FODDER RESEARCH INSTITUTE, SARGODHA

INTRODUCTION

Economy of Pakistan is predominantly agriculture driven which not only contributing 19.5% GDP but also providing jobs. Livestock is vital sub-sector of Agriculture contributing 11.4% to GDP which is 58.33% of the Agriculture's share to GDP (Economic Survey of Pakistan, 2017-18) and provides milk, meat and other by-products of animal origin for human nutrition. Pakistan occupies at 4th position in milk production in the world and produces 56,080 thousand tons of milk per year. The value of milk alone is more than the combined value of two major crops i.e wheat and cotton. Fodder is backbone of the livestock and provides 2 to 3 times cheaper feed than concentrate to livestock.

Fodder crops have unique position in context of livestock in our country where more than 70% of our population is directly involved in livestock as a primary source of food and income. Total animal population comprising of cattle, buffalo, goat, sheep and others is 191.3 million in Pakistan (Economic Survey of Pakistan, 2017-18).

Fodders occupied an area of 2.11 million hectares producing 45.77 million tonnes of green fodder out of which Punjab province contributes 39.20 million tonnes production of the country from 1.81 million hectares. In Punjab, fodder crops occupying third place after wheat and cotton with average fodder yield of 21.6 t/ha. Major Kharif fodder crops are maize, pearl millet and sorghum.

There is an overall fodder shortage and the conditions worsen during lean or scarcity periods. There are two fodder scarcity periods i.e. May-June when the Rabi fodders come to end and November-December when the Kharif fodders are not available. Animals are generally underfed and under-nourished which results in their poor performance. The major constraints in fodder production are non-availability of good quality seed and lack of awareness of seed production technology among the fodder growers.

There is big gap between demand and productivity of fodders and there is a dire need to fulfill the gap between the demand & supply of fodder and shortage of good seed. It is only possible through evolution of high yielding, multicut varieties / hybrids of different fodder crops and standardization of their fodders and seed production technology. Different experiments on Kharif fodder crops have been planned to find out the appropriate and feasible answers to fodder production problems through development of high fodder yielding varieties having tolerance against major pests and diseases, good quality in terms of high output of livestock production and also establishment of technology for seed production of approved varieties.

SALIENT ACHIEVEMENTS DURING 2018

SORGHUM

- Line Jable produced the highest green fodder yield of 74.81 t/ha in Preliminary green fodder yield trial with 14% increase over check variety Sorghum.2011 (65.93 t/ha.).

- Sgd-02-2017 produced the highest green fodder yield of 74.07 t/ha in Advanced green fodder yield trial, whereas check variety Sorghum.2011 produced 67.04 t/ha with 10.48 % increase over check.

- A-145 produced highest green fodder yield of 57.31 t/ha in Zonal Green Fodder Yield Trial, whereas check variety Sorghum.2011 (check) produced 54.02 t/ha with 6.09 % increase over check.

PEARL MILLET

- Line G-White yielded 78.04 t/ha green fodder yield in Zonal Green Fodder Yield Trial, whereas check variety Sgd. Bajra-2011 produced 72.68 t/ha with 7.37 % increase over check.

MAIZE

- The promising line of maize MA-01-2016 gave the highest green fodder yield of 51.48 t/ha in Zonal Green Fodder Yield Trial, as compared to check variety Sgd. 2002 which produced 44.05 t/ha with 16.86 % increase over check.

GUAR

- An early maturing, short duration and drought tolerant variety of guar BR-2017 (S-5274) has been approved for rain-fed and irrigated areas.
- Advanced guar lines are in pipeline i.e.

    - For grain purpose: S-6547, S-6543, S-6558, S-6565and S-6560.
    - For fodder purpose: S-6553, S-6552 and S-6566.

ANNUAL RESEARCH PROGRAMME FOR KHARIF-2019

SORGHUM (*Sorghum bicolor* L.)

1. TITLE: COLLECTION AND MAINTENANCE OF SORGHUM GERMPLASM

OBJECTIVE: To maintain/ evaluate the germplasm and to collect new lines from different sources to broaden the genetic base.

RESEARCH WORKERS: Ghulam Ahmad, and Muhammad Saleem Akhter

PROJECT DURATION: 2019 (Continuous nature)

LOCATION: Fodder Research Institute, Sargodha.

TREATMENT/ METHODOLOGY:

Total entries = 600
No. of rows = 2 rows of 5 m
Row distance = 60cm

Following data will be recorded for evaluation of lines:

- Plant height
- No. of leaves/plant
- Leaf Area
- Disease resistance
- TSS
- Stem thickness
- Leaf colour
- Days to heading
- Crude Protein

REVIOUS YEAR'S RESULTS: The seed of selfed heads (10-15) from each entry was collected for further studies in the next year.

Data of different characteristics was recorded which ranged as under:

- Plant height = 110 to 350cm
- Stem thickness = 1.0 to 3 cm
- No. of leaves/plant = 9 to 20
- Days to 50 % heading = 65 to 85
- Leaf colour = Light to dark green
- TSS range = 04 to 13 percent

2. TITLE: HYBRIDIZATION AND STUDY OF FILIAL GENERATIONS OF SORGHUM

OBJECTIVE: To create genetic variability in sorghum to get desirable recombinants possessing following traits

1. High fodder yield potential
2. Leaf to stem ratio
3. Sweetness/Juiciness
4. Quality
5. Greenish
6. Grain yield
7. Insect and disease resistant.

RESEARCH WORKERS Ghulam Ahmad and Muhammad Saleem Akhtar.

PROJECT DURATION 2019(Continuous nature)

LOCATION Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY NEW CROSSES TO BE ATTEMPTED

S. No.	Crosses	Purpose
1	K-94x No.1567	Number of leaves, Height
2	No.65174-2x Pvk-801	Quality, Stay green
3	No.1567 xB-203	Greenness, Height
4	JS-263x No.9802	Stay green, Grain yield
5	K-94x No.65174-2	Height, TSS
6	PVK-65130x No.1567	Number of leaves, Height
7	No.1567x No.6001	Disease resistance, Protein percentage
8	JS-263 xFRI-02	Height, TSS
9	JS-2002x YSS-89	Sweetness, Juiciness
10	YSS-4x PARCSS-1	Height, Stay green
11	I-45x PARCSS-II	Stay green, Number of leaves
12	YSS-89 xYSS-16	Grain yield, Disease resistance
13	FRI-07x JS-2009	Insect resistance, Number of leaves
14	No.1803x No.1620	TSS, Grain yield
15	No.3449 x xNo.74724	Height, Stay green
16	No.59901x No.3448	Grain yield, Height
17	SGD-01-2 x FRI-04	Number of leaves, Stay green
18	No.1620x FM-147	Disease resistance, Grain yield
19	SGD-2011x Hegari	Protein percentage, Sweetness
20	Sukkarx No.74702	Number of leaves, Height
21	JS-263x No.337	Height, TSS
22	No.1620x S-2	Grain yield, Height
23	No.80008x No.403415	Protein, Disease resistance
24	FM-147x No.74724	Grain yield, Stay green
25	BALLO x No.59905	Insect resistance, Greenness
26	FRI-07x S-167	Juiciness, more sweetness
27	S-167x F-9917	Lodging resistance, dry matter percentage
28	S-2x TURBO	More protein, more TSS
29	Local Quetta x JS-263	Stay green, grain yield
30	JS-2002x No.1518	Disease resistance, sweetness
31	No.59905x No.59905	Height, TSS
32	S-2x No.337x FRI-07	Number of leaves, Height
33	No.74702x Hegari	Disease resistance, Protein percentage
34	No.1803x No.1620	Height, TSS
35	No.74724x No.337	Sweetness, Juiciness
36	No.65174-2x Pvk-801	Protein percentage, Sweetness
37	No.1567 xB-203	Number of leaves, Height
38	JS-263x No.1567	Height, TSS
39	K-94x No.65174-2	Grain yield, Height
40	PVK-65130x No.9802	Lodging resistance, dry matter percentage

CROSSES/ PROGENIES TO BE STUDIED.

Generations	Crosses/Progenies
F1	30 crosses
F2	15crosses
F3	30 Progenies
F4	32 Progenies
F5	35 Progenies
F6	25 Progenies

PREVIOS YEAR'S RESULTS.

FILIAL GENERATION		Entries studied	Selected
F1	15	Crosses	-
F2	20	Crosses	30 Plants of 15 crosses
F3	35	Plants Progenies of 20 crosses	32 Plants of 16 crosses
F4	38	Plants Progenies of 32 crosses	35 Plants of 20 crosses
F5	30	Plants Progenies of 20 crosses	25 Plants of 15 crosses
F6	25	Plants Progenies of 5 crosses	3 uniform lines

3. TITLE — PRELIMINARY GREEN FODDER YIELD TRIAL OF SORGHUM

OBJECTIVE — To test the promising uniform lines for green fodder and grain yield.

RESEARCH WORKERS — Ghulam Ahmad and Muhammad Saleem Akhtar .

PROJECT DURATION — 2019

LOCATION(S) — Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY

Lines /Varieties = 14

Lay out = RCBD
Replications = 3
Plot size = 1.8m x5m.
Row spacing = 30cm.
Sowing time = June-July

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Following data will be recorded for evaluation of lines:

- Plant height
- No. of leaves/plant
- Leaf Area
- TSS value
- Disease incidence
- Stem thickness
- Leaf colour
- Days to 50% heading
- Green fodder yield

PREVIOUS YEAR'S RESULTS

Sr. No.	Lines/varieties	Green Fodder Yield (t/ha)
1	Jable	74.81
2	Yss-15	74.81
3	I-6	72.59
4	Yss-89	72.22
5	No-6197	72.22
6	SD-167	69.26
7	F-03-2018	67.04
8	FRI-02	66.30
9	No-39501	66.30
10	Sorghum-2011	65.93
11	F-02-2018	63.70
12	65174-2	62.59
13	JS-2002	61.48
14	F-01-2018	55.56
	LSD 5%	5.11

4. TITLE — ADVANCED GREEN FODDER YIELD TRIAL OF SORGHUM

OBJECTIVE — To evaluate green fodder and seed yield performance of promising lines selected on the basis of their morphological good traits from preliminary yield trials.

RESEARCH WORKERS — Ghulam Ahmad, Muhammad Saleem Akhtar.

PROJECT DURATION — 2019

LOCATION(S) — Fodder Research Institute, Sargodha.

TREATMENTS/ — Lines/Varieties = 8

METHODOLOGY

Lay out = RCBD
Replications = 3
Plot size = 1.8m x 5m.
Row spacing = 30cm.
Sowing time = June-July

Following data will be recorded for evaluation of lines:

- Plant height
- No. of leaves/plant
- Leaf Area
- TSS value
- Crude Protein
- Stem thickness
- Leaf colour
- Days to 50% heading
- Disease incidence
- Green fodder yield

PREVIOUS YEAR'S RESULTS

Sr. No.	Lines/varieties	Green Fodder Yield (t/ha)
1	SGD-02-2017	74.07
2	F-01—2017	71.85
3	SGD-01-2017	68.52
4	Sorghum-2011(Check)	67.04
5	JS-2002(Check)	66.67
6	No-5017	65.93
7	F-02-2017	60.74
8	No-1863	51.48
	LSD 5%	4.32

5. TITLE — ZONAL GREEN FODDER YIELD TRIAL OF SORGHUM

OBJECTIVE — To evaluate green fodder yield potential of different sorghum lines at various locations in the province.

RESEARCH WORKERS — Ghulam Ahmad and Muhammad Saleem Akhtar

PROJECT DURATION — 2019

LOCATIONS
1. Fodder Research Institute, Sargodha.
2, ESPU, Farooqabad.
3 FRSS, AARI, Faisalabad.
4. ARS, Bahawalpur

TREATMENTS / METHODOLOGY

Lines/varieties	=	8
Lay out	=	RCBD
Replications	=	3
Plot size	=	1.8m x 5m
Row spacing	=	30cm.
Sowing time	=	June-July

Following data will be recorded for evaluation of lines:

- Plant height
- No. of leaves/plant
- Leaf Area
- TSS value
- Stem thickness
- Leaf colour
- Days to 50% heading
- Green fodder yield

PREVIOUS YEAR'S RESULTS — Green fodder yield (t/ha.)

Sr. No.	Variety/ line	FRI. Sgd.	FRSS, F/Abad	ESPU Farooqabad	ARS. B/pur	Average.
1.	S-145	72.96	72.2	46.66	37.4	57.31
2.	FRI-07	61.85	64.07	57.77	35	54.67
3.	PVK-801	71.48	64.81	46.28	36	54.64
4.	Sorghum-2011 (check)	61.67	62.59	48.51	43.3	54.02
5.	F-02-2016	65.56	72.59	42.22	35	53.84
6.	JS-2002 (check)	60.7	61.85	48.14	43.1	53.45
7.	F-01-2016	65.56	54.07	38.5	47.6	51.43
8.	JS-1	62.59	61.11	41.47	39.9	51.27
	LSD 5%	4.11	7.02			

6.	TITLE	NATIONAL UNIFORM FODDER YIELD TRIAL OF SORGHUM
	OBJECTIVE	To evaluate the promising lines / varieties of sorghum for their green fodder yield potential throughout the country.
	RESEARCH WORKERS	Ghulam Ahmad, Muhammad Saleem Akhtar
	PROJECT DURATION	2019
	LOCATION(S)	Fodder Research Institute, Sargodha.
	TREATMENTS/ METHODOLOGY	Experiment will be laid out according to the plan and methodology supplied by the National Coordinator (Fodder), NARC, Islamabad.
	PREVIOUS YEAR'S RESULTS	Results awaited.

PEARL MILLET (*Pennisetum americanum*)

7.	TITLE	COLLECTION AND MAINTENANCE OF MILLET GERMPLASM		
	OBJECTIVE	To maintain /evaluate the germplasm and to collect new lines from different sources to broaden the genetic base.		
	RESEARCH WORKERS	Sikander Hayat and Dr. ImtiazAkram		
	PROJECT DURATION	2019 (Continuous nature.)		
	LOCATION	Fodder Research Institute, Sargodha.		
	TREATMENTS/ METHODOLOGY	Entries	=	100
		No. of rows	=	2
		Row length	=	10m.
		Row spacing	=	60cm.
		Sowing time	=	July
		Fertilizer	=	70-57-62 NPK kg/ha.

Following data will be recorded for evaluation of lines:

- Plant height
- No. of leaves/plant
- No. of tillers /plant
- Stem thickness
- Leaf Area
- Spike length

PREVIOUS YEAR'S RESULTS

Seed of elite selected plants from each line/variety was collected.

Data of different characteristics were recorded which ranged as under:

- Plant height = 250 to 275cm
- Stem thickness = 1.0 to 1.8cm
- No. of leaves/plant = 10 to 13
- No. of tillers / plant = 3-5
- Leaf area = 316.8 to 508.8 cm
- Spike length = 25- 55 cm

8. TITLE — HYBRIDIZATION & SELECTION OF PEARL MILLET

OBJECTIVE — To create genetic variability in pearl millet to get desirable recombinants with higher fodder yield and better quality.

RESEARCH WORKERS — Sikander Hayat and Dr. Imtiaz Akram

PROJECT DURATION — 2019 (Continuous nature)

LOCATION — Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY — CROSSES TO BE ATTEMPTED

Purpose	Number of crosses
Multicut	4
Green Fodder Yield	4
Dual Purpose (Grain/Fodder)	4
Total	12

PREVIOUS YEAR'S RESULTS — 12 crosses were attempted and F_0 seed was collected.

9. TITLE — PRELIMINARY GREEN FODDER TRIAL OF PEARL MILLET

OBJECTIVE — To evaluate the uniform promising lines for green fodder and grain yield.

RESEARCH WORKERS — Sikander Hayat and Dr. Imtiaz Akram

PROJECT DURATION — 2019 (Continuous nature)

LOCATION — Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY

- Lines/ Varieties = 12
- Lay out = RCBD
- Replications = 3
- Plot size = 1.8 x 6m.
- Row spacing = 30cm.
- Sowing time = May – June

Following data will be recorded for evaluation of lines:

- Plant height
- No. of leaves/plant
- Leaf Area
- Green fodder yield
- No. of tillers/plant
- Stem thickness
- Leaf color
- Days to 50% heading
- Lodging
- Dry matter percentage

PREVIOUS YEAR RESULTS

S.No.	Varieties / Lines	Green Fodder Yield (t/ha.)
1	N.5	75.13
2	PM.03.2017	73.91
3	DP. POP	72.37
4	PM.04.2017	72.07
5	PM.05.2017	71.76
6	High Group	71.76
7	PM-01-2017	70.84
8	DBR III	70.84
9	PM.06.2017	70.53
10	POP.01	70.23
11	Composite IV	69.00
12	PM02-2017	68.69
13	EX BD2 Bulk	65.01
14	SGD.Bajra2011(check)	64.40
15	POP-6	64.09
16	M.S.3	63.17
	LSD	4.19

10. TITLE — ADVANCED GREEN FODDER AND GRAIN YIELD TRIAL ON PEARL MILLET

OBJECTIVE — To evaluate the promising lines/ varieties for maximum Green fodder yield.

RESEARCH WORKERS — Sikander Hayat and Dr. Imtiaz Akram Niazi

PROJECT DURATION — 2019 (Continuous nature)

LOCATION — Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY

Line/Varieties	=	8
Lay out	=	RCBD
Replications	=	3
Row spacing	=	30cm.
Plot size	=	1.8m x 6 m.
Seed rate	=	10 kg/ha.
Sowing time	=	May - June

Following data will be recorded for evaluation of lines:-

- Plant height
- No. of leaves/plant
- Leaf Area
- Green fodder yield
- Dry matter percentage
- Stem thickness
- Leaf color
- Days to 50% heading
- No. of tillers/unit area

PREVIOUS YEAR'S RESULTS

S.No.	VARIETIES / LINES	GREEN FODDER YIELD (t/ha)
1	Tift 85D	76.36
2	H.72	76.05
3	TifT383	75.44
4	Sen POP	74.83
5	Composite III	74.52
6	DP.PAK	74.21
7	PM.01.2016	72.99
8	Sgd. Bajra 2011(check)	69.92
	LSD	4.63

11. TITLE — ZONAL GREEN FODDER YIELD TRIAL OF PEARL MILLET

OBJECTIVE — To ascertain green fodder yield potential of different elite line of pearl millet in Sargodha and at different agro ecological conditions in Punjab.

RESEARCH WORKERS — Sikander Hayat and Dr. Imtiaz Akram Niazi

PROJECT DURATION — 2019 (Continuos nature)

LOCATION

1. Fodder Research Institute, Sargodha.
2. ESPU., Farooqabad
3. ARS, Bahawalpur
4. FRSS, AARI, Faisalabad.
5. BARI, Chakwal.

TREATMENT / METHODOLOGY

Promising lines/varieties	=	4
Lay out	=	RCBD
Replications	=	3
Row spacing	=	30cm.
Plot size	=	1.8m x 6 m
Seed rate	=	10 kg/ha.
Sowing time	=	May - June

Following data will be recorded for evaluation of lines:

- Plant height
- No. of leaves/tiller
- Leaf Area
- Green fodder yield
- Stem thickness
- Leaf color
- Days to 50% heading
- No. of tillers/ unit area

PREVIOUS YEAR'S RESULTS GREEN FODDER YIELD (t/ha.)

