

**ANNUAL REPORT-2015-16**  
**COTTON RESEARCH STATION, VEHARI**

**WEATHER (2015)**

Average data for temperature, relative humidity and precipitation during the crop season is as under:-

Month	Temperature (°c)		Mean Relative Humidity (%)		Rain Fall (mm)	Fog (Days)
	Mean Maximum	Mean Minimum	8AM	4PM		
January	13.9	5.4	87.1	62.8	4.00	12
February	19.6	11.1	85.1	49.1	8.00	Nil
March	23.5	10.6	83.3	50.6	44	Nil
April	32.5	20.6	69.3	36.3	14	Nil
May	41.2	27.5	46.4	29.9	03	Nil
June	41.4	24.9	51.6	40	17	Nil
July	38	25.5	67	43	35	Nil
August	35.08	27.04	77.04	45.04	21	Nil
Sep	33.9	27.8	77.6	43	64	Nil
Oct	33.04	27.01	83.5	43.7	1	Nil
Nov	26.00	19.01	82.5	40	Nil	Nil
Dec	21.2	8.4	86	40	Nil	Nil
<b>Total</b>						

**1. BREEDING PHASE****1.1 MAINTENANCE AND ENRICHMENT OF GENEPOOL**

184 local and exotic genotypes were maintained at CRS, Vehari during 2015-16. Data were recorded for CLCuV intensity and other parameters also. All the entries showed CLCuV symptoms but the intensity varied.

The rating of the genotypes was done according to the rating scale (0-4):-

**Table 1.1 Characters of gene pool entries along with their range**

Character	Range
Plant Yield (g)	40 – 375
Plant Height (cm)	45 – 220
No. of Bolls/Plant	5 – 150
Boll weight (g)	2.0 - 6.0
CLCuV infection (Rating)	0 – 4
No. of Monopodial Branches	0 – 5
No. of Sympodial Branches	4 – 42
Nodes to first fruiting branch	4 – 10
Leaf Shape	Okra – Broad
Leaf size	Small – Large
GOT %	30 – 50
Staple Length (mm)	22 – 33
Fiber Fineness (µg/inch)	3.6 – 6
Fiber Strength (g/tex)	27-34

List of gene pool entries given as Annexure-1

Sr. No	Name of Entry	Sr. No	Name of Entry	Sr. No	Name of Entry
1	A-637	63	COKER	125	V-2
2	A-3367	64	CAROLINE-QUEEN	126	V-3
3	A-Big Boll	65	DR-1	127	V-4
4	Acala-1571	66	DR-2	128	V-5
5	Acala-571	67	DR-107	129	V-6
6	AC-252	68	DR.CHESI PETOR	130	V-7
7	Anmol	69	DH-5A3	131	VH-25
8	ASP-1	70	DELTA PINE-57	132	VH-206

