

ANNUAL PROGRAM

OF

RESEARCH WORK

RABI 2016-17



VEGETABLE RESEARCH INSTITUTE

FAISALABAD

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1. TOMATO (*Solanum lycopersicum* L.)

1. TITLE	COLLECTION AND MAINTENANCE OF TOMATO GERMPLASM
OBJECTIVE	Collection and maintenance of local and exotic germplasm for future use in breeding programme.
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. KashifNadeem Mr. Amir Latif Mr. Muhammad Najeebullah
LOCATION	Faisalabad
DURATION/TREATMENTS	Continuous Entries (Existing) = Total 179 (118 Det. & 61 Ind.) (local and exotic).
METHODOLOGY	Nursery sowing = Mid October, 2016 Transplanting = Mid November, 2016 Experimental design = Non replicated Plant spacing = 50 cm (Det.) & 40 cm (Ind.) Bed width = 1.25 m (Det.) & 0.85 m (Ind.) Off-type plants will be rouged out to maintain the purity.
PREVIOUS YEAR'S RESULTS	118 entries of determinate and 61 of indeterminate were maintained for further use in breeding program. Selected 15 entries each type i.e. determinate and indeterminate will be used in breeding program.
2. TITLE	STUDY OF FILIAL GENERATIONS IN TOMATO
OBJECTIVE	To develop/select high yielding, disease resistant, good quality determinate and indeterminate tomato pure lines.
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. KashifNadeem Mr. Amir Latif Mr. Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS	Determinate F ₂ combinations = 14 cross F ₃ progenies of 13 crosses = 64 single plant F ₄ progenies of 7 crosses = 34 single plant F ₅ progenies of 5 crosses = 31 single plant F ₆ progenies of 3 crosses = 65 single plant F ₇ = 5 single plant

	progenies of 5 crosses Intermediate i) F ₂ = 13 cross combinations ii) F ₃ = 17 single plant progenies of 13 crosses iii) F ₄ = 32 single plant progenies of 6 crosses iv) F ₅ = 32 single plant progenies of 7 crosses v) F ₆ = 5 single plant progenies of 2 crosses vi) F ₇ = 2 single plant progenies of 1 cross																																																																				
METHODOLOGY	Nursery sowing = Mid October, 2016 Transplanting = 2 nd week of November, 2016 Plant to plant distance = 50 cm (Det.) & 40 cm (Ind.) Experimental design = Non-replicated F ₂ – F ₆ will be advanced by using Pedigree method. Desirable plant progenies will be selected for further studies.																																																																				
PREVIOUS YEAR'S RESULTS	a) Determinate <table border="1"> <thead> <tr> <th rowspan="2">S. No.</th> <th rowspan="2">Generation</th> <th colspan="2">No. of Crosses / Progeny</th> </tr> <tr> <th>Studied</th> <th>Selected</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>F₁</td> <td>40</td> <td>14</td> </tr> <tr> <td>2</td> <td>F₂</td> <td>14</td> <td>13/64</td> </tr> <tr> <td>3</td> <td>F₃</td> <td>8/40</td> <td>7/34</td> </tr> <tr> <td>4</td> <td>F₄</td> <td>7/51</td> <td>5/31</td> </tr> <tr> <td>5</td> <td>F₅</td> <td>5/34</td> <td>3/65</td> </tr> <tr> <td>6</td> <td>F₆</td> <td>7/13</td> <td>5/5</td> </tr> <tr> <td>7</td> <td>F₇</td> <td>5/13</td> <td>5/8</td> </tr> </tbody> </table> b) Intermediate <table border="1"> <thead> <tr> <th rowspan="2">S. No.</th> <th rowspan="2">Generation</th> <th colspan="2">No. of Crosses / Progeny</th> </tr> <tr> <th>Studied</th> <th>Selected</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>F₁</td> <td>40</td> <td>13</td> </tr> <tr> <td>2</td> <td>F₂</td> <td>13</td> <td>13/17</td> </tr> <tr> <td>3</td> <td>F₃</td> <td>6/28</td> <td>6/32</td> </tr> <tr> <td>4</td> <td>F₄</td> <td>9/42</td> <td>7/32</td> </tr> <tr> <td>5</td> <td>F₅</td> <td>3/11</td> <td>2/5</td> </tr> <tr> <td>6</td> <td>F₆</td> <td>4/8</td> <td>1/2</td> </tr> <tr> <td>7</td> <td>F₇</td> <td>4/24</td> <td>2/18</td> </tr> </tbody> </table>	S. No.	Generation	No. of Crosses / Progeny		Studied	Selected	1	F ₁	40	14	2	F ₂	14	13/64	3	F ₃	8/40	7/34	4	F ₄	7/51	5/31	5	F ₅	5/34	3/65	6	F ₆	7/13	5/5	7	F ₇	5/13	5/8	S. No.	Generation	No. of Crosses / Progeny		Studied	Selected	1	F ₁	40	13	2	F ₂	13	13/17	3	F ₃	6/28	6/32	4	F ₄	9/42	7/32	5	F ₅	3/11	2/5	6	F ₆	4/8	1/2	7	F ₇	4/24	2/18
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3. TITLE	PRELIMINARY EVALUATION OF DETERMINATE TOMATO PURE LINES																																																																				
OBJECTIVE	To evaluate determinate tomato pure lines selected from advanced generations.																																																																				
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. KashifNadeem Mr. Amir Latif Mr. Muhammad Najeebullah																																																																				
LOCATION	Faisalabad																																																																				
DURATION	2016-17																																																																				
TREATMENTS	Entries = 15 (including 3 checks) viz; 16241, 16242, 16243,																																																																				

	16244, 16245, 16246, 16247, 16248, 16249, 16250, 16251, 16252, Nadir (Check), Naqeeb (Check) & Rio Grande (Check).
METHODOLOGY	Nursery sowing = Mid October, 2016 Transplanting = 3 rd week of November, 2016 Experimental design = RCBD Plot size = 8.0 × 1.25 m Plant Spacing = 50 cm Repeats = 3 Data regarding fruit length, fruit width, fruit firmness, fruit weight and fruit yield will be recorded.
PREVIOUS YEAR'S RESULTS	During previous year 17 entries including two checks were studied. Data recorded for fruit length, fruit width, fruit firmness, fruit weight and fruit yield is given below.

Rank	Entry	Fruit length (mm)	Fruit width (mm)	Fruit firmness (kg/cm ²)	Fruit weight (g)	Fruit yield (t/ha)
1	13229	57.5	46.9	3.60	75.8	34.62
2	13240	44.3	42.2	3.66	61.8	34.00
3	13234	62.1	47.4	3.70	86.8	31.01
4	13232	60.0	48.9	3.22	92.6	30.30
5	13236	46.3	40.8	2.94	58.0	28.39
6	13230	60.3	46.0	3.06	85.4	27.34
7	13235	54.3	47.6	3.18	75.2	26.66
8	13231	55.1	45.0	3.50	73.2	25.27
9	Naqeeb (Check)	60.6	51.3	3.96	85.2	25.13
11	Rio Grande (Check)	57.9	48.5	4.06	80.8	24.03
12	13233	55.5	46.0	3.62	72.4	23.20
17	13238	53.6	48.0	3.36	82.8	13.21
LSD (0.05)						2.24

4. TITLE	SECONDARY EVALUATION OF DETERMINATE TOMATO PURE LINES
OBJECTIVE	To evaluate the selected determinate tomato pure lines for open field cultivation.
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. KashifNadeem Mr. Amir Latif Mr. Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	2016-17
TREATMENTS	Entries = 11 (including 3 checks) viz; 13189, 13229, 13230, 13232, 13234, 13239, 13240, 10139, Nadir (Check), Naqeeb (Check) & Rio Grande (Check).
METHODOLOGY	Nursery sowing = Mid October, 2016

	Transplanting = 3 rd week of November, 2016 Exp. Design = RCBD Plot size = 8.0 × 1.25 m Repeats = 3 Plant spacing = 50 cm Data regarding fruit length, fruit width, fruit firmness, fruit weight and fruit yield will be recorded.
PREVIOUS YEAR'S RESULTS	During previous year 8 entries including 2 checks were evaluated. Data recorded for fruit length, fruit width, fruit firmness, fruit weight and fruit yield is given below.

Rank	Entry	Fruit length (mm)	Fruit width (mm)	Fruit firmness (kg/cm ²)	Fruit weight (g)	Fruit yield (t/ha)
1	13198	57.8	49.6	3.96	88.2	26.40
2	Naqeeb (Check)	59.8	50.1	4.08	84.4	25.38
3	13201	40.8	44.1	3.82	58.6	24.54
4	13213	52.7	47.7	3.78	74.6	22.98
5	Rio Grande (Check)	58.8	50.6	4.26	82.8	22.94
6	13209	50.0	46.9	3.74	73.0	20.99
7	13215	52.3	47.3	3.62	73.0	19.46
8	13211	48.4	47.2	4.02	71.2	18.70
LSD (0.05)						1.95

5. TITLE	MULTI-LOCATIONAL / ZONAL EVALUATION OF DETERMINATE TOMATO PURE LINES
OBJECTIVE	To evaluate the selected determinate tomato pure lines for open field cultivation at different locations.
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. KashifNadeem Mr. Amir Latif Mr. Muhammad Najeebullah Dr. GhulamNabi Mr. Abrar Ahmad Mr. ZahidAslam
LOCATION	Faisalabad, Sheikhpura, Multan & Bahawalpur
DURATION	2016-17
TREATMENTS	Entries = 09 (including 3 checks) viz; 10139, 10142, 10173, 13198, 13209, 13213, Nadir (Check), Naqeeb (Check) & Rio Grande (Check).
METHODOLOGY	Nursery sowing = Mid October, 2016 Transplanting = 3 rd week of November, 2016 Experimental design = RCBD Plot size = 8.0 × 1.25 m Plant Spacing = 50 cm

	Repeats = 3 Data regarding fruit length, fruit width, fruit firmness, fruit weight and fruit yield will be recorded at VRI, Faisalabad whereas; only yield data will be recorded at out-stations.																																																																											
PREVIOUS YEAR'S RESULTS	During previous year 8 entries including 2 checks were studied. Data is presented below.																																																																											
<table border="1"> <thead> <tr> <th rowspan="2">Rank</th> <th rowspan="2">Entry</th> <th colspan="5">Fruit yield (T/ha)</th> </tr> <tr> <th>FSD</th> <th>S. Pura</th> <th>Multan</th> <th>B. Pur</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>10139</td> <td>33.50</td> <td>30.08</td> <td>29.03</td> <td>21.81</td> <td>28.61</td> </tr> <tr> <td>2</td> <td>10173</td> <td>30.05</td> <td>28.84</td> <td>27.60</td> <td>19.62</td> <td>26.53</td> </tr> <tr> <td>3</td> <td>10142</td> <td>25.42</td> <td>26.91</td> <td>25.50</td> <td>15.96</td> <td>23.45</td> </tr> <tr> <td>4</td> <td>Nadir</td> <td>26.36</td> <td>25.22</td> <td>23.92</td> <td>18.08</td> <td>23.40</td> </tr> <tr> <td>5</td> <td>NB-242</td> <td>24.26</td> <td>23.98</td> <td>21.66</td> <td>-</td> <td>23.30</td> </tr> <tr> <td>6</td> <td>Naqeeb (Check)</td> <td>24.53</td> <td>22.95</td> <td>21.89</td> <td>17.18</td> <td>21.64</td> </tr> <tr> <td>7</td> <td>Rio Grande (Check)</td> <td>23.74</td> <td>19.70</td> <td>18.34</td> <td>12.95</td> <td>18.68</td> </tr> <tr> <td>8</td> <td>13189</td> <td>17.25</td> <td>20.86</td> <td>16.78</td> <td>13.28</td> <td>17.04</td> </tr> <tr> <td colspan="2">LSD (0.05)</td> <td>2.54</td> <td>1.61</td> <td>2.48</td> <td>1.87</td> <td>-</td> </tr> </tbody> </table>		Rank	Entry	Fruit yield (T/ha)					FSD	S. Pura	Multan	B. Pur	Average	1	10139	33.50	30.08	29.03	21.81	28.61	2	10173	30.05	28.84	27.60	19.62	26.53	3	10142	25.42	26.91	25.50	15.96	23.45	4	Nadir	26.36	25.22	23.92	18.08	23.40	5	NB-242	24.26	23.98	21.66	-	23.30	6	Naqeeb (Check)	24.53	22.95	21.89	17.18	21.64	7	Rio Grande (Check)	23.74	19.70	18.34	12.95	18.68	8	13189	17.25	20.86	16.78	13.28	17.04	LSD (0.05)		2.54	1.61	2.48	1.87	-
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2	10173	30.05	28.84	27.60	19.62	26.53																																																																						
3	10142	25.42	26.91	25.50	15.96	23.45																																																																						
4	Nadir	26.36	25.22	23.92	18.08	23.40																																																																						
5	NB-242	24.26	23.98	21.66	-	23.30																																																																						
6	Naqeeb (Check)	24.53	22.95	21.89	17.18	21.64																																																																						
7	Rio Grande (Check)	23.74	19.70	18.34	12.95	18.68																																																																						
8	13189	17.25	20.86	16.78	13.28	17.04																																																																						
LSD (0.05)		2.54	1.61	2.48	1.87	-																																																																						
6. TITLE	ADAPTABILITY TRIAL OF EXOTIC TOMATO VARIETIES / HYBRIDS																																																																											
OBJECTIVE	To find out high yielding, well adapted, better quality and disease resistant / tolerant tomato varieties / hybrids.																																																																											
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. KashifNadeem Mr. Amir Latif Mr. Muhammad Najeebullah																																																																											
LOCATION	Faisalabad																																																																											
DURATION	2016-17																																																																											
TREATMENTS	Varieties / hybrids will be supplied by the Seed Companies and commercial cultivars will be used as standard checks.																																																																											
METHODOLOGY	Nursery sowing = Mid October, 2016 Transplanting = 3 rd week of November, 2016 Experimental design = RCBD Plot size = 8.0 × 1.25 m Plant Spacing = 50 cm Repeats = 3 Data regarding fruit length, fruit width, fruit firmness, fruit weight and fruit yield will be recorded.																																																																											
PREVIOUS YEAR'S RESULTS	97 determinate tomato varieties / F ₁ hybrids were studied in open field along with two checks in each of four sets whereas; 3 indeterminate tomato F ₁ hybrids along with two checks was studied under high tunnel in a separate trial. Data recorded for fruit yield and quality parameters is given below:																																																																											

Set-1 (Det.)