Sr. No	LINES/VARIETIES	FRI, Sgd.	FRSS, F/Abad	ARS, B/pur.	ESPU, Fq.Abad	Average
1	G.White	72.68	64.10	84.70	93.50	78.74
2	FB.809	73.29	57.00	70.70	96.29	74.32
3	Q Bajra	76.97	61.30	76.00	82.40	74.16
4	FB.791	70.84	59.20	81.30	85.00	74.08
5	CZ K 923	74.83	52.70	93.70	71.29	73.13
6	FB.797	71.45	58.90	88.30	73.00	72.91
7	Sgd.Bajra 2011 (Check)	71.15	62.60	81.00	76.00	72.68
8	No: 7703	73.91	62.30	63.00	69.40	67.15
	LSD	5.47	N.S	4.36	8.12	

12. TITLE — NATIONAL UNIFORM FODDER YIELD TRIAL OF PEARL MILLET

OBJECTIVE — To evaluate the promising lines under coded No. for fodder Yield throughout the country.

RESEARCH WORKERS — Sikander Hayat ,Dr. Imtiaz Akram

PROJECT DURATION — 2019

LOCATION — Fodder Research Institute, Sargodha.

TREATMENT / METHODOLOGY — The seed and sowing plan as supplied by the National Coordinator (Cereal System), NARC, Islamabad will be followed.

PREVIOUS YEAR'S RESULTS — Result awaited.

13. TITLE — EVALUATION OF MULTI CUT LINES OF PEARL MILLET

OBJECTIVE — To evaluate the lines with higher green fodder yield having potential of multi cuttings.

RESEARCH WORKERS — Sikander Hayat and Dr. Imtiaz Akram

PROJECT DURATION — 2019

LOCATION — Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY

Lines/ Varieties	=	8
Lay out	=	RCBD
Replications	=	3
Plot size	=	1.8 x 6m.
Row spacing	=	30cm.
Sowing time	=	March

The following observations will be recorded:-

1. Plant Height
2. Stem Thickness
3. Leaf area
4. No.of leaves per plant
5. Green Fodder Yield
6. No. of tillers per plant
7. No. of cuttings

PREVIOUS YEAR'S RESULT: New Experiment

14. TITLE: DEVELOPMENT OF COMPOSITE VARIETY OF MILLET

OBJECTIVE: To create variability and produce high fodder and grain yielding variety with good quality.

RESEARCH WORKERS: Sikander Hayat and Dr.ImtiazAkram

PROJECT DURATION: completed.

LOCATION: Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY:

No. of lines/ varieties	=	5
Row spacing	=	45cm
Sowing time	=	Mid July to Mid-August

1. Equal quantity of seed of Phenotypically outstanding lines will be mixed and sown in isolated field. Random mating will be allowed through open pollination.

2. In the subsequent 3-4 generations of random mating, the undesirable types will be eliminated to achieve uniformity & homogeneity in various morphological characters.

3. Such uniform population will be tested in replicated trials along with standard checks and high yielding stable type will be released as composite variety.

PREVIOUS YEAR'S RESULT: A new composite line has been developed .

MAIZE (*Zea mays* L) 2n = 20

15. TITLE: MAINTENANCE OF MAIZE GERMPLASM

OBJECTIVE: To maintain and study the gene pool for utilization in maize breeding programme

RESEARCH WORKERS: Abdul Basit and Abdul Jabbar

PROJECT DURATION: 2019 (continuous nature)

LOCATION: Fodder Research Institute, Sargodha.

TREATMENTS: Entries = 56

METHODOLOGY: Sowing time = Mid July to Mid-August

The germplasm will be maintained through sib mating.

Following data will be recorded for confirmation of results of last year:

- Plant height
- No. of leaves/plant
- Leaf Area
- Number of cobs/plant
- Crude Protein
- Stem thickness
- Leafcolour
- Days to 50% heading
- 1000 grain weight
- Dry Matter (%)

PREVIOUS YEAR'S RESULTS: Seed of selected plants from each line/variety was collected

Data of different characteristics ranged as under:

- Plant height = 140 to 280 cm
- Stem thickness = 1.3 to 3.2 cm
- No. of leaves/plant = 10 to 16
- Leaf Area = 280.5 to 678.7 cm^2
- Leaf colour = Light to dark green
- Days to 50% heading = 40 to 70 days
- No. of cobs/plant = 01 to 02
- Crude Protein (%) = 4.23 to 14.00
- Dry Matter (%) = 16.10 to 26.85

16. TITLE — FODDER AND GRAIN YIELD IMPROVEMENT IN MAIZE THRUOGH EAR TO ROW SELECTION

OBJECTIVE — To develop improved variety/ line with high fodder and grain yield and resistant to insect pests & diseases.

RESEARCH WORKERS — Abdul Basit and Abdul Jabbar.

PROJECT DURATION — 2019

LOCATION — Fodder Research Institute, Sargodha.

TREATMENTS METHODOLOGY — No. of plants to be selected = 50 – 100

Single ears from selected plants will be raised in progeny rows along with standard check variety. The superior progenies will be identified and selected.

Check Variety	=	Sgd.2002
R – R Distance	=	45cm
P-P Distance	=	30cm

PREVIOUS YEAR'S RESULTS — 50 phenotypically superior plants having better fodder yielding characters with superior ears were selected.

17. TITLE — DEVELOPMENT OF COMPOSITE VARIETY OF MAIZE

OBJECTIVE — To create variability and produce high fodder and grain yielding variety with good quality.

RESEARCH WORKERS — Abdul Basit and GhulamNabi.

PROJECT DURATION — 2018 (continuous nature)

LOCATION — Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY

No. of lines/ varieties	=	5
Row spacing	=	45cm
Sowing time	=	Mid July to Mid-August

1. Equal quantity of seed of Phenotypically outstanding lines will be mixed and sown in isolated field. Randommating will be allowed through open pollination.

2. In the subsequent 3-4 generations of random mating, the undesirable types will be eliminated to achieve uniformity & homogeneity in various morphological characters.

3. Such uniform population will be tested in replicated trials along with standard checks and high yielding stable type will be released as composite variety.

PREVIOUS YEAR'S RESULTS — Seed of $C_1$and C2 and C3 generations were collected for further study and selection process

18. TITLE PRELIMINARY FODDER YIELD TRIAL OF MAIZE

OBJECTIVES: To test the promising uniform lines for green fodder yield.

RESEARCH WORKER: Abdul Basit and Abdul Jabbar

PROJECT DURATION: 2019

TREATMENTS: Total Entries = 10 (Including Check)

METHODOLOGY:

1.	MS-01-2019	2.	MS-02-2019
3.	MS-03-2019	4.	MS-04-2019
5.	MS-05-2019	6.	MS-06-2019
7.	MS-07-2019	8.	MS-08-2019
9.	MS-09-2019	10.	Sgd.2002 (Check)

Layout = RCBD
Replications = 3
Plot Size = 1.8m x 5m
Row Spacing = 30 cm
Sowing time = August

The following observations will be recorded:-

1. Plant Height
2. Stem Thickness
3. Leaf area
4. No.of leaves per plant
5. Green Fodder Yield
6. Dry Matter percentage

PREVIOUS YEAR'S RESULTS

Sr. No.	Varieties/ Lines	Green Fodder Yield (t/ha)
1	MS-05-2018	58.51
2	MS-06-2018	55.92
3	Composite-01-18	52.22
4	Composite-02-18	51.11
5	MS-04-2018	50.74
6	MS-02-2018	48.51
7	Sgd.2002 (Check)	46.66
8	MS-07-2018	42.59
9	MS-03-2018	38.89
10	MS-01-2018	37.77
	LSD (5%)	4.36

19. TITLE ADVANCED FODDER YIELD TRIAL OF MAIZE

OBJECTIVES: To evaluate green fodder yield performance of promising lines previously selected from preliminary yield trial on basis of green fodder yielding characters.

RESEARCH WORKER: Abdul Basit and Abdul Jabbar

PROJECT DURATION: 2019

TREATMENTS: Total Entries = 7(Including check)

METHODOLOGY:

1.	MS-05-2018	2.	MS-06-2018
3.	Composite-01-18	4.	Composite-02-18
5.	MS-04-2018	6.	MS-02-2018
7.	Sgd.2002 (Check)		

Layout = RCBD
Replications = 3
Plot Size = 1.8x5m
Row Spacing = 30 cm
Sowing time = August

The following observations will be recorded:-

1. Plant Height
2. Stem Thickness
3. Leaf area
4. No.of leaves per plant
5. Green Fodder Yield
6. Dry Matter percentage

PREVIOUS YEAR'S RESULTS

Sr. No.	Varieties/ Lines	Green Fodder Yield (t/ha)
1	Composite-15	54.07
2	MS-05-2017	53.70
3	MS-01-2017	53.33
4	MS-03-2017	51.48
5	Sgd.2002 (check)	49.25
6	MS-04-2017	44.81
7	Composite-16	38.15
	LSD (5%)	2.64

20. TITLE ADAPTABILITY TRIAL OF MAIZE

OBJECTIVES: To test the advance lines /varieties at different locations of Punjab province for their green fodder yield and adaptability.

RESEARCH WORKER: Abdul Basit and Abdul Jabbar

PROJECT DURATION: 2019

LOCATION:
1. FRI Sargodha
2. ESPU Farooqabad
3. Fodder Research Sub Station AARI Faisalabad
4. ARS, Bahawalpur

TREATMENTS: Total Entries = 7 (Including checks)

METHODOLOGY:

1.	Composite-15	2.	MS-05-2017
3.	MS-01-2017	4.	MS-03-2017
5.	MS.2020	6.	Sgd.2002 (Check)
7.	MMRI Yellow (Check)		

Layout = RCBD
Replications = 3
Plot Size = 1.8m x 5m
Row Spacing = 30 cm
Sowing time = August

The following observations will be recorded:

1. Plant Height
2. Stem Thickness
3. Leaf area
4. No.of leaves per plant
5. Green Fodder Yield

PREVIOUS YEAR'S RESULTS

GREEN FODDER YIELD (t/ha)

Sr. No.	Lines / Varieties	FRI, Sargodha	FRSS, F/Abad	ARS, B/Pur	ESPU, Farooqabad	Average (t/ha.)
1	MS-01-2016	48.51	59.65	68.88	28.88	51.48
2	MS-04-2016	57.03	61.99	55.92	28.51	50.86
3	MS-07-2016	48.51	60.43	62.99	30.73	50.67
4	FSD.2020	51.11	57.31	46.29	30.50	46.30
5	MS-03-2015	46.29	58.09	42.96	33.70	45.26
6	MS-05-2016	38.51	60.62	49.62	27.77	44.13
7	Sgd.2002 (Check)	47.40	57.70	43.7	27.40	44.05
8	FSD.2025	36.29	54.19	52.21	27.30	42.50
	LSD 5%	4.58				

21. TITLE — NATIONAL UNIFORM FODDER YIELD TRIAL OF MAIZE

OBJECTIVE — To evaluate the promising lines / varieties of Maize for their green fodder yield potential throughout the country.

RESEARCH WORKERS — Abdul Basit and Abdul Jabbar

PROJECT DURATION — 2019

LOCATION(S) — Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY — Seed along with the plan of sowing will be provided by the National Coordinator (Cereal system), NARC Islamabad. The trial will be conducted according to the instruction given in the plan.

PREVIOUS YEAR'S RESULTS — Results awaited.

S.S. HYBRID

22. TITLE: MAINTENANCE OF SUDAN GRASS GERMPLASM

OBJECTIVE: To maintain different Sudan Grass lines and produce their seed for S.S hybrid seed development.

RESEARCH WORKERS: Abdul Basit and Abdul Jabbar

PROJECT DURATION: 2019(Continuous nature)

LOCATION: Fodder Research Institute, Sargodha

TREATMENTS / METHODOLOGY:
Total Entries = 19
Row spacing = 60 cm.
Sowing time = July
Sudan grass lines will be maintained through selfing.

PREVIOUS YEAR'S 20-25 RESULTS: Nineteen (19) lines were maintained and the selfed seed of heads were collected from each entry for further utilization in S.S Hybrid development.

23. TITLE: MAINTENANCE OF A&B LINES OF SORGHUM

OBJECTIVE: To maintain different A (CMS) lines of sorghum and produce their seed for S.S hybrid development.

RESEARCH WORKERS: Abdul Basit and Abdul Jabbar

PROJECT DURATION: 2019 (Continuous nature)

LOCATION: Fodder Research Institute, Sargodha.

TREATMENTS / METHODOLOGY:
Cytoplasmic male sterile lines (A) = 11
Maintainer lines (B) = 11

Row spacing = 60 cm.
Lines Ratio (A:B) = Planted in the ratio of 1:1
Sowing time = July

PREVIOUS YEAR'S RESULTS: Eleven (11) A-lines (CMS) were maintained with their B-lines and seed were collected for further utilization in S.S Hybrid development.

24. TITLE — DEVELOPMENT OF NEW S.S HYBRID COMBINATIONS

OBJECTIVE — To find out new S.S hybrid combinations with more tillering capacity and high green fodder yield.

RESEARCH WORKERS — Abdul Basit and Abdul Jabbar

PROJECT DURATION — 2019

LOCATION(S) — Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY

A - lines of sorghum (CMS lines) = 2
Sudangrass lines (R) = 4

Lines ratio (A : R) = 4 : 2
Row spacing = 60 cm.
Sowing time = Month of July

PREVIOUS YEAR'S RESULTS — Seven (7) Hybrid combinations were made.

25. TITLE — EVALUATION OF S.S HYBRIDS FOR GREEN FODDER YIELD

OBJECTIVE — To evaluate s.s hybrids on basis of green fodder yield

RESEARCH WORKERS — Abdul Basit and Abdul Jabbar

PROJECT DURATION — 2019

LOCATION(S) — Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY

Total Entries = 8 (including check)
Layout = RCBD
Replications = 3
Plot Size = 1.8x5m
Row Spacing = 30 cm
Sowing time = March

Green fodder yield data will be recorded at 50% flowering stage for each cut.

PREVIOUS YEAR'S RESULTS

Sr. No.	Varieties/ Lines	Green Fodder Yield (t/ha)
1	FRI-4	125.54
2	FRI-1	116.66
3	FRI-6	114.43
4	FRI-2	108.88
5	FRI-5	105.17
6	FRI-3	103.69
7	Pak Saudax (check)	103.69
8	FRI-7	102.58
9	FRI-8	97.03
	LSD (5%)	7.42

COWPEAS (*Vigna unguiculata*)

26. TITLE — MAINTENANCE AND EVALUATION OF GERMPLASM OF COWPEAS

OBJECTIVE — To maintain and evaluate the germplasm.

RESEARCH WORKERS — Ahmad Hussain and Ameer Abdullah

PROJECT DURATION — 2019 (Continuous nature)

LOCATION — Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY

Total entries = 32
No. of rows = 2
Row spacing = 120 cm.
Sowing time = May –June

Data will be recorded on the following parameters.
- Vine length
- No. of leaves/vine
- No. of branches/vine
- Leaf area
- No. of days to initiation of pods
- Days to maturity

PREVIOUS YEAR'S RESULTS

Ranges of data recorded:
- Vine length (250-335 cm)
- No. of leaves/vine (120-280)
- No. of branches/vine. (12-17)
- Stem thickness (0.7-1.2 cm)
- Green fodder yield (18-47.6 t/ha)

27. TITLE — PRELIMINARY FODDER YIELD TRIAL OF COWPEAS

OBJECTIVES: To test the promising uniform lines for green fodder yield.

RESEARCH WORKER: Ahmad Hussain and Ameer Abdullah

PROJECT DURATION: 2019

TREATMENTS: Lines/ varieties = 12
METHODOLOGY:

Layout = RCBD
Replications = 3
Plot Size = 3m x 6m
Row Spacing = 45 cm
Sowing time = June- July

The following observations will be recorded:
-Vine length
- No. of leaves/vine
- No. of branches/vine
- Leaf area
- Green fodder yield

PREVIOUS YEAR'S RESULTS

S. No	Lines/varieties	Green fodder yield (t/ha)
1	CP-95	43.06
2	CP-035	42.30
3	CP-96	41.93
4	CP-101	41.83
5	CP-219	40.40
6	Elite	36.92
7	Rawan-2003 (check)	36.75
8	SS-92	36.68
9	SS-92-2	35.56
10	IT-82E-715	34.93
11	AYT-CP-012	34.79
12	AYT-CP-021	34.43
	LSD	2.70

28. TITLE — ADVANCE GREEN FODDER YIELD TRIAL OF COWPEAS

OBJECTIVE — To test the lines/ varieties for green fodder yield.

RESEARCH WORKERS — Ahmad Hussain and Ameer Abdullah.

PROJECT DURATION — 2019

LOCATION — Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY

Varieties/ lines = 9
Lay out = RCBD
Replications = 3
Plot size = 3m x 6m
Sowing time = May –June

The data will be recorded on the following parameters.

-Vine length
- No. of leaves/vine
- No. of branches/vine.
- Leaf area
- Green fodder yield

PREVIOUS YEAR'SRESULTS

S.No	LINES/VARIETIES	Green Fodder Yield (t/ha)
1.	CP-271	40.40
2.	IT-82E-715	39.30
3.	CP-96	39.25
4.	CP-219	35.50
5.	CP-162	35.11
6.	Rawan-2003 (check)	33.50
7.	Elite	33.30
	LSD 5%	2.30

29. TITLE ADAPTABILITY TRIAL OF COWPEAS

OBJECTIVES: To test the advance lines / varieties at different locations of Punjab Province for their green fodder yield and adaptability.

RESEARCH WORKER: Ahmad Hussain and Amir Abdullah

PROJECT DURATION: 2019

LOCATION:
1. FRI Sargodha
2. ESPU Farooqabad
3. Fodder Research Sub Station AARI Faisalabad
4. BARI, Chakwal

TREATMENTS: Lines/ varieties = 7

METHODOLOGY:
Lay out = RCBD
Replications = 3
Plot size = 3m x 6m
Sowing time = May- June

Data will be recorded on the following parameters.
-Vine length - No. of leaves/vine
- No. of branches/vine. - Leaf area
- Green fodder yield

PREVIOUS YEAR'S RESULT:

Sr. No.	Lines / Varieties	FRI, Sargodha	Agronomy (F.P) AARI	BARI, Chakwal	ESPU, Farooqabad	Average (t/ha.)
1	CP-383	33.86	36.04	18.80	39.93	32.15
2	CP-145	33.12	29.30	16.41	38.13	29.24
3	CP-271	32.88	25.00	18.12	38.69	28.67
4	IT84-D-552	31.62	23.29	17.91	39.62	28.11
7	Rawan-2003 (check)	27.23	31.83	17.70	35.60	28.09
5	CP-162	30.90	23.29	17.29	37.92	27.50
6	CP-219	24.65	27.98	17.96	34.00	26.15
	LSD 5%	0.50	-	-	-	

30. TITLE NATIONAL UNIFORM FODDER YIELD TRIAL OF COWPEA

OBJECTIVE To evaluate the promising lines / varieties of Cowpea for their green fodder yield potential through out the country.

RESEARCH WORKERS Ahmad Hussain and Ameer Abdullah

PROJECT DURATION 2019

LOCATION(S) Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY: Seed along with the plan of sowing will be provided by the National Coordinator (Cereal system), NARC Islamabad. The trial will be conducted according to the instructions given in the plan.

PREVIOUS YEAR'S RESULTS: Results awaited.

31. TITLE: BNS & PRE-BASIC SEED PRODUCTION

OBJECTIVE: Production of BNS and Pre-basic seed of Sorghum, Pearl millet and Maize

RESEARCH WORKERS: Ahmad Hussain and Ameer Abdullah.