9	ASP-2	71	F-124	133	VH-306
10	ASP-59	72	FH-930	134	VH-208
11	AMST-38	73	F5 (13) 5013	135	VH-225
12	AV-4	74	F6 (13) 6005	136	VH-240
13	AZ-181	75	F6 (13) 6006	137	VH-252
14	B-69	76	F6 (13) 6018	138	VH-255
15	Big Boll	77	F6 (60) 28	139	VH-257
16	BT-55	78	6044 (F6)	140	VH-260/P1
17	BTA-1	79	6050 (F6)	141	VH-260/P2
18	BT-1507	80	GHAURI-3	142	VH-261
19	BTA-HL27-20/163	81	GN-2085 P2	143	VH-264
20	BTSBoll-3	82	H-406-7	144	VH-280
21	CHB	83	H	145	VH-281
22	CH-8	84	HNF-189	146	VH-282
23	CH-18	85	IRMA-2364	147	VH-285
24	CH-19	86	IUB-222/S	148	VH-286
25	CH-20	87	LS-55	149	VH-289
26	CH-24	88	LA-OKRA-548	150	VH-290
27	CH-25	89	LEA-5166	151	VH-291
28	CH-26	90	LSS	152	VH-292
29	CH-32	91	LUMANAH	153	VH-295
30	CH-33	92	FH-142	154	VH-297
31	CH-38	93	M-1	155	VH-300
32	CH-41	94	M-3	156	VH-307
33	CH-42	95	M-5	157	VH-345
34	CH-43	96	M-6	158	VH-346
35	CH-49	97	M-7	159	VH-347
36	CH-52	98	M-8	160	VH-350
37	CH-54	99	M-9	161	VRS-1
38	CH-57	100	MC-1	162	VRS-Big Boll
39	CH-58	101	MG-6	163	VRS-F
40	CH-59	102	MS-40	164	321 TALL
41	CHINA	103	MLR-11	165	324 TALL
42	CHINA-1	104	MLR-222	166	326/1
43	CHINA-2	105	MNH-886	167	326/2
44	CHINA-3	106	N-112	168	326/05
45	CHINA-5	107	N 449/3	169	326/08
46	CHINA-6	108	NO.20	170	2077/09
47	CHINA-7	109	NIAB-111	171	2085
48	CHINA-8	110	NIA-78	172	2085/1
49	CHINA-9	111	NEX-12	173	2307
50	CHINA-10	112	NT-1401	174	3047/3037
51	CHINA-11	113	PRS-72	175	3701
52	CHINA-12	114	PCCT-5/07	176	4049/4
53	CHINA-13	115	PCCT-6/07	177	03/03
54	CHINA-14	116	PCCT-12/07	178	9107
55	CHINA-15	117	QSR-189	179	10/07
56	CHINA-16	118	RASHAM	180	43/NO
57	CHINA-18	119	SARMAST	181	41/51
58	CHINA-20	120	SHAHEEN	182	VH-319/S
59	CHINA-21	121	SPCHAR-586	183	2006/Y T/1
60	CHINA-24	122	TMA-1	184	2006/Y T/2
61	CHINA-26	123	UCD-581		
62	CLENCLE	124	V-1		

## 1.2 STUDY OF FILIAL POPULATION

The following F<sub>1</sub> to F<sub>6</sub> filial populations were studied in breeding area of Cotton Research Station, Vehari during the year 2015-16. Selection was done keeping in view yield performance, CLCuV incidence and fiber quality traits.

**Table 1.2 BREEDING MATERIAL STUDIED DURING THE YEAR 2015-16**

Sr. No.	Generations	Crosses	
		Entries Studied	Crosses/PSS Selected
1	F <sub>1</sub>	21	-
2	F <sub>2</sub>	126	92 Single Plants Finally Selected out of 126 PSS
3	F <sub>3</sub>	41	23 Single Plants Finally Selected out of 41 PSS
4	F <sub>4</sub>	44	25 Single Plants Finally Selected out of 44 PSS
5	F <sub>5</sub>	12	7 Single Plants Finally Selected out of 12 PSS

## 2. EVALUATION PHASE

### 2.1 PRELIMINARY YIELD TRIALS

Preliminary Yield Trials were conducted for yield tests of the superior lines that have gone through the process of selection following Pedigree method. These lines were selected from filial populations keeping in view several improved traits like disease resistance, better yield performance in diverse conditions, insect resistance and quality traits. During 2015-16, 16 lines were evaluated for their yield performance against the check FH-142 in two trials. Several lines performed better than check variety not only in terms of yield but also with respect to CLCuV and fiber traits. The variety which showed comparative edge in Preliminary Yield Trials during 2015-16 is VH-375 (1797 Kg/ha) over check FH-142 (1488 Kg/ha). The summarized results are given in Table 2.1.

