

# **ANNUAL PROGRAMME OF RESEARCH WORK** **OFSUGARCANE FOR THE YEAR 2017**

Sugarcane is grown on 705.35 thousand hectares in Punjab with production of 41.96 million tonnes and average cane yield of 639 maunds/acre for the year 2015-16 (CRS, 2016). Some farmers are getting more than 1500 maunds/acre but a large number of farmers are obtaining low yield. This low yield is a challenge and demands special emphasis on research and production technology efforts. The Annual Research Programme is prepared to develop the research strategy for the coming crop year.

The Research Program includes 55 experiments on various disciplines including Sugarcane Breeding (16), Agronomy (14), Pathology (7), Entomology (3) and Technology (5) on going trials including 24 new experiments in the current research year. The Sugarcane Breeding components includes collection of fuzzi and cultivars, raising of seedlings, selection of seedlings, screening and selection of clones at various selection stages and varietal adaptability under different soil and climatic conditions. The research programme work also includes cane flowering at Research Sub Station, Pail & Charapani, Murree. The Annual Programme of Research Work for 2017-18 at Khanpur / Bahawalpur Stations includes 10 experiments.

Development of production technology is another important aspect of agronomy. Sugarcane Agronomy comprises of experiments on weed management, fertilizer, water use efficiency under different regimes and radiation use efficiency, seed cane/ rates, planting geometry, planting time, intercropping, ratooning and different cultural operations.

Study on cane juice analysis of different varieties is a permanent feature of sugarcane research for determining sugar yield. Moreover, *Gur* quality of different varieties will be determined.

Study on disease resistance/tolerance in different varieties starting from Nursery-I to Final Varietal Trials is a permanent feature of this Institute. Information is obtained on red rot, smut, pokkahboeng, red stripe, rust and mosaic. Varieties are screened against diseases under natural/artificial inoculation conditions.

Screening of varieties against insect pests is another important component of research programme i.e. development of IPM strategy for efficient control measures.

Zonal testing of cane varieties is an important component of Sugarcane Research Programme. It gives information on adaptability of cane varieties in different ecological zones. It provides feedback from the growers towards varietal behaviour in various soil and climatic conditions that helps the scientists to develop site-specific varieties / technologies for maximum output.

The Annual Programme of Research Work also includes varietal & agronomic experiments planted at Sugarcane Research Stations, Khanpur/Bahawalpur for better understanding of varietal behavior in Southern Punjab. Testing of varieties from different Institutes in National Uniform Varietal Yield Trial (NUVYT) is also a regular feature of this Institute.

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**A. SUGARCANE BREEDING & VARIETY  
DEVELOPMENT**

**1. TITLE****HYBRIDIZATION OF SUGARCANE BREEDING LINES AT MURREE****OBJECTIVES**

To make the combinations of most desirable parents with the expectation of producing superior progeny having high yield and sugar content, insect and disease (red rot specifically) resistant, early maturing and having high ratoon.

**RESEARCHERS:**

Muhammad Farooq Ahmed, Abdul Sattar and Dr. Naeem Ahmad

**PROJECT DURATION**

Continuous nature.

**LOCATION**

Sugarcane Breeding Sub-Station (SBSS), Murree

**TREATMENTS**

22 parental lines having synchronization will be used to make 16 desired bi-parental cross combinations as below:

Sr#	Cross Combinations	Sr#	Cross Combinations
1	S-84-US-1543 x Co-1148	9	S-05-FD-307 x Co-205
2	S-04-FD-298 x Q-49	10	CoL-50 x S-06-US-904
3	S-06-US-904 x Co-285	11	S-05-FD-317 x Co-205
4	HSF-240 x Co-285	12	Co-637 x S-06-US-904
5	S-95-NSG-60 x CoL-69	13	Q-49 x S-04-FD-298
6	SPF-241 x S-94-HS-229	14	HSF-240 x Q-81
7	S-06-US-904 x HSF-242	15	S-05-FD-317 x Co-602
8	S-05-FD-317 x S-27-70	16	S-95-NSG-45 x Co-637

**METHODOLOGY**

Four meter row of each parental line will be planted keeping row to row distance 0.9 m in the last week of March, 2017. Pollen proof lanterns made of cloth will be used to handle the bi-parental crosses before the dehiscence of inflorescence and exposure of stigmas. Bi-parental crosses will be attempted during mid-April-May, 2018. Hybrid seed (Fuzz) will be collected and sown in the last week of May, 2018 to September, 2018 at SBSS, Murree for raising sugarcane seedlings for variety evolution.

**PREVIOUS YEAR'S RESULTS**

Bi-parental crosses attempted and Fuzz produced during 2016 are tabulated below:

No. of Bi-parental crosses attempted	No. of successful Bi-parental cross	Parentage of successful crosses	Successful seedling produced
11	02	Col-50 × S06-US-904	82
		Col-50 × S-2770	81
Total			163

**2. TITLE:****RAISING OF SUGARCANE SEEDLINGS FROM FUZZ**

**OBJECTIVES:** To raise sugarcane seedlings from fuzz having different genetic makeup for variety development.

**RESEARCHERS:** Muhammad Farooq Ahmed, Abdul Sattar and Dr. Naeem Ahmad

**PROJECT DURATION:** Continuous nature (2017)

**LOCATION:** Sugarcane Breeding Sub-Station (SBSS), Murree

**TREATMENTS:** Fuzz collected from open pollinated varieties/lines & the fuzz produced locally from hybridization at SBSS, Murree.

**METHODOLOGY:** Raised seed beds will be prepared in Walk-in Tunnels in the month of May, 2017. Sugarcane fuzz (Bi-parental crosses and open-pollinated crosses) will be sown in last week of May to September, 2017. Sugarcane fuzz will be spread evenly over the seed bed and lightly covered with fine silt and water will be showered on it regularly till the germination of fuzz. Seed beds will be drenched with suitable fungicide weekly in order to reduce any risk of fungal disease. Foliar spray of liquid fertilizer containing essential macro and micro nutrients will be done after the second week of germination of fuzz for the healthier growth of seedlings. Foliar spray of liquid fertilizer will be repeated after every 10-12 days. At the age of 40-45 days, seedlings from seed bed will be singly shifted in polythene bags. Mortality data will be recorded, Alive ploy bagged seedlings will be shifted in the field at the age of 3-4 months for further evaluation.

**PREVIOUS YEAR'S RESULTS**

Seedlings raised from fuzz during 2016 at SBSS, Murree.

Sr. No.	Source of fuzz	No. of Parents/cross combination	No. of seedling produced
1.	Open pollination	23	460
2.	Bi-parental Crosses	02	163
	<b>Total</b>	<b>25</b>	<b>623</b>

**3. TITLE** **FLOWERING INDUCTION IN SUGARCANE.**

**OBJECTIVES:** To induce flowering in non/shy-flowering varieties/lines to strengthening hybridization program at Murree

**RESEARCHERS:** Muhammad Farooq Ahmed and Dr. Naeem Ahmad

**PROJECT DURATION:** Continuous nature (2017)

**LOCATION:** Sugarcane Breeding Sub-Station (SBSS), Murree

**TREATMENTS:** Selected 8 non-flowering varieties/lines along with 2 profusely flowering ones.

Variety/line	Category
CoL-8	A
S-05-FD-307	A
S-06-US-641	B
CPF-223	C
CPF-247	C
CPF-248	C
CP-72-2086	C
CP-77-400	C
S-96-SP-1215	C
S-96-SP-1218	C

A: Profusely flowering lines/varieties under local natural conditions

B: Very very poor flowering line under natural conditions. Produced very few flags, but rare arrows

C: So far no flags observed in these varieties/lines.

**METHODOLOGY:** Infrastructure will be developed such to block or to provide light whenever desired and to control temperature.

**PREVIOUS YEAR'S RESULTS:** New experiment

**4. TITLE:** **GROWING OF SUGARCANE FUZZ AND TRANSPLANTING OF SEEDLINGS IN FIELD**

**OBJECTIVE:** To raise sugarcane seedlings from fuzz having different genetic make-up for the variety development

**RESEARCHERS:** Abdul Sattar, Dr. Muhammad Ijaz Tabassum and Dr. Arshad Mahmood

**PROJECT DURATION:** Continuous nature (2017)



**LOCATION:** Sugarcane Research Institute, Faisalabad.

**TREATMENTS: Sources of Fuzz:**

i. Local

ii. Exotic

**METHODOLOGY:** Seed beds will be prepared under shade, during May, 2017 Cane fuzz will be spread evenly over raised seedbeds and lightly covered with fine silt. Seed beds will be irrigated with hand sprinkler. Observation regarding germination will be recorded. Loss of seedlings from any soil borne diseases will be reduced by sterilization of media of seed beds with suitable fungicide. Drenching the beds regularly with foliar spray of liquid nutrients containing essential macro (NPK) and micro elements will be done to nourish the seedlings once a week. Germination data will be recorded. Seedlings at the age of 45-60 days will be shifted in the earthen pots. Some portion of the seedlings will be remained on the bed for direct transplanting. Well established seedlings of 3-4 months will be transplanted in to the field for further evaluation during September, 2017.

**PREVIOUS YEAR'S RESULTS Sugarcane seedlings raised from fuzz during, 2016 and transplanted in field during 2017**

Sr. No	Source of fuzz	Cross	Successful seedlings shifted in the field
a)	<b>Local:</b> Pakistan (Murree)	25	614
b)	<b>Exotic:</b> Sri-Lanka	79	12,608
<b>Total</b>		<b>104</b>	<b>13,222</b>

**5. TITLE:**

**STUDY OF SUGARCANE SEEDLINGS IN FIELD AND SELECTION OF DESIRABLE PHENOTYPES**

**OBJECTIVES:**

To select desirable phenotypes from the progeny of each cross having different genetic make-up for further evaluation.

**RESEARCHERS:**

Abdul-Sattar, Dr Muhammad Ijaz Tabassum, Muhammad Younus and Dr. Arshad Mahmood

**PROJECT DURATION:**

Continuous nature (2017-18)

**LOCATION:**

Sugarcane Research Institute, Faisalabad

**TREATMENTS:** Successful earthen potted seedlings raised from fuzz.  
 Check variety = CPF-249  
 Planting geometry P × P = 120 cm  
 R × R = 120 cm

**METHODOLOGY:** Successful potted seedlings raised from fuzz will be transplanted in field during Sep/Oct-2017. A single row of check variety will be planted in the centre of each plot. Standard agronomic / cultural practices will be carried out. Observations will be recorded for cane growth, cane stand, lodging, pith, diseases and insect pest's infestation. At maturity of the crop (Sep – Oct, 2018), brix will be recorded with hand refracto-meter and superior phenotypes will be selected. The selected single plants will be promoted to Nursery-I for further evaluation.

**PREVIOUS YEAR'S RESULTS**

Seedlings Clones		Selection
Total	Selected	%
20396	313	1.53

**6.TITLE:** **STUDIES OF SUGARCANECLONES IN NURSERY- I.**

**OBJECTIVES:** Evaluation of clones on the basis of qualitative and quantitative characters for high cane and sugar yields.

**RESEARCH WORKER(S)** Muhammad AshfaqNadeem, Naeem Fiaz &Dr. Arshad Mahmood

**PROJECT DURATION:** Continuous nature (2016-17)

**LOCATION:** Sugarcane Research Institute, Faisalabad

**TREATMENTS:** No. of clones 313

**METHODOLOGY:** Layout Augmented design (Non-replicated plots)  
 Plot size 4 m × 1.2m  
 Fertilizer 168-112-112NPK Kg/ha  
 Time of sowing November - 2016  
 Irrigation Normal  
 Control HSF-240, CPF-246, CPF-248 & CPF-249

Single row of each clone was planted and four

control varieties were repeated in each 20 clones group. Selection will be made on the visual judgment (cane growth, cane stand, lodging, pith, disease, insect pest attack) and quality performance by recording brix reading with the help of hand refracto-meter. Selected clones will be promoted to nursery-II for further study.

**PREVIOUS YEAR'S RESULTS:** Total clones Clones promoted

638

113 (List attached)

On next page.

**LIST OF CLONES PROMOTED FROM N-I TO N-II (OCT 2016)**

<b>SR. NO.</b>	<b>CLONE NO.</b>	<b>SR. NO.</b>	<b>CLONE NO.</b>	<b>SR. NO.</b>	<b>CLONE NO.</b>	<b>SR. NO.</b>	<b>CLONE NO.</b>
1	S-2015-SL-07	31	S-2015-SL-156	61	S-2015-SL-343	91	S-2015-SL-466
2	S-2015-SL-10	32	S-2015-SL-158	62	S-2015-SL-354	92	S-2015-SL-468
3	S-2015-SL-16	33	S-2015-SL-166	63	S-2015-SL-367	93	S-2015-SL-485
4	S-2015-SL-25	34	S-2015-SL-168	64	S-2015-SL-369	94	S-2015-SL-486
5	S-2015-SL-26	35	S-2015-SL-176	65	S-2015-SL-374	95	S-2015-SL-503
6	S-2015-SL-43	36	S-2015-SL-177	66	S-2015-SL-382	96	S-2015-SL-540
7	S-2015-SL-53	37	S-2015-SL-183	67	S-2015-SL-392	97	S-2015-SL-546
8	S-2015-SL-55	38	S-2015-SL-189	68	S-2015-SL-394	98	S-2015-SL-554
9	S-2015-SL-58	39	S-2015-SL-201	69	S-2015-SL-395	99	S-2015-SL-547
10	S-2015-SL-64	40	S-2015-SL-223	70	S-2015-SL-396	100	S-2015-SL-549
11	S-2015-SL-65	41	S-2015-SL-244	71	S-2015-SL-404	101	S-2015-SL-566
12	S-2015-SL-66	42	S-2015-SL-257	72	S-2015-SL-406	102	S-2015-SL-569
13	S-2015-SL-70	43	S-2015-SL-265	73	S-2015-SL-409	103	S-2015-SL-572
14	S-2015-SL-73	44	S-2015-SL-273	74	S-2015-SL-410	104	S-2015-SL-574
15	S-2015-SL-76	45	S-2015-SL-280	75	S-2015-SL-413	105	S-2015-SL-575
16	S-2015-SL-77	46	S-2015-SL-282	76	S-2015-SL-416	106	S-2015-SL-580
17	S-2015-SL-86	47	S-2015-SL-283	77	S-2015-SL-417	107	S-2015-SL-592
18	S-2015-SL-89	48	S-2015-SL-285	78	S-2015-SL-421	108	S-2015-SL-593
19	S-2015-SL-90	49	S-2015-SL-286	79	S-2015-SL-425	109	S-2015-SL-598
20	S-2015-SL-91	50	S-2015-SL-288	80	S-2015-SL-429	110	S-2015-SL-599
21	S-2015-SL-92	51	S-2015-SL-289	81	S-2015-SL-432	111	S-2015-SL-618
22	S-2015-SL-96	52	S-2015-SL-290	82	S-2015-SL-435	112	S-2015-SL-624
23	S-2015-SL-97	53	S-2015-SL-294	83	S-2015-SL-437	113	S-2015-SL-636
24	S-2015-SL-101	54	S-2015-SL-296	84	S-2015-SL-441		
25	S-2015-SL-102	55	S-2015-SL-300	85	S-2015-SL-443		
26	S-2015-SL-108	56	S-2015-SL-302	86	S-2015-SL-444		
27	S-2015-SL-122	57	S-2015-SL-304	87	S-2015-SL-446		
28	S-2015-SL-123	58	S-2015-SL-310	88	S-2015-SL-448		
29	S-2015-SL-127	59	S-2015-SL-320	89	S-2015-SL-461		
30	S-2015-SL-136	60	S-2015-SL-324	90	S-2015-SL-463		

**7. TITLE:**

**STUDIES OF SUGARCANE CLONES IN NURSERY-II**

**OBJECTIVES:**

Evaluation of clones on the basis of qualitative and quantitative characters for high cane and sugar yields.

**RESEARCH WORKER(S)**

Muhammad AshfaqNadeem, Naeem Fiaz andDr. Arshad Mahmood

**PROJECT DURATION:**

Continuous nature (2016-17)

**LOCATION:**

Sugarcane Research Institute, Faisalabad

**TREATMENTS:**

No. of clones                      113

**METHODOLOGY:**

Control	HSF-240, CPF-246, CPF-248 & CPF-249
Layout	Augmented design (Non-replicated plots)
Plot size	4 m x 2.4 m
Fertilizer	168-112-112NPK Kg/ha
Time of sowing	November - 2016
Irrigation	Normal

Double row of each clone was planted and four control varieties were repeated in each 20 clones group. Selection will be made on the visual judgment (cane growth, cane stand, lodging, pith, disease, insect pest attack) and quality performance by recording brix reading with the help of hand refracto-meter. Selected clones will be promoted to nursery- III for further study.

**PREVIOUS YEAR'S RESULTS:**

Total clones	610	Clones promoted	125 (List attached)
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**LIST OF CLONES PROMOTED FROM N-II TO NIII (DURING OCT. 2016)**

<b>SR. NO.</b>	<b>CLONE NO.</b>	<b>SR. NO.</b>	<b>CLONE NO.</b>	<b>SR. NO.</b>	<b>CLONE NO.</b>
1	S-2014-SL-347	43	S-2014-SL-1224	85	S-2014-SL-1882
2	S-2014-SL-349	44	S-2014-SL-1288	86	S-2014-SL-1933
3	S-2014-SL-353	45	S-2014-SL-1307	87	S-2014-SL-1936
4	S-2014-SL-360	46	S-2014-SL-1322	88	S-2014-SL-2006
5	S-2014-SL-365	47	S-2014-SL-1336	89	S-2014-SL-2045
6	S-2014-SL-367	48	S-2014-SL-1339	90	S-2014-SL-2049
7	S-2014-SL-380	49	S-2014-SL-1351	91	S-2014-SL-2069
8	S-2014-SL-389	50	S-2014-SL-1359	92	S-2014-SL-2070
9	S-2014-SL-396	51	S-2014-SL-1362	93	S-2014-SL-2076
10	S-2014-JG-525	52	S-2014-SL-1372	94	S-2014-SL-2128
11	S-2014-SL-592	53	S-2014-SL-1399	95	S-2014-SL-2133
12	S-2014-SL-602	54	S-2014-SL-1412	96	S-2014-SL-2136
13	S-2014-SL-636	55	S-2014-SL-1425	97	S-2014-SL-2138
14	S-2014-SL-675	56	S-2014-SL-1442	98	S-2014-SL-2142
15	S-2014-SL-680	57	S-2014-SL-1469	99	S-2014-SL-2143
16	S-2014-SL-681	58	S-2014-SL-1474	100	S-2014-SL-2154
17	S-2014-SL-753	59	S-2014-SL-1475	101	S-2014-SL-2176
18	S-2014-SL-775	60	S-2014-SL-1503	102	S-2014-SL-2186
19	S-2014-SL-779	61	S-2014-SL-1520	103	S-2014-SL-2200
20	S-2014-SL-781	62	S-2014-SL-1527	104	S-2014-SL-2201
21	S-2014-SL-916	63	S-2014-SL-1535	105	S-2014-SL-2246
22	S-2014-SL-921	64	S-2014-SL-1537	106	S-2014-SL-2290
23	S-2014-SL-941	65	S-2014-SL-1540	107	S-2014-SL-2349
24	S-2014-SL-951	66	S-2014-SL-1574	108	S-2014-SL-2350
25	S-2014-SL-955	67	S-2014-SL-1576	109	S-2014-SL-2384
26	S-2014-SL-966	68	S-2014-SL-1593	110	S-2014-SL-2392
27	S-2014-SL-968	69	S-2014-SL-1613	111	S-2014-SL-2456
28	S-2014-SL-973	70	S-2014-SL-1617	112	S-2014-SL-2457
29	S-2014-SL-974	71	S-2014-SL-1621	113	S-2014-SL-2463
30	S-2014-SL-1022	72	S-2014-SL-1624	114	S-2014-SL-2465
31	S-2014-SL-1024	73	S-2014-SL-1626	115	S-2014-SL-2466
32	S-2014-SL-1079	74	S-2014-SL-1631	116	S-2014-SL-2469
33	S-2014-SL-1081	75	S-2014-SL-1643	117	S-2014-SL-2471
34	S-2014-SL-1087	76	S-2014-SL-1699	118	S-2014-SL-2477
35	S-2014-SL-1089	77	S-2014-SL-1700	119	S-2014-SL-2491
36	S-2014-SL-1103	78	S-2014-SL-1706	120	S-2014-SL-2494
37	S-2014-SL-1116	79	S-2014-SL-1716	121	S-2014-SL-2503
38	S-2014-SL-1125	80	S-2014-SL-1802	122	S-2014-SL-2567
39	S-2014-SL-1145	81	S-2014-SL-1838	123	S-2013-M-72
40	S-2014-SL-1179	82	S-2014-SL-1871	124	S-2013-US-876
41	S-2014-SL-1212	83	S-2014-SL-1876	125	S-2013-US-969
42	S-2014-SL-1215	84	S-2014-SL-1878		

<b>8. TITLE:</b>	<b>PRELIMINARY VARIETAL TRIAL</b>
<b>OBJECTIVES:</b>	Selection of clones for high cane and sugar yields
<b>RESEARCHERS:</b>	Dr. Muhammad Yasin, Dr. Mahmood-UI-Hassan and Dr. Abdul Khaliq
<b>PROJECT DURATION:</b>	Continuous nature (2016-2017)
<b>LOCATION:</b>	Sugarcane Research Institute, Faisalabad
<b>TREATMENTS:</b>	Total Clones                    125 Two Standards HSF-240 & CPF-249
<b>METHODOLOGY:</b>	Layout                                RCBD Replications                        3 Plot size                              4 m × 3.6 m Seed rate                             50,000 TBS <sup>ha</sup> <sup>-1</sup> Planting time                        November, 2016

One hundred twenty five (125) clones were planted in 09 sets along with two check varieties i.e. HSF 240 and CPF 249.

