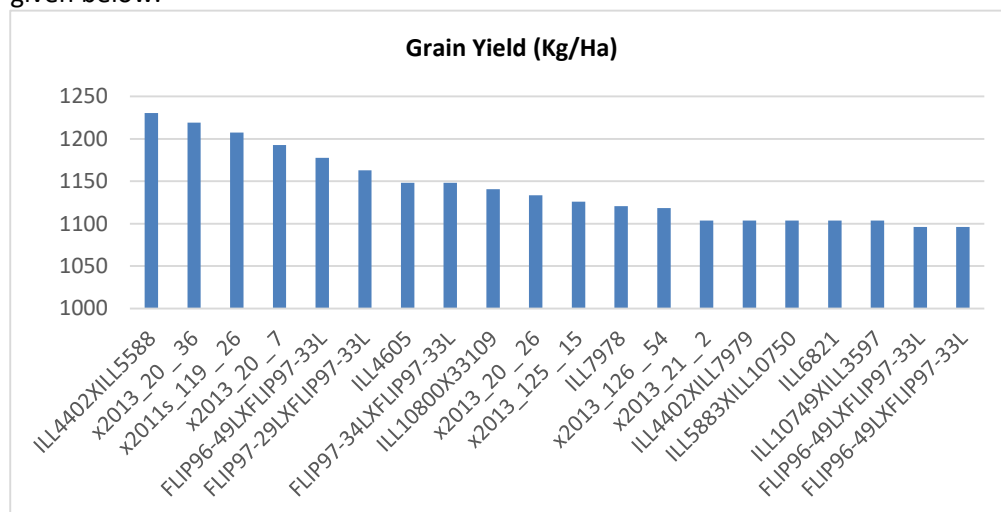
Key outcome	: Marchouch: The crop failed due to severe drought during early stage of the crop growth. However, seeds of individual genotypes harvested for further evaluation. Kfardan: 252 advanced lines evaluated in various trials showed significance variability for days to 50% flowering (101 to 116), days to maturity (109-152) and grain yield (190 to 1481 kg/ha) (Attachment: MEL-F08). High yield lines with desired traits including extra earliness, disease resistance and market traits identified. Top 20 lines with high yield and earliness are given below:
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Genotype	Grain yield Kg/Ha
7978/ILWL 118/3-9	1480
99/209/DPL 62/3-7	1420
4605/8006/1-6	1350
ILL590	1320
358/10870/21-7	1300
99/209/DPL 62/11	1280
6002/LURL-21-50-1-1-1/29	1270
F1X2011S-6/F1X2011S-76/2-6	1260
7978/ILWL 118/1-1	1250
7978/ILWL 118/5-4	1240
7978/ILWL 118/3-5	1230
7978/ILWL 118/1-2	1220
ILL6002	1210
7978/DPL 62/8-1	1200
8114/7663/8-6	1190
8114/10956/14-2	1180
2313/4605/6	1170
6002/LURL-21-50-1-1-1/25-1	1160
LURL-21-50-1-1-1/DPL 62/7	1150

3. Activity: Advanced yield trials in lentil and chickpea

Title	: Multi-environment yield evaluation of promising lines
Objectives	: To evaluate promising lines for their yield potential and phenotypic stability.
Activities	: Continued
Observations to be taken	: Plant height, Height of the lowest pod, Phenological traits, Yield and yield components
Materials and methods	: Advanced Yield Trial- Large seeded (33 lines + 2 improved checks + 1 local check) Advanced Yield Trial – Small seeded (33 lines + 2 improved checks + 1 local check) Advanced Yield Trial- Early (33 lines + 2 improved checks + 1 local check) Advanced Yield Trial- Machine harvest (33 lines + 2 improved checks + 1 local check) Advanced Yield Trial- Micro Nutrient (33 lines + 2 improved checks + 1 local check) Advanced Yield Trial – Extra early (33 lines + 2 improved checks + 1 local check) Advanced Yield Trial- Drought (33 lines + 2 improved checks + 1 local check) In chickpea, 281 elite lines evaluated along with checks under winter and spring season.
Key outcome	: Marchouch: The crop failed due to severe drought during early stage of the crop growth. However, seeds of individual genotypes harvested for further evaluation. Kfardan: There were significant varietal differences for days to flowering (73-118 day), days to maturity (126-156 and grain yield (330-1230 kg/ha) across the trials

(Attachment: MEL-F09). High yield lines with desired traits including extra earliness, disease resistance and market traits identified for seed increase and distribution as International Nurseries. The best performing elite lines over the check variety are as given below.



Trial	Promising lines
AYT-large seeds	x2011s17_20_3, x2011 s139_124_9, x2011s242_230_3, x2011s33_34_32, x2011s17_20_2, x2011s126_116_21, x2011s133_119_4
AYT-small seeds	x2011s_246_25, x2011s_183_16, x2011s_203_2, x2011s_192_45, x2011s_176_1
AYT-Early	x2011s_129_13, x2011s_119_25, x2011s_206_26, x2011s_130_1, x2011s_129_36, x2011s_129_28, x2011s_122_26, x2011s_247_19, x2011s_172_20, x2011s_203_2, x2011s_171_7, x2011s_138_20
AYT-Extra early	x2013_20_36, x2013_20_7, x2013_20_26, x2013_125_15, x2013_126_54, x2013_21_2, x2013_118_3, x2013_20_3, x2013_175_35, x2013_72_28, x2013_125_40, x2013_119_14, x2013_82_10, x2013_126_5, x2013_126_8, x2013_119_24, x2013_280_18, x2013_72_19, x2013_166_8, x2013_140_1, x2013_266_2, x2013_142_15
AYT-Machine Harvest	x2011s_200_13, x2011s_176_1, x2011s_199_9, x2011s_243_12, x2011s_200_10
AYT- Drought tolerance	x2011s_119_26, x2011s_172_34, x2011s_125_23, x2011s_206_58, x2011s_223_6, x2011s_195_4, x2011s_111_26, x2011s_123_36, x2011s_163_9, x2011s_204_51, x2011s_119_23
AYT- Micronutrients	x2011s_163_15, x2011s_126_60, ILL6821, x2011s_97_20, x2011s_125_36, x2011s_198_33, x2011s_97_17, x2011s_192_45, x2011s_54_14, x2011s_118_21, x2011s_278_1, x2011s_89_25, x2011s_118_12, x2011s_176_31, x2011s_110_13, x2011s_72_44, x2011s_115_22, x2011s_175_1, x2011s_172_25, x2011s_63_7, x2011s_82_3, x2011s_244_9
Chickpea (>3.5 tonnes per ha)	S0110117, S0110287, S0110477, S0110286, S0110311, S0110435, S0110313, S0110314, S0110315