**Table 2.1 SUMMARIZED YIELD RESULTS OF PRELIMINARY YIELD TRIALS DURING THE YEAR 2015-16**

TRIAL	STRAINS / VARIETIES	YIELD (kg/ha)	CLCuV % age
PYT-1	VH-368	927	73
	VH-369	1466	70
	VH-371	1237	78
	VH-372	1520	80
	VH-373	1268	80
	VH-374	1067	80
	VH-375	1797	77
	VH-Gulzar	1564	58
	FH-142 (Std.)	1488	80
	<b>LSD(0.05)</b>		
PYT-2	VH-376	1341	70
	VH-377	1148	71
	VH-378	733	80
	VH-379	557	75
	VH-380	650	72
	VH-381	898	70
	VH-2489	749	54
	VH-8643	1072	69
	FH-142 (Std.)	1029	75
	<b>LSD(0.05)</b>		

### 2.2 ADVANCED YIELD TRIALS

The advanced Yield Trials were conducted at the station during 2015-16 to check the performance of previously selected lines from Preliminary Yield Trials. Various promising lines were included in the trials. The results of Advanced Yield Trials indicated superiority of several lines over check variety. In AYT-1, VH-327 (1623kg/ha) yielded higher than check variety FH-142 (998kg/ha). Among these lines, VH-327 recommended for Provincial and National trials for further testing. Summarized results are given in.

**Table 2.2 SUMMARIZED YIELD RESULTS OF ADVANCED YIELD TRIALS DURING THE YEAR 2015-16**

TRIAL	STRAINS / VARIETIES	YIELD (Kg/ha)	CLCuV%
AYT-1	VH-305	968	100
	VH-311	806	100
	VH-319	577	100
	VH-327	1623	86
	VH-335	664	100
	VH-340	710	96
	VH-348	599	100
	VH-351	674	100
	FH-142	998	100

TRIAL	STRAINS / VARIETIES	YIELD (Kg/ha)	CLCuV%
AYT-2	VH-354	816	100
	VH-355	1119	89
	VH-356	287	100
	VH-357	566	100
	VH-358	565	100
	VH-363	677	100
	VH-367	837	97
	FH-142	924	100

### 3. EVALUATION OF OUT STATION RESEARCH TRIALS

#### 3.1 PROVINCIAL COORDINATED COTTON TRIALS

The Provincial Coordinated Cotton Trial (PCCT) comprised several genotypes from various research centers of Punjab. Twenty four entries (22 lines + two checks MNH-886 & FH-142) were tested in PCCT set 1, twenty one entries (19 lines + two checks MNH-886 & FH-142) in set 2, four entries of Non Bt. in set 3 and three entries & one check of desi cotton were studied during 2015-16. Among new varieties developed at Cotton Research Station, Vehari included in PCCT were VH-305 and VH-327. The results of trials are given below:-

**Table 3.1 SUMMARIZED SEED COTTON YIELD RESULTS OF ENTRIES INCLUDED IN PCCT DURING THE YEAR 2015-16  
PCCT(Bt) SET-1**

SR. No.	Variety	PCCT Code	Yield (kg/ha)	CLCuV %
1	SLH-12	PC-1	1231	88
2	RH-647	PC-2	886	91
3	CIM-602	PC-3	813	86
4	BH-185	PC-4	1179	93
5	FH-Kehkashan	PC-5	518	100
6	IR-NIBGE-8	PC-6	728	61
7	NIAB-874	PC-7	1552	83
8	FH-142	PC-8	845	87
9	IUB-65	PC-9	940	100
10	VH-327	PC-10	2442	85
11	FH-Noor	PC-11	712	100
12	MNH-992	PC-12	1121	92
13	NIAB 1101/4B	PC-13	1660	95
14	RH-651	PC-14	545	100

15	FH-312	PC-15	501	100
16	NIAB-8788	PC-16	1686	90
17	FH-444	PC-17	776	100
18	IR-NIBGE-7	PC-18	730	100
19	MNH-886	PC-19	641	93
20	CYTO-178	PC-20	1425	91
21	VH-363	PC-21	999	88
22	FH-326	PC-22	1535	100
23	NIAB-Bt-2	PC-23	825	100
24	IUB-63	PC-24	1058	82