In Set-01 to Set 08, 14 clones in each, and in Set-09, 13 clones along with 2 standard varieties were planted during November, 2016. The selection criteria is based on growth habit, tillering, brix%, disease and insect pest attack. The crop will be raised by applying recommended cultural practices. The data regarding germination, tillering, cane count, cane and sugar yields will be recorded.

**PREVIOUS YEARS RESULTS** Out of 34 clones, 12 clones were selected and promoted to semi-final trial for further study.

**NURSERY-3, SET-1 (2015-16).**

Sr. No.	Varieties/ clones	Germination %	Tiller s/ plant	Cane count (000 ha <sup>-1</sup> )	Cane yield (tha <sup>-1</sup> )	CCS%	Remarks
1	<b>S2013-M-45</b>	60.2A	1.05 F	122 B	127 A	13.1 CD	<b>Selected &amp; promoted</b>
2	<b>S2013-M-46</b>	54.8B	0.73 I	119 C	124 B	12.2 GHI	<b>Selected &amp; promoted</b>
3	<b>S2013-M-113</b>	45.5C	1.24 CD	128 A	119 C	13.0 D	<b>Selected &amp; promoted</b>
4	<b>S2013-M-264</b>	37.3G	1.17 DE	75.0 F	86.1 D	11.5 J	<b>Selected &amp; promoted</b>
5	S2013-M-271	32.9H	1.08 F	82.0 E	60.4 I	11.5 J	Rejected due to poor growth stand and high lodging
6	S2013-M-381	24.4K	0.87 H	54.2 J	53.5 J	12.6 EF	Rejected due to poor stand, growth and smut
7	S2013-M-382	23.8K	1.24 C	53.5 J	71.5 FG	12.4 EFG	Rejected due to poor growth, stand & aerial roots
8	S2013-M-383	20.9L	2.20 A	52.8 J	46.5 K	11.9 I	Rejected due to poor growth & thin cane stand,
9	HSF-240 (St)	29.9 J	1.23 CD	82.9 E	75.6 E	13.7 B	Check variety
10	CPF-247 (St)	33.4 H	0.97 G	73.6 F	74.3 E	13.3 C	Check variety
11	S2013-M-405	24.3 K	1.12 EF	56.9 I	44.4 K	12.6 E	Rejected due to smut
12	S2013-M-446	31.9	1.29 C	67.7 G	70.8 G	14.2 A	Rejected due to Red Rot & short cane
13	S2013-M-491	40.7 E	0.43 J	66.6 G	59.1 I	14.1 A	Rejected due to Red stripe, aerial roots & Pith
14	S2013-M-576	43.5 D	0.76 I	61.1 H	51.4 J	12.3 FGH	Rejected due to Red Rot & high lodging
15	<b>S2013-B-642</b>	38.9 F	1.22 CD	83.2 E	86.7 D	12.1 HI	<b>Selected &amp; promoted</b>
16	S2013-US-862	36.7 G	1.87 B	73.6 F	64.5 H	12.2 GH	Rejected due to Red Rot & pith
	LSD@ 0.05	0.781	0.073	2.57	2.36	0.283	



**NURSERY-3 SET-2 (2015-16).**

Sr. No	Varieties/ clones	Germination %	Tillers/ plant	Cane count (000 ha <sup>-1</sup> )	Cane yield (tha <sup>-1</sup> )	CCS%	Remarks
1	<b>S2013-US-917</b>	50.6 B	1.30 D	96.8 C	109 B	13.4 B	<b>Selected &amp; promoted</b>
2	<b>S2013-US-920</b>	42.6 D	1.15 G	105.5 B	98.5 C	13.4 AB	<b>Selected &amp; promoted</b>
3	S2013-US-921	40.7 E	0.94 I	79.8 E	81.9 G	11.5 HI	Rejected due to high lodging & thin cane
4	S2013-US-929	42.8 D	1.03 H	68.7 G	77.7 HI	13.2 B	Rejected due to Red Rot & splits
5	<b>SL-04-688</b>	54.4 A	0.58 K	87.4 D	94.4 D	12.5 DE	<b>Selected &amp; promoted</b>
6	SL-04-689	37.2 G	0.73 J	43.7 I	56.9 K	11.4 I	Rejected due to Pith & Smut
7	SL-04-1004	36.1 H	1.73 A	77.7 E	79.8 GH	10.6 J	Rejected due to high splits & lodging
8	SL-04-5222	35.9 H	1.33 CD	60.4 H	63.8 J	11.9 G	Rejected due aerial roots pith & splits
9	HSF-240 (St)	43.8 C	1.06 H	116.6 A	113.1 A	12.3 F	Check variety
10	CPF-247 (St)	33.5 I	1.16 FG	38.1 J	31.9 M	12.4 EF	Check variety
11	SL-04-5227	35.5 H	0.64 K	71.5 F	84.7 F	12.7 CD	Rejected due to smut, high pith & lodging
12	SL-04-5236	22.8 K	1.28 DE	43.7 I	52.7 L	12.3 EF	Rejected due to Red Rot, Smut & Pith
13	SL-04-5237	38.2 F	1.22 EF	79.8 E	87.5 E	12.9 C	Rejected due to Red high splits & Pith
14	SL-04-5351	27.9 J	0.90 I	59.1 H	77.1 I	11.7 H	Rejected due to aerial roots, high lodging & splits
15	<b>PSR-07-45</b>	54.2 A	1.49 B	95.8 C	109.7 B	13.6 A	<b>Selected &amp; promoted</b>
16	<b>PSR-07-70</b>	38.3 F	1.38 C	73.6 F	81.9 G	12.7 CD	<b>Selected &amp; promoted</b>
	LSD@ 0.05	0.797	0.065	2.67	2.21	0.23	

**NURSERY-3, SET-3 (2015-16).**

Sr. No	Varieties/ clones	Germination %	Tillers/ plant	Cane count (000 ha <sup>-1</sup> )	Cane yield (t-ha <sup>-1</sup> )	CCS%	Remarks
1	PSR-07-93	30.1 CDE	1.41 C	62.4 G	74.9 F	12.4 DE	Rejected due to high Pith & lodging
2	PSR-07-106	28.8 E	0.94 D	60.4 G	61.1 G	12.6 D	Rejected due to Red Rot & lodging
3	PSR-07-140	31.2 CD	0.99 D	77.7 E	84.7 E	12.8 C	Rejected due high pith & lodging
4	<b>PSR-07-145</b>	40.6 A	3.04 A	128.4 A	133.7 A	12.3 EF	<b>Selected &amp; promoted</b>
5	<b>PSR-07-219</b>	35.2 B	2.43 B	100.1 B	104.1 B	13.4 A	<b>Selected &amp;</b>

							<b>promoted</b>
6	PSR-07-228	29.8 DE	0.61 E	65.9 F	87.4 D	12.2 F	Rejected due to high Pith, lodging poor growth in stand
7	HSF-240 (St)	40 A	1.58 C	100.6 B	106.2 B	12.3 EF	Check variety
8	CPF-247 (St)	31.5 C	1.01 D	85.4 C	100.6 C	13.1 B	Check variety
	LSD@ 0.05	1.682	0.191	3.045	2.74	0.201	

**9. TITLE:**

**SEMI FINAL VARIETAL TRIAL**

**OBJECTIVES:**

Selection of clones on the basis of quantitative and qualitative characteristics for final selection stage

**RESEARCHERS:**

Naeem Fiaz, Dr. Mahmood ul Hassan and M. Khurshid Anwar

**PROJECT DURATION:**

Continuous nature (2017-2018)

**LOCATION:**

Sugarcane Research Institute, Faisalabad

**TREATMENTS:**

No. of clones                      12

- |                       |                       |
|-----------------------|-----------------------|
| i. S2013-M-45         | i. S2013-US-920       |
| ii. S2013-M-46        | ii. SL 04-688         |
| iii. S2013-M-113      | iii. PSR 07-45        |
| iv. S2013-M-264       | iv. PSR 07-70         |
| v. S2013-B-642        | v. PSR 07-145         |
| vi. S2013-US-917      | vi. PSR 07-219        |
| vii. HSF 240 (Check)  | vii. HSF 240 (Check)  |
| viii. CPF 249 (Check) | viii. CPF 249 (Check) |

**METHODOLOGY:**

Layout	RCBD
Replications	5 (Two for periodic analysis)
Plot size	8.4m × 4m
Seed rate	50,000 TBS ha <sup>-1</sup>
Fertilizer	168-112-112 NPK kg ha <sup>-1</sup>

1

Time of planting                      Spring– 2017

It is the fourth selection stage of variety development program. Trial will be consisting of 12 clones promoted from Nursery-III. The data regarding germination, tillering, cane count, cane yield, lodging, pithiness, frost, insect pest and disease tolerance will be recorded. Periodic juice analysis will be made on monthly basis from 15<sup>th</sup> October, 2017 to 15<sup>th</sup> March, 2018

**PREVIOUS YEAR'S RESULTS**

**Set-I.**

Sr. No.	Varieties/ clones	Germ. (%)	Tillers /plant	Canes/ha	Cane yield (t/ha)	S. Rec. (%) (Oct.-Feb.)	Remarks
1	<b>S2008-FD-25</b>	66.0 A	0.51	82291 G	105 DEF	9.59	<b>Promoted</b>
2	<b>S2011-FD-18</b>	49.1 CD	1.28	130208 A	145 A	10.4	<b>Promoted</b>
3	S2011-SL-392	56.9 ABC	0.95	119791 BC	114 CDE	9.49	Rejected due to red rot
4	S2011-SL-809	62.3 AB	0.93	112847 CD	112 CDEF	8.34	Rejected low in s. recovery
5	S2012-SL-280	52.6 BCD	1.18	103819 E	119 BCDE	9.89	Rejected due to red rot
6	S2012-SL-424	54.4 ABCD	1.08	83333 G	88.9 F	11.3	Rejected due to aerial roots
7	<b>S2012-SL-426</b>	56.0 ABC	1.15	91319 F	115 CDE	11.7	<b>Promoted</b>
8	<b>S2012-SL-443</b>	62.0 AB	0.75	81597 GF	95.1 EF	10.9	<b>Promoted</b>
9	<b>S2012-SL-883</b>	58.1 ABC	0.98	93402 A	102 EF	9.10	<b>Promoted</b>
10	S2012-SL-1071	50.7 BCD	1.45	125694 B	138 AB	9.04	Rejected due to red rot
11	HSF 240	59.5 ABC	0.92	111111 DE	130 ABC	10.3	Check
12	CPF 246	43.5 D	1.72	108333 DE	128 ABCD	11.7	Check
<b>LSD @ 0.05</b>		<b>10.7</b>	<b>N.S</b>	<b>7544</b>	<b>21</b>		

**Set-II**

Sr. No.	Varieties/ clones	Germ. (%)	Tillers /plant	Canes/ha	Cane yield (t/ha)	S. Rec. (%) (Oct. - Feb.)	Remarks
1	<b>PSR 97-41</b>	55.8 AB	0.88	81944 G	123 A	11.4	<b>Promoted</b>
2	<b>M 2238-89</b>	42.6 C	1.73	98264 DEF	127 A	9.9	<b>Promoted</b>
3	S2012-M-622	58.1 AB	1.06	94791 EF	98.3 BC	10.7	Rejected due to splits
4	<b>S2012-M-632</b>	60.4 A	0.96	131250 A	134 A	10.2	<b>Promoted</b>
5	<b>S2012-M-780</b>	53.0 AB	0.96	106250 C	112 ABC	10.9	<b>Promoted</b>
6	<b>S2012-M-791</b>	59.5 AB	0.55	98958 DEF	117 AB	10.4	<b>Promoted</b>
7	S2012-M-799	58.8 AB	0.82	100347 CDE	116 AB	11.0	Rejected due to smut

8	S2012-M-1046	50.9 B	1.16	116319 B	115 AB	10.0	Rejected due to smut & lodging
9	<b>S2012-M-1362</b>	53.7 AB	1.14	104166 CD	92.0 C	11.0	<b>Promoted</b>
10	<b>S2012-M-1379</b>	60.2 A	1.02	114583 B	127 A	10.8	<b>Promoted</b>
11	HSF 240	52.1 AB	1.15	97222 DEF	123 A	10.4	Check
12	CPF 246	54.6 AB	0.97	92361 F	113 ABC	12.4	Check
<b>LSD @ 0.05</b>		<b>7.57</b>	<b>N.S</b>	<b>6571</b>	<b>19.32</b>		

**10. TITLE:**

**FINAL VARIETAL TRIAL**

**OBJECTIVE:**

Selection of clones on the basis of qualitative and quantitative characteristics at final selection stage

**RESEARCHERS:**

Dr. Mahmood Ul Hassan, Naeem Fiaz, Dr. Naeem Ahmad

**PROJECT DURATION:** Continuous nature (2017-2018)

**LOCATION:** Sugarcane Research Institute, Faisalabad

**TREATMENTS:** Clones 16

**Set-I**

V<sub>1</sub>= S2008-FD-25 V<sub>2</sub>= S2008 AUS-134  
V<sub>3</sub>= S2009 SA-8 V<sub>4</sub>=S2011-FD-18  
V<sub>5</sub>= S2011-SL-62 V<sub>6</sub>= M 2238-89  
V<sub>7</sub>= PSR 97-41 V<sub>8</sub>= VMC 88-354

**Set-II**

V<sub>1</sub>= S2012-SL-426 V<sub>2</sub> = S2012-SL-443  
V<sub>3</sub> = S2012-SL-883 V<sub>4</sub> = S2012-M-632  
V<sub>5</sub> = S2012-M-780 V<sub>6</sub> = S2012-M-791  
V<sub>7</sub> = S2012-M-1362 V<sub>8</sub> = S2012-M-1379

**METHODOLOGY:**

Check CPF 249 & HSF 240  
Layout RCBD  
Replications 5 (Two for periodic analysis)  
Plot size 4m × 8.4 m  
Seed rate 50,000 TBS ha<sup>-1</sup>  
Fertilizer 168-112-112 NPK Kg ha<sup>-1</sup>  
Time of planting Spring-2017

The trial is consist of two sets (Set-I & Set-II) and having 16 clones: 12 clones promoted from semi-final varietal trial and 04 were retained in previous final varietal trial. The data on germination, tillering, cane count, and cane yield will be recorded. Periodic juice analysis

will be done fortnightly from mid-October, 2017 to mid-March, 2018 for quality performance. The selection will be done on the basis of yield and quality performance of clones.

## PREVIOUS YEAR'S RESULTS

CLONE	Germ. (%)	Tillers per plant	Millable cane	Cane yield (T/ha)	Sugar recovery (%) (Oct.-Feb)	Remarks
S2008 FD-17	36.8 F	1.43 A	77.00 D	88.5 D	10.4	Rejected due to poor growth & yield
<b>S2008 FD-19</b>	56.5 BC	1.06 ABCD	129.0 A	142.01 A	11.1	<b>Promoted</b>
S2008 FD-22	49.3 CD	0.97 BCD	86.3 BCD	99.3 BCD	8.45	Rejected due to low recovery
<b>S2008 M-34</b>	62.0 AB	0.51 E	99.7 BCD	129.9 AB	9.26	<b>Promoted</b>
S2008 M-55	41.2 EF	1.32 AB	94.3 BCD	102.1 BCD	7.80	Rejected due to low recovery
S2008 AUS-107	67.1 A	0.54 E	111.0 AB	119.8 ABCD	11.0	Rejected due to red rot
S2008 AUS-134	43.9 DEF	1.12 ABCD	94.3 BCD	110.8 ABCD	10.9	Retained
S2009 SA-8	50.0 CD	0.98 BCD	81.3 CD	91.3 CD	11.3	Retained
<b>S2009 SA-79</b>	45.2 DE	0.80 DE	98.7 BCD	126.7 AB	9.70	<b>Promoted</b>
S2011 SL-62	65.3 A	0.74 DE	97.0 BCD	99.0 BCD	10.3	Retained
<b>SL-96-175</b>	55.0 BC	0.77 DE	96.0 BCD	121.2 ABC	9.16	<b>Promoted</b>
<b>VMC-87/599</b>	57.1 BC	0.79 DE	107.7 ABC	127.1 AB	9.56	<b>Promoted</b>
VMC-88/354	45.8 DE	1.25 ABC	85.7 BCD	108.0 BCD	8.97	Retained
HSF 240	45.4 DE	1.40 A	99.7 BCD	113.9 ABCD	10.8	
CPF 246	65.1 A	0.91 CDE	105.7 ABCD	118.4 ABCD	12.4	
<b>LSD Value</b>	<b>7.7911</b>	<b>0.4044</b>	<b>29.066</b>	<b>32.105</b>		

### 11. TITLE

### PERFORMANCE OF PROMISING SUGARCANE VARIETIES UNDER SPRINGPLANTATION

#### OBJECTIVES:

To study the comparative performance of elite sugarcane clones planted in Spring.

#### RESEARCHERS:

Muhammad Rizwan Khurshid, Dr. Mahmood UI Hussan, and Dr. Naeem Ahmad

#### PROJECT DURATION:

Continuous nature (2017-2018)

#### LOCATION:

Sugarcane Research Institute, Faisalabad.

**TREATMENTS**

Clone/variety 13

V<sub>1</sub>= S2005-US-54      V<sub>7</sub>= S2009-SA-111  
 V<sub>2</sub>= S2008-FD-19      V<sub>8</sub>= SL-96-175  
 V<sub>3</sub>= S2008-M-34      V<sub>9</sub>= VMC-87/599  
 V<sub>4</sub>= S2008-AUS-130   V<sub>10</sub>= S2003-US-127  
 V<sub>5</sub>= S2008-AUS-133   V<sub>11</sub>= S2003-US-633  
 V<sub>6</sub>= S2009-SA-79      V<sub>12</sub>= S2006-US-658  
 V<sub>13</sub>=HSF-240 (check)

**METHODOLOGY**

Layout = RCBD  
 Plot size = 4m × 8.4 m  
 Replications = 3  
 Seed rate = 50,000 TBS ha<sup>-1</sup>  
 Fertilizer = 168-112-112 NPK kgha<sup>-1</sup>  
 Date of planting = Spring - 2017

The trial comprised of elite clones promoted from final varietal trial and retained from previous promising varietal trial. All the recommended agronomic practices will be kept uniform for all the treatments. The data regarding germination, tillering, cane count, cane yield and sugar recovery will be recorded during the course of study.

**PREVIOUS YEAR'S RESULTS:**

New experiment

**12. TITLE****NATIONAL UNIFORM VARIETAL YIELD TRIAL (1<sup>st</sup> YEAR).****OBJECTIVES**

To evaluate the adaptability of different sugarcane clones

**RESEARCHERS:**

Dr. Mahmood-Ul-Hassan, Naeem Fiaz and Dr. Naeem Ahmad

**PROJECT DURATION:**

2017-2019

**LOCATION:**

Sugarcane Research Institute, Faisalabad.

**TREATMENTS:**

Clones = 20  
 (S2008-AUS-130, S2008-AUS-134, Ganj Bakhsh, PS-TJ-41, MS-2003-CP-368, MS-2003-CP-380, MS-2003-CP-389, S-9883-CSSG-155, Th-1312, NIFA-1, SL-96-061, SL-771, HoCP-810, HoCP-832, HoCP-840, HoCP-846, CPSG-2525, CPSG-2730, HSF 240 & CPF 249)

**METHODOLOGY:**

Layout = RCBD  
 Plot size = 4m × 6m  
 Replications = 4  
 Seed rate = 50,000 TBS ha<sup>-1</sup>  
 Fertilizer =168-112-112 NPK kg ha<sup>-1</sup>  
 Date of planting = September - 2016

Necessary cultural and plant protection operations will be carried out as and when required. Data on germination, tillering, number of millable canes, cane girth, cane height and cane yield will be recorded. Quality parameters like brix%, pol% and commercial cane sugar % will be recorded using standard procedures. Insect pest and disease data will also be recorded.

**PREVIOUS YEARS RESULTS**

New experiment.

**13. TITLE**

**NATIONAL UNIFORM VARIETAL YIELD TRIAL (2<sup>nd</sup> YEAR).**

**OBJECTIVES:**

To evaluate the adaptability of different sugarcane clones

**RESEARCHERS:**

Dr. Mahmood-Ul-Hassan, Naeem Fiaz and Dr. Naeem Ahmad

**PROJECT DURATION:**

2016-2018

**LOCATION:**

Sugarcane Research Institute, Faisalabad.

**TREATMENTS:**

Clones = 10  
 (S2006-US-658, S2006-US-272, S2008-FD-19, CPSG-06, NSG-197, Th-1210, Th-7201, MS-2000-HO-535, MS-91-CP-523 & CPF-248)

**METHODOLOGY:**

Layout = RCBD  
 Plot size = 4m × 6m  
 Replications = 4  
 Seed rate = 50,000 TBS ha<sup>-1</sup>  
 Fertilizer =168-112-112 NPK kg ha<sup>-1</sup>  
 Date of planting = September – 2016

Necessary cultural and plant protection operations will be carried out as and when required. Data on germination, tillering, number of millable canes, cane girth, cane height and cane yield will be recorded. Quality parameters like brix%, pol% and commercial cane sugar % will be recorded using standard procedures. Insect pest and disease data will

also be recorded.