PROJECT DURATION: 2019 (Continuous nature)

LOCATIONS: Fodder Research Institute, Sargodha

SOWING PLAN:

Row distance	=	60cm
No. of rows / block	=	6
Row length	=	5m
Sowing time	=	25 June -15July

PREVIOUS YEAR'S RESULT

Crops	Varieties	Selected No. of Heads.	Selected No. of Head -Row.	Selected row to block.	BNS (kg.)	Pre-Basic (kg.)
Sorghum	Hegari	50	36/50	21/32	48	2574
	JS-263	30	24/50	15/30	27	537
	JS-2002	50	32/50	16/28	35	1317
	Sorghum2011	50	33/50	13/24	31	1375
Pearl Millet	MB-87	30	21/30	12/20	15	79
	Sgd. Bajra	30	18/30	7/12	9	702
Maize	Sgd. 2002	50	40/50	19/28	205	4709

AGRICULTURAL RESEARCH STATION, BAHAWALPUR

1. GUAR (*Cyamopsis tetragonoloba* L.)

1. Title **COLLECTION, MAINTENANCE AND EVALUATION OF GUAR GERMPLASM**

OBJECTIVE To collect, maintain & evaluate desirable genotypes of guar possessing high yield potential, earliness and resistance to insect pests &diseases.

RESEARCH WORKERS Rashid Minhasand, Dr. Lal Hussain Akhtar

PROJECT DURATION Continuous

LOCATION Agricultural Research Station, Bahawalpur

TREATMENTS/ METHODOLOGY

Entries = 348(For fodder=155, for grain=189, for vegetable= 04)
Plot size = 0.9m x 7.2m
Layout = Augmented design
Row Spacing = 45 cm
Line x Line =3m
Data on the following characters will be recorded:

1. Days to 50% flowering	7. Pods plant^{-1}
2. Days to 90% maturity	8. Pod length
3. Plant height	9. GrainsPod^{-1}
4. Branches plant^{-1}	10. 1000-Grain weight
5. Clusters plant^{-1}	11. Grain Yield plant^{-1}
6. Pods cluster^{-1}	12. Green pod yieldplant^{-1}

PREVIOUS YEAR'S RESULTS

A. Seed of 200 lines/varieties was harvested on maturity and was preserved for further studies. Theconsolidated data of various traits are given as under

Sr. No.	Characters	Range
1	Days to 50% flowering	42-68 days
2	Days to 90% maturity	120-170 days
3	Plant height	70-215 cm
4	Branches plant^{-1}	0-15
5	Clusters plant^{-1}	10-40
6	Pods plant^{-1}	30-420
7	Pods cluster^{-1}	3-12
8	Pod length	2-8cm
9	Grains pod^{-1}	3-10
10	1000-Grain weight	20-35gm

B. A total of 148new guar germplasm/accessions/lines wereacquired from BCI, NARCduring Kharif, 2018.

2	**HYBRIDIZATION AND STUDY OF FILIAL GENERATIONS**
OBJECTIVE	To create genetic variability by crossing local and exotic lines possessing desirable traits like yield, earliness and

<table>
<tr><td></td><td>resistance to insect pests &diseases.</td></tr>
<tr><td>RESEARCH WORKERS</td><td>Rashid Minhas, Muhammad Shahjhan Bukhari, Muhammad Zubair, Rahmat Ullahand Dr. Lal Hussain Akhtar</td></tr>
<tr><td>PROJECT DURATION</td><td>Continuous</td></tr>
<tr><td>LOCATION</td><td>Agricultural Research Station, Bahawalpur</td></tr>
<tr><td>TREATMENTS/ METHODOLOGY</td><td>Hybridization: 12 new crosses will be attempted using available germplasm keeping in view the breeding objectives i.e. grain, fodder and vegetable purposes as under:
Grain Yield = 5
Fodder Yield = 5
Vegetable = 2
Filial Generations: Following generations will beraised during the year 2019.
<table>
<tr><th>Generation</th><th>Parental Crosses/ progenies</th></tr>
<tr><td>F_1</td><td>3</td></tr>
<tr><td>F_2</td><td>4</td></tr>
<tr><td>F_3</td><td>6</td></tr>
</table></td></tr>
<tr><td>PREVIOUS YEAR'S RESULTS</td><td>Following 8 crosses were attemptedduring Kharif, 2018.
<table>
<tr><th>Cross #</th><th>Cross attempted</th><th>No. of pods harvested</th></tr>
<tr><td>1.</td><td>S-6384 X S-6036</td><td>1</td></tr>
<tr><td>2.</td><td>S-6036 X S-6384</td><td>1</td></tr>
<tr><td>3.</td><td>S-5823 X S-6161</td><td>-</td></tr>
<tr><td>4.</td><td>S-6161 X S-5823</td><td>-</td></tr>
<tr><td>5.</td><td>S-6558 X BR-2017</td><td>1</td></tr>
<tr><td>6.</td><td>S-6161 X BR-2017</td><td>-</td></tr>
<tr><td>7.</td><td>S-5823 X BR-2017</td><td>-</td></tr>
<tr><td>8.</td><td>S-6036 X BR-99</td><td>-</td></tr>
</table>
F_0 seed of successful crosses was harvested for growing F_1 during 2019.
Following generations were studied during the previous year:
<table>
<tr><th>Generation</th><th>Parental Crosses/ progenies studied</th><th>crosses/plants/ progenies selected</th></tr>
<tr><td>F_1</td><td>4</td><td>4</td></tr>
<tr><td>F_2</td><td>3</td><td>6</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>3</td><td>IDENTIFICATION OF PROMISING LINES OF GUAR</td></tr>
<tr><td>OBJECTIVE</td><td>Identification of promising lines of guar keeping in view the grain, fodder and vegetable traits and resistance to insect pests &diseases for their evaluation in yield trials during subsequent years.</td></tr>
<tr><td>RESEARCH WORKERS</td><td>Rashid Minhasand Dr. Lal Hussain Akhtar</td></tr>
<tr><td>PROJECT DURATION</td><td>2019</td></tr>
</table>

LOCATION	Agricultural Research Station, Bahawalpur
TREATMENTS/ METHODOLOGY	No. of Entries= 50 Checks= BR-90 & BR-2017 Layout = Alpha Lattice Row Spacing = 45 cm Data on following characters will be recorded: 1. Days to 50% flowering 7. Pods plant^{-1} 2. Days to 90% maturity 8. Grains pod^{-1} 3. Plant height 9. 1000-Grain weight 4 Branches plant^{-1} 10. Pod length 5. Clusters plant^{-1} 11. Grain Yield 6. Podscluster^{-1} 12. Fodder yield
PREVIOUS YEAR'S RESULTS	46lines were evaluated during Kharif, 2018. 15lines were selected on basis of better performance for their evaluation in preliminary yield trials during 2019.

4	**IRRADITION OF GUAR SEED TO CREATE GENETIC VARIABILITY**
OBJECTIVE	To create genetic variability among existing (old and new) genotypes of guar through irradiation.
RESEARCH WORKERS	Muhammad Zubairand Dr. Lal Hussain Akhtar
PROJECT DURATION	2019
LOCATION	Agricultural Research Station, Bahawalpur
TREATMENTS/ METHODOLOGY	The seed will be treated with radiations at 5 dozes in collaboration with NIAB, Faisalabad. Varieties = 2 (S-6384, S-6161)

Treatment	Doze (Kr)	Treatment	Doze (Kr)
T1	10	**T4**	40
T2	20	**T5**	50
T3	30		

After irradiation process, seed of the above varieties will be sown
toraise M_1 Generation.
Checks = S-6384, S-6161 (Non-treated)
Plot size = 2.7m x 7.2m
Row Spacing = 45 cm
The following generations will beraised during the year 2019.

Generation	Mutants/progenies	Design
M_1	10	Non replicated
M_2	10	Non replicated

PREVIOUS YEAR'S RESULTS	The following generation were studied during the previous

year:

Generation	Mutants/progenies studied	Mutants/progenies selected
M_1	30	10

5	**PRELIMINARY YIELD TRIALS OF GUAR (A-TRIALS).**
OBJECTIVE	To evaluate the promising genotypes of guar for grain, fodder & vegetable purpose keeping in view the yield and resistance to insect pests &diseases.
RESEARCH WORKERS	Muhammad Zubair and Dr. Lal Hussain Akhtar
PROJECT DURATION	2019
LOCATION	Agricultural Research Station, Bahawalpur
TREATMENTS/ METHODOLOGY	No. of Trials = 02 No. of Entries = 20
	PRELIMINARY YIELD TRIALS-I(A-I) (Grain Purpose) No. of Entries = 08 Check = BR-2017
	PRELIMINARY YIELD TRIALS-II(A-II) (Fodder Purpose) No. of Entries = 07 Checks = BR-90
	Layout = RCBD Replications = 4 Plot size = 2.7m x 7.2m Row Spacing = 45 cm Data on following characters will be recorded: 1. Days to 50% flowering 2. Days to 90% maturity 3. Plant height 4 Branches plant^{-1} 5. Clusters plant^{-1} 6. Pods cluster^{-1} 7. Pods plant^{-1} 8. Grains pod^{-1} 9. 1000-Grain weight 10. Pod length 11. Grain Yield 12. Fodder yield
PREVIOUS YEAR'S RESULTS	Out of 20lines tested in 2 trials, 12 were selected. These lines will be tested in B-Trials during 2019. Their performance is given as under: **A-I Trial**

Varieties	Grain Yield (Kg ha^{-1})
S-6637	**2663**
S-6642	2551
S-6638	2464
S-6673	2442
S-6636	2195
S-6655	2118
S-6666	1999
BR-2017 (Check)	1967
S-6631	1603
S-6632	1459

S-6629	1137
S-6639	996
LSD (0.05)	341.9

A-II Trial

Varieties	Grain Yield (Kg ha^{-1})	Fodder Yield (t ha^{-1})
S-6669	**2407**	33.50
S-6668	1828	30.49
S-6625	1776	32.13
S-6663	1502	28.70
S-6671	1307	**37.38**
BR-90	1300	29.22
S-6660	844	22.09
S-6627	549	24.01
S-6656	436	16.43
S-6657	401	33.16
LSD (0.05)	175.5	2.90

6	**REGULAR YIELD TRIAL OF GUAR (B-TRIAL)**
OBJECTIVE	To evaluate yield performance of promising lines of guar to select better performing lines.
RESEARCH WORKERS	Muhammad Shahjhan Bukhari and Dr. Lal Hussain Akhtar
PROJECT DURATION	2019
LOCATION	Agricultural Research Station, Bahawalpur
TREATMENTS/ METHODOLOGY	No. of Entries = 12 Checks = BR-2017, BR-90 Layout = RCBD Replications = 4 Plot size = 2.7m x 7.2m Row Spacing = 45 cm Data on following characters will be recorded: 1. Days to 50% flowering 2. Days to 90% maturity 3. Plant height 4 Branches plant^{-1} 5. Clusters plant^{-1} 6. Pods cluster^{-1} 7. Pods plant^{-1} 8. Grains pod^{-1} 9. 1000-Grain weight 10. Pod length 11. Grain Yield 12. Fodder yield
PREVIOUS YEAR'S RESULTS	Out of 9 lines tested in B-Trial, 5 were selected on the basis of their better performance. These lines will be tested in C-Trial during 2019. The results are given as under: **B-Trial**

Varieties	Grain Yield (Kg ha^{-1})	Fodder Yield (t ha^{-1})
S-6547	**2767**	33.47
S-6553	2575	34.98
S-6536	2431	35.36
S-6543	2418	**35.67**

S-6560	2404	33.26
BR-2017	2270	31.04
S-6566	1948	15.81
S-6558	1701	18.76
BR-90	1481	29.29
S-6565	1454	22.94
S-6552	1396	25.58
LSD(0.05)	336.9	7.2

7 **ADVANCE GUAR YIELD TRIAL (C-TRIAL)**

OBJECTIVE To select high yielding and better adapted lines of guar.

RESEARCH WORKERS Rahmat Ullah and Dr. Lal Hussain Akhtar

PROJECT DURATION 2019

LOCATION Agricultural Research Station, Bahawalpur

TREATMENTS/ METHODOLOGY

No. of Entries = 05
Checks = BR-2017, BR-90
Layout = RCBD
Replications = 4
Plot size = 2.7m x 7.2m
Row Spacing = 45 cm
Data on the following characters will be recorded:

1. Days to 50% flowering
2. Days to 90% maturity
3. Plant height
4. Branches plant^{-1}
5. Clusters plant^{-1}
6. Pods cluster^{-1}
7. Pods plant^{-1}
8. Grains pod^{-1}
9. 1000-Grain weight
10. Pod length
11. Grain Yield
12. Fodder yield

PREVIOUS YEA'S RESULTS

Out of 7 lines tested in the C-Trial, 4 lines were selected on the basis of their better performance. These lines will be tested in Zonal & NUYT Trial during 2019. The results are given as under:

Varieties	**Grain Yield (Kg ha^{-1})**	**Fodder Yield (t ha^{-1})**
6384	**2922**	33.85
6161	2726	31.65
6159	2524	**36.67**
6165	2517	34.26
BR-2017	2150	31.62
6260	2126	31.10
6000	1869	22.12
BR-90	1337	28.57
6251	926	19.65
LSD(0.05)	427.1	6.42

8 **ZONAL GUAR YIELD TRIAL**

OBJECTIVE	To test the advance lines of guar in different ecological zones of the Punjab for their grain yield and fodder yield and adaptability.
RESEARCH WORKERS	Muhammad Zubair and Dr. Lal Hussain Akhtar
PROJECT DURATION	2019
LOCATIONS	1. Agronomic Research Station, Bahawalpur 2. Agronomic Research Station, Karor. 3. Agronomic Research Station, Khanewal
TREATMENTS/ METHODOLOGY	Seed will be provided to above mentioned stations. No. of Entries = 04 Check = BR-2018 Layout = RCBD Replications = 4 Plot size = 3.6m x 7.2m Row Spacing = 45 cm Data on following characters will be recorded: 1. Plant height (cm) 2. Pods plant^{-1} 3. No. of Branches plant^{-1} 4. Grain Yield (kg ha^{-1}) 5. Green Fodder Yield (t ha^{-1})
PREVIOUS YEAR'S RESULTS	

Varieties	**Grain Yield (Kg ha^{-1})**			**Average**
	ARS, KWL	**ARS, Karor**	**ARS, BWP**	
S-6384	**2257**	**1323**	**2713**	**2098**
S-5885	1800	1069	2482	1784
S-5823	2160	1233	2218	1870
S-6161	2251	754	2103	1703
BR-2017	1794	934	2160	1629
S-6260	1382	683	1685	1250

9	**NATIONAL UNIFORM GUAR YIELD TRIAL**
OBJECTIVE	To test the most promising strains of guar in different ecological zones of Pakistan.
RESEARCH WORKERS	Rashid Minhas and Dr. Lal Hussain Akhtar
PROJECT DURATION	2019
LOCATIONS	-
TREATMENTS/ METHODOLOGY	No. of Entries = 03 Check = BR-2017 Trial will be conducted by the Coordinator Fodder, NARC, Islamabad.
PREVIOUS YEAR'S RESULTS	

Name	**Grain Yield (Kg ha-1)**						
	BARS FatehJang	**BARI Chakwal**	**AZRI BWP**	**AZRI Bhakkar**	**AZRC D.I.Khan**	**CRI Khanpur**	**Av. All Sites**
S-5885	3525	2230	1726	1139	988	1595	1867
BR-2017 (Check)	3674	1909	1909	881	1189	1698	1877
S-6384	4233	2140	2319	1446	1385	2430	2326

	S-5823	3500	2136	1689	1100	1052	1879	1893
	LSD (0.05)	229.4	351.4	216.3	679.8	160.7	151.1	60.82

10	**EVALUATION OF ADVANCED LINES OF GUAR UNDER DROUGHT STRESS CONDITIONS.**
OBJECTIVE	To evaluate high yielding and better adapted varieties/lines of guar under drought stress conditions for areas experiencing water shortage.
RESEARCH WORKERS	Rahmat Ullah and Dr. Lal Hussain Akhtar
PROJECT DURATION	2019
LOCATION	Agricultural Research Station, Bahawalpur
TREATMENTS/ METHODOLOGY	No. of Entries = 04 Check = BR-2017 Layout = RCBD Replications = 4 Plot size = 2.7m x 7.2m Row Spacing = 45 cm **Irrigations = No irrigations after sowing till harvesting.** Data on following characters will be recorded: 1. Days to 50% flowering 7.Pods plant^{-1} 2. Days to 90% maturity 8.Grains pod^{-1} 3. Plant height 9.1000-Grain weight 4 Branches plant^{-1} 10. Pod length 5. Clusters plant^{-1} 11. Grain Yield 6. Pods cluster^{-1} 12. Root shoot ratio
PREVIOUS YEAR'S RESULTS	The results are given as under:

Varieties	**Grain Yield (Kg ha^{-1})**	
	No irrigation	3 irrigations
S-6384	1689	2801
S-5823	1577	2322
BR-2017	1569	2246
S-6161	1535	2315
S-5885	1355	2548
S-6260	977	2222
LSD(0.05)	147.22	356.61

Rainfall during the crop season:
05-07-2018= 62mm
23-07-2018= 66mm
09-08-2018= 82mm
10-08-2018= 02mm
18-08-2018= 02mm

11	**SCREENING OF NEW GUAR STRAINS AGAINST DISEASES**
OBJECTIVE	To select guar genotypes resistant/tolerant to various pathological diseases.

RESEARCH WORKERS	Saeed Ahmad and Dr. Lal Hussain Akhtar
PROJECT DURATION	2019
LOCATION	Regional Agricultural Research Institute, Bahawalpur.
TREATMENTS/ METHODOLOGY	No. of Entries = 04 Check = BR-2017 Layout = RCBD Replication = 4 Plot size = 2.7m x 7.2m Row Spacing = 45cm Data on various diseases will be recorded.
PREVIOUS YEAR'S RESULTS	

Entries	**Bacterial blight and Alternaria blight** were observed and plant reaction was as under	
	Bacterial blight	**Alternaria blight**
S-5885	Moderately Susceptible	Moderately Resistant
S-6384	Moderately Resistant	Moderately Resistant
S-6161	Moderately Susceptible	Moderately Resistant
S-5823	Moderately Resistant	Resistant
S-6262	Susceptible	Moderately Resistant
BR-2017 (Check)	Moderately Susceptible	Moderately Resistant

12	**SCREENING OF NEW GUAR GENOTYPES AGAINST INSECT PESTS**
OBJECTIVE	To select genotypes of guar resistant/tolerant to insect pests.
RESEARCH WORKERS	Muhammad Imran and Dr. Lal Hussain Akhtar
PROJECT DURATION	2019
LOCATION	Regional Agricultural Research Institute, Bahawalpur
TREATMENTS/ METHODOLOGY	No. of Entries = 04 Check = BR-2017 Layout = RCBD Replication = 4 Plot size = 2.7m x 7.2m Row Spacing = 45 cm Data on the infestation of jassid, aphid & whitefly will be recorded at an interval of 2 weeks.
PREVIOUS YEAR'S RESULTS	The Entomologist, Regional Agricultural Research Institute, Bahawalpur reported the following results

Entries	**AverageJassid/Leaf**	**Average W.F./Leaf**	**Average Aphid/Leaf**
S-5885	0.93	4.05	-
S-6384	0.70	2.21	-
S-6161	1.5	5.23	-
S-5823	0.83	4.13	-
S-6262	1.4	5.5	
BR-2017 (Check)	1.6	4.4	
LSD 5%	0.22	1.20	-

13 — **RESPONSE OF GUAR STRAINS TO N.P FERTILIZER FOR GRAIN YIELD**

OBJECTIVE — To find out the optimum dose of N&P for optimum grain yield of guar strains.