**PCCT(Bt) SET-2**

SR. No.	Varieties	PCCT Code	Yield (kg/ha)	CLCuV %
1	EC-002	PC-1	698	100
2	AG-NAZEER-1	PC-2	1088	100
3	NS-181GMO	PC-3	1063	100
4	BPC-11	PC-4	1285	100
5	BPC-10(Bt-01)	PC-5	864	100
6	FH-142	PC-6	727	100
7	Hamalia-1	PC-7	861	100
8	GCH-1	PC-8	3224	100
9	BS-70	PC-9	1594	100
10	Silkee-3 Bt	PC-10	968	100
11	SH-Buraq	PC-11	1038	100
12	MNH-886	PC-12	408	100
13	EC-003	PC-13	1172	100
14	Weal-AG-Gold	PC-14	724	100
15	ADAN-11	PC-15	1028	94
16	GCH-2	PC-16	2417	82
17	Sahara-150	PC-17	1272	100
18	Shahkar	PC-18	959	100
19	Crystal-2	PC-19	1125	100
20	SAIM-32	PC-20	1422	100
21	Crystal-1	PC-21	1003	97

**PCCT (Non Bt) SET-3**

SR.NO.	Varieties	PCCT Code	Yield (kg/ha)	CLCuV %
1	RH-652	PC-1	1098	100
2	FH-942	PC-2	1081	94
3	FH-442	PC-3	877	92
4	NIAB-414	PC-4	1283	98

**PCCT Desi Cotton**

SR. NO.	Varieties	PCCT Code	Yield (kg/ha)
1	FDH-512	V-1	2093
2	FDH-502	V-2	2556
3	FDH-228	V-3	2506

**3.2 NATIONAL COORDINATED VARIETAL TRIAL (NCVT A&B)**

National Coordinated Varietal Trials are governed by Pakistan Central Cotton Committee (PCCC), which receives the delinted cotton seed from public sector Research Institutes all over the country and from interested private sector organizations. PCCC codes of the candidate strains and send seed to different Research Station for evaluation. Cotton Research Station, Vehari also received the seed of 63 coded strains in two sets (B,C & D) with their sowing plan and protocol during the year 2015-16. The strains were sown according to plan and normal agronomic practices were adopted throughout the season. The results of Cotton Research Station, Vehari are given below:-

**Table 3.2.1 AVERAGE YIELD KG/ha AND CLCuV %age OF NCVT (SET B)**

Rank	Code	Varieties Name	Source	Av. Yield Kg/ha	CLCuV %age
1.	B-12	TH-21/09	ARI, TANDOJAM	218.9	100
2.	B-19	FH-142(std-1)	CRI, FSD	382.6	100
3.	B-1	AURIGA-215	AURIGA SEED	468	100
4.	B-10	BH-185	CRS, BAHAWALPUR	484.4	100
5.	B-2	SITARA-14	AGRI FARM SERVICE	502.3	100
6.	B-5	JS-733	JULNDUR SEED	507.7	100
7.	B-17	IR-NIBGE-7	NIBGE, FSD	527.9	100
8.	B-15	FH-NOOR	CRI, FSD	556.1	100
9.	B-9	CIM-622	CCRI, MULTAN	557.7	100
10.	B-11	GH-BAGHDADI	CRS, GHOTKI	613.1	100
11.	B-20	CEMB-77	CEMB, LAHORE	636.4	100
12.	B-18	CIM-602	CCRI, MULTAN	687.5	100
13.	B-21	BZU-75	BZU, MULTAN	688.9	100
14.	B-22	IUB-63	IUB, BHAWALPUR	700.1	100
15.	B-6	CRYSTAL-1	WARICH SEED	763.8	100
16.	B-7	BS-70	BANDASHA SEED	766	100
17.	B-8	CYTO-178	CCRI, MULTAN	775.9	100
18.	B-4	SAHARA-150	PATRON SEED	822.5	100
19.	B-3	AGC-NAZEER-1	WEAL AG	903.7	100
20.	B-13	RH-647	CRI, RY KHAN	947.2	100
21.	B-16	NIAB-8748	NIAB, FSD	1096.7	100
22.	B-14	VH-327	CRI, VEHARI	1625.8	100