**PREVIOUS YEARS RESULTS:**

CLONE	Germ. (%)	Tillers per plant	Cane girth (cm)	Cane height (m)	Millable cane	Cane yield (t/ha)	Sugar recovery (%)
S2006 US-658	51.1 D	1.24 CD	2.84 AB	2.31 CD	76.8 ABC	98.5 A	10.6
S2006 US-272	64.0 A	1.13 DE	2.48 D	2.71 ABC	53.1 DE	66.3 BCD	10.8
S2008 FD-19	41.0 E	1.98 A	2.48 D	2.45ABC D	95.5 A	108.5 A	11.5
CPSG-06	61.8 AB	1.25 BCD	2.42 D	2.77 AB	91.7 A	97.3 A	10.8
NSG-197	54.1 BCD	1.26 BCD	2.67 ABCD	2.69 ABC	93.3 A	101.4 A	11.0
Th-1210	59.7 ABC	0.95 F	2.90 A	2.23 D	42.9 E	43.6 D	10.1
Th-7201	54.7 BCD	1.00 EF	2.78 ABC	2.80 A	81.5 AB	93.9 A	10.5
MS-2000-HO-535	53.1 CD	1.34 BC	2.56 CD	2.36 BCD	82.8 AB	90.9 AB	11.7
MS-91-CP-523	55.5 BCD	1.39 B	2.63 BCD	2.38 ABCD	65.3 BCD	82.8 ABC	12.3
CPF 248	47.2 DE	1.30 BC	2.47 D	2.11 D	56.3 CDE	62.5 CD	11.0
<b>LSD Value</b>	<b>8.4412</b>	<b>0.1337</b>	<b>0.2584</b>	<b>0.4174</b>	<b>21.56</b>	<b>27.043</b>	

**14A. TITLE:**

**INTRODUCTION AND MAINTENANCE OF GENE POOL**

**OBJECTIVES:**

To maintain the diverse genetic stock of sugarcane clones / varieties for its utilization in breeding.

**RESEARCHERS:**

Muhammad Younus, Ijaz Tabassum, Abdul Sattar and M. Khurshid Anwar

**PROJECT DURATION:**

Continuous nature (2017)

**LOCATION:**

Sugarcane Research Institute, Faisalabad

**TREATMENTS:**

Following varieties / clones along-with variety CPF-249 will be planted during Spring 2017.

<u>Country</u>	<u>Nos.</u>	<u>Country</u>	<u>Nos.</u>
Australia	9	Puerto Rico	07
Bangladesh	3	Pakistan	113
Brazil	13	Philippines	01
China	02	Reunion	01
India	11	Taiwan	02
Mauritius	01	U.S.A.	113



Mexico	11	West Indies	<u>23</u>
		Total:	<u><b>310</b></u>

**METHODOLOGY:** Single row of each clone will be maintained

**PREVIOUS YEAR'S RESULTS** The brix % of total 310 countries was ranged from 16 to 24.

<u>Country</u>	<u>Brix (%)</u>	<u>Country</u>	<u>Brix (%)</u>
Australia	19-20	Puerto Rico	16-23
Bangladesh	20	Pakistan	20
Brazil	16-20	Philippines	20
China	20-21	Reunion	20
India	20-21	Taiwan	16-24
Mauritius	20	U.S.A.	16-20
Mexico	20-23	West Indies	<u>16-20</u>

**14B. TITLE:** **GENEPOOL MAINTENANCE TRIAL**

**OBJECTIVES:** To maintain the diverse genetic stock of sugarcane clones / varieties for its utilization in breeding.

**RESEARCHERS:** Muhammad Younus, Abdul Sattar and Dr. M.Ijaz Tabassum

**PROJECT DURATION:** Continuous nature

**LOCATION:** Sugarcane Research Institute, Faisalabad

**TREATMENTS:** Following varieties / clones along-with variety CPF-249 will be planted during Spring, 2017.

<u>Country</u>	<u>Nos.</u>	<u>Country</u>	<u>Nos.</u>
Australia	9	Puerto Rico	07
Bangladesh	3	Pakistan	113
Brazil	13	Philippines	01
China	02	Reunion	01
India	11	Taiwan	02
Mauritius	01	U.S.A.	113
Mexico	11	West Indies	<u>23</u>
		Total:	<u><b>310</b></u>

**METHODOLOGY:** Single row of varieties included in breeding exchange program, semi-final, final, NUVYT-2017 will be planted as fresh crop

**PREVIOUS YEAR'S RESULTS** New Experiment

**15. TITLE:** **TAXONOMIC CLASSIFICATION OF**

## CANE VARIETIES/CLONES.

- OBJECTIVES:** To study taxonomic characters of promising sugarcane clones for their identification.
- RESEARCHERS:** Muhammad Younus, Naeem Faiz and Mahmood-UI-Hassan
- PROJECT DURATION:** Continuous nature (2017)
- LOCATION:** Sugarcane Research Institute, Faisalabad
- TREATMENTS:** Varieties/Clones included in Final varietal Trial
- METHODOLOGY:** The trials will be conducted on promising clones/varieties. Observations on taxonomic characters like inter-node, node, bud, leaves and cane etc. will be recorded.
- PREVIOUS YEAR'S RESULTS** The following thirteen (13) clones were morphologically studied.

S-2008-AUS-107, VMC-87-599, VMC-88-354, SL-96-175, SL-96-62, S-2009-SA-8, S-2008-M-34, S-2008-M-55, S-2008-FD-17, S-2008-FD-19, S-2008-FD-22, S-2008-AUS-134, S-2009-SA-79

The distinctness of given clones were observed in which some of them are as follows

Sr.No.	Variety/Clone	Distinct Character
1	SL-96-62	Auricle, Pubescence and anthocyanin absent
2	SA-79	Auricle long-Lanceolate Pubescence present Spines present Bud shape Beaked
3	FD-17	Bud missing on alternate inter-node Auricle absent
4	FD-19	Anthocyanin pigmentation on leaf sheath
5	VMC-88-354	Deulape shape-Dentoid
6	VMC-87-599	Auricle long- Lanceolate
7	SL-96-175	Ligule-Semi crescent Auricle absent Shape zigzag

## 16. TITLE:

## ZONAL VARIETAL TRIALS

- OBJECTIVE:** To check the performance of promising

sugarcane clones in different agro-ecological zones of Punjab.

**RESEARCHER:** Muhammad Sarwar, Dr. Muhammad Saeed and Dr. M. AzharMunir

**PROJECT DURATION:** Continuous Nature (2017-18)

**TREATMENTS:** Seven advanced varieties / clones e.g. S2005-US-54, S2008-FD-19, AUS-130, AUS-133, AUS-134, CPF-249, HSF-240 were arranged in RCBD with the following specifications

Row spacing: 1.2 m  
NPK: 168-112-112 kg ha<sup>-1</sup>  
Seed rate: 50000 TBS/ha

**LOCATIONS:** 7  
**(A)SEPTEMBER PLANTATION (2016):**

Sr.No.	Name and Place	Cell No.
1.	Chohan Farm, Chak No. 160/EB Vehari.	0300-6999374
2.	Kashmir Sugar Mill Farm, MerikSial	0300-6690275
3.	Ashraf Sugar Mill, BahawalPur	062-2870361-2
4.	Govt. Seed Farm, Chalianwala	0301-6873773
5.	Ramzan Sugar Mill Farm, Bhawana	0300-8409982
6.	Layyah Sugar Mill Farm, 275/TDA	060-6411981-4
7.	Ghulam Murtaza, Chak No. 142/TDA, Lalazar, Layyah	0303-7448702

**(B) FEBRUARY PLANTATION (2017):**

<b>1. SOUTH PUNJAB (Muhammad Sarwar, Assistant Agronomist)</b>			
Sr. No.	Name	Mobile NO.	Address
1.	MianAftab Ahmad	0300-4439292	MauzaKotliMahtamKarpur, Vehari.
2.	Mr. GhulmMurtaza	0303-7448702	Cak No.142 TDA LalaZarLayyah.
3.	Mr. Muhammad Zaeem	0301-7514631	Chak No.8 P Khanpur.
4.	Mr. Naveed Ahmad	0305-6606330	MauzaMudwala Tehsil Ali Pur, District Muzaffargarh.
<b>2. CENTRAL PUNJAB, (Dr. Muhammad Saeed, Assistant Research Officer)</b>			
5	Rana Ahmad Ali	0321-4488980 0331-4741197	MauzaJabokaGogair Bangla. Okara
6.	Mr. Abdul Ghaffor	0300-4576567	Chak No. 529 G.B,Gojra.
7.	RanaMaqsood Ahmad	0300-8409982	Ramzan Sugar Mill,Bhawana.
8.	Dr. WaqarHaider	0300-8445242	Chak No. 239 G.B Lahore Road, Jaranwala.
<b>3.NORTH PUNJAB (Dr. Muhammad AzharMunir, Assistant Research Officer)</b>			
9.	Mr. Muhammad Tayyab	0300-6539410	Asalparmungotaroo Tehsil & District Nankana Sahib.
10.	Govt. Seed Farm, Chalianwala.	0301-6873773	Mandibahaudin.
11.	Mr. Khalil Ahmad Khara	0301-8441428	Saifna Sugar mill Lalian, Sargodha.

**PREVIOUS YEAR'S RESULTS:**

**1. Haji Riaz Hussain, Chak No. 165/Gandewala, Nia Lahore.**

Sr. No.	Varieties / clones	Germination %	Tillers / plant	Canes / ha(000)	Yield (t/ha)	CCS %
1	S2008-FD-19	59.8 b	2.19 a	179 a	120bc	11.99ab
<b>2</b>	<b>S2006-US-658</b>	<b>57.2 bc</b>	<b>1.69 b</b>	<b>177 ab</b>	<b>148 a</b>	<b>10.8 c</b>
3	S2003-US-633	76.5 a	1.43 c	158cde	113bc	12.8 a
4	S2003-US-127	54.6 cde	1.44 c	159bcd	118bc	12.7 a
5	CPF249	53.8 de	1.75 b	172abc	127 b	11.4bc
6	CPF 248	56.6 bcd	1.38 c	147 de	102 c	11.6bc
7	CPF 247	52.5 e	2.10 a	186 a	115bc	11.3bc
8	CPF 246	75.3 a	1.36 c	110 e	120bc	12.7 a
<b>LSDat0.05</b>		<b>3.29</b>	<b>0.238</b>	<b>18.23</b>	<b>19.56</b>	<b>0.98</b>

**2. Ghulam Murtaza, Chak No. 142/TDA, Layyah**

Sr. No.	Varieties / clones	Germ. %	Tillers / plant	Canes / ha	Yield (t/ha)	CCS %
1	S2008-FD-19	62.96 ab	1.92 a	173.60 a	107.00 b	13.63 ab
2	S2006-US-658	57.90 bc	1.78 ab	168.07 a	112.37 ab	13.52 b
3	S2003-US-633	55.18 cd	1.76 ab	161.10 a	88.87 c	13.69 ab
4	S2003-US-127	48.89 d	1.62 ab	143.10 b	90.23 c	14.43 a
<b>5</b>	<b>CPF249</b>	<b>49.14 d</b>	<b>1.75 ab</b>	<b>130.50 bc</b>	<b>123.53 a</b>	<b>13.64 ab</b>
6	CPF 248	63.70 ab	1.65 ab	131.97 bc	84.70 c	14.15 ab
7	S2003-US-778	68.02 a	1.27 b	115.63 c	86.13 c	13.51 b

<b>LSD at 0.05</b>	<b>7.05</b>	<b>0.56</b>	<b>17.88</b>	<b>15.42</b>	<b>0.82</b>
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**3. Muhammad Imran s/o Hassan Numberdar, Moaza Yarewala, Basti Mangna, Shorkot**

Sr. No.	Varieties / clones	Germination %	Tillers / plant	Canes / ha (000)	Yield (t/ha)	CCS %
1	S2008-FD-19	55.63 a	1.92 ab	158.30 b	127.73 bc	11.87 ab
<b>2</b>	<b>S2006-US-658</b>	<b>53.18 a</b>	<b>1.72 b</b>	<b>155.53 bc</b>	<b>155.67 a</b>	<b>11.51 abc</b>
3	S2003-US-633	49.33 ab	1.85 ab	156.90 b	116.63 c	11.36 bc
4	S2003-US-127	52.29 ab	2.04 ab	162.47 b	138.87 ab	12.12 ab
5	S2006-US-272	43.93 b	2.31 a	193.03 a	137.50 ab	10.66 c
6	CPF 248	44.07 b	1.73 ab	140.23 cd	115.30 cd	12.47 a
7	CPF 247	55.93 a	1.71 b	137.77 d	119.40 bc	12.43 a
8	CPF 246	56.52 a	1.63 b	134.60 d	95.80 d	12.25 ab
<b>LSD at 0.05</b>		<b>9.02</b>	<b>0.59</b>	<b>15.79</b>	<b>19.90</b>	<b>0.97</b>

**4. Rashid, Sr.Clerk (Rtd.), Depalpur, Okara**

Sr. No.	Varieties / clones	Germination %	Tillers / plant	Canes / ha	Yield (t/ha)	CCS %
1	S2008-FD-19	58.37 b	1.29 b	120.80 cd	119.43 c	13.54 a
<b>2</b>	<b>S2006-US-658</b>	<b>55.92 bc</b>	<b>0.86 b</b>	<b>132.43 c</b>	<b>140.27 a</b>	<b>12.28 ab</b>
3	S2003-US-633	62.55 ab	1.13 b	149.83 b	122.17 bc	12.41 ab
4	S2003-US-127	45.17 c	1.34 b	158.34 b	102.77 e	12.60 ab
5	S2006-US-272	32.75 d	2.09 a	191.60 a	101.37 e	12.48 ab
6	CPF 248	57.27 b	0.97 b	113.87 de	117.10 cd	13.21 ab
7	CPF 247	66.54 ab	0.81 b	105.67 e	132.17 ab	11.71 b
8	CPF 246	71.36 a	0.84 b	106.90 e	104.77 de	12.85 ab
<b>LSD at 0.05</b>		<b>11.19</b>	<b>0.57</b>	<b>12.44</b>	<b>12.72</b>	<b>1.68</b>

**5. Munshi Saith Javed, Khanpur**

Sr. No.	Varieties / clones	Germination %	Tillers / plant	Canes / ha (000)	Yield (t/ha)	CCS %
1	S2008-FD-19	21.85 c	3.07 a	83.37 c	104.99 bc	13.54
<b>2</b>	<b>S2006-US-658</b>	<b>48.89 ab</b>	<b>1.91 b</b>	<b>104.99 ab</b>	<b>116.62 a</b>	<b>14.04</b>
3	S2003-US-633	46.48 b	2.27 b	116.62 a	113.30 ab	13.66
4	CPF-249	41.39 b	1.86 b	103.32 ab	114.96 ab	13.58
5	CPF-248	42.94 b	1.83 b	116.62 a	93.35 d	14.08
6	CPF-246	56.94 a	1.77 b	95.01 bc	108.31 ab	12.65
<b>LSD at 0.05</b>		<b>8.48</b>	<b>0.73</b>	<b>14.37</b>	<b>10.52</b>	<b>N.S</b>

**6. Ch. Ashfaq Sahib, Ittehad Sugar Mills, Rahim Yar Khan**

Sr. No.	Varieties / clones	Germination %	Tillers / plant	Canes / ha (000)	Yield (t/ha)	CCS %
1	S2008-FD-19	37.31 cd	1.94 ab	108.33 ab	95.36 ab	13.03
<b>2</b>	<b>S2006-US-658</b>	<b>44.91 bc</b>	<b>1.95 ab</b>	<b>93.65 cd</b>	<b>103.32 a</b>	<b>13.99</b>
3	S2003-US-633	52.87 b	1.71 ab	104.48 bc	101.66 a	12.17
4	S2003-US-127	37.31 cd	1.33 b	85.04 d	99.85 a	11.66
5	SPF-234	33.79 d	2.15 a	90.03 d	85.04 b	13.42

6	CPF-249	50.65 b	2.34 a	103.33bc	101.66 a	12.82
7	CPF-248	51.11 b	1.63 ab	94.92 cd	86.70 b	13.25
8	CPF-246	68.33 a	1.42 b	119.95 a	98.34 a	11.67
<b>LSD at 0.05</b>		<b>10.05</b>	<b>0.73</b>	<b>12.99</b>	<b>12.85</b>	<b>N.S</b>

7. Zulfiqar Ali, Chak No. 327/EB, Burewala, Distt. Vehari

Sr. No.	Varieties / clones	Germination %	Tillers / plant	Canes / ha	Yield (t/ha)	CCS %
1	S2008-FD-19	58.99 b	1.63 a	203.33 a	165.00 a	13.51 ab
2	<b>S2006-US-658</b>	<b>59.48 b</b>	<b>0.53 c</b>	<b>166.67 b</b>	<b>171.67 a</b>	<b>13.16 b</b>
3	CPF249	60.70 b	1.48 a	206.67 a	106.00 d	12.68 b
4	CPF 248	60.66 b	0.41 c	126.67 c	74.33 e	13.06 b
5	CPF 247	71.50 a	0.53 c	186.67 ab	120.00 c	14.27 a
6	CPF 246	63.57 b	1.03 b	173.33 b	139.33 b	12.82 b
<b>LSD at 0.05</b>		<b>7.44</b>	<b>0.45</b>	<b>22.93</b>	<b>13.88</b>	<b>0.870</b>

8. RanaJaved Iqbal, Chak no. 596/GB, Tandlianwala

Sr. No.	Varieties / clones	Germination %	Tillers / plant	Canes / ha	Yield (t/ha)	CCS %
1	<b>S2008-FD-19</b>	<b>40.17 de</b>	<b>1.57 ab</b>	<b>200.00 b</b>	<b>168.50 a</b>	<b>12.57 a</b>
2	S2006-US-658	41.09 de	1.24 bc	158.33 d	163.00 ab	12.39 ab
3	S2003-US-633	52.68 ab	1.54 ab	226.67 a	158.83 ab	11.10 abc
4	S2003-US-127	37.77 e	1.93 a	181.67 bc	100.50 d	11.13 bc
5	CPF249	45.18 cd	1.07 bc	195.00 b	140.83 c	11.93 abc
6	CPF 248	50.81 bc	0.67 c	90.00 e	56.00 f	11.83 abc
7	CPF 247	50.42 bc	1.55 ab	191.17 b	147.33 bc	10.95 c
8	CPF 246	58.61 a	1.39 ab	168.33 cd	140.17 c	11.53 abc
<b>LSD at 0.05</b>		<b>6.29</b>	<b>0.69</b>	<b>18.61</b>	<b>16.49</b>	<b>1.41</b>

**Zonal Varietal Trial Khairpur Farm, Noon Sugar Mills, Sargodha**

Sr. No.	Name of variety/clone	Germination (%)	Tillers / plant	Cane/ha	Yield (t/ha)	S.Rec. (%)
1	S2008-FD-19	55.97 BC	0.31 CD	84259 CD	72.22 BC	14.96
2	S2008-M-34	54.45 BC	0.30 CD	70370 D	66.66 BCD	14.52
3	S2008-AUS-107	65.97 A	0.27 D	75925 CD	62.04 CD	15.29
4	S2008-AUS-134	49.16 CD	0.27 D	103703 B	113.0 A	13.73
5	S2009-SA-57	33.89 FG	0.75 B	75926	68.52	14.61

				CD	BCD	
6	S2009-SA-79	38.89 EF	0.15 D	102777 B	79.63 B	13.29
7	S2009-SA-169	39.86 EF	0.13 D	71296 CD	55.56 D	13.87
8	S2009-SA-8	42.78 DE	0.53 BC	110185 B	79.63 B	15.89
9	S2005-US-54	56.53 BC	0.33 CD	125926 A	117.6 A	14.70
10	CPF 247	57.78 B	0.25 D	87037 C	68.52 BCD	14.33
11	CPF 248	29.45 G	1.21 A	107407 B	61.11 CD	14.32
<b>LSD at 0.05</b>		<b>6.929</b>	<b>0.2348</b>	<b>14870</b>	<b>14.38</b>	

### **SUMMARY OF ZONAL VARIETAL TRIALS (Pool Data)**

<b>S.Cane varieties</b>	<b>Germination %</b>	<b>Tillers/Plant</b>	<b>No.of 000 canes/ha</b>	<b>Yield t/ha</b>	<b>CCS %</b>
S2008FD-19	50.13	1.76	145.68	120.11	12.43
S2006US-658	52.33	1.46	144.66	138.94	12.72
S2006US-272	38.34	2.20	192.32	119.43	11.57
S2003US-633	56.52	1.67	153.41	116.48	12.45
S2003US-127	45.91	1.62	148.39	108.37	12.44
S2003US-778	68.02	1.27	115.63	86.13	13.51
SPF-234	33.79	2.15	90.03	85.04	13.42
CPF-249	50.14	1.71	115.84	119.12	12.69
CPF-248	50.69	1.28	118.87	83.93	12.37
CPF-247	59.12	1.16	149.06	117.11	11.57
CPF-246	65.82	1.35	129.76	115.36	12.35
S2005US-54	56.53	0.33	125.93	117.60	14.70
S2008M-34	54.45	0.30	70.37	66.66	14.52
S2008AUS-107	65.97	0.27	75.93	62.04	15.29
S2008AUS-134	49.16	0.27	103.70	113.00	13.73
S2009SA-57	33.89	0.75	75.93	68.52	14.61
S2009SA-79	38.89	0.15	102.78	79.63	13.29
S2009SA-169	39.86	0.13	71.30	55.56	13.87
S2009SA-8	42.78	0.53	110.19	79.63	15.89

## **B. SUGARCANE AGRONOMY**

### **1. TITLE:**

**WEED MANAGEMENT IN SUGARCANE.**

### **OBJECTIVE:**

To find out the most suitable method of weed control in plant / ratoon crop.