RESEARCH WORKERS — Muhammad Imran Akramand Dr. Lal Hussain Akhtar

PROJECT DURATION — 2019

LOCATION — Agricultural Research Station, Bahawalpur

TREATMENTS/ METHODOLOGY

No. of Entries = 01(New promising line S-6384)
Check = BR-2017
Replications = 3
Plot size = 1.8m x 7.2m
Row Spacing = 30cm
Layout = Split plot design
Soil analysis will be conducted before and after sowing.
Data on following characters will be recorded:

1. Days to 50% flowering
2. Days to 90% maturity
3. Plant Height
4. BranchesPlant^{-1}
5. Clustersplant^{-1}
6. Podscluster^{-1}
7. PodsPlant^{-1}
8. GrainsPod^{-1}
9. 1000-Grain weight
10. Pod length
11. Grain Yield

Treatments	**N (Kg ha^{-1})**	**P (Kg ha^{-1})**
T1	0	0
T 2	15	30
T 3	15	60
T 4	15	90
T 5	30	30
T 6	30	60
T 7	30	90
T 8	45	30
T9	45	60
T10	45	90

PREVIOUS YEAR'S RESULTS

The results are summarized as under:

Grain Yield Kg ha^{-1}

Treatments	**N (Kg ha^{-1})**	**P (Kg ha^{-1})**	**Variety**	
			BR-2017	**S-5885**
T1	0	0	1405	1640
T 2	15	30	1747	1953
T 3	15	60	2099	2373
T 4	15	90	1858	2038
T 5	30	30	2196	2493
T 6	**30**	**60**	**2385**	**2734**
T 7	30	90	2306	2652
T 8	45	30	1585	1743
T9	45	60	1710	1801
T10	45	90	1600	1609
LSD (0.05)		**V=226.9**	**NP=323.9**	

14	**RESPONSE OF GUAR STRAINS TO K. FERTILIZER FOR GRAIN YIELD.**
OBJECTIVE	To find out the optimum dose of K. for grain yield of guar
RESEARCH WORKERS	Muhammad Imran Akramand Dr. Lal Hussain Akhtar
PROJECT DURATION	2019
LOCATION	Agricultural Research Station, Bahawalpur
TREATMENTS/ METHODOLOGY	No. of Entries = 01(New promising line S-6384) Check = BR-2017 Replications = 4 Plot size = 1.8m x 7.2m Row Spacing = 45cm Layout = Split plot design Soil analysis will be conducted before and after sowing. Data on following characters will be recorded: 1. Days to 50% flowering 7. Pods Plant^{-1} 2. Days to 90% maturity 8. Grains Pod^{-1} 3. Plant Height 9. 1000-Grain weight 4 Branches Plant^{-1} 10. Pod length 5. Clusters plant^{-1} 11. Grain Yield 6. Pods cluster^{-1}

Treatments	**(Kg ha^{-1})**		
	N	**P**	**K**
T1	30	60	0
T2	30	60	30
T3	30	60	60
T4	30	60	90

PREVIOUS YEAR'S RESULTS

The results are summarized as under:

Grain Yield Kg ha^{-1}

Treatments	**(Kg ha^{-1})**			**variety**	
	N	**P**	**K**	**BR-2017**	**S-5885**
T1	30	60	0	2215	2515
T2	30	60	30	2310	2620
T3	**30**	**60**	**60**	2440	2740
T4	30	60	90	2395	2700
LSD (0.05)	**K=357.31**			**V=469.30**	

15	**EFFECT OF DIFFERENT ROW SPACING ON THE GRAIN YIELD OF NEW GUAR STRAINS.**
OBJECTIVE	To find out the optimum row spacing for new guar strains.
RESEARCH WORKERS	Muhammad Imran Akram and Dr. Lal Hussain Akhtar
PROJECT DURATION	2019
LOCATION	Agricultural Research Station, Bahawalpur
TREATMENTS/ METHODOLOGY	No. of Entries = 1(New promising line S-6384) Check = BR-2017 **Row Spacing =30cm, 45cm, 60cm** Replications = 4 Plot size = 2.7m x 7.2m

	Layout = Split plot design Data on following characters will be recorded: 1. Days to 50% flowering 7. Pods Plant^{-1} 2. Days to 90% maturity 8. Grains Pod^{-1} 3. Plant Height 9. 1000-Grain weight 4 Branches Plant^{-1} 10. Pod length 5. Clusters plant^{-1} 11. Grain Yield 6. Pods cluster^{-1}
PREVIOUS YEAR'S RESULTS	The results are summarized as under: **Grain Yield Kg ha^{-1}**

Treatments	**Row Spacing (cm)**	**variety**	
		BR-2017	**S-5885**
T1	30	2068	2274
T2	**45**	**2332**	**2700**
T3	60	1818	2425
LSD (0.05)	V=269.5	RS=337.26	

16	**EFFECT OF DIFFERENT SOWING DATES ON THE GRAIN YIELD OF NEW GUAR STRAINS.**
OBJECTIVE	To find out the optimum sowing dates for new guar strains.
RESEARCH WORKERS	Muhammad Imran and Dr. Lal Hussain Akhtar
PROJECT DURATION	2019
LOCATION	Agricultural Research Station, Bahawalpur
TREATMENTS/ METHODOLOGY	No. of Entries = 01(New promising line S-6384) Check = BR-2017 Sowing Dates = 01/05, 15/05, 01/06, 15/06, 01/07, 15/07 Replications = 4 Plot size = 2.7m x 7.2m Layout = Split plot design Data on following characters will be recorded: 1. Days to 50% flowering 7. Pods/Plant 2. Days to 90% maturity 8. Grains/Pod 3. Plant Height 9. 1000-Grain weight 4 Branches/Plant 10. Pod length 5. Clusters/plant 11. Grain Yield 6. Pods/cluster
PREVIOUS YEAR'S RESULTS	The results are summarized as under: **Grain Yield Kg ha^{-1}**

Treatments	**Variety**	
	BR-2017	**S-5885**
T1 (01/05)	2168	2400
T 2 (15/05)	2340	2363
T 3 (01/06)	2282	1817
T 4 (15/06)	**2363**	**2745**
T 5 (01/07)	2289	2390
T 6 (15/07)	1843	1446

LSD (0.05)	V=204.81	SD=583.28	

17	**EFFECT OF DIFFERENT WEEDICIDES ON THE DENSITY OF WEEDS AT DIFFERENT GROWTH STAGES IN GUAR CROP TO ACHIEVE MAXIMUM GRAIN YIELD.**
OBJECTIVE	To find out the optimum time of different weedicides application in guar for control of weeds.
RESEARCH WORKERS	Muhammad Imran Akram and Dr. Lal Hussain Akhtar
PROJECT DURATION	2019
LOCATION	Agricultural Research Station, Bahawalpur
TREATMENTS/ METHODOLOGY	Variety = BR-2017 Replications = 3 Plot size = 1.8m x 7.2m Row Spacing = 45 cm Layout = Split plot design Soil analysis will be conducted before and after sowing. Data on following parameters will be recorded **Crop parameters:** 1. Plant Height (cm) 7. Pods Plant^{-1} 2. CGR (g m^{-2} day^{-1}) 8. Grains Pod^{-1} 3. NAR (g m^{-2} day^{-1}) 9. 1000-Grain weight 4 LAI 10. Pod length (cm) 5. Clusters plant^{-1} 11. Grain Yield (Kg ha^{-1}) 6. Pods cluster^{-1} **Weeds parameters:** 1. No. of weeds m^{-2}(before & after spray) 2. Weeds Fresh weight (g m^{-2})(before spray) 3. Weeds dry weight (g m^{-2})(before spray) 4. Weed Index(before & after spray)

Treatments	Weedicides	Time of application
T1	Control	-
T2	Burner (Paraquat)	After emergence
T3	Burner (Paraquat)+ Easy Super (Quizalofop-P ethyl)	After emergence
T4	Lesher(Glyphosat)+ Easy Super (Quizalofop-P ethyl)	After emergence
T5	Control	-
T6	Burner (Paraquat)	At 3-4 Leaf stage
T7	Burner (Paraquat) + Easy Super (Quizalofop-P ethyl)	At 3-4 Leaf stage
T8	Lesher (Glyphosat) + Easy Super (Quizalofop-	At 3-4 Leaf stage

		P ethyl)	
	T9	Control	-
	T10	Burner (Paraquat)	At 8-10 leaf stage
	T11	Burner (Paraquat)+ Easy Super (Quizalofop-P ethyl)	At 8-10 leaf stage
	T12	Lesher (Glyphosat) + Easy Super (Quizalofop-P ethyl)	At 8-10 leaf stage
PREVIOUS YEAR'S RESULTS	New experiment		

18	**RESPONSE OF VARIOUS FUNGICIDES TOCONTROL FUNGAL DISEASES OF GUAR CROP UNDER IRRIGATED CONDITIONS OF BAHAWALPUR FOR SEED YIELD.**
OBJECTIVE	To find out appropriate fungicides for control of fungal diseases of guar crop to achieve maximum seed yield.
RESEARCH WORKERS	Muhammad Imran Akram and Dr. Lal Hussain Akhtar
PROJECT DURATION	2019
LOCATION	Agricultural Research Station, Bahawalpur
TREATMENTS/ METHODOLOGY	Variety/line = BR-2017, S-6384 Replications = 3 Plot size =1.8m x 7.2m Row Spacing = 45cm Layout = Split Plot Soil analysis will be conducted before and after sowing. Data on following characters will be recorded: 1. Days to 50 % flowering 7. Wilting % 2. Days to 90 % maturity 8. Root/Shoot Ratio 3. Plant Height (cm) 9. Pod length (cm) 4 Clusters plant^{-1} 10. 1000-Grain weight 5. Pods cluster^{-1} 11. Grain Yield (kg ha^{-1}) 6. Pods plant^{-1}
PREVIOUS YEAR'S RESULTS	New experiment

Treatments	**Fungicides**
T1	Antracol 70 WP @ 500 g/100 lit
T2	Acrobat MZ @ 400 g/100 lit
T3	Aliette 80 WP @ 250 g/100 lit
T4	Emistar Top @ 200 ml/acre
T5	Topsin-M 150 g/100 lit
T6	Topas 100 EC @ 50 ml/100 lit
T7	Redomil Gold @ 250 g/100 lit
These fungicides will be sprayed thrice with 7 days interval a/f 35 DAS as preventive measures.	

19	**SEEDPRODUCTION OF GUARAND SORGHUM CROPS**
OBJECTIVE	To produce pre-basic seed of approved varieties of Guar and Sorghum crops to meet the requirement of seed companies/ growers/farmers of the southern Punjab.
RESEARCH WORKERS	Muhammad Zubair, Rashid Minhas and Dr. Lal Hussain Akhtar
PROJECT DURATION	2019
LOCATION	Agricultural Research Station, Bahawalpur
TREATMENTS/ METHODOLOGY	Guar Varieties =BR-99 & BR2017 Sorghum Varieties = Sorghum-2011 & SJ-263 The BNS of Sorghum varieties will be provided by the Director, FRI, Sargodha
PREVIOUS YEAR'S RESULTS	The BNS & Pre-basic seed produced during Kharif, 2018 is as follows;

Results	**Guar**		**Sorghum**	
	BR-2017	**BR-99**	**Sorghum-2011**	**JS-263**
No. of plants selected for plant to row planting	100	100	-	-
No. of plant to rows selected for planting in Blocks	35	40	-	-
No. of Blocks selected	10	15	-	-
BNS seed (Kg)	80	100	-	-
Pre-basic seed (Kg)	720	1600	1600	468

2. PEARL MILLET (*Pennisetum americanum*)

20	**ADAPTABILITY TRIAL OF PEARL MILLET**
OBJECTIVE	To test the advanced varieties/lines of pearl millet in different ecological zones of the Punjab for their green fodder yield and adaptability.
RESEARCH WORKERS	Rahmat Ullahand Dr. Lal Hussain Akhtar
PROJECT DURATION	2019
LOCATION	Agricultural Research Station, Bahawalpur
TREATMENTS/ METHODOLOGY	The seed and methodology of the trial will be received from the Director, FRI, Sargodha.
PREVIOUS YEA'S RESULTS	The results were sent to Director, Fodder Research Institute, Sargodha and are summarized as under:

Entry	**GFY(t ha^{-1})**
Q. Bajra	76.0
No.7703	63.0
FB-809	70.7
Sgd. Bajra-2011 (Check)	81.0
FB-797	88.3
CZK-923	93.7
G.White	84.7

	FB-791	81.3

3. **SORGHUM (*Sorghum bicolor*)**

21	**ADAPTABILITY TRIAL OF SORGHUM**
OBJECTIVE	To test the advanced varieties/lines of Sorghum in different ecological conditions of the Punjab for their green fodder yield and adaptability.
RESEARCH WORKERS	Muhammad Zubair and Dr. Lal Hussain Akhtar
PROJECT DURATION	2019
LOCATION	Agricultural Research Station, Bahawalpur
TREATMENTS/ METHODOLOGY	The seed and methodology of the trial will be received from the Director, FRI, Sargodha.
PREVIOUS YEAR'S RESULTS	The results were sent to Director, Fodder Research Institute, Sargodha and are summarized as under:

Entry	**GFY(t ha^{-1})**
F-01-2016	**47.6**
F-02-2016	35.0
PVK-801	36.0
FRI-07	35.0
S-145	37.4
JS-1	39.9
JS-2002 (Check)	**43.1**
Sorghum-2011	43.3

4. **MAIZE (*Zea mays* L.)**

22	**ADAPTABILITY GREEN FODDER YIELD TRIAL OF MAIZE**
OBJECTIVE	To test the advanced varieties/lines of Maize in different ecological zones of the Punjab for their green fodder yield and adaptability.
RESEARCH WORKERS	Muhammad Shahjhan Bukhari and Dr. Lal Hussain Akhtar
PROJECT DURATION	2018
LOCATION	Agricultural Research Station, Bahawalpur
TREATMENTS/ METHODOLOGY	The seed and methodology of the trial will be received from the Director, FRI, Sargodha.
PREVIOUS YEA'S RESULTS	The results were sent to Director, Fodder Research Institute, Sargodha and are summarized as under:

Entry	**GFY(t ha^{-1})**
MS-04-2016	55.92
MS-05-2016	49.62
MS-07-2016	62.99
MS-01-2016	68.88
MS-03-2015	42.96
Sgd.2002 (Check)	43.70
FSD.2020	46.29
FSD.2025	52.21

FODDER RESEARCH SUB-STATION AARI, FAISALABAD

1. SORGHUM

1. TITLE	**COLLECTION AND MAINTENANCE OF SORGHUM GERMPLASM**
OBJECTIVE	To maintain the purity of breeding genepool of sorghum lines possessing desirable traits for direct introduction. Also usethe material for hybridization purpose.
RESEARCH WORKER(S)	Dr. Qamar Shakil, Ahmed Hassan Khan, Suleman Raza.
PROJECT DURATION	Continues Nature.
LOCATION	Fodder Research Sub-Station, AARI Faisalabad.
TREATMENT	Germplasm lines/varieties = 105
METHODOLOGY	Method of Sowing: line sowing Row length: 3m Row to Row distance: 60 cm No of rows: 2 Sowing Time: July

PREVIOUS YEAR'S RESULTS

One hundred Sorghum accessions were evaluated for following traits.

CHARACTER	RANGE
Plant height at 50% flowering	(96-325 cm)
Leaf Area	(176-445 cm^2)
No of leaves/plant	(11-19)
Stem thickness	(1.1-3.1 cm)
Days to 50% flowering	(70-95)
Days to maturity	(95-135)
leaf color	(light to dark green)
TSS	(04 to 13%)
Early maturing	(95-100 days)
Late maturing	(Above 125 days)

The seed of five selfed bagged plants was collected to avoid out rossing and kept reserved for further studies in the next year.

2.TITLE **HYBRIDIZATION OF SORGHUM AND STUDY OF FILIAL GENERATIONS (F1-F6)**

OBJECTIVE To create sufficient genetic variability in order to select distinct recombinants possessing desirable traits i.e.

1. High fodder yield potential
2. Stay green
3. Leaf to stem ratio
4. Juiciness
5. Quality
6. Greenish
7. Grain yield
8. Insect and disease resistant.

RESEARCH WORKER(S) Dr.Qamar Shakil, Ahmed Hassan Khan, Suleman Raza

PROJECT DURATION 2019

LOCATION Fodder Research Sub-Station, AARI Faisalabad.

TREATMENT/ METHODOLOY CROSSES OF SORGHUM TO BE ATTEMPTED

Sr#	Cross	Purpose
1	China X FS26 II	Height, TSS
2	JS-263 X SL 15	High Grain Yield, height
3	KALASH x NARC 1620	Tallness, Insect Resistance
4	JS-3911 X Sildmarhar	Insect résistance and Number of Leaves
5	SL-15 X A-ASIL	Protein Percentage and Sweetness
6	JS-2002 X SANDAL BAR	Stay Green & Better Quality,
7	AUS- 07 X S- 2011	Dry Matter Percentage & Lodging Resistance
8	Hegari X S- 2011	Lodging resistance & juiciness
9	JS-04 X JS-263	Disease Resistanceand Protein percentage
10	SL-18 X MSM- 03	High Protein & high GFY

F_1 will be planted in single row along with parents.
F_2 will be planted in four rows each.
F_3-F_6 will be planted in three rows each.
Row Spacing 60 cm
Row length 03 m
Sowing time July

CROSSES/PROGENIES TO BE STUDIED.

Generations	Crosses/Progenies
F1	10 crosses
F2	09 (recombinants)
F3	10 Progenies
F4	15 Progenies
F5	14 Progenies
F6	12 Progenies

All the above mentioned progenies will be studied in a pedigree selection method.

PREVIOUS YEAR'S RESULTS.

FILIAL GENERATION	CROSSES/PROGENIES	
	Studied	Selected
F1	10	09
F2	12	10
F3	18	15
F4	20	14
F5	22	12
F6	20	08

3. TITLE **PRELIMINARY GREEN FODDER YIELD TRIAL ON SORGHUM**

OBJECTIVE To study yield performance of elite advance lines selected from F5, F6 and F7on the basis of phenotypic superiority, uniformity and resistance to disease and insect.

RESEARCH WORKER(S) Dr. Qamar Shakil, Ahmed Hassan Khan, Suleman Raza

PROJECT DURATION 2019.

LOCATION Fodder Research Sub-Station, AARI Faisalabad.

TREATMENT/ METHODOLOY The seed will be received along with sowing methodology from Director, Fodder Research Institute Sargodha. Fodder Research Sub-Station AARI, Faisalabad will contribute the following elite lines.

Sr.No	Varieties/Lines
1.	F-01-19
2.	F-02-19
Check varieties	JS-2002 and Sorghum-2011.
Lay out	R.C.B.D
Replication	3
Sowing Method	line sowing
Row spacing	30cm
Sowing Time	June-July

PREVIOUS YEAR'S RESULTS.

Sr.No	Coded Varieties	GFY (t/ha)
1.	SD-167	73.68
2.	YSS-15	65.11
3.	JABLE	64.72
4.	F-01-2018	63.94
5.	FRI-02	63.55
6.	F-02-2018	62.38
7.	YSS-89	61.99
8.	NO.39501	61.99
9.	**JS-2002(check)**	**61.99**
10.	**Sorghum-2011(check)**	**60.82**
11.	NO6197	58.48
12.	I-6	57.70
13.	65174-2	57.31
14.	F-03-2018	53.02
	LSD @ 5%	7.11

4. TITLE **ADVANCE GREEN FODDER YIELD TRIAL ON SORGHUM.**

OBJECTIVE To evaluate the green fodder yield potential of the most promising lines, which are selected on the basis of their morphological traits from the preliminary yield trial.

RESEARCH WORKER(S) Dr. Qamar Shakil, Ahmed Hassan Khan, Suleman Raza

PROJECT DURATION 2019.

LOCATION Fodder Research Sub-Station, AARI Faisalabad.