LSD (0.05)= 294.01

**Table 3.2.2 AVERAGE YIELD KG/ ha AND CLCuV %age OF NCVT (SET C)**

Rank	Code	Varieties Name	Source	Av. Yield (kg/ha)	CLCuV %age
1.	C-21	NIA-86	NIA, TANDOJAM	171.8	100
2.	C-22	SAU-1	SAU, TANDOJAM	367.1	100
3.	C-6	CIM-625	CCRI, MULTAN	387.9	100
4.	C-15	IR-NIBGE-8	NIBGE, FSD	394.4	100
5.	C-20	NIA-85	NIA, TANDOJAM	439.1	100
6.	C-13	RH-651	CRS, RY KHAN	466.4	100
7.	C-1	TAHAFUZ-5	SUNGRO, MULTAN	622.5	100
8.	C-16	FH-KEHKASHAN	CRI, FSD	666.9	100
9.	C-19	QM-IUB-65	IUB, BHAWALPUR	767.6	100
10.	C-17	CEMB-88	CEMB, LAHORE	822.9	100

11.	C-2	SUNCROP-2	SUNCROP	883.8	100
12.	C-4	CIM-602(std-1)	CCRI, MULTAN	923.4	100
13.	C-5	FH-142(std-2)	CRI, FSD	983.5	100
14.	C-11	SLH-12	CRS,SAHIWAL	1121.2	100
15.	C-12	VH-363	CRS, VEHARI	1137.4	100
16.	C-9	MNH-992	CRS,MULTAN	1138.3	100
17.	C-7	CYTO-179	CCRI, MULTAN	1186.7	100
18.	C-3	ADAN-11	ADAN SEED	1221.7	100
19.	C-18	ZAKARIYA-1	IMBB,BZU, MULTAN	1341.4	100
20.	C-8	GH-MUBARAK	CRS,GHOTKI	1367.4	100
21.	C-14	NIAB-8788	NIAB,FSD	1508.7	100
22.	C-10	FH-326	CRS,JHANG	1517.7	100

LSD (0.05) =252.56

\* Check Variety

**Table 3.2.3 AVERAGE YIELD KG/ ha AND CLCuV %age OF NCVT (SET D)**

Rank	Code	Varieties Name	Source	Av. Yield (kg/ha)	CLCuV %age
1.	D-6	TASSCO-1000	TASSCO SEED	194.2	100
2.	D-16	Bt. HYBRID-33	FOUR BROTHER	405.9	100
3.	D-8	SITARA-15	AGRI FARM SERVICE	430.1	100
4.	D-17	TARZAN-4	FOUR BROTHER	572.7	100
5.	D-14	CIM-602(std-1)	CCRI, MULTAN	592.9	100
6.	D-10	HAMALIA-1	MULTAN SEED	619.4	100
7.	D-3	SAHARA-BURAQ	PATRON SEED	629.5	100
8.	D-2	WEAL AG SHAKAR	WEAL AG	778.6	100
9.	D-1	WEAL AG-GOLD	WEAL AG	782.6	100
10.	D-9	NS-181	NEELUM SEED	807.4	100
11.	D-18	SAHARA-120	PATRON SEED	829.3	100
12.	D-13	SUNCROP-HYB-1	SUNCROP	850.3	100
13.	D-4	CRYSTAL-12	WARICH SEED	853	100
14.	D-15	FH-142(std-2)	CRI, FSD	878.1	100
15.	D-19	EAGLE-1	FOUR BROTHER	894.3	100
16.	D-5	BS-15	BANDASHA SEED	946.8	100
17.	D-11	BPC-10	BIO CENTURY	1054.4	100
18.	D-7	SAIM-32	SAIM SEED	1076.4	100
19.	D-12	BPC-11	BIO CENTURY	1110.5	100