**RESEARCHERS:** Dr. Muhammad Saeed, Abdul Khaliq, M. Rizwan Khurshid and Muhammad Ashiq. Assistant Agronomist. ARI, Faisalabad

**PROJECT DURATION:** 2017-20

**LOCATION:** Sugarcane Research Institute, Faisalabad.

**TREATMENTS:** **Weed control methods.**

- 1 Ametryn + Atrazine @ 1000 gm / acre post emergence 45DAP (Days after planting) / DAH (Days after harvesting) / + interculture (Tractor) 60-65 DAP/ DAH + Earthing up 100 DAP / DAH.
- 2 Mesotrione + Atrazine + Holosulfuron @ 600 gm / acre post-em. 45 DAP / DAH + interculture (Tractor) 60-65 DAP / DAH + Earthing up 100 DAP / DAH.
- 3 Topramezone + Atrazine @ 1000ml / acre post em. 45 DAP / DAH + interculture (Tractor) 60-65 DAP / DAH + Earthing up 100 DAP / DAH.
- 4 Mesotrione + Atrazine 550 SC @ 1000 ml / acre post em. 45 DAP / DAH + interculture (Tractor) 60-65 DAP / DAH + Earthing up 100 DAP / DAH.
- 5 Interculture (Tractor) 30 DAH (only in Ratoon crop) + S-metolachlor @ 1000 ml / acre pre-em. 45 DAP / DAH + interculture (Tractor) 60-65 DAP / DAH + Earthing up 100 DAP / DAH.
- 6 Interculture (Tractor) 45DAP (Plant crop) and 30 DAH (Ratoon crop) + interculture (Tractor) 60-65 DAP / DAH + Earthing up 100 DAP / DAH.
- 7 Control (weedy check).

## **METHODOLOGY**

Layout = RCBD  
Plot size = 5m × 4.8 m  
R x R Distance = 1.2 m  
Replication = 3  
Seed rate = 50,000 TBS ha<sup>-1</sup>  
Fertilizer = 168-112-112 NPK kg ha<sup>-1</sup>  
(30 % more fertilizer in ratoon crop)  
Time of planting = Spring, 2017  
Treatments will be applied as per treatment schedule. Earthing up will be done 100 DAP / DAH. All other agronomic practices will be kept normal. Data regarding tillering, cane count, cane girth, cane length, cane yield and CCS t ha<sup>-1</sup> will be recorded during the course of



study.

## PREVIOUS YEARS RESULTS New Experiment

- 2. TITLE:** **EFFICACY OF VARIOUS WEEDICIDES IN SUGARCANE.**
- OBJECTIVE:** To find out the most effective weedicide for weed control in sugarcane.
- RESEARCHERS:** Dr. Muhammad Saeed, Abdul Khaliq and M. RizwanKhurshid.
- PROJECT DURATION:** 2016-18
- LOCATION:** Sugarcane Research Institute. Faisalabad
- TREATMENTS:** **Weed control treatments.**
1. S-metolachlor @ 1000 ml / acre pre-emergence 1-3 DAP (Days after planting).
  2. Ametryn + Atrazine @ 1000 gm / acre post-em. 40 DAP.
  3. Mesotrione + S-metolachlor @ 1000 ml / acre pre-em. 1-3 DAP.
  4. Mesotrione + Atrazine + Holo-sulfuron @ 350 gm / acre post em. 40 DAP.
  5. Manual control i.e hand weeding 30 DAP
  6. Control (weedy check)

## METHODOLOGY

Layout	=	RCBD
Plot size	=	5m × 4.8 m
R x R Distance	=	1.2m
Replications	=	3
Seed rate	=	50,000 TBS ha <sup>-1</sup>
Fertilizer	=	168-112-112 NPK kg ha <sup>-1</sup>
Time of planting	=	Spring, 2017

Treatments will be applied accordingly. Promising variety CPF-247 will be used as test variety. Earthing up will be done 90-100 DAP. All other agronomic practices will be kept normal. Data regarding germination, tillering, weed count, cane count, cane girth, cane length, cane yield and CCS % will be recorded during the course of study.

## PREVIOUS YEARS RESULTS:

Treatment	Tiller/ plant	Canes/ha (000)	Cane height (m)	Cane yield (t ha <sup>-1</sup> )	CCS%
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T <sub>1</sub> : S-metolachlor @ 1000 ml / acre pre-em. (1-3 DAP)	2.79 a	92.95 c	2.45 c	90.54 c	13.6
T <sub>2</sub> : Ametryn + Atrazine @ 1000 g / acre post-em. (40 DAP).	2.44 c	91.22 c	2.42 c	84.25 d	13.3
T <sub>3</sub> : Mesotrione + S-metolachlor @ 1000 ml / acre pre-em. (1-3 DAP)	2.63 b	103.29 ab	2.58 ab	102.35 b	12.7
T <sub>4</sub> : Mesotrione + Atrazine + Holosulfuron @ 350 gm / acre post em. (40 DAP)	2.75 a	108.29 a	2.65 a	107.40 a	13.1
T <sub>5</sub> : Manual control i.e hand weeding 30 DAP)	2.61 b	100.85 b	2.53 b	101.05 b	12.6
T <sub>6</sub> : Control (Weedy Check)	2.06 d	84.98 d	2.29 d	72.68 e	12.9
<b>LSD(P≤0.05)</b>	<b>0.13</b>	<b>7.12</b>	<b>0.11</b>	<b>5.02</b>	N.S

### 3. TITLE:

### EFFECT OF INTER-CROPPING ON YIELD AND QUALITY OF AUTUMN PLANTED SUGARCANE.

### OBJECTIVES:

To explore the feasibility and scope of intercropping and to determine the effect of different associated legume and non-legume crops on growth, yield and quality of autumn sugarcane.

### RESEARCHERS:

A) Dr. Muhammad Yasin, Dr. Mahmood-Ul-Hassan, Abdul Khaliq and Mubashra Yasin

### PROJECT DURATION:

2015-2017

### LOCATION:

Sugarcane Research Institute, Faisalabad

### TREATMENTS:

T<sub>1</sub>: Sugarcane + two rows of lentil  
T<sub>2</sub>: Sugarcane + two rows of linseed  
T<sub>3</sub>: Sugarcane + two rows of canola  
T<sub>4</sub>: Sugarcane + two rows of onion  
T<sub>5</sub>: Sugarcane alone.

### METHODOLOGY:

Layout = RCBD  
Plot size = 5 m × 9.6 m  
Replications = 3  
Variety/clone = S2008-FD-19  
Seed rate = 50,000 TBS ha<sup>-1</sup>  
Fertilizer = 168-112-112 NPK kg ha<sup>-1</sup>  
Sugarcane was planted in 120 cm apart double row strips in autumn 2016. The lentil variety 'Pb-M-2009', linseed variety 'LS-147', variety 'Faisal-Canola' was intercropped in the month of November-2016. Half of the recommended seed rate that is lentil 20 kg, linseed 20 kg and canola 5 kg/ha respectively. Onion will be sown

by using its nursery. All other Agronomic practices were kept uniform in all the treatments. Statistical analysis and economics of the sole as well as intercropped sugarcane will be calculated. Following observations will be recorded for main crop and inter crops.

**MAIN CROP (Sugarcane)**

- Germination %
- Tillers per plant
- Cane count ha<sup>-1</sup>
- Cane yield t ha<sup>-1</sup>
- CCS %
- Sugar yield t ha<sup>-1</sup>

**INTER CROPS**

- Seed yield of lentil kg ha<sup>-1</sup>
- Seed yield of linseed kg ha<sup>-1</sup>
- Seed yield of canola kg ha<sup>-1</sup>
- Onion yield kg ha<sup>-1</sup>

**PREVIOUS YEAR RESULTS**

**(A) INTERCROPPING (2015-16).**

Treatments	Germination %	Tillers/plant	Cane count (000 ha <sup>-1</sup> )	Cane yield (t-ha <sup>-1</sup> )	CCS%	Sugar Yield (th <sup>-1</sup> )
T1 SUGARCANE +LENTIL	49.60 A	2.20 A	140.33 A	138.44 A	12.76 A	16.56 A
T2 SUGARCANE + LINSEED	49.45 A	2.02 C	121.57 A	117.16 E	12.25 B	14.02 D
T3 SUGARCANE + CANOLA	49.48 A	2.09 BC	134.51 C	129.83 C	12.74 A	15.46 B
T4 SUGARCANE + ONION	49.28 A	2.15 AB	139.07 B	135.55 B	12.74 A	15.61 B
T5 SUGARCANE ALONE	49.25 A	2.08 BC	130.46 D	127.30 D	12.35 B	14.77 C
LSD @ 0.05	NS	0.0832	0.6036	1.1252	0.150 9	0.2324

**DATE OF SOWING:**

- SUGARCANE: 25.10.2015
- LENTIL, LINSEED, CANOLA: 27.11.2015
- ONION NURSERY TRANSPLANTING: 23.12.2015

**DATE OF HARVESTING:**

- SUGARCANE: 24.12.2016
- CANOLA: 28.03.2016
- LENTIL, LINSEED: 10.04.2016
- ONION: 27.04.2016

**(B) ECONOMIC ANALYSIS**

Treatments	S. cane yield (t/ha)	Inter-crops yield (kg/ha)	Income sugarcane (Rs.)	Income Inter-crop (Rs.)	Total income (Rs.)	Cost of production sugarcane (Rs.)	Cost inter-crop (Rs.)	Total cost (Rs.)	Net income (Rs.)
T1 Sugarcane + lentil	138.44	496.03	622980	74405	697385	150575	4000	154575	542810
T2 Sugarcane + linseed	117.16	535.72	527220	53572	580792	150575	3250	153825	426967
T3 Sugarcane + canola	129.83	376.97	584235	20733	604968	150575	3200	153775	451193
T4 Sugarcane + onion	135.55	1295.33	609975	27202	637177	150575	27500	178075	459102
T5 Sugarcane alone	127.3	0	572850	0	572850	150575	0	150575	422275

**4. TITLE:**

**COMPARATIVE EVALUATION OF DIFFERENT PLANTING METHODS**

**OBJECTIVE:**

To find out economically the most suitable planting method to get higher cane yield

**RESEARCH WORKERS:**

Naeem Fiaz, Dr. Mahmood ul Hassan and Salma Niaz

**PROJECT DURATION:**

(2017-18)

**LOCATION:**

Sugarcane Research Institute, Faisalabad

**TREATMENTS:**

**A. Planting methods:**

P<sub>1</sub>. = 0.75m apart single row (farmer practice)

P<sub>2</sub>. = 1.2m apart dual rows (recom'd practice)

P<sub>3</sub>. = 1.5m apart dual rows

P<sub>4</sub>. = Pits (R × R = 1.5m, Pit × Pit = 1m)

**B. Varieties**

V<sub>1</sub> S2003-US-633 (lodging tendency)

V<sub>2</sub> CPF 248 (moderately lodging)

V<sub>3</sub> S2006-US-658 (non lodging)

**METHODOLOGY:**

Layout RCBD (with split plot arrangement)

Replications 3

Seed rate 50000 TBS ha<sup>-1</sup>

Fertilizer 168-112-112 NPK (kg ha<sup>-1</sup>)

Date of planting: Spring 2017

Planting techniques will be kept in main plot and the varieties / clones in sub plots. All other recommended agronomic practices will be kept

uniformly for the treatments. Data like germination (%), tillering, cane count ha<sup>-1</sup>, cane yield (t ha<sup>-1</sup>) and sugar recovery (%) will be recorded during course of study. Economic analysis will be made after harvesting.

#### PREVIOUS YEAR'S RESULTS:

Treatments	Germ. (%)	Tillers per plant	Canes per hectare	Cane yield (t ha <sup>-1</sup> )
<b>Planting techniques</b>				
P <sub>1</sub> = 0.75m apart single row (farmer practice)	60.80 A	0.98 B	87731 B	89.93
P <sub>2</sub> = 1.2m apart dual rows (recom'd practice)	52.84 B	1.31 A	98271 A	87.28
P <sub>3</sub> = 1.5m apart dual rows	48.77 C	1.03 B	83518 B	78.98
P <sub>4</sub> = Pits (R × R = 1.5m, P × P = 1m)	38.02 D	0.76 C	88580 AB	89.69
<b>LSD</b>	<b>2.554</b>	<b>0.0965</b>	<b>10350</b>	<b>N.S</b>
<b>Varieties</b>				
V <sub>1</sub> = S2003-US-633 (lodging tendency)	50.81	0.97	100364 A	82.63 B
V <sub>2</sub> = CPF 248 (moderately lodging)	48.81	1.04	82714 B	73.28 C
V <sub>3</sub> = S2006-US-658 (non-lodging)	50.70	1.05	85497 B	103.5 A
<b>LSD</b>	<b>N.S</b>	<b>N.S</b>	<b>7128</b>	<b>8.275</b>
<b>Interactions</b>				
P <sub>1</sub> × V <sub>1</sub>	58.79	0.91	105902	93.40
P <sub>1</sub> × V <sub>2</sub>	60.18	1.14	77430	74.31
P <sub>1</sub> × V <sub>3</sub>	63.43	0.89	79861	102.08
P <sub>2</sub> × V <sub>1</sub>	54.08	0.91	107407	86.30
P <sub>2</sub> × V <sub>2</sub>	51.11	1.42	97037	78.89
P <sub>2</sub> × V <sub>3</sub>	53.33	1.60	90370	96.67
P <sub>3</sub> × V <sub>1</sub>	50.37	1.19	80000	63.61
P <sub>3</sub> × V <sub>2</sub>	50.37	0.90	81388	66.94
P <sub>3</sub> × V <sub>3</sub>	45.55	1.00	89166	106.39
P <sub>4</sub> × V <sub>1</sub>	40.00	0.88	108148	87.22
P <sub>4</sub> × V <sub>2</sub>	33.58	0.70	75000	72.96
P <sub>4</sub> × V <sub>3</sub>	40.49	0.69	82592	108.89
<b>LSD</b>	<b>N.S</b>	<b>N.S</b>	<b>N.S</b>	<b>N.S</b>

#### 5. TITLE:

**PERFORMANCE OF PROMISING CLONES/VARIETIES UNDER DIFFERENT IRRIGATION REGIMES**

#### OBJECTIVE:

To screen out the drought tolerant clones under semi arid conditions.

#### RESEARCH WORKERS:

Muhammad Sarwar, Dr. AzharMunir, Miss

<b>PROJECT DURATION:</b>	2017-19
<b>LOCATION:</b>	Sugarcane Research Institute, Faisalabad
<b>TREATMENTS:</b>	<p><b>A. Irrigation levels:</b></p> <p>I<sub>1</sub>. 1.0 coefficient  I<sub>2</sub>. 0.8 coefficient  I<sub>3</sub>. 0.6 coefficient</p> <p><b>B. Varieties/Clones:</b></p> <p>V<sub>1</sub> S2008-AUS-130  V<sub>2</sub> S2008-AUS-133  V<sub>3</sub> S2005-US-54  V<sub>4</sub> S2008-AUS-134  V<sub>5</sub>CPF 249 (standard)</p>

<b>METHODOLOGY:</b>	Layout	RCBD split plot arrangement
	Replications	3
	Plot size	9.6m × 4m
	Seed rate	50,000 TBS ha <sup>-1</sup>
	Fertilizer	168-112-112 NPK (kg ha <sup>-1</sup> )
	Date of planting:	Spring, 2017

Three irrigation levels 1.0, 0.8 and 0.6 coefficient will be kept in main plot while the clones in sub plot. Crop will be subjected to drought stress after formative stages. Agronomic data like germination (%), tillering, cane count (ha), cane yield (t/ha) and CCS (%) will be recorded during the course of study.

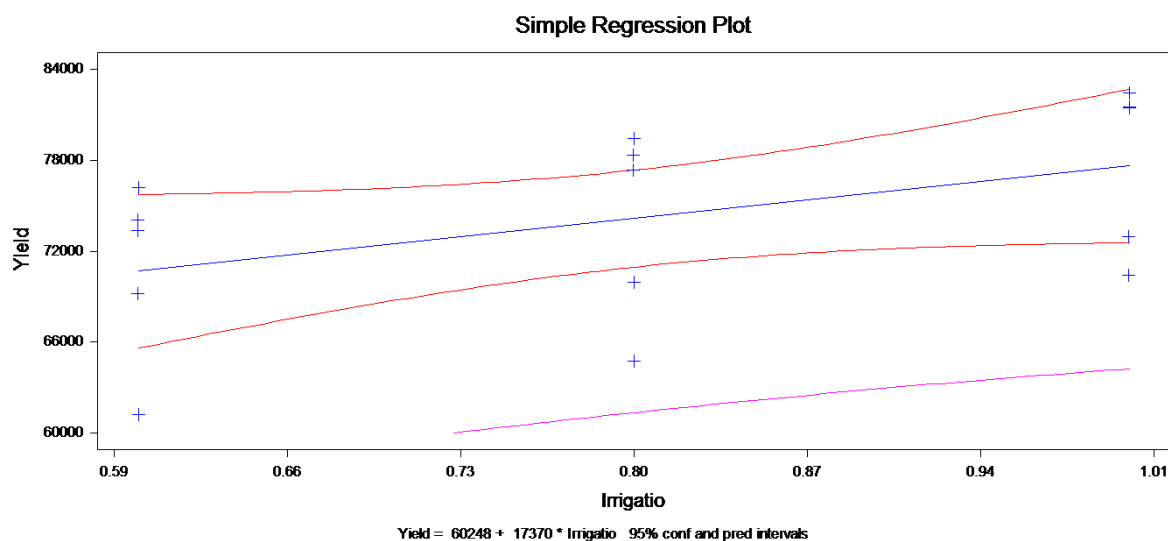
**PREVIOUS YEAR'S RESULTS:**

Treatment	Germination %	Tillers/ plant	No of (000) canes/ha	Cane yield t/ ha	CCS%
<b>A) Irrigation Levels</b>					
I <sub>1</sub> 1.0 Co-efficient	56.309a	0.918a	90.486a	98.982a	13.495a
I <sub>2</sub> 0.8 Co-efficient	56.753a	0.911a	84.236a	89.141ab	13.413a
I <sub>3</sub> 0.6 Co-efficient	58.136a	0.870a	80.694a	76.131b	13.675a
LSD 0.05	6.374	0.190	12.081	18.532	0.803
<b>B) Varieties</b>					
V <sub>1</sub> S2003-US-127	55.597b	0.836b	80.208b	74.299bc	14.092a
V <sub>2</sub> S2003 US - 704	57.263ab	0.891ab	70.718b	70.276c	13.463a
V <sub>3</sub> S2006 US - 272	57.490ab	0.883b	81.597ab	85.804a	12.403b
V <sub>4</sub> S2008 FD -19	55.679b	1.098a	94.213a	81.781ab	13.881a
V <sub>5</sub> CPF-247	59.300a	0.790b	82.292ab	78.264abc	13.797a
LSD 0.05	3.432	0.210	13.334	9.014	0.655
<b>A x B ) Irrigation Levels x Varieties</b>					
I <sub>1</sub> x V <sub>1</sub>	57.840a	0.684d	81.60abc	75.738a	14.130ab

I <sub>1</sub> x V <sub>2</sub>	56.975a	0.879abcd	64.93c	68.974a	13.403abcd e
I <sub>1</sub> x V <sub>3</sub>	56.667a	1.070abc	80.21abc	81.623a	12.400de
I <sub>1</sub> x V <sub>4</sub>	52.531a	1.108ab	89.93ab	84.461a	13.827ab
I <sub>1</sub> x V <sub>5</sub>	57.531a	0.848abcd	85.76abc	84.115a	13.713abc
I <sub>2</sub> x V <sub>1</sub>	51.975a	0.956abcd	83.68abc	80.251a	14.353a
I <sub>2</sub> x V <sub>2</sub>	58.827a	0.791bcd	75.00bc	71.934a	13.163bcde
I <sub>2</sub> x V <sub>3</sub>	55.432a	0.841abcd	86.81abc	89.315a	12.273e
I <sub>2</sub> x V <sub>4</sub>	57.160a	1.173a	100.00a	78.556a	13.593abcd
I <sub>2</sub> x V <sub>5</sub>	60.370a	0.796bcd	75.69bc	75.650a	13.630abcd
I <sub>3</sub> x V <sub>1</sub>	56.975a	0.869abcd	75.35bc	66.910a	13.793ab
I <sub>3</sub> x V <sub>2</sub>	55.988 a	1.004abcd	72.22bc	69.920a	13.823ab
I <sub>3</sub> x V <sub>3</sub>	60.370a	0.738bcd	77.78abc	86.472a	12.537cde
I <sub>3</sub> x V <sub>4</sub>	57.346a	1.013abcd	92.71ab	82.326a	14.223ab
I <sub>3</sub> x V <sub>5</sub>	60.000a	0.727cd	85.42abc	75.026a	13.997ab
LSD 0.05	10.827	0.364	23.095	28.438	1.134

### Regression Analysis

Source	DF	SS	MS	F	P
Regression	1	1.206E+08	1.206E+08	3.67	0.0778
Residual	13	4.280E+08	3.292E+07		
Total	14	5.487E+08			



#### **6. TITLE:**

**RESPONSE OF SUGARCANE  
VARITIES/CLONES AT DIFFERENT  
NITROGEN LEVELS**

#### **OBJECTIVE:**

To evaluate the performance of promising sugarcane clones under various levels and split application of Nitrogen.

**RESEARCHERS:** Muhammad Sarwar, Dr. AzharMunirand Dr. Arshad Mahmood

**PROJECT DURATION:** 2016-2018

**LOCATION:** Sugarcane Research Institute, Faisalabad

**TREATMENTS:** **A. Fertilizer levels (NPK kg ha<sup>-1</sup>)**

F<sub>1</sub>= 126-112-112

F<sub>2</sub>= 168-112-112

F<sub>3</sub>= 210-112-112

F<sub>4</sub>= 252-112-112

**B. Sugarcane Varieties/Clones**

V<sub>1</sub> = CPF-246

V<sub>2</sub> = S2005-US-54

V<sub>3</sub> = S2006-US-658

V<sub>4</sub> = S2003-US-633

V<sub>5</sub> = CPF-248

**C. Application of Nitrogen (Days after planting)**

T<sub>1</sub>= 4585 115

T<sub>2</sub>= 4585 115 145

**METHODOLOGY:**

Layout RCBD Split plot arrangement

Replications 3

Plot size 4m × 4.8 m

Seed rate 50,000 TBS ha<sup>-1</sup>

Time of planting Spring - 2017

All the P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O will be applied at sowing time, other Nitrogen fertilizer will be applied according to treatments. Data regarding yield parameters, germination, tillering, cane count, cane length, cane diameter, cane yield and quality data like brix %, pol %,purity %, fiber % and sugar yield will be recorded.