TREATMENT/ METHODOLOGY The seed will be received along with sowing methodology from Director, Fodder Research Institute Sargodha. Fodder Research Sub-Station AARI, Faisalabad will contribute the following elite lines.

Sr.No	Varieties/Lines
1.	F-01-18
2.	F-02-18

Check varieties	JS-2002 and Sorghum-2011.
Lay out	R.C.B.D
Replication	3
Sowing Method	line sowing
Row spacing	30cm
Sowing Time	June-July

PREVIOUS YEAR'S RESULTS.

Sr.#	Coded Varieties	GFY (t/ha)
1.	SGD-02-17	77.78
2.	SGD-01-17	72.59
3.	F-01-2017	68.52
4.	NO.5017	63.70
5.	**Sorghum-2011 (check)**	**61.11**
6.	**JS-2002(check)**	**59.63**
7.	F-2-2017	57.41
8.	NO.1863	39.26
	LSD @ 5%	6.7

5. TITLE **ZONAL GREEN FODDER YIELD TRIAL ON SORGHUM.**

OBJECTIVE To evaluate promising/Candidate lines of sorghum for their green fodder yield in various agro ecological zones in Punjab province.

RESEARCH WORKER(S) Dr. Qamar Shakil, Ahmed Hassan Khan, Suleman Raza

PROJECT DURATION 2019.

LOCATION Fodder Research Sub-Station, AARI Faisalabad.

TREATMENT/ METHODOLOY The seed along with methodology will be received from Director, Fodder Research Institute Sargodha. This station will contribute in the trial with the following elite lines.

1. F-01-2017
2. F-02-2017

PREVIOUS YEAR'S RESULTS.

Sr.No	Coded Varieties	Green Fodder Yield (t/hac)
1.	F-02-2016	72.59
2.	S-145	72.22
3.	PVK-801	64.81
4.	FRI-07	64.07
5.	**SORGHUM-2011 (check)**	62.59
6.	**JS-2002 (check)**	61.85
7.	JS-01	61.11
8.	F-01-2016	54.07
	LSD @ 5 %	7.04

6. TITLE	**NATIONAL UNIFORM GREEN FODDER YIELD TRIAL ON SORGHUM**
OBJECTIVE	To test the green fodder yield performance of coded promising/candidate lines on a wide range of agro ecological conditions throughout the country.
RESEARCH WORKER(S)	Dr. Qamar Shakil, Ahmed Hassan Khan, Suleman Raza
PROJECT DURATION	2019.
LOCATION	Fodder Research Sub-Station, AARI Faisalabad.
TREATMENT/ METHODOLOY	The seed/sowing plan will be supplied by the Coordinator (Fodder) NARC, Islamabad and the trial will be laid out accordingly. Data will be recorded as per instruction. This station will contribute in the trial with the following elite lines. 1. FD-3290 2. FD-4154
PREVIOUS YEAR'S. RESULTS	Results Awaited
7. TITLE	**NATIONAL UNIFORM GREEN FODDER YIELD TRIAL ON S.S HYBRID**
OBJECTIVE	To test the green fodder yield performance of coded promising/candidate liens on a wide range of agro ecological conditions throughout the country.
RESEARCH WORKER(S)	Dr. Qamar Shakil, Ahmed Hassan Khan, Suleman Raza
PROJECT DURATION	2019.
LOCATION	Fodder Research Sub-Station, AARI Faisalabad.
TREATMENT/ METHODOLOY	The seed/sowing plan will be supplied by the Coordinator (Fodder) NARC, Islamabad and the trial will be laid out accordingly. Data will be recorded as per instruction. This station will contribute in the trial an advance line of multicut sorghum, AK-113
PREVIOUS YEAR'S RESULTS	**A& B TRIAL. (Yield per 2 cuts):** Results awaited.

9. TITLE **ZONAL GREEN FODDER YIELD TRIAL ON MAIZE**

OBJECTIVE To evaluate green fodder yield potential of different varieties of Maize in various agro ecological conditions in Punjab.

RESEARCH WORKER(S) Dr. Qamar Shakil, Ahmed Hassan Khan, Suleman Raza

PROJECT DURATION 2019.

LOCATION Fodder Research Sub-Station, AARI Faisalabad.

TREATMENT/ METHODOLOY The seed will be supplied by the Director, Fodder Research Institute Sargodha along with sowing plan and methodology. This station will contribute in the trial with the following elite lines.

FSD MAIZE 2020

PREVIOUS YEAR'S RESULTS

Sr.No	Coded Variety	GFY (t/ha)
1.	MS-07-2016	61.99
2.	FSD.2025	60.62
3.	FSD.2020	60.43
4.	MS-01-2016	59.65
5.	MS-03-2015	58.09
6.	MS-05-2016	57.70
7.	**Sgd.2002 (check)**	**57.31**
8.	MS-04-2016	54.19
	LSD @ 5%	5.9

10. TITLE **NATIONAL UNIFORM GREEN FODDER YIELD TRIAL ON MAIZE**

OBJECTIVE To evaluate green fodder yield potential of different varieties of Maize in various agro ecological in Punjab.

RESEARCH WORKER(S) Dr. Qamar Shakil, Ahmed Hassan Khan, Suleman Raza

PROJECT DURATION 2019.

LOCATION Fodder Research Sub-Station, AARI Faisalabad.

TREATMENT METHODOLOY The seed sowing plan will be supplied by Coordinator (Fodder, NARC, Islamabad and the trial will be laid out accordingly. Data will be recorded as per instruction. This station will contribute in the trial with the following elite line.

FSD Maize -2025

PREVIOUS YEAR'S RESULTS Results awaited

PEARL MILLET:

11 TITLE **ZONAL GREEN FODDER YIELD TRIAL ON PEARL MILLET**

OBJECTIVE To evaluate green fodder yield potential of different varieties of millet in various agro ecological conditions in Punjab.

RESEARCH WORKER(S) Dr. Qamar Shakil, Ahmed Hassan Khan, Suleman Raza

PROJECT DURATION 2019.

LOCATION Fodder Research Sub-Station, AARI Faisalabad.

TREATMENT/ METHODOLOY The seed, along with the sowing plan will be received from Director, Fodder Research Institute Sargodha along with sowing plan and methodology. This station will contribute in the trial with the following elite lines.

1. FB-889 2. FB-895

PREVIOUS YEAR'S RESULTS.

Sr.No	Coded Varieties	GFY (t/ha)
1.	G WHITE	64.51
2.	NO7703	62.65
3.	FB-797	62.35
4.	C2K923	61.73
5.	FB-791	59.57
6.	FB-809	57.41
7.	**BAJRA-2011(check)**	**54.63**
8.	C2K923	53.09
	LSD @5%	8.1

12 TITLE **NATIONAL UNIFORM GREEN FODDER YIEDL TRIALS ON MILLET**

OBJECTIVE To evaluate promising lines of millet for green fodder yield.

RESEARCH WORKER(S) Dr. Qamar Shakil, Ahmed Hassan Khan, Suleman Raza

PROJECT DURATION 2019.

LOCATION Fodder Research Sub-Station, AARI Faisalabad.

TREATMENT METHODOLOY The seed sowing plan will be supplied by Coordinator Fodder, NARC, Islamabad and the trial will be laid out accordingly. Data will be recorded as per instruction. This station will contribute in the trial with the following elite lines.

1. FB-792 **2. FB-806**

PREVIOUS YEAR RESULT: Results awaited

13. TITLE	**NATIONAL UNIFORM GREEN FODDER YIEDL TRIALS ON JANTAR**
OBJECTIVE	To evaluate promising lines of Jantar for green fodder yield.
RESEARCH WORKER(S)	Dr. Qamar Shakil, Ahmed Hassan Khan, Suleman Raza
PROJECT DURATION	2019.
LOCATION	Fodder Research Sub-Station, AARI Faisalabad.
TREATMENT METHODOLOY	The seed sowing plan will be supplied by Coordinator Fodder, NARC, Islamabad and the trial will be laid out accordingly. Data will be recorded as per instruction. This station will contribute in the trial with the following elite line 1. **SA-1**
PREVIOUS YEARS RESULT:	Results awaited

AGRONOMIST (FORAGE PRODUCTION), AARI, FAISALABAD

14. Title: **EFFECT OF PLANTING METHODS ON GREEN FODDER YIELD OF MAIZE-1501**

Objective: To determine the best sowing method for maximum green fodder yield of promising line maize-1501.

RESEARCH WORKERS: Muhammad Arshad and Arbab Jahangeer.

DURATION: 2019-2021

LOCATION: Agronomy (Forage Production) Section AARI, Faisalabad

TREATMENTS:

- **T_1** Broadcast
- **T_2** Broadcast with furrows
- **T_3** Line sowing (20 cm apart rows)
- **T_4** Line sowing (30 cm apart rows)

METHODOLOGY: The experiment will be sown according to the treatments as mentioned with recommended seed rate 100kg/ha and fertilizer dose (NPK 120-80-25 kg ha^{-1}) having plot size 3m × 6m in split plot design with 4 replications. All Agronomic practices will be kept uniform. Data regarding plant height, number of leaves per plant, number of plants/m^2 and green fodder yield will be recorded.

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

Title: 2 **EFFECT OF PLANTING METHODS ON GREEN FODDER YIELD OF DIFFERENT SORGHUM VARIETIES/ PROMISING LINES**

Objective: To determine the best sowing method for maximum green fodder yield among different sorghum varieties/promising lines.

RESEARCH WORKERS: Arbab Jahangeer and Muhammad Arshad.

DURATION: 2018-2019

LOCATION: Agronomy (Forage Production) Section AARI, Faisalabad

TREATMENTS:

Varieties/Lines (Main Plot)

- **T_1**= Sorghum 2011
- **T_2**= K-94
- **T_3**= PVK-801

Planting Methods (Sub Plot)

- **M_1** Broadcast
- **M_2** Broadcast with furrows
- **M_3** Line sowing (30 cm apart rows)

METHODOLOGY: The experiment will be sown according to treatments with recommended seed rate @ 80kg/ha and fertilizer dose (NPK80-60-25 kg ha^{-1}) having plot size 3m × 6m in split plot design with 3 replications. All agronomic practices will be kept uniform. Data regarding plant height, number of leaves per plant, number of plants/m^2 and green fodder yield etc. will be recorded.

PREVIOUS YEAR'S RESULTS:

Variety/lines / Sowing Methods	Green Fodder Yield (t/ha)			
	Sorghum-2011	**K-94**	**PVK-801**	**Means**
Broadcast	50.40 c	56.50 b	47.40 d	51.43 ab
Broadcast with Furrows	56.70 b	60.80 a	50.90c	56.13 a
Line sowing	46.20 d	49.40 cd	44.60 e	46.73 b
Means	51.10 b	55.57 a	47.63 c	
LSD for Varieties = 2.214, Sowing Methods = 5.989, Interaction = 3.835				

TITLE:3 **FODDER YIELD AND QUALITATIVE RESPONSE OF PEARL MILLET PLANTED ALONE AND IN MIXTURE WITH GUAR AND COWPEA**

OBJECTIVE: To determine the best combination of leguminous and non-leguminous fodders for best quality fodder and maximum green fodder yield.

RESEARCH WORKERS: Muhammad Arshad and Arbab Jahangeer

DURATION: 2017-2019

LOCATION: Agronomy (Forage Production) Section AARI, Faisalabad

TREATMENTS: **Planting Methods**

T_1 Pearl Millet alone
T_2 Guar alone
T_3 Cowpea alone
T_4 Pearl millet (50%) + Guar (50%)
T_5 Pearl millet (50%) + cowpea (50%)
T_6 Pearl millet (50%) + Guar (25%) + Cowpea (25%)

METHODOLOGY: The experiment will be sown by broadcast method with recommended fertilizer dose (NPK80-60-25kg ha^{-1}) having plot size 3m × 6m in RCBD with 3 replications. All Agronomic practices will be kept uniform. Data regarding plant height, number of plants/m^2, green fodder yield, TDN, Crude Protein, crude fiber and ash % etc. will be recorded.

PREVIOUS YEAR'S RESULTS:

Treatments	Green Fodder Yield (t/ha)	Crude Protein (%)
T1 = Pearl Millet alone	79.63 a	09.04
T2 =Guar alone	28.98 e	18.67
T3= Cowpea alone	21.52 f	15.17
T4 = Pearl millet (50%) + Guar (50%)	77.22 b	12.83
T5= Pearl millet (50%) + cowpea (50%)	65.18 d	10.50
T6 = Pearl millet (50%) + Guar (25%) + Cowpea (25%)	70.04 c	14.29
LSD value for GFY= 2.362		

Title:4 **EFFECT OF PLANTING TIME OF MAIZE LINE 1501 ON MAXIMUM GREEN FODDER YIELD**

Objective: To determine the best planting /sowing date for maximum green fodder yield of maize-1501.

RESEARCH WORKERS: Arbab Jahangeer and Muhammad Arshad

DURATION: 2018-2020

LOCATION: Agronomy (Forage Production) Section AARI, Faisalabad

TREATMENTS: **Planting dates**

- **T_1** 15^{th}June
- **T_2** 1^{st} July
- **T_3** 15^{th} July
- **T_4** 1^{st} August
- **T_5** 15^{th}August

METHODOLOGY: The experiment will be sown according to the treatments as mentioned with recommended seed rate 100kg/ha and fertilizer dose (NPK120-80-25kg ha^{-1}) having plot size 3m × 6m in RCBD with 3 replications. All Agronomic practices will be kept uniform. Data regarding plant height, number of leaves per plant, number of plants/m^2 and green fodder yield will be recorded.

PREVIOUS YEAR'S RESULTS:

Treatments	**Green Fodder Yield (t/ha)**
T1 = 1^{st} June	39.33 d
T2 = 15^{th} June	42.60 c

T3 = 1st July	44.00 c
T4 = 15th July	50.60 a
T5 = 1st August	46.83b
LSD value for GFY = 2.774	

Title: 5 **EFFECT OF SOWING TIME OF SORGHUM ON GREEN FODDER YIELD**

Objective: To determine the best planting /sowing date for maximum green fodder yield of sorghum K-94.

RESEARCH WORKERS: Muhammad Arshad and Arbab Jahangeer.

DURATION: 2017-2019

LOCATION: Agronomy (Forage Production) Section AARI, Faisalabad

TREATMENTS: **Planting dates**

T_1 1st June
T_2 15th June
T_3 1st July
T_4 15th July
T_5 1st August

METHODOLOGY: The experiment will be sown according to treatments with recommended seed rate @ 80kg/ha and fertilizer dose (NPK80-60-25 kg ha^{-1}) having plot size 3m ×6m in RCBD with 3 replications. All agronomic practices will be kept uniform. Data regarding plant height, number of leaves per plant, number of plants/m^2 and green fodder yield will be recorded.

PREVIOUS YEAR'S RESULTS:

Treatments	Green Fodder Yield (t/ha)
T_1= 15th June	56.66 a
T_2= 30th June	52.45 b
T_3= 15th July	51.48 b
T_4= 30th July	39.53 d
LSD Value for GFY=3.231	

Title:6 **ADAPTABILITY TRIAL OF COWPEAS**

Objective: To determine the adaptability of cowpea strains at different locations for maximum green fodder yield.

RESEARCH WORKERS: Muhammad Arshad and ArbabJahangeer.

DURATION: 2018-2019

LOCATION: Agronomy (Forage Production) Section AARI, Faisalabad

TREATMENTS: **V_1=CP-383**

V_2=CP- 271
V_3=CP-162
V_4=CP-145
V_5=IT-552
V_6=CP-219
V_7=Cowpeas (Ravan-2003) Check

METHODOLOGY: The experiment will be sown according to the treatments as mentioned above in RCBD with 4 replications. All Agronomic practices will be kept uniform. Data regarding green fodder yield will be recorded.

PREVIOUS YEAR'S RESULTS:

Treatments	Green Fodder Yield (t/ha)
V_1=CP-383	36.043 a
V_2=CP-271	29.305 c
V_3=CP-162	25.035 e
V_4=CP-145	23.160 f
V_5=IT-552	23.160 f
V_6=CP-219	27.985 d
V_7=Cowpeas (Ravan-2003) Check	31.840 b
LSD value for GFY = 1.1074	

Title: 7 **EFFECT OF DIFFERENT RATIONS ON MILK PRODUCTION IN BUFFALOES**

Objective: To determine the effect of different rations on milk production in buffaloes.

RESEARCH WORKERS: Dr. Abdul Majid.

DURATION: 2018-2020

LOCATION: Dairy Farm Agronomy (Forage Production) Section AARI, Faisalabad

TREATMENTS: **Composition of rations**

Ingredient	Rations No.1	Rations No.2	Rations No.3
Maize	46%	UAF Wanda	Anmol Wanda
Wheat	-		(L & DD)
Wheat bran	-		
Rice Polishing	20%		
Cotton seed cake	-		
Saroon seed cake	-		

Sun flower cake	20%		
Molasses	10%		
Sodium chloride	1%		
Di calcium Phosphate	2%		
Sodium bi carbonate	1%		
Total	**100**		

METHODOLOGY: Nine lactating buffaloes having similar lactation period and production will be randomly selected from the dairy herd of this formation and each ration will be fed to three buffaloes in each treatment. Data regarding daily milk yield /day, weight, milk composition (fat, protein and SNF) will be recorded.

PREVIOUS YEAR'S RESULTS: **Average Milk Yield/Animal/day (litre)**

Ration 1	Ration 2	Ration 3
10.35	9.10	9.50

AGRONOMY

1. TITLE: EFFECT OF DIFFERENT SEED RATE ON GREEN FODDER YIELD OF ADVANCE LINE OF SORGHUM NO. 1572

OBJECTIVE: To study optimum seed rate for maximum fodder production of Sorghum line.

RESEARCH WORKERS: Muhammad Riaz Gondal and Anees-ul-Husnain.

PROJECT DURATION: 2018-19

LOCATION: Fodder Research Institute, Sargodha

TREATMENT/ METHODOLOGY: Seed rate = 60, 70, 80, 90, 100 kg/ha

Layout	=	RBCD
R-R Spacing	=	30cm
Plot size	=	2.7m x 6m
Replication	=	4

Following observations will be recorded:

- No of plants/m^2
- Leaf Area
- Plant height
- Stem thickness
- Leaves/ plant
- Fodder yield (t/ha)

PREVIOUSYEAR'S RESULTS

Treatments (Seed rate)	Green Fodder Yield (t/ha)
T1 (60 kg/ha)	65.43
T2 (70 kg/ha)	55.86
T3 (80 kg/ha)	59.75
T4 (90 kg/ha)	54.78
T5 (100 kg/ha)	55.25
LSD 5%	

2. TITLE: EFFICACY OF DIFFERENT WEEDICIDES ON S.S HYBRID.

OBJECTIVE: To study most effective dose weedicide for maximum control of weeds in S.S hybrid.

RESEARCH WORKERS: Muhammad Riaz Gondal and Anees-ul-Husnain.

PROJECT DURATION: 2018-19

LOCATION: Fodder Research Institute, Sargodha

TREATMENT/ METHODOLOGY

Layout	=	RCBD
Replication	=	4
Plot Size	=	2.7 x 6m
Variety	=	Pak-Sudax
Seed rate	=	40 kg/ha

Weedicides	Doses
Clodinafop(propergyl)	T1 = 01 g/ litre water just after 1st cut.
	T2 = 1.5 g / litre water just after 1ST cut.
Paraquat	T3 = 6 ml/ litre water just after 1st cut
	T4 = 8 ml/ litre water just after 1st cut
Round up	T5 = 6ml/ litre water just after 1st cut
	T6 = 8ml/ litre water just after 1st cut
Poma super	T7 = 4ml/ liter water just after 1st cut
	T8 = 6 ml/ liter water just after 1st cut.
Control	----------

OBSERVATIONS TO BE RECORDED.