Rank	Variety/ Hybrid	Fruit length (mm)	Fruit width (mm)	Fruit firmness (kg/cm ²)	Fruit weight (g)	Fruit yield (T/ha)
1	Kamaal F ₁	52.7	47.0	3.16	88.0	34.13
2	Mishal F ₁	49.2	45.9	3.08	61.0	30.39
3	Roshan F ₁	52.6	48.6	3.12	71.0	28.90
4	AS-6484 F ₁	50.5	46.2	3.04	61.0	26.84
5	TO-1080	48.7	46.4	2.90	64.0	26.41
6	Kortaja F ₁	61.9	54.9	3.26	98.0	25.73
13	Naqeeb (Check)	62.4	50.9	3.60	82.0	23.53
14	Miracle F ₁	56.0	48.1	3.44	76.0	23.46
25	TAI-1757 F₁ (Check)	50.4	47.7	3.52	65.0	18.07
29	Maryam F ₁	56.6	51.6	3.30	84.0	10.75
LSD (0.05)						2.01

Set-2 (Det.)

Rank	Variety/ Hybrid	Fruit length (mm)	Fruit width (mm)	Fruit firmness (kg/cm ²)	Fruit weight (g)	Fruit yield (T/ha)
1	DRD-8564	59.9	57.6	2.88	122.0	31.15
2	Advanta-1211 F ₁	50.2	40.6	2.80	54.0	27.90
3	Yaqui	56.9	50.0	2.64	88.0	27.85
4	Jumbo Super AB F ₁	52.6	43.1	3.62	57.0	26.90
5	MDS Royal Star	62.9	45.0	3.12	79.0	26.14
6	Happy Tomatay	56.2	46.2	2.74	68.0	25.98
10	Naqeeb (Check)	60.2	49.8	3.26	81.0	24.63
11	RattoTomatay	56.2	47.4	2.82	62.0	23.78
23	TAI-1757 F₁ (Check)	48.1	45.0	3.20	62.0	19.11
29	Fast Tomatay	40.0	36.1	2.66	36.0	8.09
LSD (0.05)						2.02

Set-3 (Det.)

Rank	Variety/ Hybrid	Fruit length (mm)	Fruit width (mm)	Fruit firmness (kg/cm ²)	Fruit weight (g)	Fruit yield (T/ha)
1	Rani	55.6	45.5	3.66	62.0	25.98
2	Hiker F ₁	60.4	46.4	4.12	76.0	25.49
3	Chaman F ₁	59.9	46.4	3.36	73.0	25.33
4	Solo-1	65.1	56.9	3.10	120.0	24.53
5	TM-1826	50.9	44.0	3.26	57.0	22.78
6	GSL-198	52.4	47.1	3.46	70.0	22.58
7	Naqeeb (Check)	59.0	48.5	3.50	78.0	21.61
8	Leader F ₁	53.5	45.3	3.40	74.0	21.25
14	TAI-1757 F₁ (Check)	47.7	45.0	3.56	59.0	18.04

28	Cosmic F ₁	53.6	47.2	4.04	71.0	5.62
LSD (0.05)						3.02

Set-4 (Det.)

Rank	Variety/ Hybrid	Fruit yield (T/ha)
1	Red Cross	2.84
2	Advanta-1247 F ₁	2.15
3	007	1.80
4	Supremo	1.61
5	Zamora	1.36
6	T-100	1.28
7	Naqeeb (Check)	1.26
8	Zermatt	1.09
14	TAI-1757 F₁ (Check)	0.83
19	Marina	0.38
LSD (0.05)		0.61

Indeterminate

Rank	Variety/ Hybrid	Fruit length (mm)	Fruit width (mm)	Fruit firmness (kg/cm ²)	Fruit weight (g)	Fruit yield (T/ha)
1	Sahel F₁ (Check)	55.0	46.9	3.78	83.6	101.17
2	Salar F₁ (Check)	56.2	45.3	3.60	70.8	100.47
3	GSL-A46	50.1	46.2	3.10	77.2	89.28
4	GHTO-01	51.3	44.5	3.48	76.4	85.38
5	CBS-A92	57.7	51.6	3.96	85.2	84.88
LSD (0.05)						4.35

7. TITLE	MULTILOCATIONAL EVALUATION OF TOMATO PURE LINES FOR AUTUMN PLANTING
OBJECTIVES	To select high yielding and disease tolerant tomato genotypes suitable for early / autumn planting.
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. Kashif Nadeem Mr. Amir Latif Mr. Muhammad Najeebullah
LOCATION(S)	Faisalabad, Chakwal & Vehari
DURATION	2016-17
TREATMENTS	12 entries including 3 checks = AUT-302, AUT-305, AUT-309, AUT-312, AUT-315, AUT-318, AUT-324, AUT-330, 10139, T-1359 F ₁ (Check), RS-1312 F ₁ (Check) & Kanwal F ₁ (Check).
METHODOLOGY	Nursery sowing = 1 st week of August, 2016 Transplanting = 1 st week of September, 2016 Experimental design = RCBD

	Plot size = 8.0 × 1.25 m Plant Spacing = 50 cm Repeats = 3 Data regarding fruit weight and fruit yield will be recorded.																																	
PREVIOUS YEAR'S RESULTS	9 selected lines along with 3 checks were studied during the previous year. Data regarding fruit yield is presented below:																																	
	<table border="1"> <thead> <tr> <th>Rank</th> <th>Entry</th> <th>Fruit yield (T/ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>AUT-302</td> <td>18.71</td> </tr> <tr> <td>2</td> <td>AUT-305</td> <td>17.66</td> </tr> <tr> <td>3</td> <td>AUT-318</td> <td>17.31</td> </tr> <tr> <td>4</td> <td>AUT-309</td> <td>14.08</td> </tr> <tr> <td>5</td> <td>AUT-312</td> <td>13.50</td> </tr> <tr> <td>6</td> <td>T-1359 F₁ (Check)</td> <td>12.73</td> </tr> <tr> <td>7</td> <td>AUT-315</td> <td>12.54</td> </tr> <tr> <td>8</td> <td>RS-1312 F₁ (Check)</td> <td>11.29</td> </tr> <tr> <td>9</td> <td>Kanwal F₁ (Check)</td> <td>9.95</td> </tr> <tr> <td></td> <td>LSD (0.05)</td> <td>1.92</td> </tr> </tbody> </table>	Rank	Entry	Fruit yield (T/ha)	1	AUT-302	18.71	2	AUT-305	17.66	3	AUT-318	17.31	4	AUT-309	14.08	5	AUT-312	13.50	6	T-1359 F₁ (Check)	12.73	7	AUT-315	12.54	8	RS-1312 F₁ (Check)	11.29	9	Kanwal F₁ (Check)	9.95		LSD (0.05)	1.92
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8. TITLE	SYNTHESIS OF DETERMINATE TOMATO HYBRIDS SUITABLE FOR OPEN FIELD CULTIVATION																																	
OBJECTIVES	To develop high yielding determinate tomato hybrids suitable for open field cultivation.																																	
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. Kashif Nadeem Mr. Amir Latif Mr. Muhammad Najeebullah																																	
LOCATION	Faisalabad																																	
DURATION	2016-17																																	
TREATMENTS	Parents = 20																																	
METHODOLOGY	Nursery sowing = Mid October, 2016 Transplanting = 3 rd week of November, 2016 Plot size = 8.0 × 1.75 m / as per requirements Plant Spacing = 50 cm The crosses amongst desirable parents will be made to develop 40 new and 20 selected/ promising F ₁ hybrids.																																	
PREVIOUS YEAR'S RESULTS	A total of 54 F ₁ crosses seed (40 fresh & 14 under evaluation hybrids) was produced.																																	
9. TITLE	PRELIMINARY EVALUATION OF DETERMINATE TOMATO HYBRIDS SUITABLE FOR OPEN FIELD CULTIVATION																																	
OBJECTIVES	To evaluate locally developed determinate tomato hybrids suitable for open field cultivation.																																	

RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. Kashif Nadeem Mr. Amir Latif Mr. Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	2016-17
TREATMENTS	F ₁ hybrids = 42 (including 2 checks) viz; LTH-410, LTH-411, LTH-412, LTH-413, LTH-414, LTH-415, LTH-416, LTH-417, LTH-418, LTH-419, LTH-420, LTH-421, LTH-422, LTH-423, LTH-424, LTH-425, LTH-426, LTH-427, LTH-428, LTH-429, LTH-430, LTH-431, LTH-432, LTH-433, LTH-434, LTH-435, LTH-436, LTH-437, LTH-438, LTH-439, LTH-440, LTH-441, LTH-442, LTH-443, LTH-444, LTH-445, LTH-446, LTH-447, LTH-448, LTH-449, T-1359 F ₁ (Check) and Nadir (Check).
METHODOLOGY	Nursery sowing = Mid October, 2016 Transplanting = 3 rd week of November, 2016 Experimental design = RCBD Plot size = 8.0 × 1.25 m Plant Spacing = 50 cm Repeats = 3 Data regarding fruit length, fruit width, fruit firmness, fruit weight and fruit yield will be recorded.
PREVIOUS YEAR'S RESULTS	40 locally developed determinate F ₁ hybrids along with two checks were evaluated in two different sets (20 F ₁ hybrids & 2 checks in each set). Data recorded for fruit length, fruit width, fruit firmness, fruit weight and fruit yield is given below.

Set-1

Rank	Entry	Fruit length (mm)	Fruit width (mm)	Fruit firmness (kg/cm ²)	Fruit weight (g)	Fruit yield (t/ha)
1	LTH-375	46.0	50.9	3.28	76.6	33.78
2	LTH-373	49.3	52.6	3.02	82.8	32.82
3	LTH-376	49.3	51.7	3.44	83.6	31.39
4	LTH-369	50.0	51.5	3.00	78.0	30.61
5	LTH-377	51.2	56.7	3.42	94.4	29.31
6	LTH-366	62.0	44.1	4.44	72.4	27.08
9	T-1359 F₁ (Check)	49.2	44.2	4.24	66.4	24.92
10	LTH-363	39.2	47.0	3.58	57.6	24.65
21	TAI-1757 F₁ (Check)	50.6	46.0	3.96	64.6	15.67
22	LTH-368	44.3	41.9	2.72	57.2	12.94
LSD (0.05)						2.43

Set-2

Rank	Entry	Fruit length (mm)	Fruit width (mm)	Fruit firmness (kg/cm ²)	Fruit weight (g)	Fruit yield (t/ha)
1	LTH-409	31.4	38.0	3.52	40.6	31.34
2	LTH-408	47.8	46.6	3.36	70.6	27.58
3	LTH-397	47.9	49.6	3.14	77.0	27.22
4	LTH-395	42.9	44.5	3.34	56.6	26.63
5	LTH-403	48.4	41.4	3.20	55.8	25.17
6	LTH-399	45.0	47.8	3.50	72.0	24.13
9	T-1359 F₁ (Check)	49.6	43.0	3.92	64.4	21.36
10	LTH-405	56.0	47.9	3.54	76.8	21.01
18	TAI-1757 F₁ (Check)	48.3	43.1	3.76	62.6	16.05
22	LTH-393	23.6	23.7	3.06	20.4	13.88
LSD (0.05)						2.22

10. TITLE	SECONDARY / STATION YIELD EVALUATION OF DETERMINATE TOMATO HYBRIDS SUITABLE FOR OPEN FIELD CULTIVATION
OBJECTIVES	To evaluate the selected locally developed tomato hybrids suitable for open field cultivation.
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. Kashif Nadeem Mr. Amir Latif Mr. Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	2016-17
TREATMENTS	F ₁ hybrids = 11 (including 3 checks) viz; LTH-324, LTH-350, LTH-365, LTH-366, LTH-371, LTH-379, LTH-405, 10139, T-

	1359 F ₁ (Check), Nadir (Check) and Naqeeb (Check).																																																																													
METHODOLOGY	Nursery sowing = Mid October, 2016 Transplanting = 3 rd week of November, 2016 Experimental design = RCBD Plot size = 8.0 × 1.25 m Plant Spacing = 50 cm Repeats = 3 Data regarding fruit length, fruit width, fruit firmness, fruit weight and fruit yield will be recorded.																																																																													
PREVIOUS YEAR'S RESULTS	7 determinate F ₁ hybrids along with two exotic checks were evaluated. Data recorded for fruit length, fruit width, fruit firmness, fruit weight and fruit yield is given below.																																																																													
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11. TITLE	MULTI-LOCATIONAL / ZONAL EVALUATION OF DETERMINATE TOMATO HYBRIDS SUITABLE FOR OPEN FIELD CULTIVATION																																																																													
OBJECTIVES	To evaluate the selected locally developed tomato hybrids suitable for open field cultivation at different locations.																																																																													
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. Kashif Nadeem Mr. Amir Latif Mr. Muhammad Najeebullah Dr. GhulamNabi Mr. Abrar Ahmad Mr. ZahidAslam																																																																													
LOCATION	Faisalabad, Sheikhpura, Multan & Bahawalpur																																																																													
DURATION	2016-17																																																																													
TREATMENTS	Entries = 5 F ₁ hybrids along with 3 checks viz; LTH-287, LTH-291, LTH-297, LTH-324, LTH-350, 10139, T-1359 F ₁ (Check), Nadir (Check) and Naqeeb (Check).																																																																													
METHODOLOGY	Nursery sowing = Mid October, 2016																																																																													