**PREVIOUS YEAR'S RESULTS:**

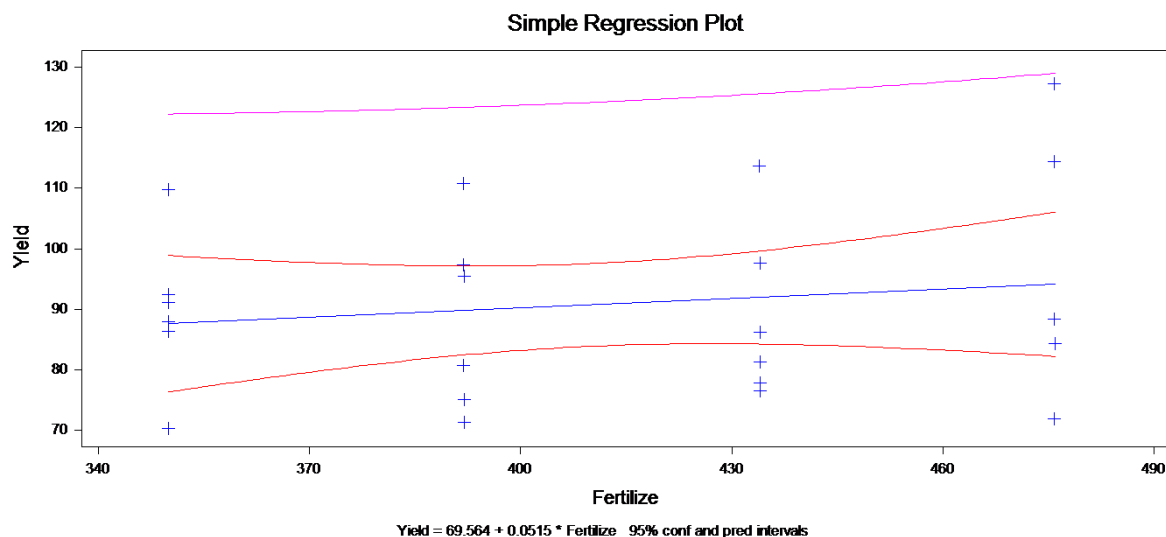
Treatment	Germination %	Tillers/ plant	No. of (000) canes/ha	Cane yield t/ ha	CCS%
<b>A) Fertilizer Levels</b>					
F <sub>1</sub> 126-112-112 NPK Kg/ha	50.839 B	1.028 B	86.667 A	89.589 A	13.122A
F <sub>2</sub> 168-112-112-NPK kg/ha	48.589 B	1.256 A	84.033 A	88.372 B	13.136A
F <sub>3</sub> -210-112-112 NPK kg/ha	57.089 A	0.750 C	82.978 A	88.789 AB	13.094A
F <sub>4</sub> 252-112-112 NPK kg/ha	51.700 B	1.133 AB	82.106 A	96.372 A	12.975A
<b>LSD (P ≤ 0.05)</b>	<b>3.761</b>	<b>0.178</b>	<b>6.838</b>	<b>7.808</b>	<b>0.514</b>
<b>B) Varieties</b>					



V <sub>1</sub> CPF- 246	56.033 A	0.958 BC	80.458 B	76.81 C	13.463b
V <sub>2</sub> S2006 US -272	49.683 B	0.983 BC	82.883 B	105.25 A	12.457d
V <sub>3</sub> S2005 US -54	50.867 B	1.233 A	85.058 B	97.49 A	12.997c
V <sub>4</sub> S2003 US -633	49.342 B	1.167 AB	93.833 A	87.25 B	13.970a
V <sub>5</sub> S2003 US - 658	52.967 AB	1.058 ABC	79.333 B	98.01 A	12.057d
V <sub>6</sub> CPF-248	53.433 AB	0.850 C	82.108 B	79.88 BC	13.547ab
<b>LSD(P ≤ 0.05)</b>	<b>4.39</b>	<b>0.209</b>	<b>7.146</b>	<b>9.849</b>	<b>0.443</b>
<b>A x B ) Fertilizer Levels x Varieties</b>					
F <sub>1</sub> x V <sub>1</sub>	55.700 abc	1.000defg	91.63abcd	86.40efghij	14.200ab
F <sub>1</sub> x V <sub>2</sub>	49.767 cdef	0.967efg	78.10defgh	109.77abcd	12.183cde
F <sub>1</sub> x V <sub>3</sub>	40.167 g	1.867a	83.30cdefg	90.93defghi	12.833abcde
F <sub>1</sub> x V <sub>4</sub>	51.133 cdef	0.933efgh	104.87a	87.87efghij	13.980abc
F <sub>1</sub> x V <sub>5</sub>	51.933 bcde	0.867fgh	86.43bcde	92.37cdefgh	11.483de
F <sub>1</sub> x V <sub>6</sub>	56.333 abc	0.533hi	75.67efgh	70.20j	14.050abc
F <sub>2</sub> x V <sub>1</sub>	55.567 abc	1.100bcdefg	81.63cdefg	71.20j	12.860abcde
F <sub>2</sub> x V <sub>2</sub>	40.267 g	1.167bcdefg	89.23bcde	110.70abc	12.570abcde
F <sub>2</sub> x V <sub>3</sub>	54.733 abc	1.067cdefg	77.77defgh	97.27bcdef	12.957abcde
F <sub>2</sub> x V <sub>4</sub>	42.733 fg	1.500ab	100.37ab	95.50bcdefg	14.067abc
F <sub>2</sub> x V <sub>5</sub>	53.333 bcd	1.400bcd	64.93h	75.00hij	13.210abcde
F <sub>2</sub> x V <sub>6</sub>	44.900 defg	1.300bcde	90.27abcde	80.57efghij	13.153abcde
F <sub>3</sub> x V <sub>1</sub>	62.733 a	0.533hi	77.77defgh	77.77fghij	13.673abcd
F <sub>3</sub> x V <sub>2</sub>	52.900 bcd	0.800gh	71.17fgh	86.13efghij	12.670abcde
F <sub>3</sub> x V <sub>3</sub>	52.900 bcd	1.167bcdefg	93.73abc	113.57ab	13.140abcde
F <sub>3</sub> x V <sub>4</sub>	60.200 ab	0.800gh	90.27abcde	81.27efghij	13.213abcde
F <sub>3</sub> x V <sub>5</sub>	50.833 cdef	0.900efgh	83.33cdefg	97.60bcde	12.187bcde
F <sub>3</sub> x V <sub>6</sub>	62.967 a	0.300i	81.60cdefg	76.40ghij	13.680abcd
F <sub>4</sub> x V <sub>1</sub>	50.133 cdef	1.200bcdefg	70.80gh	71.87ij	13.117abcde
F <sub>4</sub> x V <sub>2</sub>	55.800 abc	1.000defg	93.03abc	114.40ab	12.403bcde
F <sub>4</sub> x V <sub>3</sub>	55.667 abc	0.833gh	85.43cdef	88.20efghij	13.057abcde
F <sub>4</sub> x V <sub>4</sub>	43.300 efg	1.433bc	79.83cdefg	84.37efghij	14.620a
F <sub>4</sub> x V <sub>5</sub>	55.767 abc	1.067cdefg	82.63cdefg	127.07a	11.350e
F <sub>4</sub> x V <sub>6</sub>	49.533 cdef	1.267bcdef	80.90cdefg	92.33cdefgh	13.303abcd
LSD 0.05	8.798	0.417	14.292	19.698	1.810

### Regression Analysis

Source	DF	SS	MS	F	P
Regression	1	129.62	129.623	0.52	0.4780
Residual	21	5216.47	248.403		
Total	22	5346.10			



**7. TITLE**

**PERFORMANCE OF PROMISING SUGARCANE VARIETIES AT DIFFERENT PLANT POPULATIONS.**

**OBJECTIVE**

To evaluate the best seed rate in different promising sugarcane varieties.

**RESEARCHERS**

Dr. Muhammad AzharMunir, Dr. Muhammad Yasin and Dr. Muhammad Saeed.

**DURATION**

2017-18

**LOCATION**

Sugarcane Research Institute, Faisalabad.

**TREATMENTS**

**A= Seed rates**

S1 = 25000 TBS/ha

S2 = 50000 TBS/ha

S3 = 75000 TBS/ha

**B=Varieties**

V1=S2003-US-127

V2=S2003-US-633

V3=S2006-US-658

V4=S2008-AUS-134

V5=HSF-240 (Standard)

**METHODOLOGY:**

Layout: RCBD (Split plot arrangement)

Replications: 3

Plot size 4 m x 8.4 m

Sowing time: Spring, 2017.

The experiment will be laid out according to RCBD (Split plot arrangement) in spring 2017. Seed rates will be applied as per treatment. All other agronomic practices will be kept normal. Data regarding germination, tillering, cane count, stripped cane yield and

sugar recovery will be recorded during the course of study.

**PREVIOUS YEAR'S RESULTS:** New experiment.

**8. TITLE:** **PERFORMANCE OF SUGARCANE AT VARIOUS PLANTING TIMES**

**OBJECTIVES:** To evaluate the best time of planting for sugarcane in relation to climate change.

**RESEARCHERS:** Abdul Khaliq, Dr. Muhammad Yasin and Dr. M. AzharMunir

**PROJECT DURATION:** 2017-19

**LOCATION:** Sugarcane Research Institute, Faisalabad

**TREATMENTS:** Planting Time  
PT<sub>1</sub> = 15 August  
PT<sub>2</sub> = 15 September  
PT<sub>3</sub> = 15 October  
PT<sub>4</sub> = 15 January  
PT<sub>5</sub> = 15 February  
PT<sub>6</sub> = 15 March  
PT<sub>7</sub> = 15 April  
Sugarcane clone = S2006-US-658

**METHODOLOGY:** Layout = RCBD  
Net plot size = 8 m × 8.4 m  
Replication = 3  
Seed rate = 50,000 TBS ha<sup>-1</sup>  
Fertilizer = 168-112-112 NPK kg ha<sup>-1</sup>  
The trial will be sown as per mentioned schedule. The full doze of phosphorus and potash fertilizer will be applied at the time of planting and nitrogen will be applied in 3 splits viz. at completion of germination, tillering and earthing up. All the agronomic practices will be kept normal for all the treatments. The data on different yield parameters regarding germination %, tillering, cane count, cane yield and sugar yield will be recorded. Quality analysis will also be done by using standard procedures.

**PREVIOUS YEAR'S RESULTS:** New experiment

**9. TITLE:** **PERFORMANCE OF SUGARCANE**

## CLONES AT VARIOUS HARVESTING TIMES

### OBJECTIVES:

1. To study the impact of climate change on yield and quality of sugarcane plant crop.
2. To evaluate the best time of harvesting for high yielding ratoon crop.

### RESEARCHERS:

Abdul Khaliq(Plant crop), Muhammad RizwanKhurshid(Ratoon crop), Dr. Muhammad Saeedand Dr. Naeem Ahmad.

### PROJECT DURATION:

2017-19

### LOCATION:

Sugarcane Research Institute, Faisalabad

### TREATMENTS:

#### A. Harvesting dates (Main plots)

HD<sub>1</sub> = 15November

HD<sub>2</sub> =15 December

HD<sub>3</sub> = 15 January

HD<sub>4</sub> = 15 February

HD<sub>5</sub> = 15 March

#### B. Variety / Clone (Sub-plots)

V<sub>1</sub> = S2003-US-127

V<sub>2</sub> = S2005-US-54

V<sub>3</sub> = HSF-240

### METHODOLOGY:

Layout = RCBD (Split plot arrangement)

Plot size = 5 m × 8.4 m

Replication = 3

Seed rate = 50,000 TBS ha<sup>-1</sup>

Fertilizer = 168-112-112 NPK kg ha<sup>-1</sup>  
(Plant crop)

= 218-112-112 NPK kg ha<sup>-1</sup>  
(Ratoon crop)

The trial will be sown in spring 2017. The full doze of phosphorus and potash fertilizer will be applied at the time of planting and nitrogen will be applied in 3 splits *viz.* at completion of germination, tillering and earthing up. The agronomic practices will be kept normal for all the treatments. The ratoon will be kept at above mentioned harvesting dates and 30% more nitrogen will be applied in case of ratoon crop. The data on different yield parameters regarding germination / sprouting, cane count, cane yield and sugar yield will be recorded. Quality parameters like Pol%, brix% and commercial cane sugar % will also be recorded using standard procedures.

**PREVIOUS YEAR'S RESULTS:** New experiment

**10. TITLE:** **RATOONING POTENTIAL OF PROMISING SUGARCANE CLONES**

**OBJECTIVE:** To study the ratooning ability of sugarcane clones at final selection stage.

**RESEARCHERS:** M. Rizwan Khurshid, Dr. Mahmood Ul Hassan, Ashfaq Nadeem and M. Khurshid Anwar Sahi

**PROJECT DURATION:** Continuous nature (2017-2018)

**LOCATION:** Sugarcane Research Institute, Faisalabad

**TREATMENTS:** Clones 13  
V<sub>1</sub>= S2008-FD-17 V<sub>7</sub>= S2008-AUS-134  
V<sub>2</sub>= S2008-FD-19 V<sub>8</sub>= S2009-SA-8  
V<sub>3</sub>= S2008-FD-22 V<sub>9</sub>= S2009-SA-79  
V<sub>4</sub>= S2008-M-34 V<sub>10</sub>= S2011-SL-62  
V<sub>5</sub>= S2008-M-55 V<sub>11</sub>= SL 96-175  
V<sub>6</sub>= S2008-AUS-107 V<sub>12</sub>= VMC-87-599  
V<sub>13</sub>= VMC 88-354  
Check HSF 240 & CPF 246

**METHODOLOGY:** The trial after harvesting of final varietal trial will be kept as ratoon. The experiment will be laid out in RCBD with three repeats having net plot size of 4 m x 9.6 m. The recommended dose of phosphorous and potash will be applied along with 30% more nitrogen (218-112-112 NPK Kg/ha). All the agronomic practices will be kept uniform for all the treatments. The data regarding sprouting, cane count, cane yield and sugar recovery will be recorded.

**PREVIOUS YEAR'S RESULTS** New experiment

**11. TITLE: REDUCING THE DOSE OF HERBICIDE BY USING SORGHUM WATER EXTRACTS TO CONTROL WEEDS IN SUGARCANE**

**OBJECTIVE:** To minimize the use of weedicide through allelopathy.

**RESEARCHERS:** Wardah Muzaffar, Mubashra Yasin, Salma Niaz and Dr. Arshad Mahmood

**PROJECT DURATION:** (2017-2018)

**LOCATION:** Sugarcane Research Institute, Faisalabad

**TREATMENTS:** T<sub>0</sub>= Weedy check (control)

T<sub>1</sub>= Sorghum water extracts @ 6 L acre<sup>-1</sup>  
 T<sub>2</sub>=Ametryn + Atrazin(post-emergence) @ 1 kg acre<sup>-1</sup>+Sorghum water extracts @ 3 L acre<sup>-1</sup>  
 T<sub>3</sub>=Ethoxy-Sulfuron (post-emergence) @ 50g acre<sup>-1</sup>+Sorghum water extracts @ 3 L acre<sup>-1</sup>  
 T<sub>4</sub>= Ametryn + Atrazin (post-emergence) @ 1 kg acre<sup>-1</sup>  
 T<sub>5</sub>= Ethoxy-Sulfuron (post-emergence) @ 100gacre<sup>-1</sup>

**METHODOLOGY:**

Clone	S-2003-US-127
Layout	RCBD
Replications	3
Plot size	4m × 9.6 m
Seed rate	50,000 TBS ha <sup>-1</sup>
Fertilizer	168-112-112 NPK Kg ha <sup>-1</sup>
Time of planting	Spring, 2017

Necessary cultural will be carried out as and when required. The data on different yield parameters regarding germination / sprouting, cane count, cane yield and sugar yield will be recorded. Quality parameters like Pol%, brix% and commercial cane sugar % will also be recorded using standard procedures.

**PREVIOUS YEARS RESULTS**

New experiment.

**12. TITLE**

**RESPONSE OF VARIOUS SUGARCANE CLONES/VARIETIES TO CROP MODEL AND THEIR RADIATION USE EFFICIENCY AT DIFFERENT ROW ORIENTATION**

**OBJECTIVES:**

To determine radiation use efficiency and crop model performance for sugarcane clones/varieties

**RESEARCHERS:**

MubashraYasin, Salma Niaz, WardahMuzaffar and Dr. Naeem Ahmad

**PROJECT DURATION:**

2017-2019

**LOCATION:**

Sugarcane Research Institute, Faisalabad.

**TREATMENTS:**

**A.**Row Orientation  
 East ↔ West  
 South ↔ North

**B.**Varieties:-

1-S2003-US-633  
2- S2005-US-54  
3-S2003-US-127

4-HSF 240  
5-CPF 249

**METHODOLOGY:**

Layout = RCBD under split Plot  
Plot size = 4m × 9.6m  
Replications = 3  
Seed rate = 50,000 TBS ha<sup>-1</sup>  
Fertilizer = 168-112-112 NPK kg ha<sup>-1</sup>  
Date of planting = Spring - 2017

Necessary cultural operations and plant protection operations will be carried out as and when required. Data on crop growth, development will be recorded on various time intervals and yield will be recorded at final harvest. Weather data will also be collected for model use.

**PREVIOUS YEARS RESULTS**

New experiment.

**13. TITLE**

**IMPACT OF INTEGRATED TRASH MANAGEMENT PRACTICES IN RATOON CROP**

**OBJECTIVES:**

To evaluate impact of integrated trash management on soil fertility and sugarcane yield.

**RESEARCHERS:**

Salma Niaz, Mubashra Yasin, Wardah Muzaffar and M. Khurshid Anwar

**PROJECT DURATION:**

2017-2019

**LOCATION:**

Sugarcane Research Institute, Faisalabad.

**TREATMENTS:**

A. Harvesting dates  
1<sup>st</sup> week of December  
1<sup>st</sup> week of February

**B. Trash Management Practices**

- 1- Burning
- 2- Equal Spreading In Field
- 3- Chopping+ Spreading of Trash
- 4- Spreading of Trash+ 1 bag of Urea
- 5- Disk Harrow
- 6- Intercultural + covering with trash

Layout = RCBD under split plot  
Plot size = 4m × 9.6m  
Replications = 3  
Seed rate = 50,000 TBS ha<sup>-1</sup>

Fertilizer = 218-112-112 NPK Kg/ha  
Date of planting = Spring - 2017

**METHODOLOGY:** Necessary cultural and plant protection operations will be carried out as and when required. Soil analysis will be done after harvesting of fresh crop and ratoon crop. The data on weeds and different yield parameters regarding germination / sprouting, cane count, cane yield and sugar yield will be recorded. Quality parameters like Pol%, brix% and commercial cane sugar % will also be recorded using standard procedures.

**PREVIOUS YEARS RESULTS:** New Experiment.

**14. TITLE** **EFFECT OF DIFFERENT INTERN-CROPS ON YIELD AND QUALITY OF SPRING PLANTED SUGARCANE**

**OBJECTIVE** To explore the feasibility and scope of intercropping and to determine the effect of different associated legume on the growth, yield and quality of spring sugarcane.

**RESEARCHERS** A. Dr. Muhammad Yasin, Abdul Khaliq and Mubashra Yasin

B. Dr. Aziz-ur-Rehman, Pulses Res. I, Fsd

C. Dr. M. Rafiq, Oilseeds Res. Instt. Fsd.

**PROJECT DURATION** 2017-2019

**LOCATION** Sugarcane Research Institute, Faisalabad

**TREATMENTS** Layout =RCBD  
Plot size =5m x 8.4m  
Replication=3  
Variety= CPF-249  
Seed rate=50,000 TBS/ha  
Fertilizer= 168-112-112 NPK kg ha<sup>-1</sup>

**TREATMENTS** T<sub>1</sub>: Sugarcane+two rows of mash  
T<sub>2</sub>: Sugarcane+two rows of mung  
T<sub>3</sub>: Sugarcane+one row of sunflower  
T<sub>4</sub>: Sugarcane+two rows of sunflower  
T<sub>5</sub>: Sugarcane +one row of maize Fodder  
T<sub>6</sub>: Sugarcane +two rows of maize Fodder  
T<sub>7</sub>: Sugarcane alone

**METHODOLOGY** Sugarcane variety CPF-249 will be used as medium of the trail. The crop will be sown 120



cm apart double row strip in spring, 2017. The mash (Arooj), mung (AZRI), sunflower (HYSUN-33) and maize fodder will be intercropped in the month of March, 2017. Half seed rate of the recommended seed rate that is 25 Kg, 25 Kg, 5 Kg, and 100 Kg ha<sup>-1</sup> will be used respectively. All other Agronomic practice will be kept uniform in the treatment. A recommended dose of NPK will be applied @ 168-112-112 Kg NPK ha<sup>-1</sup>. Economics of the sole as well as intercropped sugarcane will be calculated. During the study the following observation will be recorded:

**MAIN CROP.**

- Germination %age
- Tillering per plant
- Cane count/ha
- Cane yield count t/ha-1
- CCS%
- Sugarcane Yield t/ha-1

**INTER CROP**

- Seed yield of mash Kg/ha
- Seed yield of mung Kg/ha
- Seed yield of sunflower Kg/ha
- Forage yield Kg/ha

**PREVIOUS YEAR's RESULTS** New Experiment

## **C. SUGARCANE PATHOLOGY**

<b>1. TITLE</b>	<b>EVALUATION OF RESISTANCE IN SUGARCANE CLONES TO RED ROT (<i>Colletotrichumfalcatum</i>went).</b>
<b>OBJECTIVE</b>	To find out resistance in sugarcane clones against red rot.
<b>RESEARCHERS</b>	Hafiz Muhammad Walayat Ali Khan, Dr. Muhammad Abdul Shakoor&Dr. Naeem Ahmad
<b>DURATION</b>	Continuous nature (2017-18)
<b>LOCATION</b>	Sugarcane Research Institute, Faisalabad.
<b>TREATMENTS</b>	i. Nursery II ii. Nursery III iii. Semi-Final Trial iv. Final v. NUVYT vi. Ratoon crop of advance lines/clones= 15 vii. Advance lines/Clone (plant crop) = 15 <b>S2009-SA-111, M-2238/89, M-34, S2008-S-130, S2011-SL-809, PSR-97/41, FD-18, VML-88/354, S2011-SL-392, S2008-FD-19, S2003-US-133, SA-79, S2008-AUS-134, FD-17, VML-88/599</b>
<b>METHODOLOGY</b>	Layout Design: Augmented Plot size: 3m × 2.4 m Check clone: Co-1148, S2003-US-718 and SPSG-394 <p>Clones of sugarcane will be planted in autumn/spring season along with three check varieties. Inoculations of standing canes will be done by inoculating lower internodes during July-August using plug technique @ 20-25 spores/microscopic field. The spreader variety CO-1148 will be planted in borders and in the centre of the experiment. The inoculated stalks will be harvested after two months of inoculation and spread of the disease in the form of internal lesions/spots will be recorded on the basis of Srinivasan and Bhat's scale (0-9).</p>

1  
2 = Resistant

**Disease rating scale:**

0 = Immune  
= Highly Resistant

3 – 4 = Moderately Resistant  
5 – 6 = Moderately Susceptible  
7 – 8 = Susceptible  
9 = Highly Susceptible

**2. TITLE**

**REACTION OF SUGARCANE PROMISING LINES/ CLONES TO DISEASES (SMUT, POKKAH BOENG, RED STRIP, RUST AND MOSAIC).**

**OBJECTIVE**

To find out resistance in sugarcane clones against major diseases.