1 Weed count/ unit area before spray
2 Weed count/ unit area 30 days after spray
3 Plant height
4 Stem thickness
5 Leaf area
6 No.of leaves/ tillers
7 Green fodder yield.
8 Weed count/ unit area after 2nd and 3rd cut.

PREVIOUSYEAR'S RESULTS

Weedicides	Treatments	Yield t/ha
Clodinafop(propergyl	T1 = 01 g/ litre water just after 1st cut.	76
	T2 = 1.5 g / litre water just after 1ST cut.	76.25
Paraquat	T3 = 6 ml/ litre water just after 1st cut	78.5
	T4 = 8 ml/ litre water just after 1st cut	77.5
Round up	T5 = 6ml/ litre water just after 1st cut	92.75
	T6 = 8ml/ litre water just after 1st cut	96
Poma super	T7 = 4ml/ liter water just after 1st cut	75.75
	T8 = 6 ml/ liter water just after 1st cut.	76.25
Control	T9 = control	49
LSD 5%		

3. TITLE: EVALUATION OF SORGHUM LINES/VARIETIES FOR RATOONING POTENTIAL

OBJECTIVE: To find different Sorghum lines/ varieties to check the multi-cut status

RESEARCH WORKERS: Muhammad Riaz Gondal and Anees-ul-Husnain.

PROJECT DURATION: 2019-20

LOCATION: Fodder Research Institute, Sargodha

TREATMENT/ METHODOLOGY: Sorghum varieties/lines

1.PVK-801 2. FRI-07 3. S-145
4. JS-1 5. SGD-01-17 6. SGD-02-16
7. NO-5017 8. Sorghum-2011(check)

Layout = RCBD
Plot size = 2.7 x 6m
Replication = 4
Sowing time = April - May

The following observations will be recorded:

- Plant height (cm) - No. of leaves/tiller
- Stem thickness (mm) - Fodder yield (t/ha)
- Ist cut will be taken at 50% flowering

PREVIOUSYEAR'S RESULTS: New Experiment

4. TITLE: ROLE OF BRACE ROOTS IN DIFFERENT MAIZE VARIETIES AGAINST LODGING

OBJECTIVE: To study the effect of brace roots for quality and lodging

RESEARCH WORKERS: Muhammad Riaz Gondal and Anees-ul-Husnain.

PROJECT DURATION: 2019-20

LOCATION: Fodder Research Institute, Sargodha

TREATMENT/ METHODOLOGY: Lines/varieties

1.Sgd-2002 2. No.1501 3. MS-2010
4.MMRI- yellow 5. Malka 6. MS-2015
7. Pearl 8. Swat-white

Seed rate = 10 kg/ha
Layout = RCBD
R-R Spacing = 45cm
Plot size = 2.7 x 6m
Replication = 4
Sowing time = July-August

The following observations will be recorded:

- No of lodged plants/m^2 - Plant height (cm)
- Stem thickness (mm) - No.of plants with brace roots/m^2
- No.of plants without brace roots/m^2
- Fodder yield (t/ha)

PREVIOUSYEAR'S RESULTS: New Experiment

5. TITLE: EFFECT OF LEGUMES INTERCROPING ON SORGHUM FODDER PRODUCTION

OBJECTIVE: To study optimum combination legumes with sorghum crops for maximum fodder production

RESEARCH WORKERS: Muhammad Riaz Gondal and Anees-ul-Husnain.

PROJECT DURATION: 2019-20

LOCATION: Fodder Research Institute, Sargodha

TREATMENT/ METHODOLOGY: 1. Sorghum+Jantar 2. Sorghum+Guar
3. Sorghum+ Cowpeas 4. Sorghum alone

Seed rate

Jantar = 20kg/ha Sorghum = 32kg/ha
Guar = 25kg/ha Cowpeas = 20kg/ha

Layout	=	RCBD
R-R Spacing	=	45cm (Sorghum)
Legumes	=	22.5 cm
Plot size	=	3.6 x 6m
Replication	=	4
Sowing date	=	Month of July

The following observations will be recorded:

- Plant height (cm) - Stem thickness(mm)
- Leaf area(cm^2) - No.of leaves/ tiller
- No.of heads/m^2 - No.of tiller/m^2
- Fodder yield t/ha - Weight of heads/m^2

PREVIOUSYEAR'S RESULTS: New Experiment

6. TITLE: EFFECT OF PLANTING DENSITY AND GENOTYPE OF COWPEAS ON GROWTH AND SEED YIELD OF MILLET

OBJECTIVE: To study the effect of planting density and genotypes of Cowpeas on growth and seed yield of Millet

RESEARCH WORKERS: Muhammad Riaz Gondal and Anees-ul-Husnain.

PROJECT DURATION: 2019-20

LOCATION: Fodder Research Institute, Sargodha

TREATMENT/ METHODOLOGY:

Varieties/lines

CP-383	CP-145	CP-271
IT-84 D-552	CP-162	CP-219
Cowpeas-2002	Elite	

1.1(Millet & cowpea) Density-1
1.2(Millet & Cowpea) Density-2

Layout = Split pot design
R-R Spacing = 60cm for Millet & 30cm, 20cm for Cow peas
Plot size = 4.8 x 6m
Replication = 4

Following observations will be recorded:-

- No of panicle/m^2
- Panicle weight/m^2
- Leaf Area (cm^2)
- No.of pods /m^2(cowpeas)
- Pods yield/m^2
- 1000 grain weight
- Plant height(cm)
- Tillers/m^2
- Growth rate will be measured at three stages (35,55 & 75 days after sowing)
- Fodder yield (t/ha)
- Seed yield

PREVIOUSYEAR'S RESULTS: New Experiment

SOIL SCIENCE

1.TITLE **EFFECT OF DIFFERENT CONCENTRATION OF NPK AS FOLIAR SPRAY ON GOWTH AND YIELD OF MAIZE**

OBJECTIVE To find out the best economical dose of NPK as foliar spray with basal dose to obtain maximum green fodder yield of maize

RESEARCH WORKERS Asim Pervez, M. Shoaib Farooq and Abdul Razzaq

PROJECT DURATION 2019-20

LOCATION Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY

T1	90-80-62 (NPK kg ha^{-1}basal dose)
T2	NPK basal dose+ 2gLit^{-1} NPK foliar spray
T3	NPK basal dose +4 g Lit^{-1} NPK foliar spray
T4	NPK basal dose +6 g Lit^{-1} NPK foliar spray
T5	NPK basal dose + 8 g Lit^{-1} NPK foliar spray

Lay out = RCBD
Replications = 3
Plot size = 3m x6 m
Line/variety = No.1501
Sowing method = Broadcast

Potash and phosphorous will be applied at the time of sowing while nitrogen will be applied in split applications along with irrigations. Foliar applications will be applied after 20 days interval. The following observations will be recorded:

1. Plant height
2. Stem thickness
3. Leaf area(after 20 days interval)
4. Dry matter yield (after 20 days interval)
5. Green fodder yield tha^{-1}
6. Soil analysis (before sowing)

PREVIOUSYEAR'S RESULTS New experiment

2.TITLE RESPONSE OF NEW MAIZE LINE MS-04-2016 TO NPK FERTILIZERS FOR MAXIMUM GRAIN YIELD

OBJECTIVE To find out the best combination of NPK fertilizers for obtaining maximum grain yield of new maize line MS 04-2016

RESEARCH WORKERS M. Shoaib Farooq, Abdul Razzaq and Asim Pervez

PROJECT DURATION 2019-20

LOCATION Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY	TREATMENTS N- P -K kg ha^{-1} T1 = 00 -00-00 (control) T2 = 78-68 -31 T3 = 90 -80 -31 T4 = 102 - 92-31 T5 = 78 - 68-62 T6 = 90- 80-62 (R) T7 = 102- 92-62 T8 = 78 -68- 93 T9 = 90 -80- 93 T10 = 102-92- 93 Lay out =RCBD Replications = 3 Plot Size =3mx6m Row spacing = 30 cm. Potash and phosphorous will be applied at the time of sowing while nitrogen will be applied in split along with irrigation. The following observations will be recorded: 1. Plant height 2. No of grains per cob 3. Cob length 4. 100 Grain weight 5. Grain yield tha^{-1} 6. Soil analysis(before sowing)
PREVIOUSYEAR'S RESULTS	New experiment
3.TITLE	RESPONSE OF NEW SORGHUM LINE FRI-07 TO NPK FERTILIZERS FOR MAXIMUM GRAIN YIELD
OBJECTIVE	To find out the best combination of NPK fertilizers for obtaining maximum grain yield of sorghum line FRI-07.
RESEARCH WORKERS	Asim Pervez, Abdul Razzaq and M. Shoaib Farooq
PROJECT DURATION	2019-20
LOCATION	Fodder Research Institute, Sargodha.
TREATMENTS/ METHODOLOGY	TREATMENTS N - P - K kg ha^{-1} T_1 = 00 - 00 - 00 (control) T_2 = 68 - 46 -31 T_3 = 80 - 57 -31 T_4 = 92 - 68 -31 T_5 = 68 - 46 - 62 T_6 = 80 - 57 - 62 (R) T_7 = 92 - 68 - 62 T_8 = 68 - 46 - 93 T_9 = 80 - 57 - 93 T_{10} = 92 – 68 - 93

Lay out = RCBD
Replications = 3
Plot Size =3mx6m
Row spacing = 30 cm.

Potash and phosphorous will be applied at the time of sowing while nitrogen will be applied in split along with irrigation. The following observations will be recorded:

1. Plant height
2. No of grains per head
3. 100 Grain weight
4. Grain yield tha^{-1}
5. Soil analysis(before sowing)

PREVIOUSYEAR'S RESULTS New experiment

4. TITLE RESPONSE OF NEW PEARL MILLET LINE Q Bajra TO NPK FERTILIZERS FOR MAXIMUM GRAIN YIELD

OBJECTIVE . To find out the best combination of NPK fertilizers for obtaining maximum grain yield of new pearl millet line Q Bajra

RESEARCH WORKER Abdul Razzaq, M. Shoaib Farooq and Asim Pervez

PROJECT DURATION 2019-20

LOCATION Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY

TREATMENTS
N - P - K ($kg\ ha^{-1}$)
T_1 = 00 - 00 - 00 (control)
T_2 = 58 - 46 -25
T_3 = 70 - 60 -25
T_4 = 82 - 74 -25
T_5 = 58 - 46 - 50
T_6 = 70 - 60 - 50 (R)
T_7 = 82 - 74 - 50
T_8 = 58 - 46 - 75
T_9 = 70 - 60 - 75
T_{10} = 92 - 74 - 75

Lay out = RCBD
Replications = 3
Plot Size = 3mx6m
Row spacing = 30 cm.

Potash and phosphorous will be applied at the time of sowing while nitrogen will be applied in split along with irrigation. The following observations will be recorded:

1. Plant height
2. No of grains per spike
3. Spike length
4. 1000 Grain weight
5. Grain yield tha^{-1}
6. Soil analysis(before sowing)

PREVIOUSYEAR'S RESULTS; New experiment

5.TITLE	RESPONSE OF NEW MAIZE LINE MS 04-2016 TO NPK FERTILIZERS FOR MAXIMUM GREEN FODDER YIELD
OBJECTIVE	To find out the best combination of NPK fertilizers for obtaining maximum green fodder yield of new maize line MS 04-2016
RESEARCH WORKERS	M. Shoaib Farooq, Abdul Razzaq and Asim Pervez
PROJECT DURATION	2019-20
LOCATION	Fodder Research Institute, Sargodha.
TREATMENTS/ METHODOLOGY	TREATMENTS N - P - K (kg ha^{-1}) T_1 = 00 - 00 - 00 (control) T_2 = 78 - 68 - 25 T_3 = 90 - 80 - 25 T_4 = 102 - 92 - 37.5 T_5 = 78 - 68 - 37.5 T_6 = 90 - 80 - 37.5 (R) T_7 = 102 - 92 – 37.5 T_8 = 78 - 68 - 50 T_9 = 90 - 80 - 50 T_{10} = 102 – 92 - 50 Lay out =RCBD Replications = 3 Plot Size =3mx6m Row spacing = 30 cm. Potash and phosphorous will be applied at the time of sowing while Nitrogen will be applied in split along with irrigation. The following observations will be recorded: 1. Plant height 2. Stem thickness 3. Leaf area 4. Green fodder yield t ha^{-1} 5. Soil analysis(before sowing)
PREVIOUSYEAR'S RESULTS	New experiment
6.TITLE	RESPONSE OF NEW SORGHUM LINE FRI-07 TO NPK FERTILIZERS FOR MAXIMUM GREEN FODDER YIELD
OBJECTIVE	To find out the best combination of NPK fertilizers for obtaining maximum green fodder yield of sorghum line FRI-07.
RESEARCH WORKERS	Asim Pervez, Abdul Razzaq and M. Shoaib Farooq
PROJECT DURATION	2019-20
LOCATION	Fodder Research Institute, Sargodha.
TREATMENTS/ METHODOLOGY	TREATMENTS N - P - K (kg ha^{-1}) T_1 = 00 - 00 - 00 (control) T_2 = 68 - 46 - 25

T_3 = 80 - 57 - 25
T_4 = 92 - 68 - 25
T_5 = 68 - 46 - 37.5
T_6 = 80 - 57 - 37.5 (R)
T_7 = 92 - 68 - 37.5
T_8 = 68 - 46 - 50
T_9 = 80 - 57 - 50
T_{10} = 92 – 68 - 50

Lay out = RCBD
Replications = 3
Plot Size =3mx6m
Row spacing = 30 cm.

Potash and phosphorous will be applied at the time of sowing while nitrogen will be applied in split along with irrigation. The following observations will be recorded.

1. Plant height
2. Stem thickness
3. Leaf area
4. Green fodder yield tha^{-1}
5. Soil analysis (before sowing)

PREVIOUSYEAR'S RESULTS: New experiment

7. TITLE: RESPONSE OF NEW PEARL MILLET LINE Q Bajra TO NPK FERTILIZERS FOR MAXIMUM GREEN FODDER YIELD

OBJECTIVE: To find out the best combination of NPK fertilizers for obtaining maximum green fodder yield of new pearl millet line Q Bajra

RESEARCH WORKER: Abdul Razzaq, M. Shoaib Farooq and Asim Pervez

PROJECT DURATION: 2019-20

LOCATION: Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY

TREATMENTS
N - P - K (kg ha^{-1})
T_1 = 00 - 00 - 00 (control)
T_2 = 58 - 46 - 25
T_3 = 70 - 60 - 25
T_4 = 82 - 74 - 25
T_5 = 58 - 46 - 37.5
T_6 = 70 - 60 – 37.5 (R)
T_7 = 82 - 74 – 37.5
T_8 = 58 - 46 - 50
T_9 = 70 - 60 - 50
T_{10} = 92 - 74 - 50

Lay out = RCBD
Replications = 3
Plot Size = 3mx6m
Row spacing = 30 cm.

Potash and phosphorous will be applied at the time of sowing while nitrogen will be applied in split along with irrigation. The following observations will be recorded.

1. Plant height
2. Stem thickness
3. Leaf area
4. Green fodder yield tha^{-1}
5. Soil analysis(before sowing)

PREVIOUSYEAR'S RESULTS; New experiment

8. TITLE: NUTRITIONAL QUALITY ASSESSMENT OF KHARIF FODDERS

OBJECTIVE: To find out the nutritional quality of new lines of kharif fodders.

RESEARCH WORKERS: Asim Pervez , M. Shoaib Farooq ,and Abdul Razzaq

PROJECT DURATION: 2019 (continuous nature)

LOCATION: Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY: The different lines of main kharif fodder crops will be selected for study. Plant sample will be collected and will be analyzed for their quality at 50% flowering.

Name of crop	Lines to be studied
Pearl millet	10
Sorghum	10
Maize	10

The following observations will be recorded.

1. Dry matter percentage
2. Crude fiber
3. Crude fat
4. Crude protein
5. Ash (%)
6. NFE (%)

PREVIOUSYEAR'S RESULTS;

PEARL MILLET

S No.	Varieties / Lines	Dry Matter (%)	Ash (%)	Crude Fat (%)	Crude Protein (%)	Crude Fiber (%)	NFE (%)
1	**TIFT 85 D**	18.1	10.4	3.29	9.63	21.8	54.8
2	**Composite-III**	18.1	10.3	3..89	9.45	20.6	55.7
3	**PM01016**	18.4	9.53	4.00	8.75	19.4	58.3
4	**Sargodha Bajra 2011**	15.6	10.5	3.88	9.10	23.0	53.5
5	**Sen POP**	17.8	10.5	3.25	9.98	20.7	55.5
6	**H 72**	18.2	10.6	3.34	9.28	21.8	54.9
7	**DP Pak**	17.0	10.4	3.87	8.93	22.8	53.9
8	**TIFT 383**	15.0	10.5	4.08	10.2	21.8	53.5
9	**Q Bajra**	16.4	9.89	3.84	9.10	20.0	57.2
10	**No.7703**	18.8	9..50	3.86	9.10	20.0	57.5
11	**CZK923**	17.8	11.3	3.99	9.28	23.0	52.5
12	**G White**	19.0	10.8	3.84	9.10	20.7	55.6
13	**BS-2000**	19.3	10.0	3.72	8.79	21.4	56.1
Range		15.5 to 19.5	9.5 To 11.5	3.25 To 4.00	9 To 10	19.5 To 23	53 To 57

SORGHUM

S No.	Varieties / Lines	Dry Matter (%)	Ash (%)	Crude Fat (%)	Crude Protein (%)	Crude Fiber (%)	NFE (%)
1	Advance V1	24.0	9.72	2.57	7.26	28.0	47.6
2	Advance V2	22.8	9.80	2.95	7.44	29.5	49.7
3	Advance V3	26.3	9.60	2.79	7.53	31.3	51.2
4	Advance V4	24.3	9.3	3.20	7.88	30.5	50.6
5	Advance V5	22.8	9.36	2.99	8.31	31.0	51.6
6	Advance V6	17.5	8.20	2.98	8.73	24.7	44.6
7	Advance V7	24.3	9.32	2.85	8.23	22.8	43.2
8	Advance V8	25.5	9.50	3.11	7.39	24.0	44.0
9	Zonal V1	19.5	9.51	2.98	7.93	21.8	42.2
10	Zonal V2	26.1	9.99	3.27	7.74	23.3	44.3
11	Zonal V3	26.0	9.31	3.17	7.00	23.9	43.4
12	Zonal V4	26.5	9.01	2.91	7.21	23.0	42.1
Ranges		17.5 To 26.5	9 To 10	2.5 To 3.5	7 To 9	21 To 31	42 To 51

MAIZE

S.No.	Varieties / Lines	Dry Matter (%)	Ash (%)	Crude Fat (%)	Crude Protein (%)	Crude Fiber (%)	NFE (%)
1	**C-706**	16.8	7.61	2.95	14.4	27.1	48.0
2	**Pak 2**	17.1	8.33	2.74	14.0	26.1	48.8
3	**AWL 2002**	15.5	9.21	2.90	11.4	27.3	49.2
4	**Golden**	18.0	8.70	2.40	12.1	25.4	51.4
5	**Malka**	16.4	9.53	2.94	11.9	28.9	46.8
6	**Pearl**	16.9	9.91	3.64	12.4	24.1	49.9
7	**MMRI**	16.4	9.11	2.47	13.1	22.3	53.0
8	**Ag 85**	17.6	8.54	2.49	13.1	24.0	51.9
9	**Ag 2002**	16.2	8.51	2.36	14.4	24.0	50.8
10	**No. 1501**	24.4	9.69	2.61	13.7	24.0	50.1
11	**P 1**	24.0	6.97	2.40	12.3	22.5	55.8
12	**Advanced P1**	22.4	6.27	2.13	12.8	29.2	49.6
13	**Advanced P2**	21.8	6.65	2.72	13.1	26.4	51.1
14	**Advanced P4**	23.0	7.00	2.03	12.4	28.7	49.9
15	**Advanced P5**	23.1	7.11	2.38	11.7	28.7	50.1
Range		15.5 To 24	7 To 10	2 To 3.5	11.5 To 14.5	22 To 29	46 To 55

9. TITLE — PERFORMANCE EVALUATION OF PEARLMILLET GERMPLASM ON SALT AFFECTED SOIL

OBJECTIVE — To screen out the most salt tolerant lines/varieties of pearl millet.