	Transplanting = 3 rd week of November, 2016 Experimental design = RCBD Plot size = 8.0 × 1.25 m Plant Spacing = 50 cm Repeats = 3 Data regarding fruit length, fruit width, fruit firmness, fruit weight and fruit yield will be recorded at VRI, Faisalabad whereas; only fruit yield data will be recorded at out-stations.
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PREVIOUS YEAR'S RESULTS	6 F ₁ hybrids including two checks were studied at four different locations. Data recorded for fruit yield is presented below.
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Rank	Entry	Fruit yield (T/ha)				
		FSD	S. Pura	Multan	B. Pur	Average
1	LTH-297	33.18	29.87	27.64	22.17	28.22
2	Ahmar F ₁	26.65	24.80	23.94	18.90	23.57
3	LTH-287	26.16	24.72	22.88	19.60	23.34
4	T-1359 F₁ (Check)	23.12	22.90	23.31	17.47	21.70
5	LTH-252	20.70	19.01	18.61	15.62	18.49
6	TAI-1757 F₁ (Check)	17.50	16.90	15.89	12.95	15.81
LSD (0.05)		1.74	2.23	1.89	2.37	-

12. TITLE	SYNTHESIS OF INDETERMINATE TOMATO HYBRIDS SUITABLE FOR TUNNEL CULTIVATION
OBJECTIVES	To develop high yielding indeterminate tomato hybrids suitable for tunnel cultivation.
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. Kashif Nadeem Mr. Amir Latif Mr. Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	2016-17
TREATMENTS	Parents = 20
METHODOLOGY	Nursery sowing = Mid October, 2016 Transplanting = 3 rd week of November, 2016 Plot size = 3.60 × 1.70 m / as per requirements Plant Spacing = 40 cm The crosses amongst desirable parents will be made to develop 40 new and 20 selected/ promising F ₁ hybrids.
PREVIOUS YEAR'S RESULTS	A total of 62 F ₁ crosses seed (40 fresh & 22 under evaluation hybrids) was produced.
13. TITLE	PRELIMINARY EVALUATION OF INDETERMINATE TOMATO HYBRIDS SUITABLE FOR TUNNEL CULTIVATION
OBJECTIVES	To evaluate locally developed indeterminate tomato hybrids

	suitable for tunnel cultivation.
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. Kashif Nadeem Mr. Amir Latif Mr. Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	2016-17
TREATMENTS	43 F ₁ hybrids (including one exotic check) viz: LITTH-830, LITTH-831, LITTH-832, LITTH-833, LITTH-834, LITTH-835, LITTH-836, LITTH-837, LITTH-838, LITTH-839, LITTH-840, LITTH-841, LITTH-842, LITTH-843, LITTH-844, LITTH-845, LITTH-846, LITTH-847, LITTH-848, LITTH-849, LITTH-850, LITTH-851, LITTH-852, LITTH-853, LITTH-854, LITTH-855, LITTH-856, LITTH-857, LITTH-858, LITTH-859, LITTH-860, LITTH-861, LITTH-863, LITTH-864, LITTH-865, LITTH-866, LITTH-868, LITTH-869, LITTH-870, LITTH-871, LITTH-872, LITTH-873 & Sahel F ₁ (Exotic check).
METHODOLOGY	Nursery sowing = Mid October, 2016 Transplanting = 3 rd week of November, 2016 Experimental design = RCBD Plot size = 3.60 × 1.70 m Plant Spacing = 40 cm Data regarding fruit length, fruit width, fruit firmness, fruit weight and fruit yield will be recorded.
PREVIOUS YEAR'S RESULTS	42 locally developed indeterminate F ₁ hybrids along with one exotic check were evaluated in three different sets (14 F ₁ hybrids & 1 check in each set). Data recorded for fruit length, fruit width, fruit firmness, fruit weight and fruit yield is given below.

Set-1

Rank	Entry	Fruit length (mm)	Fruit width (mm)	Fruit firmness (kg/cm ²)	Fruit weight (g)	Fruit yield (t/ha)
1	LITTH-779	50.9	49.5	3.70	81.2	93.41
2	LITTH-789	51.6	45.6	3.98	61.8	93.11
3	LITTH-778	56.3	53.8	3.64	105.4	92.47
4	Sahel F₁ (Check)	62.7	53.7	3.98	94.6	90.61
5	LITTH-780	55.6	42.3	3.50	64.1	90.22
6	LITTH-784	46.9	39.4	3.32	48.6	86.67
15	LITTH-781	45.3	41.7	3.02	49.2	53.07
LSD (0.05)						6.09

Set-2

Rank	Entry	Fruit length (mm)	Fruit width (mm)	Fruit firmness (kg/cm ²)	Fruit weight (g)	Fruit yield (t/ha)
1	LITTH-799	60.0	44.7	3.64	75.2	93.23
2	LITTH-807	44.5	44.2	4.06	59.2	92.02
3	Sahel F₁ (Check)	62.9	53.7	3.80	97.4	90.74
4	LITTH-809	62.2	40.6	4.74	64.8	85.40
5	LITTH-810	61.7	51.3	3.92	70.0	83.98
6	LITTH-801	60.8	50.1	3.06	69.0	82.27
15	LITTH-795	48.7	50.8	3.28	85.8	68.39
LSD (0.05)						4.83

Set-3

Rank	Entry	Fruit length (mm)	Fruit width (mm)	Fruit firmness (kg/cm ²)	Fruit weight (g)	Fruit yield (t/ha)
1	LITTH-818	50.5	49.6	3.66	80.6	100.37
2	LITTH-816	45.5	45.2	3.18	60.8	98.33
3	Sahel F₁ (Check)	63.5	53.1	3.86	92.6	92.90
4	LITTH-823	47.1	50.1	3.32	80.4	91.52
5	LITTH-811	60.2	47.0	3.58	98.2	87.48
6	LITTH-815	60.2	37.0	3.40	53.2	83.95
15	LITTH-824	53.4	51.7	3.12	91.2	65.00
LSD (0.05)						6.19

14. TITLE	SECONDARY / STATION YIELD EVALUATION OF INDETERMINATE TOMATO HYBRIDS SUITABLE FOR TUNNEL CULTIVATION
OBJECTIVES	To evaluate selected locally developed tomato hybrids suitable for tunnel cultivation.
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti

	Mr. Kashi fNadeem Mr. Amir Latif Mr. Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	2016-17
TREATMENTS	9 F ₁ Hybrids (including two checks) viz: LITTH-778, LITTH-779, LITTH-796, LITTH-799, LITTH-809, LITTH-811, LITTH-818, Sahel F ₁ (Exotic check) & Saandal F ₁ (Local check).
METHODOLOGY	Nursery sowing = Mid October, 2016 Transplanting = 3 rd week of November, 2016 Experimental design = RCBD Plot size = 3.6 × 1.7 m Plant Spacing = 40 cm Data regarding fruit length, fruit width, fruit firmness, fruit weight and fruit yield will be recorded.
PREVIOUS YEAR'S RESULTS	7 locally developed indeterminate F ₁ hybrids along with three checks (one exotic & two local) were evaluated. Data recorded for fruit length, fruit width, fruit firmness, fruit weight and fruit yield is given below.

Rank	Entry	Fruit length (mm)	Fruit width (mm)	Fruit firmness (kg/cm ²)	Fruit weight (g)	Fruit yield (t/ha)
1	LITTH-707	54.4	52.0	4.12	87.0	88.16
2	LITTH-765	63.6	53.1	4.18	98.0	88.02
3	Sahel F₁ (Check)	63.3	54.5	4.02	95.0	87.94
4	Anna F₁ (Check)	54.7	47.7	4.20	78.4	86.18
5	Saandal F₁ (Check)	58.9	52.7	4.06	91.2	84.54
6	LITTH-757	52.8	48.0	4.28	65.0	82.28
10	LITTH-738	50.6	53.3	3.82	80.4	71.50
LSD (0.05)						4.46

15. TITLE	MULTI-LOCATIONAL / ZONAL EVALUATION OF INDETERMINATE TOMATO HYBRIDS SUITABLE FOR TUNNEL CULTIVATION
OBJECTIVES	To evaluate selected locally developed tomato hybrids suitable for tunnel cultivation at different locations.
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. Kashif Nadeem Mr. Amir Latif Mr. Muhammad Najeebullah Dr. GhulamNabi Mr. Abrar Ahmad Mrs. NaveedaAnjum
LOCATION	Faisalabad, Sheikhpura, Multan and Chakwal

DURATION	2016-17
TREATMENTS	9 F ₁ Hybrids (including four checks) viz: LITTH-682, LITTH-691, LITTH-707, LITTH-710, LITTH-765 & Sahel F ₁ , Anna F ₁ (Exotic checks), Salar F ₁ &Saandal F ₁ (Local checks).
METHODOLOGY	Nursery sowing = Mid October, 2016 Transplanting = 3 rd week of November, 2016 Experimental design = RCBD Plot size = 3.60 × 1.70 m Plant Spacing = 40 cm Data regarding fruit length, fruit width, fruit firmness, fruit weight and fruit yield will be recorded at VRI, Faisalabad whereas; only fruit yield data will be recorded at out-stations.
PREVIOUS YEAR'S RESULTS	8 F ₁ tomato hybrids including three checks were studied at four different locations. Data recorded for fruit yield is presented below.

Rank	Entry	Fruit yield (T/ha)				
		FSD	S. Pura	Multan	Chakwal	Average
1	Salar F₁ (Check)	104.43	103.64	99.86	-	102.64
2	LITTH-691	103.18	101.96	98.11	97.87	100.28
3	LITTH-710	102.36	97.90	96.64	88.01	96.23
4	Sahel F₁ (Check)	100.38	98.74	96.85	87.68	95.91
5	Anna F₁ (Check)	96.11	94.68	93.91	-	94.90
6	LITTH-682	99.80	96.92	94.96	77.47	92.29
7	LITTH-611	90.74	93.14	89.71	85.73	89.83
8	LITTH-714	92.45	91.81	90.76	78.39	88.35
	LSD (0.05)	4.20	6.80	7.18	6.78	-

16. TITLE	SEED PRODUCTION OF APPROVED TOMATO HYBRIDS AND VARIETIES FOR GENERAL CULTIVATION
OBJECTIVES	<ul style="list-style-type: none"> To produce the hybrid seed of approved determinate and indeterminate locally developed tomato hybrids for general cultivation in tunnels and open fields. To produce the seed of approved determinate tomato varieties suitable for low tunnels and open fields.
RESEARCH WORKERS	Dr. Saeed Ahmad Shah Chishti Mr. Kashif Nadeem Mr. Amir Latif Mr. Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	2016-17
TREATMENTS	Indeterminate hybrid = 04 Determinate hybrid = 01 Determinate variety = 02
METHODOLOGY	Nursery sowing = Mid October, 2016 Transplanting = 3 rd week of November, 2016

	<p>Area = 04 Kanals (Indeterminate parents) = 10 Marlas (Determinate parents) = 06 Kanals (Determinate variety)</p> <p>Spacing = 40 cm (Indeterminate) = 50 cm (Determinate)</p> <ul style="list-style-type: none"> • 1.5 kg hybrid seed of approved indeterminate/ determinate types will be made by crossing parental lines of their respective combinations (As per EVPP Project target). • 3.0 kg seed of approved determinate varieties will be produced (As per PARB Project target).
PREVIOUS YEAR'S RESULTS	1.5 kg seed of two indeterminate tomato hybrids namely Salar F ₁ and Saandal F ₁ was produced for general cultivation in Punjab.

2. ONION (*Allium cepa* L.)

1. TITLE	COLLECTION AND MAINTAINANCE OF GERMPLASM		
OBJECTIVES:	Collection and maintenance of local and exotic germplasm for future use in breeding programme.		
RESEARCH WORKER (S)	Mrs. Mehvish Tahir Dr. Akhter Saeed Dr. Saeed Ahmad Shah Chishti		
LOCATION	VRI, Faisalabad		
DURATION	Continuous		
TREATMENTS	Varieties for sets production = 23 Varieties for seed production = 19		
METHODOLOGY	<p>For sets production Nursery sowing = 2nd fortnight of November, 2016 Harvesting of nursery sets = 1st fortnight of May, 2016</p> <p>For seed production Transplanting of sets (In isolations) = December, 2016 Plot size = up to 5 Marla Sets and seeds will be harvested at maturity</p>		
	Sr. No	Characters	Range
	1	Bulb diameter(cm)	5.6-11.6
	2	Neck diameter	0.62-1.4
	3	Bulb weight(g)	76-107
	4	Bulb color	White, piaz, purple, red
	5	Bulb shape	Spherical, Tall, Flat
	6	Ring/bulb	4-11.8
	7	Centres/bulb	1-5
2. TITLE	DEVELOPMENT OF ONION INBRED LINE		
OBJECTIVES:	For the development of hybrids/synthetic varieties		
RESEARCH WORKER (S)	Mrs. Mehvish Tahir Dr. Akhter Saeed		