LSD (0.05) =338.84

## 4 AGRONOMIC PHASE

### 4.1 VARIETAL BEHAVIOUR UNDER DIFFERENT SOWING DATES

After various testing procedures, estimation of appropriate sowing time for a particular variety is necessary. In this trial two new strains namely VH-327 and VH-363 were tested on 9 different sowing dates i.e. **01-03-2015 to 01-07-2015** with an interval of 15 days. The yield data of the trial is given below:-

**Table 4.1.1 RESULTS OF VARIETAL BEHAVIOR UNDER DIFFERENT SOWING DATES**

S. No.	Sowing Dates	Yield (Kg/ha)	
		VH-327	VH-363
1.	D1 (1 <sup>st</sup> March)	2358	2126
2.	D2 (16 March)	2298	1771
3.	D3 (1st April)	2439	1829
4.	D4 (16 April)	1733	1862
5.	D5 (1 <sup>st</sup> May)	1780	1876
6.	D6 (16 May)	1158	1225
7.	D7 (1 <sup>st</sup> June)	913	521
8.	D8 (16 June)	207	215

9.	D9 (1 <sup>st</sup> July)	42	70
<b>Average</b>		1436	1277

VH-363 performed better during early sowing dates whereas, VH-327 gave highest yield in normal sowing.

#### 4.2 PLANT SPACING EFFECT ON SEED COTTON YIELD

Depending upon the growth habit of the cotton plant, it is necessary to optimize the plant to plant and row to row planting distance of different varieties. In this trial, two new strains namely VH-327 and VH-363 were tested at 4 different plant to plant spacing's i.e. 15 cm, 30 cm, 45 cm and 60 cm. The yield data of trial is given below:-

**Table 4.2.1 PLANT SPACING EFFECT ON SEED COTTON YIELD**

Treatment	Yield (kg/ha)		CLCuV %age	
	VH-327	VH-363	VH-327	VH-363
T <sub>1</sub> (15 cm)	1866	1288	90	80
T <sub>2</sub> (30 cm)	1769	994	93	83
T <sub>3</sub> (45 cm)	1575	1085	94	85
T <sub>4</sub> (60 cm)	2058	1170	100	89

**LSD (0.05) 432.36**

#### 4.3 FACILITATING TESTING OF OUT STATION GERMLASM AGAINST CLCUV

As Vehari is considered to be a hot spot for CLCUV and thus the most suitable place for the screening of Cotton genotypes against CLCUV, therefore the Station provides facilitation to other cotton research organizations in testing/screening of their advanced lines at Vehari. During 2015-16, facilitation to test 195 genotypes from different organizations was provided. The detail is as under:-

**Table 4.3.1 DETAIL OF COTTON LINES TESTED DURING 2015-16**

R&D ORGANIZATION	No. of entries
USDA Material (ICARDA)	182
Cotton Research Institute, Faisalabad	7
Entomological Research Institute, Faisalabad	2
CEMB (PARB)	4
<b>TOTAL</b>	195

## 5 GREEN HOUSE STUDIES

### 5.1 Crosses

Twenty Six single crosses were sown in pots as F<sub>1</sub> material in green house conditions at cotton research station Vehari during Nov, 2015-16. Kanamycin sulphate (1%) was applied on 5 days leaves of hybrids to check BT gene expression. As a result of kanamycin application data was collected after 7 days of treatment, it showed that 25 out of 26 hybrids were transgenic and rest were Non-Bt. Picked seed cotton of 26 hybrids was ginned and sown in field to get succeeding generations F<sub>2</sub>. Some phenotypic markers i-e, naked seed, petal spot, profusely hairy leaf, Red stem, green cotton seed, purple spot with purple petal were separately identified and marked for further studies.