RESEARCH WORKERS — M. Shoaib Farooq, Aamir Iqbal Saqib, Asim Pervez and Abdul Razzaq

PROJECT DURATION — 2019 (Continuous nature)

LOCATION — Soil Salinity Research Institute, Pindi Bhattian.

TREATMENTS/ METHODOLOGY — Following lines/ varieties of pearl millet will be tested on salt affected soil. Soil will be analyzed before sowing.

1. Composite-I
2. Composite-II
3. Composite-IV
4. Wt-Bajra
5. GJ-Bajra
6. RCBK-948
7. Y-84
8. CZK-923
9. Q-Bajra
10. BS-2000
11. Sgd Bajra 2011
12. MB-87

Lay out =RCBD
Replications = 5
Plot Size =1.8mx5m
Row spacing = 30 cm.
Seed rate = 7.5 kg ha^{-1}
Fertilizer dose = 70-60-37.5 NPK $kgha^{-1}$
Sowing time = July- August

The following observations will be recorded.

1. Germination percentage
2. Mortality
3. Green fodder yield (tha^{-1})

PREVIOUSYEAR'S RESULTS; Soil Analysis Before Sowing

Soil Texture	ECe $mScm^{-1}$	pH	OM %	P_2O_5 mg/kg	K_2O mg/kg
Clay loam	5.11	9.1	0.76	7.6	146

Treatments	**Lines**	**Germination %age (m^{-2})**	**Mortality % (m^{-2})**	**GFY t ha^{-1}**
Comparatively Salt Tolerant				
T8	CZK-923	88	8	24.51
T6	RCBK-948	87	9	23.96
T11	Sgd Bajran2011	84	11	23.28
T9	Q-Bajra	81	12	22.63
Medium Salt Tolerant				
T5	Gj-Bajra	74	23.4	20.70
T4	Wt-Bajra	73	27.1	17.09
T2	Composite-II	72	28.3	17.01
T12	MB-87	67	31	12.30
T3	Composite-IV	65	32.3	11.69
Salt Sensitive Lines				
T7	Y-84	26	52.1	5.90
T10	BS-2000	16	54.8	4.24
T1	Composite-I	12	58.1	4.04

10. TITLE PERFORMANCE EVALUATION OF SORGHUM GERMPLASM ON SALT AFFECTED SOIL

OBJECTIVE To screen out the most salt tolerant lines/varieties of sorghum.

RESEARCH WORKERS M. Shoaib Farooq ,Aamir Iqbal Saqib, Asim Pervez and Abdul Razzaq

PROJECT DURATION 2019 (continuous nature)

LOCATION Soil Salinity Research Institute, Pindi Bhattian

TREATMENTS/ METHODOL

Following lines/ varieties of sorghum will be Tested on salt affected soil.

Soil will be analyzed before sowing.

1.YS-98 2. Sgd- 013-1
3.Sgd-013-2 4.Sorghum-2011
5. Hegari 6. JS-2002
7. No.1572 8. No.80010
9. I-6 10. PVK-801
11.FRI-07 12.S-145

Lay out = RCBD
Replications = 5
Plot Size = 1.8mx5m
Row spacing = 30 cm.
Seed rate = 72 kg ha^{-1}
Fertilizer dose = 80-57-37.5 NPK $kgha^{-1}$
sowing time = July- August

The following observations will be recorded.

1. Germination percentage 2. Mortality
3. Green fodder yield (tha^{-1})

PREVIOUSYEAR'S RESULTS;

Soil Analysis Before Sowing

Soil Texture	ECe $mScm^{-1}$	pH	OM %	P_2O_5 mg/kg	K_2O mg/kg
Clay loam	5.04	9.2	0.76	7.4	154

Treatments	**Lines**	**Germination %age(m^{-2})**	**Mortality % (m^{-2})**	**G.F.Y t ha^{-1}**
Comparatively Salt Tolerant				
T1	YS-98	72	16	24.8
T5	Hegari	71.1	19.3	24.4
T10	PVK-801	70.6	19.9	23.9
T12	S-145	68.2	21.3	22.1
Medium Salt Tolerant				
T2	Sgd-013-1	52.6	47.9	18.6
T7	No.1572	47.3	48.3	18.3
T6	JS-2002	46.9	49.7	17.7
Salt Sensitive				
T3	Sgd-013-2	24	51	11.8
T11	FRI-07	20.8	52.4	11.2
T8	No.80010	17.2	52.9	11.1
T9	I-6	15.7	54.1	9.09
T4	Sorghum-2011	14.7	54.4	7.88

11. TITLE	SCREENING OF PEARL MILLET GERMPLASM AGAINST SALINITY LEVELS
OBJECTIVE	To screen out the most salt tolerant lines/verities of pearl millet.
RESEARCH WORKERS	M. Shoaib Farooq, Asim Pervez and Abdul Razzaq
PROJECT DURATION	2019 (Continuous nature)
LOCATION	Fodder Research Institute, Sargodha
TREATMENTS/ METHODOLOGY	Ten lines/varieties of pearl millet will be tested against different salinity levels (Control, 4,6,8 and 10 dSm^{-1}) in a pot experiment. Equal no of seeds were planted in each pot. Germination and mortality data will be recorded.

1. Composit-I 2. Composit-II
3. Composit-IV 4. G White
5. G-Bajra 6. Gahi
7. POP-98 8.CZK-923
9.Q-Bajra 10.BS-2000

Lay out = RCBD Factorial
Replications = 3
Fertilizer dose = 70-60-37.5 NPK $kgha^{-1}$
Sowing time = July- August

The following observations will be recorded.

1. Germination % 2. Mortality

PREVIOUSYEAR'S RESULTS;

Comparatively Salt Tolerant Lines

Salinity Levels	CZK-923 T8		Q-Bajra T9		Pop-98 T10		Composite-II T3	
	Germination %	Mortality %	Germination %	Mortality %	Germination %	Mortality %	Germination %	Mortality %
Control	100	0	100	0	100	0	100	0
4 dSm^{-1}	100	0	100	0	100	0	93	0
6 dSm^{-1}	100	0	89	0	81	0	89	0
8 dSm^{-1}	93	0	78	11	78	11	70	0
10 dSm^{-1}	89	11	52	33	48	22	52	44

Medium Salt Tolerant Lines

Salinity Levels	G-Bajra T5		Composite-IV T4	
	Germination %	Mortality %	Germination %	Mortality %
Control	100	0	100	0
4 dSm^{-1}	74	0	63	0
6 dSm^{-1}	56	11	41	22
8 dSm^{-1}	41	33	30	30
10 dSm^{-1}	15	44	4	44

Salt Sensitive Lines

Salinity Levels	BS-2000 T1		G-White T6		Gahi T7		Composite-I T2	
	Germination %	Mortality %	Germin-ation %	Mortality %	Germination %	Mortality %	Germination %	Mortality %
Control	100	0	100	0	100	0	100	0
4 dSm^{-1}	44	11	52	33	48	48	41	22
6 dSm^{-1}	7	22	7	33	19	56	37	37
8 dSm^{-1}	7	44	4	44	7	67	7	56
10 dSm^{-1}	4	67	4	56	4	67	0	78

12.TITLE — STANDERDIZATION OF N & P FERTILIZERS FOR MAXIMUM GREEN FODDER YIELD OF MAIZE LINE 1501

OBJECTIVE — To find out the best combination of N & P fertilizers for obtaining maximum green fodder yield of maize.

RESEARCH WORKERS — M. Shoaib Farooq, Abdul Razzaq and Asim Pervez

PROJECT DURATION — 2017-18

LOCATION — Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY

Treatments

N –P - K kg ha^{-1}

T_1 = 00-00-25 (control)
T_2 = 75-65-25
T_3 = 75-80-25
T_4= 75-95-25
T_5 = 90-65-25
T_6 = 90-80-25
T_7 = 90-95-25
T_8 = 105-65-25
T_9 = 105-80-25
T_{10} = 105-95-25

Lay out =RCBD
Replications = 3
Plot Size =3mx6m
Row spacing = 30 cm.

The following observations will be recorded.

1. Plant height 2. Stem thickness
3. Leaf area 4. Green fodder yield
5. Soil analysis(before sowing)

PREVIOUSYEAR'S RESULTS;

Soil Analysis Before Sowing

Soil Texture	ECe $mScm^{-1}$	pH	OM %	P_2O_5 mg/kg	K_2O mg/kg
Clay loam	0.78	7.4	0.69	6.5	137

Treatments NPK kg /ha	Green Fodder Yield t/ha	Dry Matter %	MRR
T_1 00-00-25	48.89	18.10	--
T_2 75-65-25	51.07	18.27	0.57
T_3 75-80-25	51.47	18.43	0.60
T_4 75-95-25	52.89	18.47	0.82
T_5 90-65-25	54.62	19.50	1.38
T_6 90-80-25	61.48	**19.73**	2.71
$T_7$90-95-25	59.44	18.70	2.03
$T_8$105-65-25	56.47	18.40	1.69
T_9 105-80-25	54.63	18.27	1.15
T_{10} 105-95-25	55.19	18.60	1.14

13. TITLE — STANDERDIZATION OF N & P FERTILIZERS FOR MAXIMUM GREEN FODDER YIELD OF SORGHUM LINE SS-9901

OBJECTIVE — To find out the best combination of N & P fertilizers for obtaining maximum green fodder yield of sorghum line.

RESEARCH WORKERS — Asim Pervez, Abdul Razzaq and M. Shoaib Farooq

PROJECT DURATION — 2017-18

LOCATION — Fodder Research Institute, Sargodha

TREATMENTS/ METHODOLOGY — Treatments

N- P -K kg ha^{-1}

T_1 = 00-00-25 (control)
T_2 = 60-25-25
T_3 = 60-50-25
T_4= 60-75-25
T_5 = 80-25-25
T_6 = 80-50-25
T_7 = 80-75-25
T_8 = 100-25-25
T_9 = 100-50-25
T_{10} = 100-75-25

Lay out =RCBD
Replications = 3
Plot Size =3mx6m
Row spacing = 30 cm.

The following observations will be recorded.

1. Plant height 2. Stem thickness
3. Leaf area 4.Green fodder yield
5. Soil analysis (before sowing)

Soil Analysis Before Sowing

Soil Texture	ECe $mScm^{-1}$	pH	OM %	P_2O_5 mg/kg	K_2O mg/kg
Clay loam	0.77	7.5	0.69	6.3	135

PREVIOUSYEAR'S RESULTS;

Treatments NPK (kg /ha)	Green Fodder Yield t/ha	Dry Matter %	MRR
T_1 Control	53.27	17	--
T_2 60-25-25	50.27	17.1	0.26
T_3 60-50-25	54.05	17.2	0.32
T_4 60-75-25	54.38	17.3	0.38
T_5 80-25-25	54.77	17.3	0.78
T_6 80-50-25	55.83	17.3	1.21
$T_7$80-75-25	57.88	17.2	1.05
$T_8$100-25-25	57.72	17.2	0.95
T_9 100-50-25	56.72	17.6	0.67
T_{10} 100-75-25	56.05	17.1	0.49

14.TITLE STANDERDIZATION OF N & P FERTILIZERS FOR MAXIMUM GREEN FODDER YIELD OF PEARL MILLET LINE (COMPOSITE-II)

OBJECTIVE To find out the best combination of N & P fertilizers for obtaining maximum green fodder yield of pearl millet

RESEARCH WORKERS Abdul Razzaq, M. Shoaib Farooq and Asim Pervez

PROJECT DURATION 2017-18

LOCATION Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY

Treatments

N -P- K kg ha^{-1}

T_1 = 00-00-25 (control)
T_2 = 50-30-25
T_3 = 50-60-25
T_4 = 50-90-25
T_5 = 70-30-25
T_6 = 70-60-25 (R)
T_7 = 70-90-25
T_8 = 90-30-25
T_9 = 90-60-25
T_{10} = 90-90-25

Lay out = RCBD
Replications = 3
Plot Size = 3mx6m
Row spacing = 30 cm.

The following observations will be recorded.

1. Plant height
2. Stem thickness
3. Leaf area
4. Green fodder yield
5. Soil analysis (before sowing)

PREVIOUSYEAR'S RESULTS;

Soil Analysis Before Sowing

Soil Texture	ECe $mScm^{-1}$	pH	OM %	P_2O_5 mg/kg	K_2O mg/kg
Clay loam	0.72	7.4	0.67	6.0	133

Treatments NPK kg /ha	Green Fodder Yield t/ha^{-1}	Dry Matter %	MRR
T_1 00-00-25	45.92	16.80	
T_2 50-30-25	53.7	17.03	2.67
T_3 50-60-25	54.07	17.13	2.59
T_4 50-90-25	54.26	17.33	2.81
T_5 70-30-25	54.36	17.47	3.29
T_6 70-60-25	56.07	17.84	2.84
T_7 70-90-25	53.7	17.47	2.70
T_8 90-30-25	53.89	17.61	2.64
T_9 90-60-25	54.07	17.72	2.03
T_{10} 90-90-25	54.44	17.70	1.69

PLANT PROTECTION

1 TITLE **SCREENING OF SORGHUM GERMPLASM AGAINST RED LEAF SPOT**

OBJECTIVE To evaluate sorghum germplasm against Red Leaf Spot

RESEARCH WORKER Mr. Aftab Ahmad Khan and Dr. Saleem Il Yasin

PROJECT DURATION 2019-2020

LOCATION Fodder Research Institute, Sargodha

TREATMENTS/ METHODOLOGY

Entries	120 entries of Sorghum germplasm
Design	Augmented
Sowing method	Line sowing

PLAN OF WORK

The seed of Sorghum germplasm entries will be sown in two lines of 3 meter length. The crop will be raised adopting standard agronomic practices. Disease incidence data will be recorded at maturity.

PREVIOUS YEAR'S RESULTS

S. No.	Reaction	No. of Varieties/lines
1	**Resistant (R)**	**0**
2	**Moderately Resistant (MR)**	**19**
3	**Moderately Susceptible (MS)**	**46**
4	**Susceptible (S)**	**50**
5	**Highly Susceptible (HS)**	**0**
	Total	**115**

2 TITLE **CHEMICAL CONTROL OF LEAF SPOT DISEASE OF SORGHUM**

OBJECTIVE To find a suitable fungicides for the control of leaf spot/rot complex disease of sorghum

RESEARCH WORKER Mr. Aftab Ahmad Khan and Dr. Saleem Il Yasin

PROJECT DURATION 2019-2020

LOCATION Fodder Research Institute, Sargodha

TREATMENTS/ METHODOLOGY

Treatments (Fungicides)	Dose
Dithane M-45 80 WP (Mancozeb)	800 g/acre (8 g/litre)
Topsin-M 70 WP (Thiophanate methyl)	600 g/acre (6 g/litre)
Score 250 EC (Difenconazole)	250 ml/acre (2.5 ml/litre)
Rally 40 WSP (Myclobutanil)	20 g/acre (0.2 g/litre)

Treaty 6 ME (Tebuconazole)	750 ml/acre (7.5 ml/litre)
Success 72 WP (Chlorothalonil 64%; Metalaxyl 8%)	250 g/acre (2.5 g/litre)
Control	Untreated

Test variety	Sorghum 2011
Design	RCBD
Replications	4
Line spacing	50 cm
Plot size	3 m x 5 m

PLAN OF WORK

Sorghum 2011 will be sown in the second fortnight of July. Standard cultural and agronomic practices will be adopted to raise the crop. The crop will be sprayed 36 to 42 days after sowing. Observations on leaf spot disease incidence will be recorded at 100% flowering stage.

PREVIOUS YEAR'S RESULTS

This is first year of the experiment.

3 TITLE **SCREENING OF MAIZE GERMPLASM/LINES AGAINST STALK ROT OF MAIZE**

OBJECTIVE To evaluate maize germplasm against stalk rot of maize

RESEARCH WORKER Mr. Aftab Ahmad Khan and Dr. Saleem Il Yasin

PROJECT DURATION 2019-2020

LOCATION Fodder Research Institute, Sargodha

TREATMENTS/ METHODOLOGY

Entries	20 entries of Maize germplasm
Design	Augmented
Sowing method	Line sowing

PLAN OF WORK

The seed of maize germplasm entries will be sown in two lines of 3 meter length. The crop will be raised adopting standard agronomic practices. Disease incidence data will be recorded on appearance of the disease.

PREVIOUS YEAR'S RESULTS

This is first year of the experiment.

4 TITLE **CHEMICAL CONTROL OF LEAF STALK ROT OF MAIZE**

OBJECTIVE To find a suitable fungicides for the control of stalk rot of maize

RESEARCH WORKER Mr. Aftab Ahmad Khan and Dr. Saleem Il Yasin

PROJECT DURATION 2019-2020

LOCATION Fodder Research Institute, Sargodha

TREATMENTS/ METHODOLOGY

Treatments (Fungicides)	Dose
Dithane M-45 80 WP (Mancozeb)	800 g/acre (8 g/litre)
Topsin-M 70 WP (Thiophanate methyl)	600 g/acre (6 g/litre)
Score 250 EC (Difenconazole)	250 ml/acre (2.5 ml/litre)
Rally 40 WSP (Myclobutanil)	20 g/acre (0.2 g/litre)
Treaty 6 ME (Tebuconazole)	750 ml/acre (7.5 ml/litre)
Success 72 WP (Chlorothalonil 64%; Metalaxyl 8%)	250 g/acre (2.5 g/litre)
Control	Untreated

Test variety	SGD 2002
Design	RCBD
Replications	4
Line spacing	50 cm
Plot size	3 m x 5 m

PLAN OF WORK Maize variety SGD 2002 will be sown in the second fortnight of July. Standard cultural and agronomic practices will be adopted to raise the crop. The crop will be sprayed in the week after sowing or appearance of the disease. Observations on leaf spot disease incidence will be recorded at 100% flowering stage.

PREVIOUS YEAR'S RESULTS This is first year of the experiment.

. TITLE IMPACT OF SOWING DATES ON PREVALENCE OF SHOOT FLY AND THEIR IMPACT ON SEED YIELD OF SORGHUM

OBJECTIVE To find out the best sowing dates for maximum seed production of sorghum and less infestation of shoot fly.

RESEARCH WORKERS Abdul Khaliq, M. Riaz Gondal and Anees ul Husnain

PROJECT DURATION 2018-19

LOCATION Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY Treatments/Sowing dates
T1=01.06.2018
T2=16.06.2018
T3=01.07.2018
T4=16.07.2018
T5=01.08.2018

T6=16.08.2018
Design = RCBD
Replication = 3
R x R Distance = 45 cm
No.of Rows/plot = 10
Row length = 6m
Plot size = 27 m^2

The data regarding infestation of shoot fly (Dead hearts) will be recorded from each plot at 10 days interval starting from germination. The data will be compiled and analyzed statistically.