1. Activity: Exploring extra early maturing lentil varieties suitable for Bihar in rice systems

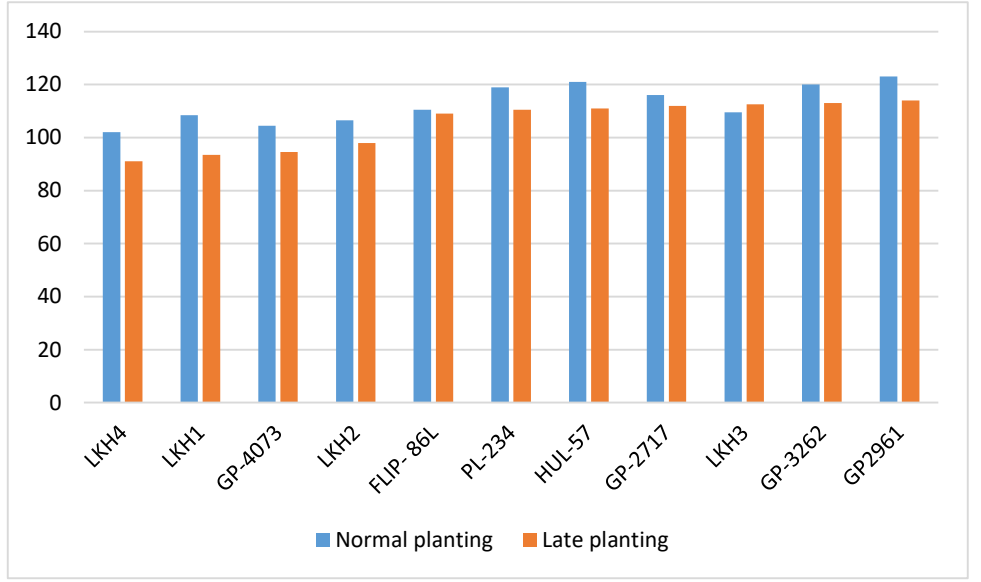
Title	:	Exploring extra early maturing lentil varieties suitable for Bihar in rice systems																																				
Objectives	:	To identify/develop extra early maturity lentil variety to overcome such abiotic stress prevalent in Bihar and ultimately boost up production of lentil in the state																																				
Activities	:	New																																				
Observations to be taken	:	Yield and yield attributes and phenological events under normal and late conditions																																				
Materials and methods	:	Evaluation of 49 lentil lines including ICARDA improved lines and local collections under normal and late planting conditions																																				
Key outcome	:	<p>Extra early line, LKH4 maturing in 102 days under normal and 91 days under late planting conditions showed great promise in rice systems in Bihar (Attachment: MEL-Ashutosh-F01). Days to 50% flowering varied from 51 to 97 days with a mean of 81 days under normal planted conditions and 44 to 83 days with a mean of 71 days under late planting conditions while days to maturity ranged from 102 to 130 days with a mean of 122 days and 91 to 126 days with a mean of 117 days, respectively.</p>  <table border="1"> <caption>Data for Figure 1: Days to maturity of early maturing lentil genotypes</caption> <thead> <tr> <th>Genotype</th> <th>Normal planting (days)</th> <th>Late planting (days)</th> </tr> </thead> <tbody> <tr> <td>LKH4</td> <td>102</td> <td>91</td> </tr> <tr> <td>LKH1</td> <td>108</td> <td>93</td> </tr> <tr> <td>GP-4073</td> <td>104</td> <td>94</td> </tr> <tr> <td>LKH2</td> <td>106</td> <td>97</td> </tr> <tr> <td>FLIP-86L</td> <td>110</td> <td>108</td> </tr> <tr> <td>PL-234</td> <td>118</td> <td>110</td> </tr> <tr> <td>HUJ-57</td> <td>120</td> <td>110</td> </tr> <tr> <td>GP-2717</td> <td>115</td> <td>111</td> </tr> <tr> <td>LKH3</td> <td>109</td> <td>112</td> </tr> <tr> <td>GP-3262</td> <td>119</td> <td>112</td> </tr> <tr> <td>GP2961</td> <td>122</td> <td>113</td> </tr> </tbody> </table>	Genotype	Normal planting (days)	Late planting (days)	LKH4	102	91	LKH1	108	93	GP-4073	104	94	LKH2	106	97	FLIP-86L	110	108	PL-234	118	110	HUJ-57	120	110	GP-2717	115	111	LKH3	109	112	GP-3262	119	112	GP2961	122	113
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Figure 1. Days to maturity of early maturing lentil genotypes under normal and late planted conditions in Bihar