**RESEARCHERS**

Hafiz Muhammad Walayat Ali Khan,  
Dr. Muhammad Abdul Shakoor & Dr. Naeem Ahmad

**DURATION**

Continuous nature (2017-18)

**LOCATION**

Sugarcane Research Institute, Faisalabad.

**TREATMENTS**

- i. Advances lines/clones: 15 (same as mentioned in Exp. 1)
- ii. Ratoon crop of advance lines/clone
- iii. Final

**METHODOLOGY** Layout Design: Augmented

Plot size: 3m × 4.8 m

Check clones:

- i. Whip smut: S2003-US-618, CPSG-2713 and S2006-US-832
- ii. PokkahBoeng: BF-162, CSSG-212 and CPSG-2875
- iii. Red Stripe: S2012-BD-1283, S2009-AUS-87 and S2008-AUS-87
- iv. Rust: BF-162, S2008-AUS-281 and S2006-SP-30

**WHIP SMUT:**

Setts of sugarcane will be dipped in spore suspension of whip smut (4 g spores per litter water) for half an hour at the time of sowing. The spreader variety S2003-US-618 will be planted after every two test clones. The paste method of inoculation at a concentration of 2g spores/2 ml water will also be followed in the month of March. The disease incidence will be recorded by counting the diseased canes.

Rating scale for Whip Smut disease of s.cane (%)

0 – 5	=	Resistant
5.1 – 15	=	Moderately Resistant
15.1 – 30	=	Moderately Susceptible
Above 30	=	Susceptible

**POKKAH BOENG**

The inoculation of the growing point will be made during the month of July @  $2 \times 10^3$  spores/microscopic field. Disease incidence will be recorded on the basis of leaf infection and malformation of the top/node of canes.

Rating scale for Pokkahboeng disease (%)

0 – 2	=	Highly Resistant
3 – 8	=	Resistant
9 – 23	=	Moderately Resistant
24 – 40	=	Moderately Susceptible
41 – 50	=	Susceptible
Above 50	=	Highly Susceptible

**RED STRIP**

The growing point of sugarcane plant will be inoculated by bacterial suspension of disease pathogen in the month of July. Observations will be recorded on the basis of leaf stripes and top rot.

Rating scale for Red Stripe disease of sugarcane (%)

0 – 5	=	Resistant
5.1 – 15	=	Moderately Resistant
15.1 – 30	=	Moderately Susceptible
Above 30	=	Susceptible

**RUST**

Sugarcane advance lines/clones will be planted in the month of September, along-with a spreader variety BF-162 sown at the border and after every two test clones. Inoculation will be occurred naturally by urediospores releasing from the infested leaves of the spreader variety BF-162. Artificial inoculation will also be made using whorl method by placing 0.5-1.0 ml spores suspension (@10urediospores/ml) into the spindle leaf whorl during the month January/February. The reaction of sugarcane clones against rust will be determined by using 1-4 disease rating scale.

Rating scale for Rust disease

1	=	Resistant
2	=	Moderately Resistant
3	=	Moderately Susceptible

4 = Susceptible

#### **MOSAIC AND OTHER DISEASES:**

Data of the varietal reaction to mosaic and other diseases will be recorded under natural conditions.

#### **PREVIOUS YEAR'S RESULTS**

##### **Brief summary of previous year's results (1 to 2)**

Reaction to disease	Clone						Total
	Red Rot	Whip Smut	PokkahBoeng	Red Stripe	Rust	Mosaic	
Resistant (R)	527	98	109	121	121	85	1061
Moderately Resistant (MR)	85	11	0	0	0	0	96
Moderately Susceptible (MS)	60	10	4	0	0	15	89
Susceptible (S)	67	2	8	0	0	21	98
Total:	739	121	121	121	121	121	1344

##### **Promising lines /important clones**

Sr. No.	Clone	Remarks
1.	S2003-US-127 (CPF-250)	Promising clone
2.	S2003-US-633 (CPF-251)	Promising clone
3.	S2006-US-658 (CPF-252)	Promising clone
4.	S2008-Aus-130	Promising clone
5.	S2005-US-54	Promising clone
6.	S2003-US-778	Promising clone
7.	S-2008-AUS-134	Good performer clone
8.	S2008-AUS-133	Good performer, new clones
9.	S2008-FD-18	Good performer, new clones

### **3. TITLE**

**SCREENING OF SUGARCANE ADVANCED LINES AGAINST DISEASES IN SOUTHERN PUNJAB, (RED ROT, WHIP SMUT, POKKAH BOENG, RED STRIP, RUST, MOSAIC AND OTHER DISEASES).**

### **OBJECTIVE**

To find out resistance in sugarcane clones against diseases under climatic condition of southern Punjab.

### **RESEARCHERS**

Hafiz Muhammad Walayat Ali Khan,  
Dr. Muhammad Abdul Shakoor & Muhammad Aslam

<b>DURATION</b>	Continuous nature (2017-18)
<b>LOCATION</b>	Sugarcane Research Station, Khanpur.
<b>TREATMENTS</b>	Advances lines/clones = 15
<b>METHODOLOGY</b>	Layout and methodology will be same as discussed earlier in previous experiments
<b>PREVIOUS YEAR'S RESULTS</b>	New Experiment
<b>4. TITLE:</b>	<b>MANAGEMENT OF WHIP SMUT DISEASE OF SUGARCANE THROUGH THE USE OF FUNGI TOXICANTS.</b>
<b>OBJECTIVE</b>	To find out the effective fungicide to control the disease.
<b>RESEARCHERS:</b>	Hafiz Muhammad Walayat Ali Khan, Dr. Muhammad Abdul Shakoor and Dr. Naeem Ahmad
<b>DURATION</b>	2017-18
<b>LOCATION</b>	Sugarcane Research Institute, Faisalabad.
<b>TREATMENTS</b>	9 i. Carbendazime @ 2.5 grams/liter water ii. Fosetyl-Al @ 2.5 grams/liter water iii. Flutriafol+Azoxystrobin @ 2.5 ml/liter water iv. Difenoconazole 8% + Azoxystrobin 22% @ 2.5 grams/liter water v. Fluazinam 40% + Metalaxyl-M 20% @ 2.5 ml/liter water vi. Thiophenate methyl vii. Check
<b>METHODOLOGY</b>	Layout Design = RCBD Replication = 3 Variety = HSF-240 Plot size = 3m × 4.8 m
	The experiment will be conducted in February planted crop and the setts of sugarcane variety HSF-240 will be dipped in spore suspension of whip smut pathogen ( <i>Ustilagoscitaminea</i> ) prepared @ 4 grams/liter for 30 minutes to produce the disease artificially. The inoculated setts will be treated with fungicides as mentioned above. The data will be recorded on the basis of percent diseased canes.

## PREVIOUS YEAR'S RESULTS

Last year sugarcane variety S2003-US-618 was included in the experiment. Since the mentioned variety (S2003-US-618) is highly susceptible to whip smut. Therefore non of the fungicide was found to be effective in controlling the disease.

## 5. TITLE

### DRENCHING OF FUNGICIDES TO CONTROL SUGARCANE RED ROT

## OBJECTIVE

To evaluate the efficacy of fungicides to overcome Red rot problem under field condition.

## RESEARCHERS:

Hafiz Muhammad Walayat Ali Khan,  
Dr. Muhammad Abdul Shakoor&Dr. Naeem Ahmad

## DURATION

2017-18

## LOCATION

Sugarcane Research Institute, Faisalabad.

## TREATMENTS

- Treatments = 8 viz;
1. Thiophenate methyl @ 400 grams/acre
  2. Fosetyl-Al @400 grams/acre
  3. Flutriafol + Azoxystrobin @ 200 ml/acre
  4. Difenoconazole 8% + Azoxystrobin 22% @ 400 grams/acre
  5. Fluazinam 40% + Metalaxyl-M 20% @ 400 ml/acre
  6. Kasugamycin @ 400 grams/acre
  7. Check

## METHODOLOGY Layout Design =

RCBD  
Replication = 3  
Variety = S2003-US-718  
Plot size = 3m × 10.8 m

The experiment will be conducted in February sown crop. Soil inoculation will be made by mixing plant diseased debris in soil one week prior sowing. Drenching application of fungicides will be carried out through irrigation after 30 days of sowing. 2<sup>nd</sup> and 3<sup>rd</sup> application of fungicides will be made at the completion of germination and cane formation of the crop respectively. Disease data will be recorded before 2<sup>nd</sup> and 3<sup>rd</sup> fungicidal application and final observation will be taken during last week of August to evaluate the fungicides.

## PREVIOUS YEAR'S RESULTS

Sr.	Treatment	Disease Incidence (%)	Control(%)
1	Thiophenate methyl	16.47	83.0
2	Thiophenate methyl + Sulphur	19.41	81
3	Fosetyl-Al	17.2	82.8
4	Flutriafol + Azoxystrobin	24.92	75.08
5	Difenoconazole 8% + Azoxystrobin 22%	41.29	58.71
6	Fluazinam 40% +Metalaxyl-M 20%	38.58	61.42
7	Kasugamycin	78.82	21.18
8	Check	93.5	6.5

### Results:

The results were found statistically significant. Thiophenate methyl, Fosetyl-Al and Flutriafol + Azoxystrobin showed the better result in controlling the disease under field condition respectively.

### 6. TITLE:

### CONTROL OF RED ROT INFECTION IN SUGARCANE SEED (SETTS).

### OBJECTIVE

To find out effective method of seed treatment to control red rot pathogen.

### RESEARCHERS:

Hafiz Muhammad Walayat Ali Khan,  
Dr. Muhammad Abdul Shakoor&Dr. Naeem Ahmad

### DURATION

2017-18

### LOCATION

Sugarcane Research Institute, Faisalabad.

### TREATMENTS

- Variety = S2003-US-718  
Plot size = 3m × 10.8 m  
Layout = RCBD  
Treatments = 6 viz;
1. Thiophenate methyl @ 2.5 grams/lit of water
  2. Fosetyl-Al @2.5 grams/lit of water
  3. Flutriafol + Azoxystrobin @ 2.5ml /lit of water
  4. Carbendazim @ 2.5ml /lit of water
  5. Fluazinam 40% + Metalaxyl-M 20% @ 400 ml/acre
  6. Check



## **METHODOLOGY**

The experiment will be carried out in spring sown crop. Artificial infection of red rot pathogen in sugarcane setts will be created with the help of dipping method @20-25 spores /microscopic field. Setts of sugarcane will be treated by immersing in the fungicidal solution for 15-20 minutes prior sowing .The spray of same fungicides will be carried out on the cane setts placed in the furrows at the time of sowing. Data will be recorded on the basis of cane infection.

## **PREVIOUS YEAR'S RESULTS**New experiment

### **7. TITLE: CONTROL OF SUGARCANE RUST THROUGH THE APPLICATION OF FUNGICIDES**

#### **OBJECTIVE**

To determine the efficacy of fungicide to overcome the sugarcane rust under field condition.

#### **RESEARCHERS:**

Hafiz Muhammad Walayat Ali Khan,  
Dr. Muhammad Abdul Shakoor&Dr. Naeem Ahmad

#### **DURATION**

2017-18

#### **LOCATION**

Sugarcane Research Station, Khanpur.

#### **TREATMENTS**

Variety = SPF-234  
Plot size = 3m × 10.8 m  
Layout = RCBD  
Replication = 3  
Treatments = 5 viz;  
1.Thiophenate methyl @ 2.5 grams/lit of water  
2.Fosetyl-Al @2.5 grams/lit of water  
3.Flutriafol + Azoxystrobin @ 2.5ml /lit of water  
4.Carbendazim @ 2.5ml /lit of water  
5. Check

## **METHODOLOGY**

The experiment will be conducted in autumn sown crop under natural appearance of rust disease. 2 sprays of fungicides will be made during the month of Jan / Feb and March after appearance of disease at the early stages of crop. Data will be recorded on the basis of leaf infection to evaluate the fungicides.

## D. SUGARCANE ENTOMOLOGY

<b>1. TITLE</b>	<b>SCREENING OF SUGARCANE CLONES FOR RESISTANCE AGAINST BORERS.</b>														
<b>OBJECTIVE</b>	To select promising clones having resistance against sugarcane borers.														
<b>RESEARCHERS</b>	Muhammad Munir, Hafiz Muhammad Walayat Ali Khan & Abdul Khaliq														
<b>DURATION</b>	Continuous nature (2017-18)														
<b>LOCATION</b>	Sugarcane Research Institute, Faisalabad														
<b>TREATMENTS</b>	<p><b>A. Under controlled conditions (Insecticide applied)</b></p> <p>i. Final varietal trial</p> <p>ii. Semi-Final varietal trial</p> <p>iii. NUVYT</p> <p><b>B. Under natural conditions (Insecticide not applied)</b></p> <p>i. Final varietal trial</p> <p>ii. Semi-Final varietal trial</p>														
<b>METHODOLOGY</b>	<table border="0"> <tr> <td>Layout</td> <td>RCBD</td> </tr> <tr> <td>Replications</td> <td>3</td> </tr> <tr> <td>Plot size</td> <td>4m × 9.6 m</td> </tr> <tr> <td>Seed rate</td> <td>50,000 TBS ha<sup>-1</sup></td> </tr> <tr> <td>Fertilizer</td> <td>168-112-112 NPK kg ha<sup>-1</sup></td> </tr> <tr> <td>Check varieties</td> <td>HSF 240 &amp; CPF 247</td> </tr> <tr> <td>Time of planting</td> <td>Spring- 2017</td> </tr> </table>	Layout	RCBD	Replications	3	Plot size	4m × 9.6 m	Seed rate	50,000 TBS ha <sup>-1</sup>	Fertilizer	168-112-112 NPK kg ha <sup>-1</sup>	Check varieties	HSF 240 & CPF 247	Time of planting	Spring- 2017
Layout	RCBD														
Replications	3														
Plot size	4m × 9.6 m														
Seed rate	50,000 TBS ha <sup>-1</sup>														
Fertilizer	168-112-112 NPK kg ha <sup>-1</sup>														
Check varieties	HSF 240 & CPF 247														
Time of planting	Spring- 2017														

All agronomic practices including insecticide application in all Varietal Trials i.e Final, Semi-final and NUVYT will be completed accordingly. Two separate sets of final and semi-final varieties will also be planted where all inputs will be uniformly applied throughout the season without insecticide application. For this purpose dead heart % will be recorded twice during the months of April & May with one month interval, by counting the total number of tillers along with infested tillers from each central 2 rows of each plot. At harvest time, inter-node damage will be recorded by collecting the samples of 10 randomly selected canes of each clone / advance line. The canes will be splitted longitudinally and closely observed for borer

damage. Internode damage will be recorded by counting the total number of internodes along with attacked internodes for each borer, separately.

The assessment of reaction for resistance of different sugarcane borers will be done on the grading given by Mann Singh 2001.

Reaction	Inter-nodal damage %		
	Top borer	Stem borer	Root borer
Resistant (R)	0-10	0-10	0-10
Moderately Resistant (MR)	10.10-20	10.10-20	10.10-20
Susceptible (S)	20.10-40	20.10-40	20.10-40
Highly Susceptible (HS)	40.10 and above	40.10 and above	40.10 and above

## PREVIOUS YEAR'S RESULTS

### Final varietal trial (insecticide applied)

Sr. No	Clone	Tiller infestation %	Inter-nodal damage %					Reaction
			T.B.	Reaction	S.B.	Reaction	R.B.	
1.	S-2008-FD-17	6.52	0.00	R	3.45	R	1.05	R
2.	S-2008-FD-19	6.74	0.00	R	3.31	R	1.09	R
3.	S-2008-FD-22	4.81	0.00	R	6.04	R	1.80	R
4.	S-2008-M-34	4.23	0.00	R	4.51	R	1.10	R
5.	S-2008-M-55	4.93	0.00	R	5.46	R	2.10	R
6.	S-2008-AUS-107	4.56	0.00	R	3.83	R	1.05	R
7.	S-2008-AUS-134	4.70	0.00	R	7.56	R	0.37	R
8.	S-2009-SA-8	3.14	1.08	R	5.77	R	0.72	R
9.	S-2009-SA-79	4.19	0.00	R	6.73	R	2.30	R
10.	S-2011-SL-62	4.62	0.00	R	6.19	R	1.47	R
11.	SL-96-175	6.52	0.53	R	8.43	R	1.14	R
12.	VMS-87/599	5.60	0.00	R	7.96	R	1.79	R
13.	VMC-88/354	6.14	0.00	R	8.43	R	1.40	R
14.	HSF-240	6.36	0.00	R	4.11	R	1.87	R
15.	CPF-246	6.39	0.00	R	4.33	R	1.83	R

### Final varietal trial (without insecticide application)

Sr. No	Clone	Tiller infestation %	Inter-nodal damage %					Reaction
			T.B.	Reaction	S.B.	Reaction	R.B.	
1.	S-2008-FD-19	9.95	0.00	R	9.71	R	2.77	R
2.	S-2008-M-34	7.92	0.00	R	9.33	R	4.16	R
3.	S-2008-M-55	8.34	0.00	R	10.25	MR	4.30	R
4.	S-2008-AUS-	5.43	0.00	R	10.4	MR	4.9	R

	107		0		6		0	
5.	S-2008-AUS-129	4.88	0.00	R	12.57	MR	3.06	R
6.	S-2008-AUS-130	8.68	0.00	R	10.48	MR	1.64	R
7.	S-2008-AUS-133	10.80	0.00	R	10.52	MR	1.37	R
8.	S-2008-AUS-134	6.10	0.00	R	16.44	MS	2.89	R
9.	S-2009-SA-8	5.97	0.00	R	14.77	MR	3.27	R
10	S-2009-SA-57	6.64	0.00	R	12.63	MR	3.96	R
11	S-2009-SA-79	7.78	0.00	R	11.27	MR	2.06	R
12	S-2009-SA-111	4.59	0.00	R	13.53	MR	2.87	R
13	S-2009-SA-169	3.07	0.00	R	11.95	MR	2.55	R
14	S-2009-SA-171	6.68	0.00	R	10.10	R	3.52	R
15	CPF-247	8.39	0.00	R	10.60	MR	1.88	R
16	HSF-240	9.51	0.00	R	11.91	MR	3.53	R

**Semi-final trial (Insecticide applied)**

Sr. No	Clone	Tiller infestation %	Inter-nodal damage %					
			T.B.	Reaction	S.B.	Reaction	R.B.	Reaction
1.	S-2008FD-25	4.48	0.00	R	7.14	R	2.19	R
2.	S-2011-FD-18	4.01	0.36	R	8.60	R	2.11	R
3.	S-2011-SL-392	3.78	0.00	R	8.41	R	2.73	R
4.	S-2011-SL-809	6.34	0.43	R	5.81	R	2.44	R
5.	S-2012-SL-280	3.82	0.38	R	13.10	MR	3.36	R
6.	S-2012-SL-424	3.95	0.56	R	10.03	R	1.13	R
7.	S-2012-SL-426	3.86	0.29	R	6.30	R	1.64	R
8.	S-2012-SL-443	5.20	0.00	R	7.57	R	2.17	R
9.	S-2012-SL-883	4.26	0.20	R	2.79	R	3.10	R
10.	S-2012-SL-1071	4.84	0.16	R	7.10	R	3.28	R
11.	HSF-240	4.64	0.38	R	5.20	R	0.91	R
12.	CPF-246	3.89	0.00	R	7.19	R	3.24	R

**Semi-final trial (without insecticide application)**

Sr. No	Clone	Tiller infestation %	Inter-nodal damage %					
			T.B.	Reaction	S.B.	Reaction	R.B.	Reaction
1.	S-2008-FD-17	17.31	0.17	R	18.86	MS	4.12	R
2.	S-2008-FD-22	8.35	0.00	R	12.85	MR	3.12	R
3.	S-2008-FD-25	6.95	0.36	R	10.25	MR	5.15	R