	Dr. Saeed Ahmad Shah Chishti
LOCATION	VRI, Faisalabad
DURATION	Continuos
TREATMENTS	<p>S₀ Sets = 7varieties S₀ Seed = 3varieties S₁ Sets = 3varieties S₁ Seed = 3varieties S₂ Sets = 7varieties S₂ Seed = 2varieties S₃ Sets = 6 varieties S₃ Seed = 1varieties S₄ Sets = 2 varieties</p>
METHODOLOGY	<p>The nursery sets (harvested during May 2015) has been planted in August for bulb formation. The bulb of S₁, S₂, S₃ and S₄ generation will be planted during December 2016 for seed production. At flowering (March-April) 25 single umbels will be bagged with butter paper bag in each variety. At maturity seed will be collected for further selfing to develop inbred lines. S₀, S₁, S₂ and S₃ Seed will be planted during 2nd fortnight of November 2016 to produce bulblets during spring 2016-17 for bulb production in next season.</p>
PREVIOUS YEAR'S RESULTS	<p>Following selfed material was harvested. S₀ Sets = 7varieties S₀ Seed = 3varieties S₁ Sets = 3varieties S₁ Seed = 3varieties S₂ Sets = 7varieties S₂ Seed = 2varieties S₃ Sets = 6 varieties S₃ Seed = 1varieties S₄ Sets = 2 varieties</p>
3. TITLE	DEVELOPMENT OF OPEN POLLINATED ONION VARIETIES
OBJECTIVES	To develop high yielding, disease resistant/tolerant and better adapted open pollinated onion varieties.
RESEARCH WORKER (S)	<p>Mrs. Mehvish Tahir Dr. Akhter Saeed Dr. Saeed Ahmad Shah Chishti</p>
LOCATION	VRI, Faisalabad.
DURATION	Continuous
TREATMENTS	<p>A. Seed of one source population B. Sets of 23 varieties</p>
METHODOLOGY	A. Seed of one source population will be planted during 2 nd fortnight of

	October and transplanted during December. At maturity desirable bulbs will be selected. B. Sets will be harvested and replanted during December to facilitate random mating. Seed will be harvested at maturity.
PREVIOUS YEAR'S RESULTS	A. One source population was developed. B. Sets exotic varieties were produced.
4. TITLE	EVALUATION OF EXOTIC VARIETIES/HYBRIDS IN ADAPTABILITY TRIAL
OBJECTIVES:	To test adaptability of imported varieties.
RESEARCH WORKER (S)	Mrs. Mehvish Tahir Dr. Akhter Saeed Dr. Saeed Ahmad Shah Chishti
LOCATION	VRI, Faisalabad
DURATION	Continuous
TREATMENTS	Varieties provided by importers
METHODOLOGY	Nursery sowing = 2 nd fortnight of October , 2016 Transplanting = December, 2016 Design = RCBD Replication = 3 Plot size = 7 × 1.5 m Data on diameter of the bulb, neck diameter, average bulb weight, number of rings per bulb and yield will be recorded.

PREVIOUS YEAR'S RESULTS

Performance of Varieties/strains is as follows

Varieties	Plant Weight (g)	Bulb Weight (g)	Neck Diameter (cm)	Bulb Diameter (cm)	# of rings /bulb	Yield (t/ha)
Ruby F₁	59.00	62.67	0.92	4.87	6.73	3.56
Red Moon	66.00	67.33	1.07	5.37	6.27	7.51
Robin F₁	71.00	68.67	0.97	5.14	7.00	6.94
Hybrid Onion Kareem	68.67	63.67	1.13	5.11	9.07	4.62
Red Snack	63.67	61.00	1.03	5.49	6.67	4.87
Premium	73.33	67.67	0.79	5.39	7.43	2.87
Islero F₁	55.33	57.33	0.99	5.01	6.67	3.46
Red King	76.67	74.67	1.05	5.67	7.13	8.10
Spice Onion (Barkeel)	55.00	55.00	0.71	5.01	7.00	4.52
SV0748NP	53.33	47.00	0.69	4.76	6.60	4.44
Monica	79.33	77.33	0.92	5.50	7.60	7.24
SV1695NP	56.67	52.67	0.95	4.51	7.10	2.98
ICI 1801	63.67	61.00	0.78	5.05	7.27	4.77
Phulkara (check)	63.67	68.67	0.94	5.53	7.47	4.88

LSD (0.05)	0.51	0.48	0.14	0.63	0.86	1.18
5. TITLE	EVALUATION OF HIGH YIELDING ONION VARIETIES FOR SPRING SEASONS					
OBJECTIVES:	To screen out high yielding onion varieties for spring seasons.					
RESEARCH WORKER (S)	Mrs. Mehvish Tahir Dr. Akhter Saeed Dr. Saeed Ahmad Shah Chishti					
LOCATION	VRI-Faisalabad.					
DURATION	Continuous					
TREATMENTS	Varieties = 23 viz. Vrio-1, Vrio-2, Vrio-3, Vrio-4, Vrio-5, Vrio-6, Vrio-7, Vrio-8, Vrio-9, Vrio-10, S-C_16, Dark red, Phulkara, Robina, Pusa red, Mirpurkhas, Early Red, Red Imposta, Desi large, Red nasik, Desi red, PK-10321 and Faisal Red					
METHODOLOGY	Nursery sowing = 2 nd fortnight of October , 2016 Transplanting = December, 2016 Design = RCBD Replication = 3 Plot size = 7 × 1.5 m Data on bolting %age, diameter of the bulb and neck, no.of rings/bulb and yield will be recorded.					
PREVIOUS YEAR'S RESULTS	Performance of Varieties/strains is as follows					

Varieties	Plant Weight (g)	Bulb Weight (g)	Neck Diameter (cm)	Bulb Diameter (cm)	No.of Rings per Bulb	Yield (t/ha)
VRIO-1	36.40	35.20	0.91	4.37	6.60	2.22
VRIO-2	53.73	51.20	0.92	5.03	6.80	3.66
VRIO-3	10.80	10.40	0.59	2.46	5.47	3.19
VRIO-4	34.27	32.67	0.95	4.19	6.67	2.05
VRIO-5	41.87	40.40	0.68	4.34	6.47	3.09
VRIO-6	31.73	30.67	0.83	3.91	6.80	4.50
VRIO-7	44.67	43.47	0.96	4.63	6.87	2.57
VRIO-8	53.87	52.00	0.93	4.87	7.13	4.24
Phulkara	36.93	35.20	0.84	4.17	6.47	2.68
Dark Red	34.00	33.53	0.93	4.14	6.67	2.68
Red Nasic	42.53	41.13	0.93	4.58	7.27	3.84
Desi Large	51.53	49.87	1.07	4.85	7.07	3.58
Red Imposta	42.53	40.67	0.93	4.67	7.13	3.34

Early Red	46.93	44.67	0.94	4.75	7.20	3.05
Robina	39.20	37.60	0.85	4.29	7.07	1.47
Desi Red	32.67	31.20	0.78	4.02	6.20	1.49
Pk-10321	36.93	35.60	0.87	4.29	7.13	2.13
Pusa Red	41.73	40.40	0.91	4.47	6.93	1.98
M.pkhas	41.20	39.73	0.79	4.49	6.87	2.84
LSD(0.05)	12.59	12.31	0.25	0.56	1.02	2.00
6.TITLE	IDENTIFICATION OF BEST SOWING TECHNIQUE					
OBJECTIVES	To identify best combination of sowing techniques for getting high yield					
RESEARCH WORKER (S)	Mrs. Mehvish Tahir Dr. Akhter Saeed Dr. Saeed Ahmad Shah Chishti					
LOCATION	VRI, Faisalabad.					
DURATION	2016-2017					
TREATMENTS	A. Flat verses ridge sowing (Main plots) B. Broad casting, line sowing of seed and transplanting of nursery (Sub plots)					
METHODOLOGY	Replication: 3 Design: Split Plot Design Treatments: A and B Plot size: 7 × 3 m A. Sowing of seed will be done both on ridges and flat experimental units in 2 nd fortnight of October. B. Seed sowing will be done through broadcasting and line sowing in all the replications and nursery will be planted on the same date and will be transplanted after 45 days both on ridges and flat experimental units. Data will be taken after harvesting of the following parameters 1. Yield 2. Bulb diameter 3. Bulb weight 4. No.of rings/bulb 5. Neck diameter					
PREVIOUS YEAR'S RESULTS	New Trial					

3. PEAS (*Pisum sativum* L.)

1. TITLE	COLLECTION AND MAINTENANCE OF PEAS GERmplasm
OBJECTIVE	To maintain and evaluate the divergent lines/varieties of pea to be used in future breeding program.

RESEARCH WORKERS	Mudassar Iqbal Dr. Saeed Ahmad Shah Chishti Muhammad Najeebullah																												
LOCATION	Faisalabad																												
DURATION	Continuous																												
TREATMENTS	Varieties/lines = 76																												
METHODOLOGY	Sowing date = First week of November, 2016 Plot size = 5.0 × 1.25 m Design = Observational plot. Off-type plants will be roughed out from each line/variety to maintain purity.																												
PREVIOUS YEAR'S RESULTS	74 lines/varieties were evaluated and maintained by selecting desirable plants and roughing off-type plants. <table border="1" data-bbox="500 785 1369 1089"> <thead> <tr> <th>S. No</th> <th>Traits</th> <th>Minimum</th> <th>Maximum</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Days to 50 % Flowering</td> <td>29</td> <td>81</td> </tr> <tr> <td>2.</td> <td>No. of Seeds/pod</td> <td>5</td> <td>9</td> </tr> <tr> <td>3.</td> <td>Pod Length (cm)</td> <td>6</td> <td>11</td> </tr> <tr> <td>4.</td> <td>Pod Width (cm)</td> <td>1.4</td> <td>2.1</td> </tr> <tr> <td>5.</td> <td>Plant Height (cm)</td> <td>32</td> <td>110</td> </tr> <tr> <td>6.</td> <td>Fresh 100- Seed Weight (g)</td> <td>14</td> <td>65</td> </tr> </tbody> </table>	S. No	Traits	Minimum	Maximum	1.	Days to 50 % Flowering	29	81	2.	No. of Seeds/pod	5	9	3.	Pod Length (cm)	6	11	4.	Pod Width (cm)	1.4	2.1	5.	Plant Height (cm)	32	110	6.	Fresh 100- Seed Weight (g)	14	65
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5.	Plant Height (cm)	32	110																										
6.	Fresh 100- Seed Weight (g)	14	65																										
2. TITLE	HYBRIDIZATION AND STUDY OF FILIAL GENERATIONS IN PEAS.																												
OBJECTIVE	To combine desirable traits for the development of high yielding, early maturing and diseases resistance/tolerance varieties																												
RESEARCH WORKERS	Mudassar Iqbal Dr. Saeed Ahmad Shah Chishti Muhammad Najeebullah																												
LOCATION	Faisalabad																												
DURATION	Continuous																												
TREATMENTS/METHODOLOGY	<p>a) Hybridization: Three crosses will be made to induce earliness in to desirable parents.</p> <p>1) High yielding = 9800-5, 9200-1 , Safeer</p> <p>2) Early maturing line = 9374</p> <p>b) Study of Filial Generations The segregating populations will be advanced by selecting desirable plants for further studies.</p> <table border="1" data-bbox="500 1822 1378 1864"> <thead> <tr> <th>Generation</th> <th>Cross</th> <th># of selected</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Generation	Cross	# of selected																									
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		Plants in each generation	
	F₁	Meteor × 9374	Bulk seed
		Lina pak × 9374	Bulk seed
		1300-8 × 9374	Bulk seed
	F₂	Meteor × 2001-40	Bulk seed
		9374 × 2001-40	Bulk seed
	F₃	9800-10 × 2001-40	14
		2001-20 × 2001-40	29
		Lina Pak × 2001-40	18
	F₄	9375 × 2001-40	12
		Pea-2009 × 2001-40	8
		9200-1 × 2001-40	10
		9375 × 9374	10
	F₅	9200-1 × 2001-60	14
	F₆	Pea-09 × 2001-60	13
		9800-10 × 2001-60	19
		Meteor Fsd × 2001-60	11
	F₇	a) 2001-20 × It-96	52
		b) 9200-1 × No. 267	11
		c) 2001-35 × No. 267	19
	PREVIOUS YEAR'S RESULTS	Seed of following generations was harvested	

Sowing date = November, 2016

Seeds of F₀ crosses will be planted along with their parents and selfed plants will be rouged out. Seed of each F₁ cross will be harvested separately as bulk. Seeds of crosses and single selected plants of different segregating generations from F₂ to F₆ will be sown on both sides of the raised beds made 1.25 m apart with plant to plant distance of 10 cm to raise next generation by using modified bulk method and desirable plants will be selected and bulked for each cross from each generation. Seed of selected Plants of F₇ generation will be planted for individual plant to row progeny and superior progenies will be selected.