**Table 5.1.1 CROSS REFERENCE CHART OF SINGLE CROSSES IN GREEN HOUSE DURING NOVEMBER, 2015.**

Cross No.	Female	Male	Cross No.	Female	Male
C-1	M-6	BTS-3	C-27	1044/13	FH-142
C-2	M-7	BTS-3	C-28	1017/13	FH-142
C-3	M-8	BTS-3	C-29	PCCT-1(NON BT/2013)	FH-142
C-4	M-9	FH-930	C-30	FH-LALAZAR	FH-142
C-5	VH-282	FH-930	C-31	VH-311	VH-327
C-6	VRS-BIG BOLL	VH-326	C-32	USDA-1140(2013)	(F <sub>2</sub> ) NO.2



C-7	KZ-181	VH-326	C-33	USDA-1140(2013)	(F2) NO.6
C-8	GN-2085	VH-326	C-34	VRS-1	FH-930
C-9	VH-319	FH-LALAZAR	C-35	FH-LALAZAR	VH-252
C-10	VH-324	LALAZAR	C-36	VH-305	PCCT-1/13(NON BT)
C-11	MNH-886	LALAZAR	C-37	VH-303	PCCT-1/13(NON BT)
C-12	LALAZAR	1001/13	C-38	BT-370	(F2) NO.11
C-13	LALAZAR	1017/13	C-39	VH-319	PCCT-1/13(NON BT)
C-14	LALAZAR	1044/13	C-40	FH-142	PCCT-1/13(NON BT)
C-15	1035/13	LALAZAR	C-41	VH-311	VH-327
C-16	OKRA	LALAZAR	C-42	LALAZAR	(F4) 2088/11
C-17	1035/13	VH-319	C-43	4074/P3( F6)	PCCT-1/13(NON BT)
C-18	VH-260	VH-319	C-44	LALAZAR	PCCT-1/13(NON BT)
C-19	FH-114	VH-319	C-45	VH-319	OKRA/FR
C-20	1027/13	VH-319	C-46	VH-259	DS-1
C-21	VR-1	VH-311	C-47	4074/P3	VH-356
C-22	DS-1	FH-142	C-48	6028/13	M-9
C-23	FH-114	FH-142	C-49	USDA-1140/13	ST
C-24	1035/13	FH-142	C-50	USDA-1066	VH-319
C-25	VH-311	FH-142	C-51	(SSH×H7)	VH-319
C-26	LALAZAR	FH-142	C-52	VH-305	VH-319

- Crosses Attempted in pots: 52
- No. of F<sub>1</sub>s sown: 26
- Detection of F<sub>2</sub>s for Bt gene: 25
- Stem propagations of USDA Material: 11
- Confirmation of CLCuV Resistance by Grafting: 10

## 6. DEVELOPMENTAL PROJECTS

### 6.1 PARB PROJECT NO. 191

One project titled “Genetic Improvement of Cotton for Herbicide and Bollworms Tolerance” approved by PARB is being run in collaboration with Centre of Excellence in Molecular Biology (CEMB), Lahore. The total Project cost is Rs. 17.195 million for 5 years. Transgenic cotton tolerant to bollworms and glyphosate herbicide through incorporation of CEMB Bt (Cry1AC & Cry2A) and Gt gene in VH-281, VH-289, VH-290 and MNH-786 was developed. Seed of above varieties have been supplied by CEMB for field evaluation of these transgenic varieties containing CEMB Bt and Gt gene at Cotton Research Station, Vehari during 2015. The results are given below