4.	S-2011-SL-62	8.65	0.00	R	6.31	R	1.12	R
5.	SL-96-175	9.39	0.00	R	11.14	MR	5.60	R
6.	SL-392	10.77	0.00	R	11.64	MR	3.42	R
7.	SL-809	8.10	0.00	R	11.63	MR	4.48	R
8.	M-3238/89	9.90	0.57	R	9.27	R	3.87	R
9.	VMC-87/599	10.43	0.00	R	14.78	MR	3.93	R
10.	VMC-88/35	7.66	0.34	R	14.94	MR	2.39	R
11.	ESL-88/354	12.71	0.00	R	17.68	MS	4.82	R
12.	PSR-97/45	13.07	0.00	R	11.00	MR	3.15	R
13.	SHF-240	5.69	0.00	R	5.20	R	1.91	R
14.	CPF-246	7.97	0.00	R	13.63	MR	4.31	R
15.	S-2006-US-658	7.72	0.00	R	14.58	MR	6.81	R
16.	CPF-248	11.41	0.00	R	13.05	MR	4.14	R

T.B. = Top Borer, S.B.= Stem Borer, R.B. = Root Borer, R = Resistant&MR = Moderately resistant

**Set-1 (NUVYT) (Insecticide applied)**

Sr. No	Advance Clones	Tiller infestation %	Inter-nodal damage %					
			T.B.	Reaction	S.B.	Reaction	R.B.	Reaction
1.	S2006-US-658	5.33	0.75	R	14.04	MR	5.71	R
2.	S2006-US-272	3.67	0.22	R	9.00	R	2.58	R
3.	S2009-FD-19	6.74	0.00	R	4.02	R	6.03	R
4.	CPSG-06	5.23	0.22	R	5.60	R	2.68	R
5.	NSG-197	5.33	0.13	R	6.20	R	2.64	R
6.	Th-1210	9.56	1.50	R	9.69	R	7.85	R
7	Th-7201	7.64	0.39	R	13.24	MR	3.80	R
8	MS-2000-Ho535	8.06	1.14	R	14.08	MR	13.14	MR
9	MS-91-CP-523	6.17	1.90	R	9.20	R	6.44	R
10	CPF-248	8.11	2.16	R	6.40	R	4.51	R

**Set-II (NUVYT)**

Sr. No	Clone	Tiller infestation %	Inter-nodal damage %					
			T.B.	Reaction	S.B.	Reaction	R.B.	Reaction
1.	S-2006-SP-93	8.25	0.00	R	10.04	R	4.38	R
2.	HOSG-31	6.79	0.38	R	9.43	R	5.54	R
3.	CSSG-32	10.48	0.32	R	14.04	MR	10.69	MR
4.	Thatta-910	6.72	0.73	R	12.46	MR	3.98	R
5.	YTTh-236	6.70	0.00	R	8.23	R	3.84	R
6.	CPF-247	5.95	0.00	R	14.02	MR	3.18	R

**Brief summary of previous year's results**  
**Insecticide Applied**

Reaction to Insect/Pest	Clone		
	Top Borer	Stem Borer	Root Borer
Resistant (R)	46	36	41
Moderately Resistant (MR)	-	6	2
Moderately Susceptible (MS)	-	-	-
Susceptible (S)	-	-	-

**Without Insecticide Application**

Reaction to Insect/Pest	Clone		
	Top Borer	Stem Borer	Root Borer
Resistant (R)	32	6	32
Moderately Resistant (MR)	-	23	-

Moderately Susceptible (MS)	-	2	-
Susceptible (S)	-	-	-

**Promising lines /important clones**

Sr. No.	Clone	Remarks
1.	S2003-US-127 (CPF-250)	Promising clone
2.	S2003-US-633 (CPF-251)	Promising clone
3.	S2006-US-658 (CPF-252)	Promising clone
4.	S2008-Aus-130	Promising clone
5.	S2005-US-54	Promising clone
6.	S2003-US-778	Promising clone
7.	S-2008-AUS-134	Good performer clone
8.	S2008-AUS-133	Good performer, new clones
9.	S2008-FD-19	Good performer, new clones

**2. TITLE**

**EFFECTIVE BORER CONTROL STRATEGY IN SUGARCANE**

**OBJECTIVE**

To prepare strategy for effective borer control.

**RESEARCHERS**

Muhammad Munir, Hafiz Muhammad Walayat Ali Khan, Naeem Fiaz and Dr.Naeem Ahmad.

**DURATION**

2017-18

**LOCATION**

Sugarcane Research Institute, Faisalabad.

**TREATMENTS**

(1) **Variety=3**

- i HSF-240
- ii S2006-US-658
- iii CPF-246

(2) **Seed Type=2**

A-Healthy seed. B- Mixed seed

T<sub>1</sub>= Granular insecticide (recommended)@  
1+1+2 bags/acreat planting, 45 DAP\* and 90 DAP.

T<sub>2</sub>= Liquid insecticide (fipronil based)  
application @ 1+1+2  
L/acreat planting, 45 DAP and 90 DAP.

T<sub>3</sub> = Potassium silicate@20 +20+40 L/acre at  
planting, 45 DAP and 90 DAP.

T<sub>4</sub> = Control. (\*Days after planting)

**METHODOLOGY:**

Layout = RCBD  
Replications 3  
Plot size 4m × 9.6 m

Seed rate 50,000 TBS ha<sup>-1</sup>  
Fertilizer 168-112-112 NPK kg ha<sup>-1</sup>  
Time of planting Spring- 2017

Treatments will be applied as per schedule. All other agronomic practices will be made as per recommendation. Dead heart % will be recorded twice after 45 & 75 DAP. At harvest time, inter-node damage will be recorded by collecting the samples of 10 randomly selected canes of each variety / advance line from each replication separately. At harvest cane yield and sugar recovery will also be recorded.

PREVIOUS YEAR'S RESULTS New experiment

**3. TITLE: SURVEY AND COLLECTION OF SUGARCANE SAMPLES FROM FARMER FIELD FOR EVALUATION OF INSECT/ PEST AND DISEASE ATTACK IN THE AREA.**

**OBJECTIVE** To analyze the intensity of insectpest attack and disease infestation on various varieties in the cane growing areas of Punjab province.

**RESEARCHERS** Muhammad Munir, Hafiz Muhammad Walayat  
Ali Khan, Dr. M. Shkooor, and Dr. Naeem Ahmad

**LOCATION** Throughout the Punjab

**PROJECT DURATION** 2017-2018

**METHODOLOGY** Survey of the reported area will be conducted. Samples will be collected and diagnosed in the Lab. for further evaluation.

PREVIOUS YEAR'S RESULTS New Experiment



**E.****SUGARCANE TECHNOLOGY****1.TITLE:****QUALITY EVALUATION OF SUGARCANE CLONES.****OBJECTIVES:**

To evaluatedifferent sugarcane clones for juice quality in order to assess CCS(%) and maturity stage.

**RESEARCHERS:**

Irfan Rasheed, Khalid Hussain, AamerSattar, and Dr. Naeem Ahmad.

**PROJECT DURATION:**

2017-2018

**LOCATION:**

Sugarcane Research Institute, Faisalabad

**TREATMENTS:**1. Final Varietal Trial.  
2.Semi-Final Varietal Trial.**METHODOLOGY:**The juice analysis of the cane clonesfor Final and Semi Final varietal trial will start in October and ends in March of next year. (In final varietal trial quality analysis will be done on 1<sup>st</sup> and 15<sup>th</sup> of every month while in semi final varietal trial it will be done on 15<sup>th</sup> of each month). The data will be recorded for brix%, pol%, purity% and CCS% of the cane juice.**PREVIOUS YEAR'S RESULTS:****Final Varietal Trial**

Sr. No	Variety	Average CCS (%)							Recovery (%)
		October	November	December	January	February	March	Avg.	
1	S2008-FD-19	11.24	13.41	13.93	13.83	14.33	14.02	13.46	12.65
2	S2008-M-34	9.65	11.35	12.68	13.36	12.84	14.13	12.34	11.59
3	S2008-M-55	8.30	8.84	10.88	13.01	13.39	14.95	11.56	10.87
4	S2008-AUS-107	5.76	7.88	9.76	12.20	13.02	13.00	10.27	9.65
5	S2008-AUS-129	9.26	11.98	13.39	11.45	14.27	15.57	12.65	11.89
6	S2008-AUS-130	8.95	10.57	11.65	11.93	12.84	13.82	11.63	10.93
7	S2008-AUS-133	10.23	10.74	12.94	12.84	14.04	14.17	12.49	11.74
8	S2008-AUS-134	10.47	12.03	14.43	14.13	15.10	16.12	13.71	12.89
9	S2009-SA-57	9.50	11.18	13.05	13.49	13.39	14.41	12.51	11.75
10	S2009-79	8.39	10.72	11.91	12.36	13.16	13.54	11.68	10.98
11	S2009-SA-111	10.86	13.49	14.09	13.30	14.52	15.09	13.56	12.74
12	S2009-SA-169	6.97	9.91	12.10	13.48	13.14	13.98	11.60	10.90
13	S2009-SA-8	11.36	13.14	13.03	14.71	13.83	15.12	13.53	12.72
14	S2009-171	8.24	10.03	12.47	13.29	13.21	13.52	11.79	11.09
15	HSF-240	7.85	9.99	10.87	11.85	13.91	12.84	11.22	10.55
16	CPF-246	8.78	11.02	12.00	12.79	13.24	13.51	11.89	11.18

## Semi-Final Varietal Trial

Sr. No	Variety	CCS (%)							Recovery (%)
		October	November	December	January	February	March	Avg.	
1	SL-809	7.50	9.07	10.52	11.43	11.91	11.10	10.26	9.64
2	M-2238/89	7.46	10.46	12.09	12.93	13.68	14.16	11.79	11.09
3	VMC-87/599	9.47	11.28	12.73	12.97	13.99	14.24	12.45	11.70
4	VMC-88/354	9.28	11.59	12.05	12.21	12.52	12.91	11.76	11.05
5	ESL-97/41	8.87	10.74	11.82	13.31	14.05	13.91	12.12	11.39
6	PSR-97/45	10.40	11.93	13.26	13.95	13.93	15.37	13.14	12.35
7	SL-392	8.23	9.80	12.19	12.45	13.27	13.66	11.60	10.90
8	SL-175	6.85	8.55	11.69	12.10	13.84	13.28	11.05	10.39
9	SL-62	8.85	11.12	10.47	13.23	13.96	13.87	11.92	11.20
10	FD-25	7.64	8.91	10.59	11.56	12.26	12.87	10.64	10.00
11	FD-22	7.07	7.17	9.09	9.94	11.66	11.32	9.37	8.81
12	FD-17	9.47	11.46	11.49	12.09	12.36	12.78	11.61	10.91
13	HSF-240	10.77	12.73	13.65	13.33	13.79	13.52	12.96	12.19
14	CPF-246	11.67	13.53	13.62	13.57	14.15	14.36	13.48	12.67

**2. TITLE:**

**SCREENING OF PROMISING SUGARCANE CLONES FOR GUR PRODUCTION AND ITS QUALITY.**

**OBJECTIVES:**

To find out new promising cane clones for gurproduction and their quality evaluation.

**RESEARCHERS:**

AamerSattar, Irfan Rasheed, and Khalid Hussain.

**PROJECT DURATION:**

2017-19

**LOCATION:**

Sugarcane Research Institute, Faisalabad.

**TREATMENTS:**

**Varieties / Promising Clones;**

1. S2005-US-54
2. S2008-FD-19
3. S2008-AUS-134
4. S2009-SA-8
5. CP77-400

Planting Time            Spring - 2017  
 Design                    RCBD  
 Plot Size                 4.0m × 9.6m

**METHODOLOGY:**

Crop will be planted in RCBD arrangement in Spring -2017 and harvested in Spring -2018. Gur will be prepared according to the procedure laid down in the book Gur Monograph (S. C. Roy-1951). The gur so

prepared will be evaluated based on physical and chemical factors. Storage behavior of gur will be judged from changes in moisture, pol, ash, color and reducing sugars after 90 days.

**PREVIOUS YEAR'S RESULTS:**

**Recovery of Gur:**

Varieties	Gur (%)	
	From Juice	From Cane
1. S2006-US-272	15.1 c	11.5 d
2. S2006-US-658	15.2 c	11.8 d
3. S2008-AUS-130	17.4 b	13.5 b
4. S2008-AUS-133	18.7 a	14.2 a
5. CPF-248(CHK)	17.1 b	12.4 c
LSD Value:	0.7095	0.5309

**Analysis of Gur (Physico-Chemical):**

Varieties	Appearance		Color (Colorimetric Units)		Pol (%)	
	B.S	A.S	B.S	A.S	B.S	A.S
1. S2006-US-272	Creamy Lt. Brown	Shiny Brown	41.49 e	53.16 e	83.88 b	83.85 b
2. S2006-US-658	Light Brown	Brown	45.33 d	61.66 c	83.37 c	83.39 c
3. S2008-AUS-130	Golden Brown	Brown	52.83 b	74.49 b	80.55 d	80.56 d
4. S2008-AUS-133	Shiny Brown	Dark Brown	56.66 a	83.66 a	72.47 e	72.45 e
5. CPF-248(CHK)	Creamy D. Golden	D. Golden Brown	48.49 c	57.66 d	85.83 a	85.80 a
LSD Value:	-	-	2.4774	2.7821	0.1907	0.1127

\* B.S = Before Storage      A.S = After Storage

Varieties	Moisture (%)		Mineral Matter (%)		Reducing Sugar (%)		Net Rendements (%)	
	B.S	A.S	B.S	A.S	B.S	A.S	B.S	A.S
1. S2006-US-272	6.52 a	3.18 a	3.69 a	3.71 a	4.79 e	4.77 e	75.40 b	75.37 b
2. S2006-US-658	5.15 c	2.78 c	3.19 c	3.18 d	5.35 c	5.33 c	74.83 c	74.88 b
3. S2008-AUS-130	5.46 b	2.91 bc	3.47 b	3.45 c	6.55 a	6.50 a	70.53 d	70.61 c
4. S2008-AUS-133	5.59 b	2.99 b	3.24 c	3.25 d	5.91 b	5.87 b	63.32 e	63.33 d
5. CPF-248(CHK)	4.53 d	2.34 d	3.58 ab	3.56 b	4.95 d	4.92 d	77.30 a	77.32 a
LSD Value:	0.1750	0.1463	0.2060	0.0949	0.1151	0.1145	0.2432	0.5884

\* B.S = Before Storage      A.S = After Storage

With respect to lighter color, good nutritional aspect and good keeping quality, Sugarcane clones S2006-US-272, S2006-US-658 and CPF-248 were found better as compared to clones

S2008-AUS-130 & S2008-AUS-133.

- 3. TITLE:** **IMPACT OF HUMIC ACID AND OTHER ORGANIC SOURCES ON SUGARCANE.**
- OBJECTIVES:** To find out the response of Humic Acid application to sugarcane crop and to check the different organic sources used in the field for their efficacy towards yield and quality parameters.
- RESEARCHERS:** Irfan Rasheed, Khalid Hussain, Aamer Sattar,
- PROJECT DURATION:** 2016-2018
- LOCATION:** Sugarcane Research Institute, Faisalabad.
- TREATMENTS:**
- A. Fertilizer Levels**  
 F1 = 100% (NPK @ 168-112-112 kg ha<sup>-1</sup>)  
 F2 = 75% (NPK @ 126-84-84 kg ha<sup>-1</sup>)
- B. Organic Sources**  
 T1 = Control (No Organic Fertilizer)  
 T2 = Humic Acid (@ 20 kg ha<sup>-1</sup>)  
 T3 = Press Mud (@ 20 t ha<sup>-1</sup>)  
 T4 = Bio-Fertilizer (@ 250 kg ha<sup>-1</sup>)
- |               |                             |
|---------------|-----------------------------|
| <b>Clone</b>  | <b>CPF-248</b>              |
| Replications  | Four                        |
| Planting Time | Spring-2017                 |
| Design        | RCBD                        |
| Plot Size     | 4.0m × 7.2m                 |
| Seed Rate     | 50,000 TBS ha <sup>-1</sup> |
- METHODOLOGY:** Crop will be planted according to RCBD arrangement in Spring-2017. Fertilizers levels will be kept in main plots while various organic sources in sub-plots according to the planned treatments. Organic sources will be applied with NPK at planting. All the cultural and agronomic practices will be kept same for all the treatments according to production technology. Germination and tillering data will be recorded at 45 & 90 DAP respectively while Cane Count, Cane Yield, CCS and Sugar Recovery will be recorded at harvest. Soil analysis will be done before planting and after harvesting of the crop.

**PREVIOUS YEAR'S  
RESULTS:**

**Pre-Planting Soil Status**

Determinations	Soil Depth	
	0-15 cm	15-30 cm
1. Soil Texture	Loam	Loam
2. EC (mS/cm)	1.00	0.92
3. pH	8.2	8.1
4. Nitrogen (%)	0.04	0.03
5. Available-P (ppm)	6.1	5.2
6. Available-K (ppm)	120	100
7. Organic Matter (%)	0.77	0.63

**Sugarcane Yield & Recovery :**

**Table: 1 Sugarcane Yield and Recovery.**

Treatments	Fertilizer Levels					
	F1 = (NPK @100%)			F2 = (NPK @75%)		
	Yield (t ha <sup>-1</sup> )	CCS (%)	Recovery (%)	Yield (t ha <sup>-1</sup> )	CCS (%)	Recovery (%)
T <sub>1</sub> (control)	97.92	13.87	13.04	89.17	13.14	12.36
T <sub>2</sub> (H.Acid)	101.67	14.23	13.38	93.76	13.68	12.86
T <sub>3</sub> (P.Mud)	99.17	13.94	13.11	90.84	13.55	12.74
T <sub>4</sub> (B.Fert.)	102.51	14.30	13.45	94.59	13.75	12.93
LSD:	N.S. CV=3.13	N.S. CV=1.15	N.S. CV=1.15	N.S. CV=3.39	N.S. CV=3.31	N.S. CV=3.31

**Table: 2 Fertilizer Levels (Pooled Analysis)**

Treatments	Yield (t ha <sup>-1</sup> )	CCS (%)	Recovery (%)
F1 = (NPK @100%)	100.32 a	14.08 a	13.24 a
F2 = (NPK @75%)	92.09 b	13.53 b	12.71 b
LSD:	4.0442	0.4227	0.3969

**4. TITLE:**

**RESPONSE CURVE STUDIES ON SUGARCANE IN  
CENTRAL AND SOUTHERN ZONES OF PUNJAB.**

**OBJECTIVES:**

To find out maximum response of N, P & K fertilizers application to sugarcane crop yield in central and southern zone conditions of Punjab and to explore the best and most economical level with better sugar recovery.

**RESEARCHERS:**

AamerSattar, Khalid Hussain, Irfan Rasheed and Muhammad Aslam.

**PROJECT DURATION:** 2017-2019

**LOCATION:** Sugarcane Research Institute, Faisalabad and Sugarcane Research Sub-Station, Khanpur.

**TREATMENTS:** **Fertilizer Treatments.**

Treatments	Fertilizers (kg ha <sup>-1</sup> )		
	N	P	K
1. (N=Control)	0	112	112
2. (N=100%)	168	112	112
3. (N=125%)	210	112	112
4. (N=150%)	252	112	112
5. (N=175%)	294	112	112
6. (P=Control)	168	0	112
7. (P=125%)	168	140	112
8. (P=150%)	168	168	112
9. (P=175%)	168	196	112
10. (K=Control)	168	112	0
11. (K=125%)	168	112	140
12. (K=150%)	168	112	168
13. (K=175%)	168	112	196

**METHODOLOGY:**

**Clone** CPF-249  
**Replications** 03  
**Planting Time** Spring-2017  
**Design** RCBD  
**Plot Size** 4.0m × 9.6 m  
**Seed Rate** 50,000 TBS ha-1

Crop will be planted according to RCBD arrangement in Spring-2017. Fertilizers will be applied as per treatments. All the cultural and agronomic practices will be kept same for all the treatments. Crop Yield parameters data along with CCS and Sugar Recovery will be recorded at harvest. Economic analysis (value cost ratio and marginal rate of return) will be made. Soil analysis for diagnostic parameters will be done before planting.

**PREVIOUS YEAR'S RESULTS:**

New Experiment.

**5. TITLE:**

**SURVEY AND COLLECTION OF SUGARCANE SAMPLES FROM THE FARMER'S FIELD FOR QUALITY ANALYSIS.**

**OBJECTIVES:**

To evaluate the qualitative performance of sugarcane clones cultivated in different areas of Faisalabad and to study the inconsistency occurring in sugar recovery.

**RESEARCHERS:**

Khalid Hussain, Irfan Rasheed and AamerSattar.

**PROJECT DURATION:** 2017-2019

**LOCATION:** Sugarcane Research Institute, Faisalabad.

**TREATMENTS:**

**Locations.**

1. Jaranwala
2. Samundri
3. Tandlianwala
4. ChakJhumra

**Sampling Interval.**

1. December
2. January
3. February

Replications	03
Start Time	December-2017
Design	RCBD (Split)

**METHODOLOGY:** Cane sampling of the clones grown in different farmer's field areas at various locations will be done from December to February during crop season. The collected samples will be analyzed in the laboratory for quality parameters. The results of qualitative performance of different clones adopted by the farmers will be evaluated and compared for sugar recovery.