Generation	Cross	# of selected Plants in each generation
F₁	Meteor × 2001-40	Bulk seed
	9374 × 2001-40	Bulk seed
F₂	9800-10 × 2001-40	14
	2001-20 × 2001-40	29
	Lina Pak × 2001-40	18
F₃	9375 × 2001-40	12
	Pea-2009 × 2001-40	8
	9200-1 × 2001-40	10
	9375 × 9374	10
F₄	9200-1 × 2001-60	14
F₅	Pea-09 × 2001-60	13
	9800-10 × 2001-60	19
	Meteor Fsd × 2001-60	11
F₆	a) 2001-20 × It-96	52
	b) 9200-1 × No. 267	11
	c) 2001-35 × No. 267	19
F₇	a) GRW-45 × It-96	19
	b) 9800-5 × No. 267	14
	c) PF-400 × No. 267	5
3. TITLE	EVALUATION OF PROMISING LINES IN PRELIMINARY YIELD TRIAL FOR EARLY PLANTING.	
OBJECTIVE	To find out the promising lines suitable for early planting	
RESEARCH WORKERS	Mudassar Iqbal Dr. Saeed Ahmad Shah Chishti Muhammad Najeebullah	
LOCATION	Faisalabad	
DURATION	2016-17	
TREATMENTS/	Lines 16 (Including 2 checks)	
METHODOLOGY	Checks = Peas-2009, Meteor Design = RCB Reps = 3 Sowing Date = November, 2016	

	Plot Size = 4.0 × 0.75 m Spacing = Plant to plant distance = 5 cm on both sides of 75cm beds. Data regarding green pod yield and disease incidence will be recorded.																												
PREVIOUS YEAR'S RESULTS	New experiment																												
3. TITLE	EVALUATION OF PROMISING LINES IN PRELIMINARY YIELD TRIAL FOR NORMAL PLANTING.																												
OBJECTIVE	To find out the promising lines suitable for normal planting																												
RESEARCH WORKERS	Mudassar Iqbal Dr. Saeed Ahmad Shah Chishti Muhammad Najeebullah																												
LOCATION	Faisalabad																												
DURATION	2016-17																												
TREATMENTS/	Lines 26 (Including 2 checks)																												
PREVIOUS YEAR'S RESULTS	<p>Performance of Pea Strains/Varieties in preliminary yield Trial at Vegetable Research Institute, Faisalabad during 2015-16.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>R. No.</th> <th>Variety/ Line</th> <th>100-Seed Weight (g) Fresh</th> <th>Green Pod Yield (T/ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Climax (C)</td> <td>48.20</td> <td>9.00</td> </tr> <tr> <td>2</td> <td>Pea-2009 (C)</td> <td>56.67</td> <td>7.31</td> </tr> <tr> <td>3</td> <td>1500-8</td> <td>31.17</td> <td>5.76</td> </tr> <tr> <td>4</td> <td>1500-13</td> <td>26.07</td> <td>5.48</td> </tr> <tr> <td>31</td> <td>1500-10</td> <td>28.57</td> <td>2.07</td> </tr> <tr> <td colspan="2">LSD (0.05)</td> <td>3.38</td> <td>0.33</td> </tr> </tbody> </table>	R. No.	Variety/ Line	100-Seed Weight (g) Fresh	Green Pod Yield (T/ha)	1	Climax (C)	48.20	9.00	2	Pea-2009 (C)	56.67	7.31	3	1500-8	31.17	5.76	4	1500-13	26.07	5.48	31	1500-10	28.57	2.07	LSD (0.05)		3.38	0.33
R. No.	Variety/ Line	100-Seed Weight (g) Fresh	Green Pod Yield (T/ha)																										
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4. TITLE	EVALUATION OF ADVANCE LINES FOR EARLY PEAS PLANTING																												
OBJECTIVE	To find out high yielding pea varieties/lines suitable for early peas planting																												
RESEARCH WORKERS	Mudassar Iqbal Dr. Saeed Ahmad Shah Chishti Muhammad Najeebullah																												
LOCATION	Faisalabad																												
DURATION	2016-17																												
TREATMENTS/METHODOLOGY	Varieties/ lines = 10 Including 2checks (Meteor Fsd, Pea-2009) Replications = 3																												

	Design = RCB Sowing Dates = 1 st week of October, 2016 Plot Size = 5.0 × 1.50 m Spacing = 5 cm (Plant to plant) = 75 cm (Row to row) Data regarding days to flowering (50%), 100-seed weight and green pod yield will be recorded.																																																	
PREVIOUS YEAR'S RESULTS	Performance of varieties/strains in early pea varietal trial <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>R. No.</th> <th>Variety/ Line</th> <th>Days to 50 % flower</th> <th>Pods / plant</th> <th>Seed s/ pod</th> <th>100-Seed Weight (g) Fresh</th> <th>Green Pod Yield (T/ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Pea-2009 (C)</td> <td>29.00</td> <td>7.6</td> <td>7.6</td> <td>74.0</td> <td>8.44</td> </tr> <tr> <td>2</td> <td>1300-8</td> <td>31.00</td> <td>15.3</td> <td>7.9</td> <td>55.0</td> <td>7.78</td> </tr> <tr> <td>3</td> <td>Sarsabz</td> <td>31.00</td> <td>8.86</td> <td>7.4</td> <td>61.3</td> <td>7.32</td> </tr> <tr> <td>4</td> <td>9375</td> <td>52.67</td> <td>12.8</td> <td>7.3</td> <td>51.6</td> <td>7.22</td> </tr> <tr> <td>10</td> <td>Strike</td> <td>27.00</td> <td>4.6</td> <td>4.9</td> <td>52.0</td> <td>4.09</td> </tr> <tr> <td colspan="2">LSD (0.05)</td> <td>0.71</td> <td>1.27</td> <td>0.45</td> <td>3.19</td> <td>0.62</td> </tr> </tbody> </table>	R. No.	Variety/ Line	Days to 50 % flower	Pods / plant	Seed s/ pod	100-Seed Weight (g) Fresh	Green Pod Yield (T/ha)	1	Pea-2009 (C)	29.00	7.6	7.6	74.0	8.44	2	1300-8	31.00	15.3	7.9	55.0	7.78	3	Sarsabz	31.00	8.86	7.4	61.3	7.32	4	9375	52.67	12.8	7.3	51.6	7.22	10	Strike	27.00	4.6	4.9	52.0	4.09	LSD (0.05)		0.71	1.27	0.45	3.19	0.62
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OBJECTIVE	To find out the high yielding varieties suitable for normal planting																																																	
RESEARCH WORKERS	Mudassar Iqbal Dr. Saeed Ahmad Shah Chishti Muhammad Najeebullah																																																	
LOCATION	Faisalabad																																																	
DURATION	2016-17																																																	
TREATMENTS/METHODOLOGY	Varieties/ lines = 8 : Including checks (Climax, Peas-2009) Replication = 3 Design = RCB Sowing Date = 1 st week of November, 2016 Plot Size = 5.0 m × 2.5 m Spacing = 10 cm plant to plant distance on both sides of 125 cm beds The line suitable for mid-season will be selected and data regarding yield and yield components will be recorded.																																																	

PREVIOUS YEAR'S RESULTS	Performance of varieties/strains in Peas varietal trial in normal planting <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>R. No.</th> <th>Variety</th> <th>No. of pods/plant</th> <th>Seeds / pod</th> <th>100-Seed Weight (g) Fresh</th> <th>Green Pod Yield (T/ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Peas-2009 (C)</td> <td>11.2</td> <td>5.8</td> <td>64.09</td> <td>9.07</td> </tr> <tr> <td>2</td> <td>Lina pak</td> <td>10.4</td> <td>7.4</td> <td>45.67</td> <td>8.43</td> </tr> <tr> <td>3</td> <td>Sarsabz</td> <td>11.4</td> <td>7.3</td> <td>56.94</td> <td>8.18</td> </tr> <tr> <td>4</td> <td>1300-8</td> <td>11.7</td> <td>6.6</td> <td>47.19</td> <td>7.73</td> </tr> <tr> <td>5</td> <td>2001-40</td> <td>15.2</td> <td>5.8</td> <td>33.43</td> <td>7.13</td> </tr> <tr> <td>12</td> <td>FS-2187</td> <td>15.8</td> <td>6.2</td> <td>24.87</td> <td>3.99</td> </tr> <tr> <td colspan="2">LSD (0.05)</td> <td>4.19</td> <td>1.32</td> <td>4.31</td> <td>1.12</td> </tr> </tbody> </table>	R. No.	Variety	No. of pods/plant	Seeds / pod	100-Seed Weight (g) Fresh	Green Pod Yield (T/ha)	1	Peas-2009 (C)	11.2	5.8	64.09	9.07	2	Lina pak	10.4	7.4	45.67	8.43	3	Sarsabz	11.4	7.3	56.94	8.18	4	1300-8	11.7	6.6	47.19	7.73	5	2001-40	15.2	5.8	33.43	7.13	12	FS-2187	15.8	6.2	24.87	3.99	LSD (0.05)		4.19	1.32	4.31	1.12
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12	FS-2187	15.8	6.2	24.87	3.99																																												
LSD (0.05)		4.19	1.32	4.31	1.12																																												
6. TITLE	MULTI-LOCATIONAL PEAS YIELD TRIALS																																																
OBJECTIVE	To find out high yielding and well adapted variety/line of Pea																																																
RESEARCH WORKERS	Mr. Mudassar Iqbal Dr. GhulamNabi Mr. Ibrar Ahmad Dr. UmbreenShahzad																																																
LOCATION	Faisalabad, Sheikhpura, Multan and Layyah																																																
DURATION	2014-15																																																
TREATMENTS/METHODOLOGY	Varieties/Entries = 7 including two checks Replications = 3 Design = RCB Sowing Dates = Second week of October, 2016 Plot Size = 6.0 × 1.50 m Spacing = 5 cm (Plant to plant) = 75 cm (Row to row) Data regarding days to flowering (50%), 100-seed weight and green pod yield will be recorded.																																																
PREVIOUS YEAR'S RESULTS	New Experiment.																																																
7. TITLE	ADAPTABILITY TRIAL OF PEA EXOTIC VARIETIES																																																
OBJECTIVE	To see the adaptability of exotic pea varieties for yield and diseases																																																
RESEARCH WORKERS	Mudassar Iqbal Dr. Saeed Ahmad Shah Chishti Muhammad Najeebullah																																																
LOCATION	Faisalabad																																																
DURATION	2016-17																																																
TREATMENTS/ME	Varieties will be provided by different seed companies																																																

THODOLOGY	Replication = 3 Design = RCB Sowing Date = 1 st week of November, 2016 Plot Size = 6.0 m × 1.5m Spacing = 5 cm plant to plant distance on both sides of 75 cm beds Data regarding yield and its parameters will be recorded.																																																																											
PREVIOUS YEAR'S RESULTS	Performance of strains/varieties in peas adaptability trail at Vegetable Research Institute, Faisalabad during 2015-16 Set-1: <table border="1" data-bbox="540 653 1425 1255"> <thead> <tr> <th>Rank</th> <th>Varieties/ Line</th> <th>Days to 50% flowering</th> <th>100 seed weight Fresh (g)</th> <th>Green pod yield (T/ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Peas-2009 (Check)</td> <td>29.33</td> <td>57.40</td> <td>9.86</td> </tr> <tr> <td>2</td> <td>Safeer</td> <td>33.00</td> <td>52.17</td> <td>9.75</td> </tr> <tr> <td>3</td> <td>Asian chief</td> <td>51.00</td> <td>46.00</td> <td>7.92</td> </tr> <tr> <td>4</td> <td>Meteor (Check)</td> <td>30.33</td> <td>49.67</td> <td>7.91</td> </tr> <tr> <td>5</td> <td>Capital</td> <td>31.00</td> <td>45.67</td> <td>7.11</td> </tr> <tr> <td>6</td> <td>Lina Pak</td> <td>30.67</td> <td>49.73</td> <td>6.63</td> </tr> <tr> <td>8</td> <td>Classic</td> <td>49.00</td> <td>47.10</td> <td>5.24</td> </tr> <tr> <td></td> <td>LSD (0.05)</td> <td>0.98</td> <td>3.63</td> <td>1.00</td> </tr> </tbody> </table> Set-2: <table border="1" data-bbox="524 1339 1442 1858"> <thead> <tr> <th>Ran k</th> <th>Varieties/ Line</th> <th>Days to 50% flowering</th> <th>100 seed weight Fresh (g)</th> <th>green pod yield (T/ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Pea-2009 (Check)</td> <td>47.33</td> <td>57.33</td> <td>8.62</td> </tr> <tr> <td>2</td> <td>Premium</td> <td>38.00</td> <td>43.43</td> <td>8.47</td> </tr> <tr> <td>3</td> <td>Meteor (Check)</td> <td>46.33</td> <td>39.60</td> <td>8.00</td> </tr> <tr> <td>4</td> <td>Super polo</td> <td>37.67</td> <td>37.83</td> <td>7.92</td> </tr> <tr> <td>5</td> <td>summer plus</td> <td>64.00</td> <td>26.13</td> <td>7.89</td> </tr> </tbody> </table>	Rank	Varieties/ Line	Days to 50% flowering	100 seed weight Fresh (g)	Green pod yield (T/ha)	1	Peas-2009 (Check)	29.33	57.40	9.86	2	Safeer	33.00	52.17	9.75	3	Asian chief	51.00	46.00	7.92	4	Meteor (Check)	30.33	49.67	7.91	5	Capital	31.00	45.67	7.11	6	Lina Pak	30.67	49.73	6.63	8	Classic	49.00	47.10	5.24		LSD (0.05)	0.98	3.63	1.00	Ran k	Varieties/ Line	Days to 50% flowering	100 seed weight Fresh (g)	green pod yield (T/ha)	1	Pea-2009 (Check)	47.33	57.33	8.62	2	Premium	38.00	43.43	8.47	3	Meteor (Check)	46.33	39.60	8.00	4	Super polo	37.67	37.83	7.92	5	summer plus	64.00	26.13	7.89
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	6	Polo pak	48.00	34.83	6.97
	LSD (0.05)		0.35	2.2	0.57