#### **Population data Recording CEMB triple gene cotton after application of 1900ml/acre Glyphosate (Galaxy)**

Event#	Total No. of plants before spray	Plants survived after spray	Plant damaged after spray	Mortality (%)	Plant Height (cm)	No. of Nodes/plant	No. of Squares/plant	No. of Flowers/plant	No. of Bolls/plant
E-1	4	0	4	100	-	-	-	-	-
E-2	14	4	10	71	101.8	30.8	7.6	1.9	24
E-3	18	9	9	50	110.4	29.8	13.1	2.3	34.8
E-4	19	17	2	10.5	112.8	29.3	8.7	2.4	34.1
E-5	13	11	2	15.4	123.9	26.6	3.3	1.5	27.4
E-6	17	14	3	17.6	87.8	23.7	7.5	1.9	13.3
E-7	16	5	11	68.8	97.4	30.2	9.5	1.4	21.9
E-8	9	2	7	77.8	79.5	30	5.3	1.8	22
E-9	8	7	1	12.5	99	27.8	13.2	2	19.7
E-10	9	3	6	66.7	96	28.5	6.1	2.2	12.4
Control Non Bt.	41	0	41	100	110.9	24.8	6.2	1.6	10.1

Event#	Days to 1 <sup>st</sup> flower opening	Days to 1 <sup>st</sup> boll opening	Boll Shape	Boll Size	Boll Weight (g)	Plant Shape	Weeds Species survived after spray
E-1	-	-	-	-	-	-	-
E-2	58	100	Round/Oval	Small	2.5	Spreading	-
E-3	60	101	Round	Small	1.94	Spreading	-
E-4	56	99	Round	Small	2.41	Spreading	-
E-5	56	96	Round	Small	2.35	Spreading	-
E-6	62	98	Round	Small	2.06	Spreading	-
E-7	61	104	Round	Small	2.46	Spreading	-
E-8	62	102	Round	Small	2.96	Spreading	-
E-9	63	106	Round	Small	2.18	Spreading	-
E-10	62	111	Round	Small	2.48	Spreading	-
Control Non Bt.	54	94	Round	Small	1.9	Spreading	-

## 6.2 ICARDA's PAK-US COTTON PRODUCTIVITY ENHANCEMENT PROJECT

### CLCuV data of USDA germplasm screened during 2015-16

Total Entries	Resistant (0)	Highly Tolerant (1)	Tolerant (2)	Susceptible (3)	Highly Susceptible (4)
183	7	11	0	19	146

## 7 ENTOMOLOGICAL PHASE

### 7.1 EFFECT OF DUSKY COTTON BUG ON SEED COTTON YIELD, QUALITY TRAITS AND SEED GERMINATION %

Experiment was conducted to investigate the effect of Dusky Cotton Bug on yield and yield components, fiber quality, oil contents and seed germination in cotton.

**Table 7.1 EFFECT OF DUSKY COTTON BUG ON SEED COTTON YIELD, QUALITY TRAITS AND SEED GERMINATION %**

Varieties	Yield per plant (g)			Seed Index			GOT %			Avg Boll Wt (g)			Seed Germ %		
	Cov	Spr	C	Cov	Spr	C	Cov	Spr	C	Cov	Spr	C	Cov	Spr	C
VH-305	24.54	18.20	16.71	7.8	7.2	7.4	37.4	39.9	40.8	1.97	2.15	2.13	67	64	57
VH-327	31.13	53.52	52.01	6.9	5.8	6.3	35.4	36.5	36.9	2.27	2.23	2.31	49	39	32
VH-363	29.96	16.60	15.01	8.6	7.0	7.2	40.0	39.6	39.7	2.65	2.62	2.29	64	49	45
FH-142	18.67	14.60	25.89	7.3	7.1	6.6	40.8	40.7	40.7	2.49	2.29	2.30	63	48	47

There were non-significant differences in in the varieties regarding yield, seed index, average boll weight and seed germination (%) of covered plants, sprayed plants and check plants because there were no dusky bug on cotton during this season.