PREVIOUS YEAR'S RESULTS

Sr.No	Treatments (Sowing dates)	% Shoot fly infestation (Dead heart %)	Yield (kg/plot)
1	1-June	13.00	0.72
2	16-june	11.00	0.82
3	1-July	11.33	2.00
4	16-July	10.67	3.38
5	1-August	9.00	3.63
6	16-August	10.00	2.67

. TITLE: EFFICACY OF DIFFERENT INSECTICIDES FOR THE CONTROL OF SORGHUM SHOOT FLY *ATHERIGONA SOCCATA* (ROND.) (DIPTERA: MUSCIDAE) IN SORGHUM SEED CROP.

OBJECTIVE: To find out the most effective insecticide for the control of Sorghum Shoot Fly.

RESEARCH WORKER Abdul khaliq Dr. Saleem Il Yasin

LOCATION FRI, Sargodha

DURATION 2018-19

TREATMENTS
T1= Control
T2= Chlorpyrifos @ 500 ml/Acre
T3= Acephate 75SP @ 400 ml/Acre
T4= Dimethoate 40EC@ 400 ml/Acre
T5= Bifenthrin 10 EC @ 300 ml/Acre
T6= Lambdacyhalothrin 2.5 EC @ 300 ml/Acre
T7= Deltamethrin 2.3 EC @ 400 ml/Acre
T8= Acetamiprid 20SP @ 125 ml/Acre
T9= Imidacloprid 20SL @ 250 ml/Acre
T10= Carbosulfan 20EC @ 500 ml/Acre

Variety = Hegari
Design = RCBD

Replications = 3
Row spacing = 45cm
Row length = 5m
Plot size = 2.7 m × 5 m
Sowing time = July

METHODOLOGY The seed will treated with confidor before sowing. Shoot fly infestation data will be recorded before and then 3, 5, and 7 days after treatment from each plot.

PREVIOUS YEAR'S RESULTS

Treatments	Mean shoot fly infestation			
	Before treatment	3DAT	5DAT	7 DAT
T1= Control	5.33	6.33	4.90	4.00
T2= Chlopyrifos	5.00	1.33	0.83	1.67
T3= Acephate	6.33	2.10	1.33	1.77
T4= Dimethoate	4.33	2.00	1.17	2.27
T5= Bifenthrin	4.67	1.00	0.93	1.33
T6= Lambda	5.13	1.50	1.17	1.00
T7= Deltamethrin	4.00	1.50	1.08	2.43
T8= Acetamiprid	4.67	1.67	1.00	1.73
T9= Imidacloprid	5.00	1.83	1.33	1.67
T10= Carbosulfan	5.67	0.67	0.33	1.50

. TITLE: EFFICACY OF NEW CHEMISTRY FOLIAR INSECTICIDES FOR THE CONTROL OF SHOOT FLYAND STEM BORER IN FODDER CROP OFSORGHUM

OBJECTIVE: To evaluate the most effective insecticide for the control of Sorghum Shoot fly and stem borer

RESEARCH WORKER Abdul khaliq

LOCATION FRI, Sargodha

DURATION 2019-20

TREATMENTS T1= Coragen @ 50 ml/Acre
T2= Belt @ 50 ml/Acre
T3= Spinosad 75SP @ 40 ml/Acre
T4= Mthoxyfenozide 40EC@ 100 ml/Acre
T5= Emmamectin 1.90 EC @ 200 ml/Acre
T6= Fipronil 2.5 EC @ 200 ml/Acre

T7= Chlorfenpyre2.3 EC @ 100 ml/Acre
T8= Bifenthrin 20SP @300 ml/Acre
T9= Control

Variety = Hegari
Design = RCBD
Replications = 3
Row spacing = 45cm
Row length = 6m
Plot size = 2.7 m × 6 m
Sowing time = Mid March

METHODOLOGY — The seed will be treated with confidor before sowing. Shoot fly and borer infestation data will be recorded before treatment and then 3, 5, and 10 days after treatment from each plot.

PREVIOUS YEAR'S RESULTS — New Experiment

. TITLE: EFFICACY OF NEW CHEMISTRY FOLIAR INSECTICIDES FOR THE CONTROL OF STEM BORER AND SHOOT FLY IN FODDER CROP OF MAIZE

OBJECTIVE: To evaluate the most effective insecticide for the control of Shoot fly and stem borer in maize

RESEARCH WORKER — Abdul khaliq

LOCATION — FRI, Sargodha

DURATION — 2019-20

TREATMENTS

T1= Coragen @ 50 ml/Acre
T2= Belt @ 50 ml/Acre
T3= Spinosad 75SP @ 40 ml/Acre
T4= Mthoxyfenozide 40EC@ 100 ml/Acre
T5= Emmamectin 1.90 EC @ 200 ml/Acre
T6= Fipronil 2.5 EC @ 200 ml/Acre
T7= Chlorfenpyre2.3 EC @ 100 ml/Acre
T8= Bifenthrin 20SP @300 ml/Acre
T9= Control

Variety = Hegari
Design = RCBD
Replications = 3
Row spacing = 45cm
Row length = 6m
Plot size = 2.7 m × 6 m

Sowing time = Mid March

METHODOLOGY	The seed will be treated with confidor before sowing. Shoot fly and borer infestation data will be recorded before treatment and then 3, 5, and 10 days after treatment from each plot.
PREVIOUS YEAR'S RESULTS	New Experiment

DAIRY TECHNOLOGY

93. TITLE: EFFECT OF PALATABILITY ON VOLUNTARY FEED INTAKE OF PROMISING LINES/VARIETIES OF SORGHUM

OBJECTIVE: To evaluate the palatability and voluntary feed intake of promising lines/varieties of sorghum.

RESEARCH WORKER(S): Muhammad Shakeel Hanif and Muhammad Saleem Akhtar

DURATION: 2019-2020

LOCATION: Fodder Research Institute, Sargodha.

TREATMENTS:
T1 SGD-013-1
T2 SGD-013-2
T3 S-9901
T4 Sorghum 2011 (check)

METHODOLOGY: Chaffed & weighed quantity of each Sorghum line/variety will be offered to twelve buffaloes according to NARC schedule in nutrition stalls following Cafeteria method. Experimental animals will be provided 20% additional fodder than their actual requirements. Daily consumption will be recorded to evaluate palatability and voluntary feed intake.

PREVIOUS YEAR'S RESULTS

Parameters	T1 Sukkar	T2 No.6001	T3 FRI-07	T4 Sorghum-2011
Quantity fed (kg)	72	72	72	72
Voluntary feed intake (kg)	53.33 B	57.50A	52.33B	50.16B
	LSD0 .05			4.0543
Palatability (%)	71.07 B	79.86 A	72.68 B	69.67B
	LSD0 .05			5.6277
Brix(%)	11.8 B	11.1 C	10.70 C	13.10 A
	LSD0 .05			0.4430
Protein (%)	6.21B	6.92A	6.08C	6.12C
	LSD0 .05			0.0893

94. TITLE: EFFECT OF PALATABILITY ON VOLUNTARY FEED INTAKE OF PROMISING LINES/VARIETIES OF PEARL MILLET

OBJECTIVE: To evaluate the palatability and voluntary feed intake of promising lines/varieties of pearl millet

RESEARCH WORKER: Muhammad Shakeel Hanif and Muhammad Saleem Akhtar

DURATION: 2019-2020

LOCATION: Fodder Research Institute, Sargodha.

TREATMENTS:
T_1 Composite IV
T_2 Q-Bajra
T_3 G-Bajra
T_4 Sargodha Bajra-2011(Check)

METHODOLOGY

Each pearl millet line/variety will be chaffed and offered to three buffaloes after weighing. Cafeteria method will be followed according to NARC schedule. 20% additional fodder will be given to these animals than their actual requirements. Consumption of these fodders will be noted to determine the palatability and voluntary feed intake.

PREVIOUS YEAR RESULTS

Parameter	Composite-IV	Q-Bajra	G-Bajra	Sargodha Bajra- 2011
Qty. fed (kg)	75.00	75.00	75.00	75.00
Voluntary feed intake (kg)	49.00A	45.00B	45.66AB	44.50B
	LSD 0.05			3.3753
Palatability (%)	65.33A	60.00B	60.89AB	59.33B
	LSD 0.05			4.4952
DM (%)	18.2 B	16.40C	19.00 A	15.60 D
	LSD 0.05			0.2514
Protein (%)	9.45 A	9.10 B	9.10 B	9.10 B
	LSD 0.05			0.1798
Crude Fiber %	20.60B	20.00C	20.70B	23.00A
	LSD 0.05			0.3782
Crude Fat %	3.89A	3.84A	3.84A	3.88A
	LSD 0.05			0.1111
Ash %	10.20C	9.87 D	10.80 A	10.50B
	LSD 0.05			0.25
NFE %	55.70B	57.20A	55.60C	53.50D
LSD 0.05				0.0999

95. TITLE

EFFECT OF FEEDING SILAGE ON MILK QUANTITY AND QUALITY IN MILCH ANIMALS

OBJECTIVE

To determine the effect of silage consumption in milch animals

RESEARCH WORKERS:

Muhammad Shakeel Hanif and Muhammad SaleemAkhtar

DURATION

2019-2020

LOCATION

Fodder Research Institute, Sargodha.

TREATMENTS:
T_1 Silage (Maize)
T_2 Silage (Sorghum)
T3 Green fodder plus Wheat straw

METHODOLOGY Silage will be prepared from maize and sorghum according to standard method and fed to buffaloes to see the effect of silage and green fodder plus wheat straw on milk production and quality. Green fodder plus wheat straw treatment will be used as standard. Dry matter will be estimated for daily requirement of animals. Nine buffaloes of almost similar stage and lactation number will be selected and fed silage & green fodder plus wheat straw. Treatments will be repeated thrice. Daily feed intake and milk yield will be recorded. Data recorded will be analyzed statistically.

PREVIOUS YEAR RESULTS

Diet	Fed (Kg)	Intake (Kg)	Milk production (Liters) Before Trial	Milk production (Liters) Before Trial
Silage	25.00	21.613B	10.170 A	10.413 A
Green fodder + Wheat straw	55.00	49.66 A	8.500 B	8.367 B
LSD 0.05		1.8666	0.5133	1.4134

Diet	Fodder and Silage Quality Characteristics					
	DM (%)	Fat (%)	Crude Fiber (%)	Ash (%)	Protein (%)	NFE(%)
Silage	31.50±0.20	3.50±0.05	24.27±0.31	7.62±0.10	12.40±0.20	52.22±0.04
Green fodder	24.40±0.20	2.60±0.01	24.00±0.33	9.67±0.02	13.70±0.2	50.01±0.08

Diet	Milk Quality Characteristics						
	Fat (%)	SNF (%)	T. Solids (%)	Protein (%)	Lactose (%)	Acidity (%)	pH
Silage	7.06A	8.67A	15.70A	3.83A	3.6667A	0.12A	6.88A
Green fodder + Wheat straw	7.1967 A	7.97A	15.17A	3.73A	3.5533A	0.11A	6.87 A
LSD 0.05	0.7865	1.4272	0.6823	1.3267	1.0760	0.0287	0.0287

96. TITLE: INCORPORATION OF DRY LEAF POWDER OF MORINGA (Moringa oleifera) ON MILK PRODUCTION AND MILK COMPOSITION IN DAIRY BUFFALOES

OBJECTIVE To evaluate the effect of Moringa dry leaf powder incorporation on milk production and milk composition.

RESEARCH WORKERS: Muhammad Shakeel Hanif and Muhammad SaleemAkhtar

DURATION 2019-2020

LOCATION Fodder Research Institute, Sargodha.

TREATMENTS:
T1 Wanda + 0 gof Moringa Leaf Powder
T2 Wanda + 75 g of Moringa Leaf Powder
T3 Wanda + 150g of Moringa Leaf Powder

METHODOLOGY

The harvested leaves of Moringa will be air dried in shade under a shed until they will be crispy to touch, while retaining their greenish coloration. The dried leaves will be then milled to produce Moringa oleifera leaf powder for incorporation. Twelve buffaloes of almost similar stage and lactation number will be selected and fed according to treatment plan. Treatments will be repeated thrice. Daily milk yield and milk composition analysis will be carried out. Data recorded will be analyzed statistically.

PREVIOUS YEAR RESULTS

Diet	Moringa leaf Powder and Wanda Quality Characteristics					
	DM (%)	Fat (%)	Crude Fiber (%)	Ash (%)	Protein (%)	NFE (%)
Moringa Leaf Powder	90.03±0.40	6.17±0.15	8.00±0.50	11.67±0.15	21.83±0.21	51.60±0.87
Wanda	89.97±0.55	5.20±0.20	12.57±0.25	11.96±0.20	16.00±0.31	54.26±0.48

Diet	Milk production (Liters) Before Trial	Milk production (Liters) Before Trial
T1. Wanda+ 0gMoringa Leaf Powder	7.80A	7.88A
T2. Wanda + 75gMoringa Leaf Powder	7.56AB	7.56AB
T3. WANDA+ 150g Moringa Leaf Powder	7.45B	7.46B
LSD 0.05	0.26	0.41

Diet	Milk Quality Characteristics (Before Trial)							
	Fat (%)	SNF (%)	Total Solids (%)	Protein (%)	Lactose (%)	Acidity (%)	pH	Salts
T1. Wanda+ 0g Moringa Leaf Powder	7.25A	8.67A	15.23A	3.52B	4.12A	0.10A	6.89A	0.53A
T2. Wanda + 75g Moringa Leaf Powder	6.73 B	7.98AB	15.24A	3.75A	3.36C	0.11A	6.89A	0.61A
T3. WANDA+ 150 Moringa Leaf Powder	6.55C	7.90B	14.64A	3.87A	3.73B	0.12A	6.89A	0.61A
LSD 0.05	0.16	0.76	0.90	0.17	0.25	0.04	0.05	0.18

Diet	Milk Quality Characteristics (After Trial)							
	Fat (%)	SNF (%)	Total Solids (%)	Protein (%)	Lactose (%)	Acidity (%)	pH	Salts
T1. Wanda+ 0g Moringa Leaf Powder	6.87B	8.74A	15.61A	3.75A	3.95A	0.10A	6.89A	0.59A
T2. Wanda + 75g Moringa Leaf Powder	7.19A	7.97B	15.16AB	3.79A	3.33C	0.09A	6.91A	0.58A
T3. WANDA+ 150gm Moringa Leaf Powder	6.78B	7.92B	14.70B	3.51B	3.73B	0.11A	6.89A	0.61A
LSD 0.05	0.23	0.62	0.68	0.23	0.19	0.03	0.03	0.22

EXPERIMENTAL SEED PRODUCTION UNIT, FAROOQABAD

TITLE **ZONAL GREEN FODDER YIELD TRIAL OF SORGHUM**

OBJECTIVE To evaluate green fodder yield potential of different sorghum lines at various locations.

RESEARCH WORKERS Nadeem Rehman

DURATION 2019

LOCATION Experimental Seed Production Unit, Farooqabad

TREATMENTS: Varieties/ Lines will be provided by the Director, FRI, Sargodha.

METHODOLOGY:

Design	RCBD
Row spacing	30 cm
Replications	3
Plot size	1.8 X 5 m
Sowing time	Mid July
Fertilizer NPK kg/ha	99-57-62

Following data will be recorded for evaluation of lines: -

-Plant height	-Stem thickness
-No. of leaves/plant	-Leaf colour
-Days to maturity	-Days to 50% flowering
-Leaf area	-Green fodder yield

PREVIOUS YEAR'SRESULTS

Fodder yield (t/ha) of eight promising lines of Sorghum

S. No.	Varieties/Lines	Green Fodder Yield (t/ha)
1.	S-145	46.66
2.	FRI-07	57.77
3.	PVK-801	46.28
4.	Sorghum-2011 (check)	48.51
5.	F-02-2016	42.22
6.	JS-2002 (check)	48.14
7.	F-01-2016	38.5
8.	JS-1	41.47

TITLE **ZONAL GREEN FODDER YIELD TRIAL OF PEARL MILLET**

OBJECTIVE To evaluate the green fodder yield potential of different Pearl millet lines at various locations.

RESEARCH WORKER Nadeem Rehman

DURATION 2019

LOCATION Experimental Seed Production Unit (ESPU), Farooqabad

TREATMENTS: Varieties/ Lines will be provided by the Director, FRI, Sargodha.

METHODOLOGY

Design	RCBD
Row spacing	30 cm
Replications	4
Plot size	1.8 X 6 m
Sowing time	Mid July
Fertilizer NPK kg/ha	99-57-62

The following data will be recorded for evaluation of lines: -

-Plan height	-Stem thickness
-No. of leaves/plant	-Leaf colour
-Days to maturity	-Days to 50% flowering
-Leaf Area	-Green fodder yield
-TSS Value	-No. of tiller/unit area

PREVIOUS YEAR'SRESULTS

Fodder yield (t/ha) of eight promising lines of Pearl Millet

S. No.	Varieties/Lines	Green Fodder Yield (t/ha)
1.	G.White	93.50
2.	FB.809	96.29
3.	Q Bajra	82.40
4.	FB.791	85.00
5.	CZ K 923	71.29
6.	FB.797	73.00
7.	Sgd.Bajra 2011 (Check)	76.00
8.	No: 7703	69.40

Date of sowing **10.07.2018**
Date of harvesting **14.09.2018**

TITLE **ZONAL GREEN FODDER YIELD TRIAL OF MAIZE**

OBJECTIVE To evaluate the green fodder yield potential of different maize lines at various locations.

RESEARCH WORKER Nadeem Rehman

DURATION 2019

LOCATION Experimental Seed Production Unit (ESPU), Farooqabad

TREATMENTS: Varieties/ Lines will be provided by the Director, FRI, Sargodha.

METHODOLOGY:

Design	RCBD
Row spacing	30 cm
Replications	3
Plot size	1.8 X 5 m
Sowing time	Mid July
Fertilizer NPK kg/ha	99-57-62

The following data will be recorded for evaluation of lines:

-Plan height	-Stem thickness
-No. of leaves/plant	-Leaf colour
-Days to maturity	-Days to 50% flowering
-Leaf Area	-Green fodder yield

PREVIOUS YEAR'SRESULTS

Table: Fodder yield (t/ha) of Maize

S. No.	Entry	Yield t/h
1	MS-01-2016	28.88
2	MS-04-2016	28.51
3	MS-07-2016	30.73
4	FSD.2020	30.50
5	MS-03-2015	33.70
6	MS-05-2016	27.77
7	Sgd.2002 (Check)	27.40
8	FSD.2025	27.30

TITLE **DEMONSTRATION TRIAL OF MAIZE FODDER VARIETIES.**

FODDER YIELD TRIAL 2018

1. AFGHOI	76/30x10,000=25,333 kg/h	=25.33t/h
2. MALKA	35/30x10,000=21,666 kg/h	=21.66t/h
3. M.MR.I.	68/30x10,000=22,666 kg/h	=22.66t/h
4. PEARL	66/30x10,000=22,000 kg/h	=22t/h

Date of sowing **25.04.2018**
Date of harvesting **10.07.2018**

TITLE **PRE-BASIC SEED PRODUCTION OF KHARIF FODDERS UNDER PROJECT ENTITLED "IMPROVEMENT IN BREEDING AND SEED PRODUCTION SYSTEM OF FODDER CROPS".**

OBJECTIVE Pre-basic seed production of approved varieties of fodder crops to ensure availability of certified seed.

RESEARCH WORKER Nadeem Rehman

DURATION 2018

LOCATION Experimental Seed Production Unit, Farooqabad

TREATMENTS

METHODOLOGY The packed seed plan will be supplied by Director, Fodder Research Institute Sargodha and the trial will be laid out accordingly. The station will produce pre-basic seed of approved cultivar of maize Sgd-2002.

PREVIOUS YEAR'SRESULTS

Sr. No.	Variety/crop	Seed produced pre-basic (Kg)
1.	Sgd-2002	6300
2.	Sorghum-2002	1550
3.	Sorghum Hegari	410
4.	Sorghum-2011	300