4. CARROT (*Daucus carota* L.)

1. TITLE	COLLECTION AND MAINTENANCE OF CARROT GERMPLASM
OBJECTIVE	Maintenance of the material for future use in the breeding program.
RESEARCH WORKERS	Dr. Muhammad Ikram Muneeb Munawar Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS	Genotype = 8 1. Red Genotype = 5 viz; DC-3, DC-4, DC-90, DC-W, T-29 2. Purple genotype = 1 viz; DC-B (Kanji) 3. Orange genotype = 1 4. Yellow genotype = 1
METHODOLOGY	Sowing Date = September, 2016 Transplantation of stack lings = December, 2016 The root will be selected on the basis of color and their shape. The selected roots will be transplanted and sibbed in isolation chamber.
PREVIOUS YEAR'S RESULTS	All the genotypes were selected and sibbed in isolation chamber. The genotype DC-4 remained in field till the end of March and frost tolerant non bolters were selected to develop market acceptability for late season.
2. TITLE	DEVELOPMENT OF CARROT VARIETIES FOR EARLY SOWING
OBJECTIVE	To select lines suitable for early planting and early availability of better marketable roots.
RESEARCH WORKERS	Dr. Muhammad Ikram Muneeb Munawar
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS	Populations = 3 viz; DC-3 (11th cycle), DC-90 (8th cycle), and DC-W (7th cycle)
METHODOLOGY	Sowing date = 2 nd week of September 2016. Plot Size = 125 m ² for screening Replications = Non repeated Selection will be done on the basis of marketable roots and transplanting of selected roots will be done after 90 days for DC-90 and more than 100 days after sowing date for remaining genotypes to develop the lines for short and normal span of the crop. The line DC-90 is early bulking with variable

	root and core color. DC-3(red core) is early genotypes and ready for registration and approval.																		
PREVIOUS YEAR'S RESULTS	Being highly cross pollinated crop, the populations are still showing variability for plant structure, root color and shape. The selection was done on the basis of root bulking and color. Previous year root yield is given below: <table border="1" data-bbox="721 411 1391 659"> <thead> <tr> <th>Sr. No.</th> <th>Variety/Population</th> <th>Yield (T/ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>DC-W</td> <td>84.47</td> </tr> <tr> <td>2</td> <td>T-29</td> <td>82.77</td> </tr> <tr> <td>3</td> <td>DC-90</td> <td>81.67</td> </tr> <tr> <td>4</td> <td>DC-3</td> <td>68.33</td> </tr> <tr> <td></td> <td>LSD</td> <td>5.2</td> </tr> </tbody> </table>	Sr. No.	Variety/Population	Yield (T/ha)	1	DC-W	84.47	2	T-29	82.77	3	DC-90	81.67	4	DC-3	68.33		LSD	5.2
Sr. No.	Variety/Population	Yield (T/ha)																	
1	DC-W	84.47																	
2	T-29	82.77																	
3	DC-90	81.67																	
4	DC-3	68.33																	
	LSD	5.2																	
3. TITLE	DEVELOPMENT OF CARROT VARIETIES SUITABLE FOR LATE PLANTING																		
OBJECTIVE	To select lines suitable for late planting and prolonged supply of marketable carrot.																		
RESEARCH WORKERS	Dr. Muhammad Ikram Muneeb Munawar Muhammad Najeebullah																		
LOCATION	Faisalabad																		
DURATION	Continuous																		
TREATMENTS	Population = 2 viz ; DC-4(Red), Orange-2007																		
METHODOLOGY	Sowing date = November, 2016 Plot size = 125 m ² for screening Replications = Non replicated Transplanting = March, 2017 Selection will be based on resistance to frost, marketable root development and non-bolting behavior till the end of March particularly for DC-4.																		
PREVIOUS YEAR'S RESULTS :	To develop a frost tolerant and late bolting variety for longer supply, sever selection against bolting remained in progress till March. After transplanting, the roots were severely infested with root rot causing 95% mortality. Very small quantity of seed is available for future use.																		
4. TITLE:	DEVELOPMENT OF CMS LINES																		
OBJECTIVE	To develop CMS, Maintainer and Restorer lines																		
RESEARCH WORKERS	Dr. Muhammad Ikram Muhammad Najeebullah																		
LOCATION	Faisalabad																		
DURATION	Continuous																		

TREATMENTS	192 Genotypes viz; BC ₃ female lines = 79 F ₄ Male lines = 63 Restorer lines = 9 F ₀ = 1 F ₁ (Female) = 33 F ₁ (Male) = 7				
METHODOLOGY	Sowing date = 05.09.2016 Design = Plant to progeny Maintainer and restorer lines will be identified and CMS lines will be advanced and classified.				
PREVIOUS YEAR'S RESULTS	The generations were advanced to BC-3, F ₄ in addition to new combinations as F ₀ and F ₁ generations to continue three line breeding system.				
5. TITLE	ADAPTABILITY TRIAL OF CARROT EXOTIC VARIETIES				
OBJECTIVE	To evaluate exotic varieties/hybrids under Faisalabad condition.				
RESEARCH WORKERS	Dr. Muhammad Ikram Muneeb Munawar Muhammad Najeebullah				
LOCATION	Faisalabad				
DURATION	2016-17				
TREATMENTS/METHODOLOGY	Material will be received from different companies for testing Sowing Date = October-2016 Design = RCBD Plot size = 7 x 1.5 m ² Replications = 03 Data on root yield will be recorded after 100 days of sowing.				
PREVIOUS YEAR'S RESULTS		Rank	Entry	Yield (T/Ha)	Remarks
		1	T-29	82.77	Red root
		2	American Beauty	68.33	-do-
		3	Nayab	65.00	-do-
		4	Kirtiroz	64.47	-do-
		5	Fire Wedge	52.77	Orange
		6	Sigma	35.03	-do-
			LSD (5%)	4.97	

5. CAULIFLOWER (*Brassica oleracea* L.var. *botrytis*)

3. TITLE	ADAPTABILITY TRIAL FOR 2nd EARLY SEASON CAULIFLOWER.																																				
OBJECTIVE	To evaluate cauliflower varieties suitable for production during high temperature.																																				
RESEARCH WORKER (S)	Dr. Muhammad Sarwar Riaz Ahmad Kainth Muhammad Najeebullah																																				
LOCATION	Faisalabad																																				
DURATION	2016-17																																				
TREATMENTS	Varieties = 11viz: CFH-1522, FD-II, C-6099, C-6015, White Glow, CKD-1425, CKD-2014, HCF-11, HCF-12, HCF-13 and CKD-1924.																																				
METHODOLOGY	Nursery sowing date = 21-07-2016 Nursery Transplanting date = 05-09-2016 Plot size = 7 x 3 m. Design = RCBD Replications = 3 Row to row distance = 75 cm Plant to plant distance = 30 cm Data regarding biomass, average curd weight, average plant weight and curd yield per plot will be recorded																																				
PREVIOUS YEAR'S RESULTS	<p>Table I: Yield performance of hybrid/varieties (2nd EARLY season) during 2015-16</p> <table border="1"> <thead> <tr> <th>Sr. No.</th> <th>Varieties / hybrid</th> <th>Curd Yield (t/ha)</th> <th>Biomass (t/ha)</th> <th>Average Plant Weight (kg)</th> <th>Average Curd weight (kg)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>C-002</td> <td>34.70</td> <td>79.40</td> <td>2.16</td> <td>0.94</td> </tr> <tr> <td>2</td> <td>Advanta- 403</td> <td>30.70</td> <td>48.00</td> <td>1.27</td> <td>0.81</td> </tr> <tr> <td>3</td> <td>Tabinda- F₁</td> <td>25.30</td> <td>56.00</td> <td>1.55</td> <td>0.70</td> </tr> <tr> <td>4</td> <td>FD-II (Check)</td> <td>23.20</td> <td>65.50</td> <td>1.72</td> <td>0.61</td> </tr> <tr> <td></td> <td>LSD 5%</td> <td>2.49</td> <td>3.75</td> <td></td> <td></td> </tr> </tbody> </table>	Sr. No.	Varieties / hybrid	Curd Yield (t/ha)	Biomass (t/ha)	Average Plant Weight (kg)	Average Curd weight (kg)	1	C-002	34.70	79.40	2.16	0.94	2	Advanta- 403	30.70	48.00	1.27	0.81	3	Tabinda- F ₁	25.30	56.00	1.55	0.70	4	FD-II (Check)	23.20	65.50	1.72	0.61		LSD 5%	2.49	3.75		
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	LSD 5%	2.49	3.75																																		
3. TITLE	ADAPTABILITY TRIAL OF MID SEASON CAULIFLOWER																																				
OBJECTIVE	To evaluate cauliflower varieties suitable for mid season.																																				
RESEARCH WORKER (S)	Dr. Muhammad Sarwar Riaz Ahmad Kainth Muhammad Najeebullah																																				

LOCATION	Faisalabad																																																																																								
DURATION	2016-17																																																																																								
TREATMENTS	Set-1 Varieties/Hybrids = 12 Set-2 Varieties/Hybrids = 05																																																																																								
METHODOLOGY	Nursery sowing date = August, 2016 Nursery Transplanting date = Mid September Plot size = 7 x 3 m Design = RCBD Replications = 3 Row to row distance = 75 cm Plant to plant distance = 45 cm Data regarding biomass, average curd weight, average plant weight and curd yield per plot will be recorded																																																																																								
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	.		(t/ha)		weight (kg)	Weight (kg)
	1	ESK-002- F ₁	72.00	120.10	1.89	3.15
	2	White Queen	71.40	127.00	1.87	3.33
	3	Madhuri- F ₁	65.80	119.80	1.72	3.14
	4	White Mountain- F ₁	62.40	116.60	1.64	3.06
	5	Greta- F ₁	52.40	98.70	1.37	2.59
	6	Remi- F ₁	51.70	85.90	1.35	2.25
	7	Siria- F ₁	43.40	81.70	1.14	2.14
	8	3570- F ₁	42.53	85.10	1.11	2.23
	9	3575- F ₁	38.90	72.60	1.02	1.90
	10	White Pearl	37.50	81.90	0.98	2.15
	11	B1- F ₁	32.60	61.50	0.85	1.61
	12	FD-III	32.10	91.80	0.84	2.14
	LSD 5%		6.68			
4. TITLE	ADAPTABILITY TRIAL OF LATE SEASON CAULIFLOWER					
OBJECTIVE	To evaluate cauliflower varieties suitable for late season					
RESEARCH WORKERS	Dr. Muhammad Sarwar Riaz Ahmad Kainth Muhammad Najeebullah					
LOCATION	Faisalabad					
DURATION	2016-17					
TREATMENTS	Varieties that will be received from the private seed companies					
METHODOLOGY	Nursery sowing date = October, 2016 Nursery Transplanting date = November, 2016 Plot size = 07 x 3 m Design = RCBD Replications = 03 Row to row distance = 75 cm Plant to plant distance = 30 cm Data regarding biomass, average curd weight, average plant weight and curd yield per plot will be recorded.					
PREVIOUS YEAR'S RESULTS	Table I :Yield performance of hybrid/varieties (Late season) Set-I during 2015-16					
	Sr.	Varieties/	Curd	Biomass	Average	Average

No.	Hybrid	Yield (t/ha)	(t/ha)	Curd weight (kg)	Plant Weight (kg)
1	Tokyo- F ₁	53.7	83.8	1.41	2.20
2	Iris	53.5	91.3	1.41	2.40
3	Chandni-F ₁	52.4	100.5	1.38	2.64
4	Bushra ACS	49.7	87.4	1.31	2.29
5	Youkon-F ₁	48.6	104.6	1.28	2.75
6	Galaxy-F ₁	48.3	98.2	1.27	2.58
7	Bianca	47.4	85.8	1.25	2.25
8	Kipper ACS	47.4	79.7	1.24	2.09
9	Zoya-F ₁	47.1	86.2	1.24	2.27
10	Kiran-F ₁	44.3	80.5	1.17	2.11
11	Seher-F ₁	39.6	84.7	1.04	2.23
12	FD-IV (Check)	30.5	88.1	0.80	2.31
LSD 5%		7.85	9.43		

Table II : Yield performance of cauliflower hybrid/varieties (Late season) Set-II during 2015-16

Sr. No.	Varieties/ hybrid	Curd Yield (t/ha)	Biomass (t/ha)	Average Curd weight (kg)	Average Plant Weight (kg)
1	Casper-RZ - F ₁	30.5	63.6	0.80	1.67
2	GSL-5054	26.8	58.8	0.70	1.54
3	Bishop-RZ- F ₁	26.2	56.4	0.68	1.48
4	FD-IV	25.8	63.9	0.67	1.68
5	CBS-5055	24.1	54.2	0.63	1.42

6	D-11- F ₁	22.1	51.3	0.58	1.34
LSD 5%		2.89	4.93		

Table III : Yield performance of cauliflower hybrid/varieties (Late season) Set-III during 2015-16

Sr. No.	Varieties/ Hybrid	Curd Yield (t/ha)	Biomass (t/ha)	Average Curd weight (kg)	Average Plant Weight (kg)
1	Twingo- F ₁	34.9	58.2	0.87	1.53
2	CLX 3322- F ₁	32.5	56.9	0.81	1.50
3	Hazroo-F ₁	32.5	63.5	0.81	1.67
4	White King- 2	32.1	58.7	0.80	1.54
5	Super White	31.1	56.5	0.78	1.49
6	KQ-HCF	30.1	52.5	0.75	1.38
7	RS-5350	27.9	51.5	0.70	1.35
8	Siara- F ₁	27.7	54.6	0.73	1.44
9	FD-IV (Check)	25.9	55.4	0.65	1.46
10	Target- F ₁	25.9	49.8	0.64	1.31
LSD 5%		3.28	4.85		

Table IV: Yield performance of cauliflower hybrid/varieties (Late season) Set-IV during 2015-16.