**PREVIOUS YEAR'S RESULTS:** New Experiment.

## F. SUGARCANE RESEARCH STATION, KHANPUR / BAHAWALPUR

**1 TITLE PRELIMINARY VARIETAL TRIAL ON SUGARCANE**

**OBJECTIVES** To evaluate the new sugarcane clones/varieties for further selection in southern Punjab

**RESEARCH WORKERS** Hafiz Abdul Rauf and Muhammad Aslam

**DURATION** Continuous nature (2017-18)

Sugarcane Research Station, Khanpur

**LOCATION**

**TREATMENTS** Varieties 12 i.e., S2008-FD-22, S2008-FD-25, VMC-88-354, VMC-87-599, S2011-SL-62, S2011-SL-392, S2011-SL-809, PSR-97-41, PSR-97-45, SL-96-175, M-2238-89 and CPF-234 (check)

Layout RCBD

Replications 3

Plot size 3.6 x 10 m

Seed rate 75000 DBS/ha

Fertilizer rate 168-112-112 Kg. NPK/ha

Sowing time February, 2017

**METHODOLGY**

The experiment will be sown on a well prepared seed bed in 1.20 m apart trenches under dry conditions. The varieties will be allowed to grow under uniform inputs and agronomic practices. The data on cane germination, tillering, cane stand, cane yield and quality will be recorded.

**PREVIOUS YEAR'S  
On the basis of  
preliminary  
observations on  
growth and  
RESULTS**

S. No	Variety	Germination %	Tillers Plant <sup>-1</sup>	100 cane wt (Kg)	Cane stand 000/ha	Cane Yield t/ha	CCS% Upto01/17	Remarks
1	S2009-SA-8	54.65bc	3.39a	<b>76.67</b> cd	119.54a	91.27c	11.46	Promoted
2	S2009-SA-41	59.51ab	2.92ab	<b>67.33</b> d	116.87ab	78.67e	10.18	Rejected, poor growth
3	S2009-SA-79	61.88a	1.61d	<b>103.3</b> 3b	98.21d	101.49b	09.80	Promoted
4	S2009-SA-111	53.89c	3.37a	<b>86.00</b> c	101.69cd	86.61d	11.29	Promoted
5	S2009-SA-169	52.98c	2.78b	<b>77.67</b> cd	102.88cd	79.37e	10.34	Rejected, poor yield
6	S2009-SA-171	62.34a	2.92ab	<b>80.00</b> c	105.95bcd	84.23d	10.54	Rejected, S plits
7	SL-96-128	62.19a	2.64bc	<b>115.3</b> 3a	95.34d	109.72a	10.39	Promoted
8	CPF-248	59.82ab	2.17c	<b>83.33</b> c	112.70abc	93.85c	11.32	Check
<b>LSD 0.05</b>		5.35	0.53	11.50	13.58	3.27	---	



**2 TITLE SEMI FINAL VARIETAL TRIAL ON SUGARCANE**

**OBJECTIVES** To evaluate the various sugarcane clones/varieties for high cane and sugar yields in southern Punjab conditions.

**RESEARCH WORKERS** Muhammad Aslam and Hafiz Abdul Rauf

**DURATION** Continuous nature (2017-18)

**LOCATION** Sugarcane Research Station, Khanpur

**TREATMENTS** Varieties 8 i.e., S2008-M-107, S2009-SA-57, S2009-SA-8, S2009-SA-79, S2009-SA-111, SL-96-128, CPF-249 and SPF-234

Layout RCBD

Replications 3

Plot size 3.6 x 10 m

Seed rate 75000 DBS/ha

Fertilizer rate 168-112-112 Kg. NPK/ha

Sowing time February 2017

**METHODOLGY** Experiment will consist of clones/varieties promoted from preliminary varietal trial. The data on germination, tillering, cane count, cane yield, and sugar yield will be recorded. The selection will be done on the basis of quantity & quality performance of the clones/varieties.

**PREVIOUS YEAR'S**  
**On the basis of**  
**preliminary**  
**observations on**  
**growth and**  
**RESULTS**

S.No	Variety	Germination %	Tillers Plant <sup>-1</sup>	100 cane wt (Kg)	Cane stand 000/ha	Cane Yield t/ha	CCS% Upto01/17	Remarks
1	S2008-M-34	58.94a	1.57b	<b>71.33b</b>	119.15ab	84.62de	10.6	Rejected, poor growth
2	S2008-M-38	60.72a	2.51a	<b>67.00b</b>	124.50a	81.94ef	12.31	Rejected, poor growth
3	S2008-M-56	46.32c	2.66a	<b>75.67b</b>	105.26bc	79.56f	10.03	Rejected, lodging
4	S2008-Aus-107	61.57a	2.31a	<b>72.67b</b>	132.64a	96.23b	9.64	Retained
5	S2009-SA-57	49.58bc	2.04ab	<b>106.33a</b>	82.24d	87.40d	10.20	Retained
6	S2009-SA-67	47.91bc	2.40a	<b>75.00b</b>	95.34cd	71.43g	10.94	Rejected, poor yield
7	CPF-246	61.02a	2.20a	<b>103.33a</b>	100.50c	103.67a	11.88	Check
8	SPF-234	52.92b	2.58a	<b>98.67a</b>	93.85cd	92.56c	11.45	Check
<b>LSD 0.05</b>		5.54	0.63	9.94	17.03	3.38		

**3 TITLE FINAL VARIETAL TRIAL ON SUGARCANE**

**OBJECTIVES** To evaluate the promising sugarcane clones/varieties for high cane and sugar yields in southern Punjab.

**RESEARCH WORKERS** Muhammad Aslam, Hafiz Abdul Rauf and Dr. Naeem Ahmad

**DURATION** Continuous nature (2017-18)

LOCATION Sugarcane Research Station, Khanpur

TREATMENTS Varieties 8 i.e., S2008-FD-19, S2008-M-42, , S2006-US-658,S2008-AUS-133, S2008-AUS-134, S2008-AUS-138,CPF-247 and SPF-234

Layout RCBD  
 Replications 3  
 Plot size 3.6 x 10 m  
 Seed rate 75000 DBS/ha  
 Fertilizer rate 168-112-112 Kg. NPK/ha  
 Sowing time February 2017

METHODOLGY It is final stage of selection. The experiment will consist of varieties promoted from semi final varietal trial. The data on germination, tillering, cane count, cane yield will be recorded. Periodic juice analysis will be recorded month wise from October to March for quality performance. The selection will be made on the basis of quantity & quality performance of the clones/varieties.

**PREVIOUS YEAR'S  
 On the basis of  
 preliminary  
 observations on  
 growth and  
 RESULTS**

S. No	Variety	Germination %	Tillers Plant <sup>-1</sup>	100 cane wt (Kg)	Cane stand 000/ha	Cane Yield t/ha	CCS% Upto01/17	Remarks
1	S2008-FD-19	52.64cd	2.48a	<b>69.33</b> d	126.29a	93.55de	11.10	Retained
2	S2008-M-42	58.77ab c	2.13ab	<b>74.67</b> cd	122.22ab	95.64cd	12.73	Retained
3	S2006-SP-93	60.89ab	2.32a	<b>81.33</b> cd	110.32abcd	89.48e	10.99	Rejected, Smut
4	S2006-US-321	50.60d	1.76bc	<b>84.67</b> bc	100.20c d	84.72f	10.53	Rejected, poor yield
5	S2006-US-658	50.81d	2.28a	<b>94.33</b> ab	116.96abc	109.42a	10.83	Retained
6	S2008-AUS-133	61.73a	1.44c	<b>101.6</b> 7a	104.86bcd	106.45a	11.89	Retained
7	S2008-AUS-134	58.39ab c	1.83bc	<b>80.67</b> cd	124.11a	99.50bc	11.11	Retained
8	S2008-AUS-138	59.76ab c	1.43c	<b>104.3</b> 3a	97.72d	101.69b	11.59	Retained
9	CPF-247	54.45bc d	1.78bc	<b>74.00</b> cd	124.80a	91.87de	11.94	Check
10	SPF-234	54.12bc d	2.39a	<b>97.67</b> a	97.32d	94.35d	11.64	Check
LSD 0.05		7.11	0.41	12.60	17.84	4.44		

**4 TITLE** **AUTUMN PLANTED VARIETAL TRIAL ON SUGARCANE<sub>(SET-I)</sub>**

**OBJECTIVES** To study the performance of various sugarcane clones for high cane and sugar yields under extended growth period in southern Punjab.

**RESEARCH WORKERS** Hafiz Abdul Rauf and Muhammad Aslam

**DURATION** Continuous nature (2017-18)

**LOCATION** Sugarcane Research Station, Khanpur

TREATMENTS Varieties 10 i.e., S2008-FD-19, S2008-M-42, S2006-Sp-93, S2006-US-321, S2006-US-658, S2008-AUS-133, S2008-AUS-134, S2008-AUS-138, CPF-247 and SPF-234(check)  
 Layout RCBD  
 Replications 3  
 Plot size 3.6 x 10 m  
 Seed rate 75000 DBS/ha  
 Fertilizer rate 168-112-112 Kg. NPK/ha  
 Sowing time September, 2016

METHODOLGY The experiment will be sown on a well prepared seed bed in 1.20 m apart trenches under dry conditions. The varieties will be allowed to grow at uniform inputs level and recommended agronomic practices. The data on cane germination, tillering, cane stand, yield and quality will be recorded during the course of study.

PREVIOUS YEAR'S  
 On the basis of preliminary observations on growth and RESULTS

S. No	Variety	Germination %	Tillers Plant <sup>-1</sup>	100 cane wt (Kg)	Cane stand 000/ha	Cane Yield t/ha	CCS %
1	S2008-FD-19	66.46 <sup>ab</sup>	2.91 <sup>a</sup>	78.33 <sup>d</sup>	124.82 <sup>a</sup>	97.59 <sup>f</sup>	11.32
2	S2008-M-42	73.81 <sup>a</sup>	3.01 <sup>a</sup>	80.67 <sup>d</sup>	123.24 <sup>a</sup>	99.26 <sup>ef</sup>	12.33
3	S2009-SA-57	59.02 <sup>bc</sup>	1.48 <sup>d</sup>	116.00 <sup>ab</sup>	78.89 <sup>d</sup>	91.48 <sup>g</sup>	10.37
4	S2009-SA-67	50.62 <sup>c</sup>	2.33 <sup>b</sup>	81.67 <sup>d</sup>	103.24 <sup>c</sup>	84.07 <sup>h</sup>	12.22
5	S2009-SA-79	52.01 <sup>c</sup>	1.35 <sup>d</sup>	106.3 <sup>3c</sup>	100.37 <sup>c</sup>	106.48 <sup>c</sup> <sub>d</sub>	10.36
6	S2008-AUS-133	71.94 <sup>a</sup>	1.47 <sup>d</sup>	105.0 <sup>0c</sup>	106.76 <sup>b</sup> <sub>c</sub>	111.85 <sup>b</sup>	11.67
7	S2008-AUS-134	74.58 <sup>a</sup>	1.76 <sup>c</sup>	87.33 <sup>d</sup>	117.96 <sup>ab</sup>	102.87 <sup>d</sup> <sub>e</sub>	10.58
8	S2008-AUS-138	68.12 <sup>a</sup>	1.73 <sup>c</sup>	108.33 <sup>bc</sup>	99.91 <sup>c</sup>	107.50 <sup>c</sup>	11.91
9	SL-96-128	65.97 <sup>ab</sup>	1.85 <sup>c</sup>	118.0 <sup>0a</sup>	100.93 <sup>c</sup>	118.80 <sup>a</sup>	10.51
10	SPF-234	67.77 <sup>a</sup>	1.89 <sup>c</sup>	102.6 <sup>7c</sup>	99.17 <sup>c</sup>	101.57 <sup>e</sup>	10.91
LSD 0.05		8.74	0.20	9.64	11.47	3.80	

5 TITLE AUTUMN PLANTED VARIETAL TRIAL ON SUGARCANE (SET-II)

OBJECTIVES To study the performance of various sugarcane clones for high cane and sugar yields under extended growth period in southern Punjab.

RESEARCH WORKERS Muhammad Aslam and Hafiz Abdul Rauf

DURATION Continuous nature (2017-18)

LOCATION Sugarcane Research Station, Khanpur  
 Varieties 12 i.e., S2008-FD-22, S2008-FD-25, VMC-88-354, VMC-87-599, S2011-SL-62, S2011-SL-392, S2011-SL-809, PSR-97-41, PSR-97-45, SL-96-175, M-2238-89 and CPF-248 (check)  
 Layout RCBD  
 Replications 3

Plot size	3.6 x 10 m
Seed rate	75000 DBS/ha
Fertilizer rate	168-112-112 Kg. NPK/ha
Sowing time	September, 2016

The experiment will be sown on a well prepared seed bed in 1.20 m apart trenches under dry conditions. The varieties will be allowed to grow at uniform inputs level and recommended agronomic practices. The data on cane germination, tillering, cane stand, yield and quality will be recorded during the course of study.

PREVIOUS YEAR'S  
On the basis of  
preliminary  
observations on growth  
and  
RESULTS

First year of the varieties at Khanpur

**6 TITLE RATOONING POTENTIAL OF PROMISING SUGARCANE CLONES/VARIETIES**

OBJECTIVES To evaluate the ratooning ability of various sugarcane clones/varieties.

RESEARCH WORKERS Hafiz Abdul Rauf, Muhammad Aslam and Dr. Naeem Ahmad

DURATION 2017-18

LOCATION Sugarcane Research Station, Khanpur

TREATMENTS Varieties 10 i.e., S2008-FD-19, S2008-M-42, S2006-Sp-93, S2006-US-321, S2006-US-658, S2008-A-133, S2008-AUS-134, S2008-AUS-138, CPF-247 and SPF-234(check)

Layout	RCBD
Replications	3
Plot size	3.6 x 10 m
Seed rate	75000 DBS/ha
Fertilizer rate	168-112-112 Kg. NPK/ha
Sowing time	February, 2017

METHODOLGY The ratoon will be maintained from the previous crop of final varietal trial. The crop will be allowed to grow under uniform inputs and agronomic practices. The data on stubble sprouting, cane stand, yield and quality will be recorded during the course of study.

**PREVIOUS YEAR'S  
On the basis of  
preliminary  
observations on  
growth and  
RESULTS**

S.No	Variety	Sprouts Plant <sup>-1</sup>	100 cane wt (Kg)	Cane stand 000/ha	Cane Yield t/ha	CCS %
1	S2006-SP-30	1.32	<b>65.33d</b>	119.54a	77.78d	11.12
2	S2006-SP-93	1.25	<b>69.67b cd</b>	117.96ab	79.63d	10.34
3	S2006-US-272	1.19	<b>68.33c d</b>	118.24ab	80.28d	12.15
4	S2006-US-321	1.23	<b>71.33b cd</b>	99.72c	71.20e	11.86
5	S2006-US-658	1.11	<b>96.67a</b>	100.74bc	96.57a	11.51
6	S2008-AUS-130	1.51	<b>82.33b</b>	96.39c	78.70d	11.33
7	S2008-AUS-133	1.53	<b>99.67a</b>	94.72c	94.35ab	11.62
8	S2008-AUS-134	1.37	<b>80.33b c</b>	109.17abc	87.50c	11.72
9	S2008-AUS-138	1.08	<b>97.67a</b>	91.67c	89.45bc	12.62
10	SPF-234	1.30	<b>81.67b</b>	106.20abc	86.67c	11.13
LSD 0.05		N.S	12.84	17.69	6.37	

**7 TITLE SOWING METHOD TRIAL OF SUGARCANE**

**OBJECTIVES** To find out the most suitable planting methods of sugarcane under southern Punjab conditions.

**RESEARCH WORKERS** Hafiz Abdul Rauf, Muhammad Aslam and Dr. Naeem Ahmad  
**DURATION** 2017-18

**LOCATION** Sugarcane Research Station, Khanpur

**TREATMENTS** Treatments = 4  
P<sub>1</sub>= Pit planting (2x2 ft) (4feet apart)  
P<sub>2</sub>= Trench Planting (4feet apart)  
P<sub>3</sub>= Ladder Planting(4feet apart)  
P<sub>4</sub>= Furrow Planting (2.5feet apart)  
Variety = SPF-234  
Layout = RCBD  
Replications = 3  
Plot size = 20 x 24 ft  
Fertilizer rate = 168-112-112 Kg. NPK ha<sup>-1</sup>  
Seed rate = 75000 DBS ha<sup>-1</sup>  
Sowing time February, 2017

**METHODOLGY** The experiment will be sown on a well prepared seed bed as per treatments under dry conditions. The crop will be allowed to grow at uniform inputs level and recommended agronomic practices. The data on cane germination, tillering, cane stand, yield and quality will be recorded during the course of study.

**PREVIOUS YEAR'S** First year of the experiment.  
**On the basis of preliminary observations on growth and RESULTS**

**8 TITLE MANAGEMENT PRACTICES TO CONTROL LODGING IN SUGARCANE**

**OBJECTIVES** To find out the most effective agronomic practice for controlling lodging in spring planted sugarcane under southern Punjab conditions.

**RESEARCH WORKERS** Muhammad Aslam, Hafiz Abdul Rauf and Dr. Naeem Ahmad  
**DURATION** 2017-18

**LOCATION** Sugarcane Research Station, Khanpur

**TREATMENTS** Treatments = 8  
P<sub>1</sub>= Shallow sowing(6") + No Earthing up  
P<sub>2</sub>= Deep sowing(12") + No Earthing up  
P<sub>3</sub>= Shallow cultivation(12") + No Earthing up  
P<sub>4</sub>= Deep cultivation(18") + No Earthing up  
P<sub>5</sub>= Shallow sowing(6") + Earthing up  
P<sub>6</sub>= Deep sowing(12") + Earthing up  
P<sub>7</sub>= Shallow cultivation(12") + Earthing up  
P<sub>8</sub>= Deep cultivation(18") + Earthing up  
Variety = 2, (SPF-234 and S2003-US-633)  
Layout = RCBD  
Replications = 3  
Plot size = 4.8 x 10m  
Fertilizer rate = 168-112-112 Kg. NPK ha<sup>-1</sup>  
Seed rate = 75000 DBS ha<sup>-1</sup>  
Sowing time February, 2017

**METHODOLGY** The experiment will be sown on a well prepared seed bed as per treatments under dry conditions. The crop will be allowed to grow at uniform inputs level and recommended agronomic practices. The data on cane germination, tillering, cane stand, yield and quality will be recorded during the course of study.

**PREVIOUS YEAR'S** First year of the experiment.  
**On the basis of preliminary observations on growth and**  
**RESULTS**

**9 TITLE SUGARCANE VARIETAL TRIAL AT BAHAWALPUR (SET-I).**

**OBJECTIVES** To evaluate the performance of new promising strains/clones of sugarcane under Bahawalpur conditions.

**RESEARCH** Abdur Rashid Zahid and Hafiz Abdul Rauf

**WORKERS DURATION** Continuous nature (2017-18)

**LOCATION** Sugarcane Research Sub-Station, Bahawalpur

**TREATMENTS** Varieties 8 i.e., S2008-AUS-133, S2008-AUS-134, S2008-AUS-138, S2006-US-658, S2008-M-42, S2008-FD-19, S2003-US-127 and SPF-234  
 Layout RCBD  
 Replications 3  
 Plot size 3.6 m x 9.0 m  
 Seed rate 75000 DBS/ha  
 Fertilizer rate 168-112-112 Kg. NPK/ha  
 Sowing time February, 2017

**METHODOLGY** The trial will be sown on a well prepared seed bed in 1.20 m apart trenches under dry conditions. The varieties will be allowed to grow at uniform inputs level and recommended agronomic practices. The data on cane germination, tillering, cane stand, yield and quality will be recorded during the course of study.

**PREVIOUS YEAR'S**  
**On the basis of preliminary observations on growth and RESULTS**

S.No	Variety	Germination %	Tillers Plant <sup>1</sup>	Cane stand 000/ha	Cane Yield t/ha	Brix %
1	S2008-FD-19	42.67 ab	2.97 a	117.18 a	95.26 c	20.5
2	S2008-AUS-133	44.22 ab	2.64 a	96.39c	109.5 ab	21.5
3	S2008-AUS-134	38.88 b	2.01 b	107.51 abc	96.60 c	20.0
4	S2008-AUS-138	47.77 a	1.69 b	99.69 bc	113.57 a	22.0
5	S2006-US-658	48.59 a	3.06 a	109.88 ab	114.60 a	20.5
6	S2008-M-42	48.79 a	2.98 a	108.02 abc	94.96 c	20.0
7	S2003-US-127	38.07 b	1.63 b	99.38 bc	99.89 bc	21.5
8	SPF-234	38.25 b	1.81 b	99.58 bc	91.87 c	20.0

**10 TITLE SUGARCANE VARIETAL TRIAL AT BAHAWALPUR(SET-II)**

**OBJECTIVES** To evaluate the performance of new promising strains/clones of sugarcane under Bahawalpur conditions.

**RESEARCH WORKERS** Abdur Rashid Zahid and Muhammad Aslam

**DURATION** 2017-2018

**LOCATION** Sugarcane Research Sub-Station, Bahawalpur

**TREATMENTS** Varieties 10 i.e., SL96-128, S2009-SA-169, S2009-SA-79, S2009-SA-67, S2009-SA-8, S2009-SA-57, S2009-SA-41, S2009-SA-171, S2009-SA-111 and SPF.234 (Check) S2009-SA-234  
 Layout RCBD  
 Replications 3  
 Plot size 3.6 m x 9.0 m  
 Seed rate 75000 DBS/ha  
 Fertilizer rate 168-112-112 Kg. NPK/ha

Sowing time      February, 2017

**METHODOLGY**    The trial will be sown on a well prepared seed bed in 1.20 m apart trenches under dry conditions. The varieties will be allowed to grow at uniform inputs level and recommended agronomic practices. The data on cane germination, tillering,cane stand, yield and quality will be recorded during the course of study.

**PREVIOUS**            First year of the trial

**YEAR'S**

On the basis of  
preliminary  
observations on  
growth and

**RESULTS**