Sr. No.	Varieties/ Hybrid	Curd Yield (t/ha)	Biomass (t/ha)	Average Curd weight (kg)	Average Plant Weight (kg)
1	Cauliflowe r-6201	40.2	78.4	1.06	2.05
2	CKD-961	36.7	65.3	0.96	1.71
3	CKD-872	35.1	66.5	0.92	1.74
4	Rani- F ₁	33.1	64.1	0.87	1.68
5	RS-5340	30.6	51.9	0.80	1.36
6	Hansa	30.1	54.6	0.79	1.43

	7	Classic- F ₁	29.6	59.9	0.78	1.57	
	8	Cauliflowe r-6199	27.6	52.2	0.73	1.37	
	9	Whistler	26.9	51.5	0.71	1.35	
	10	FD-IV	26.6	62.1	0.70	1.62	
	11	Leo- F ₁	26.5	48.0	0.70	1.26	
	LSD 5%		5.47	10.17			
2. TITLE	DEVELOPMENT OF OPEN POLLINATED VARITIES						
OBJECTIVE	To develop high yielding and disease resistant cauliflower varieties.						
RESEARCH WORKERS	Dr. Muhammad Sarwar Riaz Ahmad Kainth Muhammad Najeebullah						
LOCATION	Faisalabad						
DURATION	Continuous						
TREATMENTS	Seed obtained from open pollinated population.						
METHODOLOGY	Nursery sowing date = 19-08-2016 Nursery Transplanting date = 21-09-2016 The seed obtained from random mated population will be sown in the field keeping plant to plant and row to row distance of 45 and 75 cm, respectively. Morphologically similar and healthy plants with desirable heads on the basis of color, shape and Compactness will be selected to get high yielding genotypes to start first selection cycle. At maturity seed will be harvested and bulked for further studies.						
PREVIOUS YEAR'S RESULTS	500 gm seed of random mated population was produced.						
5. TITLE	IDENTIFICATION OF SELF-INCOMPATIBLE PLANTS IN 2nd EARLY AND MID GROUPS.						
OBJECTIVE	To develop self-incompatible inbred lines for hybrid production.						
RESEARCH WORKER (S)	Dr. Muhammad Sarwar Riaz Ahmad Kainth Muhammad Najeebullah						
LOCATION	Faisalabad						
DURATION	2016-17						
TREATMENTS	Varieties = 02 viz: FD-II and FD-III						

METHODOLOGY	<table border="1"> <thead> <tr> <th rowspan="2">Group</th> <th colspan="2">Sowing Date 2017</th> </tr> <tr> <th>Nursery</th> <th>Transplanting</th> </tr> </thead> <tbody> <tr> <td>2nd Early</td> <td>2nd fortnight July</td> <td>2nd fortnight of August</td> </tr> <tr> <td>Mid</td> <td>2nd fortnight August</td> <td>2nd fortnight of Sept</td> </tr> </tbody> </table>		Group	Sowing Date 2017		Nursery	Transplanting	2 nd Early	2 nd fortnight July	2 nd fortnight of August	Mid	2 nd fortnight August	2 nd fortnight of Sept
	Group	Sowing Date 2017											
Nursery		Transplanting											
2 nd Early	2 nd fortnight July	2 nd fortnight of August											
Mid	2 nd fortnight August	2 nd fortnight of Sept											
PREVIOUS YEAR'S RESULTS	<p>The nursery of the varieties will be planted according to standard practice and area availability. 30 desirable plants will be selected in 2nd Early and Mid Season cauliflower. 4-5 branches of all the selected plants will be selfed normally and through bud pollination. At maturity, seeds obtained from normal pollinated pods and bud pollinated pods will be counted and self-incompatibility will be calculated in case of each plant.</p> <p>There was not any plant found self-incompatible in FD-II and FD-III.</p>												

6. CABBAGE (*Brassica oleracea* L. var. *capitata*)

1. TITLE	ADAPTABILITY TRIAL ON CABBAGE VARIETIES/HYBRIDS
OBJECTIVE	To evaluate exotic cabbage varieties/hybrids for yield performance
RESEARCH WORKERS	Dr. Muhammad Sarwar Riaz Ahmad Kainth Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	2016-17
TREATMENTS	Varieties/Hybrids = Varieties that will be received from the private seed companies
METHODOLOGY	Nursery sowing date = September Nursery Transplanting date = October Plot size = 7 x 3 m. Design = RCBD Replications = 3 Row to row distance = 75 cm Plant to plant distance = 30 cm Data regarding head yield per plot, biomass, average head weight and average plant weight will be recorded.

PREVIOUS YEAR'S RESULTS

Yield performance of cabbage hybrid/varieties during 2015-16 (Set-I)

Sr. No.	Varieties/hybrid	Head Yield (t/ha)	Biomass (t/ha)	Average Head weight (kg)	Average Plant Weight (kg)
1	Delight Ball	40.7	57.9	1.07	1.52
2	Vaneza-F ₁	39.8	54.4	1.04	1.43
3	G-CB-1	39.2	56.5	1.03	1.48
4	Green Stone	38.2	58.9	1.00	1.54
5	Roshan-F ₁	36.7	58.9	0.96	1.54
6	Cabbage No-1	36.4	59.0	0.96	1.55
7	Ever Green-F ₁	34.2	54.4	0.90	1.43
8	T-138	29.7	41.5	0.78	1.08
LSD 5%		3.7	6.1		

Yield performance of cabbage hybrid/varieties during 2015-16 (Set-II)

Sr. No.	Varieties/hybrid	Head Yield (t/ha)	Biomass (t/ha)	Average Head weight (kg)	Average Plant Weight (kg)
1	Roshan-F ₁	38.74	57.93	1.02	1.52
2	CBS-222	33.84	51.43	0.89	1.35
3	GSL-1198	32.64	51.40	0.85	1.35
LSD 5%		4.4	7.0		

Yield performance of cabbage hybrid/varieties during 2015-16 (Set-III)

Sr. No.	Varieties/hybrid	Head Yield (t/ha)	Biomass (t/ha)	Average Head weight (kg)	Average Plant Weight (kg)
1	Tropicana	48.2	75.1	1.27	1.97
2	Beauty Ball	44.6	62.4	1.17	1.64
3	Saint	40.5	60.2	1.07	1.58
4	Blue Dynasty	38.1	66.0	1.00	1.74

	LSD 5%	9.9	14.5		
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7. BROCCOLI (*Brassica oleracea* L. var. *italica*)

1. TITLE	ADAPTABILITY TRIAL ON BROCCOLI VARIETIES/ HYBRIDS																													
OBJECTIVE	To evaluate exotic broccoli varieties/hybrids for yield performance																													
RESEARCH WORKERS	Dr. Muhammad Sarwar Riaz Ahmad Kainth Muhammad Najeebullah																													
LOCATION	Faisalabad																													
DURATION	2016-17																													
TREATMENTS	Varieties/Hybrids = Varieties that will be received from the private seed companies																													
METHODOLOGY	Nursery sowing date = Mid September, 2016 Nursery Transplanting date = October, 2016 Plot size = 7 x 3 m. Design = RCBD Replications = 3 Row to row distance =75 cm Plant to plant distance =30 cm Data regarding head yield will be recorded.																													
PREVIOUS YEAR'S RESULTS	<p>Yield performance of Broccoli hybrid/varieties during 2015-16 (Set-I)</p> <table border="1"> <thead> <tr> <th>Sr. No.</th> <th>Varieties/hybrid</th> <th>Head Yield (t/ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Green Pia</td> <td>16.7</td> </tr> <tr> <td>2</td> <td>06B600</td> <td>13.8</td> </tr> <tr> <td>3</td> <td>Baro Star</td> <td>12.1</td> </tr> <tr> <td colspan="2">LSD 5%</td> <td>1.62</td> </tr> </tbody> </table> <p>Yield performance of Broccoli hybrid/varieties during 2015-16 (Set-II)</p> <table border="1"> <thead> <tr> <th>Sr. No.</th> <th>Varieties/hybrid</th> <th>Head Yield (t/ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Paraiso</td> <td>14.9</td> </tr> <tr> <td>2</td> <td>Green Pia</td> <td>13.6</td> </tr> <tr> <td>3</td> <td>Baro Star</td> <td>11.5</td> </tr> </tbody> </table>			Sr. No.	Varieties/hybrid	Head Yield (t/ha)	1	Green Pia	16.7	2	06B600	13.8	3	Baro Star	12.1	LSD 5%		1.62	Sr. No.	Varieties/hybrid	Head Yield (t/ha)	1	Paraiso	14.9	2	Green Pia	13.6	3	Baro Star	11.5
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	LSD 5%	4.31	
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8. RADISH (*Raphanus sativus* L.)

1. TITLE	MAINTENANCE OF GERMPLASM
OBJECTIVE	To maintain the genotypes/lines for their subsequent inclusion in the breeding programme
RESEARCH WORKERS	Kaiser Latif Cheema Riaz Ahmad Kainth Najeebullah
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS	Varieties/lines = 8
METHODOLOGY	Sowing date = Second fortnight of October Plot size = 7x 1.5 m. Row to row spacing = 75 cm. Plant to plant spacing = 5 cm.
PREVIOUS YEAR'S RESULTS	Green Neck, Mino Local, Mino Selection, Purple Neck, Desi White, LalPari, 40Days and Gang Seong
2. TITLE	DEVELOPMENT OF BETTER VARIETIES OF RADISH
OBJECTIVE:	To develop early and non-pithy variety.
RESEARCH WORKERS	Kaiser Latif Cheema Riaz Ahmad Kainth Najeebullah
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS/	Seed of Selected group
METHODOLOGY	Seed of selected plant will be sown in observational plots, containing about 1000-1500 plants, during the month of July with row to row spacing of 75 cm. Morphologically similar and healthy plants with desirable roots will be selected to get high yield and non-pithy genotypes suitable for (Early) start 1st selection cycle.
PREVIOUS YEAR'S RESULTS	Non pithy roots after 60 days were harvested.
3. TITLE.	DEVELOPMENT OF RED FLESH WITH LONG ROOT RADISH VARIETY
OBJECTIVE	To develop longer rooted LalPari
RESEARCH WORKERS	Kaiser Latif Cheema Riaz Ahmad Kainth Najeebullah
LOCATION	Faisalabad
DURATION	Continuous

TREATMENTS	Random mated population (5 th cycle) Red root flesh color and long rooted.
METHODOLOGY	A population of 100-200 plants will be developed after sowing during 2 nd fortnight of October. The selection of desirable root will be made at maturity. The stacking of selected root will be plant at maturity to start 4 nd selection cycle.
PREVIOUS YEAR'S RESULTS	500 gram seed desirable root flesh color and long root were selected
4. TITLE.	DEVELOPMENT OF VARIETY FOR KITCHEN GARDENING
OBJECTIVE	To develop short duration and fascinating variety
RESEARCH WORKERS	Kaiser Latif Cheema Riaz Ahmad Kainth Najeebullah
LOCATION	Faisalabd
DURATION	2016-2017
TREATMENTS	two group from Random population:
METHODOLOGY	The sowing was done during 2 nd fortnight of October. The selection of desirable root will be made at maturity .The stacking of selected root will be plant at maturity to develop random population.
PREVIOUS YEAR'S RESULTS	20 gram of two group random population
5. TITLE.	EVALUATION OF RADISH VARIETIES FOR LATE SEASON
OBJECTIVE	To select varieties possessing high yield potential and better root quality suitable for late planting.
RESEARCH WORKERS	Kaiser Latif Cheema Riaz Ahmad Kainth Najeebullah
LOCATION	Faisalabad.
DURATION	2016-17
TREATMENTS	Varieties = 6 viz; Mino local,Mino (selection), Desi White, Lal pari, Red prince F1 and No.025
METHODOLOGY	Date of sowing. = Second fortnight of September. Plot size = 8 x 0.75 m Replications = 3 Design = RCB Data on root yield and root shape will be recorded.

PREVIOUS YEAR'S RESULTS	<table border="1" data-bbox="602 226 1365 905"> <thead> <tr> <th></th> <th>Variety</th> <th>Root +Leaf yield(T/ha)</th> </tr> </thead> <tbody> <tr><td>1</td><td>Desi White</td><td>109.07a</td></tr> <tr><td>2</td><td>Mino Selection</td><td>102.4ab</td></tr> <tr><td>3</td><td>YR White Spring</td><td>87.68bc</td></tr> <tr><td>4</td><td>Green Bow</td><td>86.25bcd</td></tr> <tr><td>5</td><td>Advanta</td><td>84.44bcd</td></tr> <tr><td>6</td><td>Early White Long</td><td>82.61bcd</td></tr> <tr><td>7</td><td>Mino Local</td><td>76.62cde</td></tr> <tr><td>8</td><td>Lal Pari</td><td>66.99def</td></tr> <tr><td>9</td><td>Gang Seong</td><td>56.42ef</td></tr> <tr><td>10</td><td>Red Meat</td><td>55.97f</td></tr> <tr><td>11</td><td>biz</td><td>0.00g</td></tr> <tr><td></td><td>LSD 0.05</td><td>12.33</td></tr> </tbody> </table>		Variety	Root +Leaf yield(T/ha)	1	Desi White	109.07a	2	Mino Selection	102.4ab	3	YR White Spring	87.68bc	4	Green Bow	86.25bcd	5	Advanta	84.44bcd	6	Early White Long	82.61bcd	7	Mino Local	76.62cde	8	Lal Pari	66.99def	9	Gang Seong	56.42ef	10	Red Meat	55.97f	11	biz	0.00g		LSD 0.05	12.33
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6. TITLE.	PRE -BASIC SEED PRODUCTION IN RADISH																																							
OBJECTIVE	To supply the pure seed to public / private seed companies and interest growers.																																							
RESEARCH WORKERS	Kaiser Latif Cheema Riaz Ahmad Kainth Najeebullah																																							
LOCATION	Faisalabad																																							
DURATION	Continuous																																							
TREATMENTS	Varieties = Mino Selection, 40-Days, and Lal Pari																																							
METHODOLOGY	Seed of each variety will be sown according to the recommended practices during second fortnight of September. At the time of stackling, true to type roots will be selected on the basis of root shape, root length, root girth and leaf shape. Stacklings of 40-Days will be transplanted during the month of November while other varieties will be transplanted during December in isolated plots. Rouging of off-type plants will be done at different stages. Early and late bolter plants will be rogued out .At maturity seed of healthy and true to type plants will be harvested separately.																																							
PREVIOUS YEAR'S RESULTS	<p>The following quantities of pre-basic seed were produced.</p> <table border="1" data-bbox="610 1713 1419 1890"> <thead> <tr> <th></th> <th>Varieties</th> <th>Quantity (g)</th> </tr> </thead> <tbody> <tr><td>1</td><td>40 Days</td><td>4000</td></tr> <tr><td>2</td><td>Desi White</td><td>200</td></tr> <tr><td>3</td><td>LalPari</td><td>400</td></tr> <tr><td>4</td><td>Mino Selection</td><td>1000</td></tr> </tbody> </table>		Varieties	Quantity (g)	1	40 Days	4000	2	Desi White	200	3	LalPari	400	4	Mino Selection	1000																								
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1	40 Days	4000																																						
2	Desi White	200																																						
3	LalPari	400																																						
4	Mino Selection	1000																																						

9. TURNIP (*Brassica campestris* L. var. *rapa*)

1. TITLE	MAINTENANCE OF GERmplasm
OBJECTIVE	To maintain the genotypes/lines for their subsequent inclusion in the breeding programme
RESEARCH WORKERS	Kaiser Latif Cheema Riaz Ahmad Kainth Najeebullah
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS	Strains = 6 viz; Golden, Purple, Purple Top, Green Top, White and Whit(Late)
METHODOLOGY	Sowing date = Second fortnight of September Row to row spacing = 75 cm. Plant to plant spacing = 5 cm.
PREVIOUS YEAR'S RESULTS	Turnip Purple (20 g), and Turnip Green top (200 g) was harvested.
2. TITLE	DEVELOPMENT OF HEAT TOLERANT VARIETY
OBJECTIVE:	To develop high yielding, early and better tasted variety.
RESEARCH WORKERS	Kaiser Latif Cheema Riaz Ahmad Kainth Najeebullah
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS/	Random mated population (8 th cycle).
METHODOLOGY	Seed from selected plants of Random mated population of (8 th cycle) will be sown during second fortnight of July, 2016. Plants will be selected on the basis of root shape and heat tolerance. Harvesting will be done at maturity for marketable roots and selected roots will be transplanted for seed production under random mating system for 9 th cycle of Selection.
PREVIOUS YEAR'S RESULTS	50 grams of seed of 5 selected plants were harvested.
3. TITLE.	DEVELOPMENT OF LATE BOLTING AND SHORT DURATION VARIETIES
OBJECTIVE	To develop high yielding, late bolting and better tasted variety.

RESEARCH WORKERS	Kaiser Latif Cheema Riaz Ahmad Kainth Najeebullah
LOCATION	Faisalabad.
DURATION	Continuous
TREATMENTS	Random mated population (7 th cycle)
METHODOLOGY	Seed from Random mated population (7 th cycle) will be sown in plant to progeny row method during second fortnight of October. Plants within the progeny will be selected on the basis of late bolting, root shape, single root weight, taste and single plant weight. Harvesting will be done at maturity for marketable roots and selected roots will be transplanted for seed production under random mating system for 5 th cycle selection. The seed of only those plants will be retained which bolted late. Selection will continue until to fix the gene for late bolting
PREVIOUS YEAR'S RESULTS	50 grams of seed of 5 selected plants were harvested
4. TITLE	EVALUATION OF TURNIP VARIETIES
OBJECTIVE	To select variety with high yield potential and better root quality.
RESEARCH WORKERS	Kaiser Latif Cheema Riaz Ahmad Kainth Najeebullah
LOCATION	Faisalabad.
DURATION	2016-17
TREATMENTS	Varieties = 7 viz; Golden, Purple Top, Desi Red, Green Top, Gold World F ₁ , Kansas F ₁ and Stylo
METHODOLOGY	Date of sowing. = Last week of September. Plot size = 8 x 0.75 m Replications = 3 Design = RCB Data on root yield will be recorded.
PREVIOUS YEAR'S RESULTS	Performance of turnip varieties

S.NO.	VARIETY	Root +leave YIELD (T /HA)
1	Desi Red	73.30a
2	Green Top	69.94ab
3	White	65.81abc
4	Purple Top	64.29abc
5	Golden	56.70bcd
6	Purple Golden	53.77cd
7	Purple	49.66d
8	Purple Prince	43.83d
	LSD	8.74

5. TITLE.	PRE- BASIC SEED PRODUCTION IN TURNIP
OBJECTIVE	To produce genetically pure and good quality turnip variety seed
RESEARCH WORKERS	Kaiser Latif Cheema Riaz Ahmad Kainth Najeebullah
LOCATION	Faisalabad.
DURATION	Continuous
TREATMENTS	i) Varieties = 2 viz. Purple top and Golden
METHODOLOGY	Single plant progenies of Purple top and Golden varieties will be sown during 2 nd week of October on both sides of ridges made 75 cm apart in row length of 7 meters. Progenies with off-type plants will be rogued out at different stages of crop growth. True to type and sweet tasted progenies will be selected and bulked for the production of pre-basic seed.
PREVIOUS YEAR'S RESULTS	Seed of Purple Top (400 g) and Golden (100g) was Collected

10. GARLIC (*Allium sativum* L.)

1. TITLE	GERMPLASM COLLECTION EVALUATION AND MAINTANAINENCE IN GARLIC
OBJECTIVE	To introduce better performing genotype for general cultivation.
RESEARCH WORKERS	M. Muzaffar Raza Tahir Iqbal Shah Muhammad Najeebullah

DURATION	2016-17																					
TREATMENTS	Variety = Lahsan Gulabi, White, Gulabi Exotic, White Exotic & Elephant Garlic.																					
METHODOLOGY	Date of sowing = Last week of October P × P distance = 4 Inches R × R distance = 9 Inches The data regarding bulb size, no. of cloves/bulb and bulb weight will be recorded.																					
PREVIOUS YEAR'S RESULTS	<p>Table Performance of Garlic Genotypes in NUYT during 2015-16</p> <table border="1"> <thead> <tr> <th>Sr. No.</th> <th>Genotype</th> <th>Yield T/H</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>G15101</td> <td>24.93</td> </tr> <tr> <td>2</td> <td>G15122</td> <td>14.14</td> </tr> <tr> <td>3</td> <td>G15127</td> <td>12.11</td> </tr> <tr> <td>4</td> <td>Ghulabi (Check)</td> <td>11.00</td> </tr> <tr> <td>5</td> <td>G15109</td> <td>10.58</td> </tr> <tr> <td colspan="2">LSD</td> <td>3.30</td> </tr> </tbody> </table> <p>Above data shows that three entries are above check in yield comparison but first two varieties & the last one i.e. G15101, G15122 & G15109 took almost one month extra to mature. Genotype G15101 showed bolting behavior. In genotypes G15122 & G15109 there were no clove formation just leaves like onion bulb.</p>	Sr. No.	Genotype	Yield T/H	1	G15101	24.93	2	G15122	14.14	3	G15127	12.11	4	Ghulabi (Check)	11.00	5	G15109	10.58	LSD		3.30
Sr. No.	Genotype	Yield T/H																				
1	G15101	24.93																				
2	G15122	14.14																				
3	G15127	12.11																				
4	Ghulabi (Check)	11.00																				
5	G15109	10.58																				
LSD		3.30																				

11. SPINACH (*Spinacia oleracea* L.)

1. TITLE	MAINTENANCE OF GENEPOOL IN SPINACH
OBJECTIVE	To maintain genetic purity of existing varieties of Desi and Lahori palak
RESEARCH WORKERS	M. Muzaffar Raza Tahir Iqbal Shah Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS	Desi and Lahori Palak
METHODOLOGY	About 10 Marla's each of "Desi and Lahori Palak" will be sown during 2 nd fortnight of October in rows 75 cm apart in isolation on well prepare soil in watter condition. After germination, crop will be thinned keeping plant to plant distance of 15 cm. At 20-25 cm plants height, the plants will keenly be observed regarding leaf & stem color and plants having minute ting of redness and red color midrib will be roughed out. At bolting stage all early bolters will also be rough out. Remaining full green and late bolting plants will be kept to produce

	BNS seed.
PREVIOUS YEAR'S RESULTS	Desi and Lahori Palak in isolations were maintained.

12. CORIANDER (*Coriandrum sativum* L.)

4. TITLE	MAINTENANCE OF GENEPOOL IN CORIANDER
OBJECTIVE	To maintain genetic purity of existing varieties of coriander
RESEARCH WORKERS	M. Muzaffar Raza Tahir Iqbal Shah Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS	Kandhari And Desi
METHODOLOGY	About 10 Marla's each of "Qandhari and Desi" will be sown during last week of October in rows 75 cm apart in isolation on well prepare soil in watter condition. After germination, crop will be thinned keeping plant to plant distance of 15 cm. At 20-25 cm plants height, the plants will keenly be observed regarding leaf & stem color and plants having purple color will be roughed out. At bolting stage all early bolters will also be rough out. Remaining full green and late bolting plants will be kept to produce BNS seed.
PREVIOUS YEAR'S RESULTS	Desi & Qandhari coriander were maintained
2. TITLE	ADAPTABILITY TRIAL ON CORIANDER VARIETIES
OBJECTIVE	To evaluate exotic coriander varieties for yield performance
RESEARCH WORKERS	M. Muzaffar Raza Tahir Iqbal Shah Muhammad Najeebullah
LOCATION	Faisalabad
DURATION	2016-17
TREATMENTS	Varieties = Omega, Desi, Qandhari.
PREVIOUS YEAR RESULTS	New Experiment

13. LETTUCE (*Lactuca sativa* L.)

1. TITLE	ADAPTABILITY TRIAL IN LETTUCE
OBJECTIVE	Maintenance for future use and bulk seed multiplication. To study the adaptability of exotic varieties

RESEARCH WORKERS	Ghazanfar Hammad Riaz Ahmad Kainth
LOCATION	Faisalabad
DURATION	2016-17
TREATMENTS	Seed provided by private seed companies.
METHODOLOGY	Sowing Date for nursery = 2 nd fortnight of October, 2016. Transplanting date = 2 nd fortnight of November, 2016. Plot Size = 5 Marla's each.
PREVIOUS YEAR'S RESULTS	New Experiment
2. TITLE	COLLECTION AND MAINTENANCE OF LETTUCE GERMPLASM
OBJECTIVE	Collection and maintenance of local and exotic germplasm for future use in breeding programme.
RESEARCH WORKERS	Ghazanfar Hammad Riaz Ahmad Kainth
LOCATION	Faisalabad
DURATION	Continuous
TREATMENTS	Entries (Existing) = 2 (ICE-BERG-Red and ICE-BERG-Green)
METHODOLOGY	Sowing Date for nursery = 2 nd fortnight of October, 2016. Transplanting date = 2 nd fortnight of October, 2016. Plot Size = 5 Marla's each.
PREVIOUS YEAR'S RESULTS	The seeds of the existing entries were harvested and maintained.

14. SEED PRODUCTION

1. TITLE	BREEDER, PRE BASIC AND BASIC SEED PRODUCTION OF RABI VEGETABLES
OBJECTIVE	To fulfill the seed requirements of Pre-basic and basic types of seed for Foundation Seed Cell
RESEARCH WORKERS	Respective Scientists of each crop
LOCATION	Faisalabad and Sub-stations
DURATION	Continuous
TREATMENTS	Crop varieties of the following winter vegetables Carrot Coriander Fenugreek Garlic Lettuce Onion

	Peas Spinach	Radish Turnip																																																																								
METHODOLOGY	All the crop varieties/plants will be sown/ planted in suitable seasons for seed production of specific variety according to standards of BNS and Pre-basic seed. Rouging of all off type plants will be carried out at specified stages of the crop and selection of the plants will be conducted keeping in view the traits of the variety. At ripening of the crops harvesting and seed collection will be carried out accordingly.																																																																									
PREVIOUS YEAR'S RESULTS	<p>The following seeds of winter vegetables were produced during the year 2015-16.</p> <table border="1"> <thead> <tr> <th>Sr. No.</th> <th>Crop</th> <th>Basic Seed (Kg)</th> </tr> </thead> <tbody> <tr><td>1</td><td>Cauliflower FD-I</td><td>1.5</td></tr> <tr><td>2</td><td>Cauliflower FD-II</td><td>40</td></tr> <tr><td>3</td><td>Cauliflower FD-III</td><td>10</td></tr> <tr><td>4</td><td>Cauliflower FD-IV</td><td>1.3</td></tr> <tr><td>5</td><td>Spinach</td><td>1607</td></tr> <tr><td>6</td><td>Radish (40 Days)</td><td>895</td></tr> <tr><td>7</td><td>Radish (Mino)</td><td>227</td></tr> <tr><td>8</td><td>Radish (Lal Pari)</td><td>96</td></tr> <tr><td>9</td><td>Turnip (Golden)</td><td>475</td></tr> <tr><td>10</td><td>Turnip (Purple Top)</td><td>428</td></tr> <tr><td>11</td><td>Carrot</td><td>230</td></tr> <tr><td>12</td><td>Peas</td><td>284</td></tr> <tr><td>13</td><td>Onion</td><td>366</td></tr> <tr><td>14</td><td>Muskmelon</td><td>58</td></tr> <tr><td>15</td><td>Watermelon</td><td>3</td></tr> <tr><td>16</td><td>Tinda Gourd</td><td>107.9</td></tr> <tr><td>17</td><td>Long Melon</td><td>28</td></tr> <tr><td>18</td><td>Brinjal</td><td>1.5</td></tr> <tr><td>19</td><td>Bitter Gourd (Safeena)</td><td>11</td></tr> <tr><td>20</td><td>Bitter Gourd</td><td>40</td></tr> <tr><td>21</td><td>Vegetable Marrow</td><td>10</td></tr> <tr><td>22</td><td>Tomato (F₁)</td><td>2.506</td></tr> <tr><td>23</td><td>Tomato (OPV)</td><td>6.2</td></tr> </tbody> </table>		Sr. No.	Crop	Basic Seed (Kg)	1	Cauliflower FD-I	1.5	2	Cauliflower FD-II	40	3	Cauliflower FD-III	10	4	Cauliflower FD-IV	1.3	5	Spinach	1607	6	Radish (40 Days)	895	7	Radish (Mino)	227	8	Radish (Lal Pari)	96	9	Turnip (Golden)	475	10	Turnip (Purple Top)	428	11	Carrot	230	12	Peas	284	13	Onion	366	14	Muskmelon	58	15	Watermelon	3	16	Tinda Gourd	107.9	17	Long Melon	28	18	Brinjal	1.5	19	Bitter Gourd (Safeena)	11	20	Bitter Gourd	40	21	Vegetable Marrow	10	22	Tomato (F ₁)	2.506	23	Tomato (OPV)	6.2
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