FODDER RESEARCH INSTITUTE, SARGODHA

INTRODUCTION

Economy of Pakistan is predominantly agriculture driven which not only contributing 19.5% GDP but also provides 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, 2016-17). It provides milk, meat and other by-products of animal origin for human nutrition. Pakistan being at 4th position in milk production in the world 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 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. Animal population comprising of cattle, buffalo, goat, sheep and others is 191.3 million in Pakistan (Economic Survey of Pakistan, 2016-17).

Fodders occupied an area of 2.11 million hectares and produced 45.77 million tonnes of green fodder out of which Punjab province contributed 1.81 million hectares area and 39.20 million tonnes production of the country.In Punjab, fodder crops occupying third place after wheat and cotton with average fodder yield of 21.6 t/ha. Major Rabi fodder crops are berseem, oats and alfalfa.

There is fodder shortage, which gets severe during lean 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 and 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. Multi-facet experiments on Rabi fodder crops have been planned to find out proper and feasible answer 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 2016-17

BERSEEM

1. **In adaptability trial at 4 locations, advance line SB-2-14 & FB-3-14 produced highest green fodder yield 102.00 & 99.75 t/ha whereas check variety Anmol produced 96.52 t/ha.**

2. **In advance green fodder yield trial tested at 2 locations, line SB-3-15 and FB-3-15 gave maximum yield 111.23 t/ha and 110.66 t/ha while check variety Anmol produced 100.74 t/ha.**

3. **Line SB-2-16 and FB-3-16 produced highest green fodder yield 107.36 t/ha and 107.11 in preliminary green fodder yield experiment at two locations, while check variety Agaiti produced 101.41 t/ha.**

Oats

1. **In adaptability green fodder yield trails 2 promising lines CK-1, and FRI-03 proved better yielder i.e. 84.19 t/ha and 82.64 t/ha respectively over two check varieties S-2000 and SGD - 2011 produced 79.71 and 76.14 respectively on an average of five different locations at Punjab level.**

2. **In advance green fodder yield trial 3 promising lines FSD-01-225 and No.75527 proved better yielder having average yield 80.11 t/ha, 77.74 t/ha and two check varieties SGD OATS 2011 and S-2000 produced 76.98 t/ha and 75.67 t/ha respectively.**

3. **Three lines 677, SGD 41and FSD OATS revealed highest green fodder yield 94.53, 91.08 and 90.16 t/ha respectively in preliminary green fodder yield experiment while two check varieties SGD OATS 2011 and S-2000 produced 85.56 t/ha and 84.87 t/ha respectively.**

LUCERN

1. **In advance green fodder trial, line GR-722, C 312, GR 745 and Hunter River produced 70.66, 64.74, 61.79 and 61.42 t/ha, green fodder yield than check Sargodha Lucerne 2002 which produced 53.28 t/ha green fodder yield.**

2. **30 new lines will be inducted in the germplasm maintenance of Lucerne.**

ANNUAL RESEARCH PROGRAMME FOR RABI 2017-18

FODDER RESEARCH INSTITUTE, SARGODHA

BERSEEM *(Trifolium alexandrinum. L)* 2n = 16

1. TITLE — **MAINTENANCE AND EVALUATION OF BERSEEM GERMPLASM**

OBJECTIVE — **To maintain and evaluate the germplasm and record characters for use in breeding programme.**

RESEARCH WORKER — **Amir Abdullah, Ghulam Ahamd and Ghulam Nabi.**

PROJECT DURATION — **2017-18**

LOCATION — **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY

No. of lines to be planted = 54
Fertilizer = 22-115-62 NPK kg/ha.
Sowing time = First fortnight of November

Following characters will be recorded:-

1. **No. of days to flower**
2. **No. of days to maturity**
3. **Disease incidence**
4. **Green fodder yield**
5. **Plant height**
6. **Dry matter**
7. **Crude protein %**

PREVIOUS YEAR'S RESULTS — **Seed of 30 lines was collected, and seed was preserved.**

S. No.	Parameters	Range
1	No. of days to flower	162-188 days
2	No. of days to maturity	185-211 days
3	Plant height	62-71 cm
4	Green fodder yield	65-84 t/ha.
5	Dry matter	11.6 – 16%
6	Crude protein	15.8 – 22.4%

2.	**TITLE**	**IMPROVEMENT OF FODDER AND GRAIN YIELD THROUGH MASS SELECTION IN BERSEEM.**
	OBJECTIVE	**To develop high yielding population from open pollinated material through selection in berseem**
	RESEARCH WORKER	**Amir Abdullah, Ghulam Ahamd and Mr. Muhammad Saleem Akhtar**
	LOCATION	**Fodder Research Institute, Sargodha**
	PROJECT DURATION	**2017-18 (Continuous nature)**
	TREATMENTS/ METHODOLOGY	**500 desirable healthy capsules and 100 plants will be selected from open pollinated material, then seed of selected capsules and plants will be bulked separately and next 2-3 years random mated population will be raised to include in testing preliminary fodder yield trial.**
	PREVIOUS YEAR'S RESULTS	**- Micro plot of bulk seed of selected capsules was harvested and thrashed for next year re-sowing to raise next random mated population.** **- 500 typical capsules from random mated population were selected, thrashed and bulked.**
3	**TITLE**	**PRELIMINARY GREEN FODDER YIELD TRIAL OF BERSEEM**
	OBJECTIVE	**To evaluate the green fodder yield potential of different promising lines of Berseem.**
	RESEARCH WORKERS	**Amir Abdullah and Ghulam Ahamd**
	PROJECT DURATION	**2017-18**
	LOCATION	**Fodder Research Institute, Sargodha.**
	TREATMENTS/ METHODOLOGY	**Lines / varieties = 10** **1) SB-1-17 2) SB-2-17** **3) SB-3-17 4) B. Agaiti (Check)** **5) Anmol (Check) 6) FB-01-17** **7) FB-02-17 8) FB-03-17** **9) SB-04-17 10) SB-05-17**

Lay out	**=**	**RCBD**
Replications	**=**	**3**
Plot size	**=**	**3x5 m.**
Sowing method	**=**	**Broadcast**
Fertilizer	**=**	**22-115-62 NPK kg/ha.**
Sowing time	**=**	**Ist fortnight of October**

Following observations will be recorded.

1. **Plant height (cm)**
2. **Disease incidence**
3. **Green fodder yield (t/ha)**
4. **Dry matter (t/ha)**

GREEN FODDER YIELD (t/ha.)

PREVIOUS YEAR'S RESULTS

Sr. No.	Lines/ varieties	FRI, Sargodha	FRSS, F/Abad.	Avg.
1.	SB-2-16	139.39	75.33	107.36
2.	FB-3-16	137.70	76.66	107.18
3.	FB-2-16	138.26	74.00	106.13
4.	FB-1-16	136.37	75.55	105.95
5.	SB-4-16	137.89	70.00	103.95
6.	Anmol (Check)	134.86	70.44	102.65
7.	SB-7-16	135.24	68.00	101.62
8.	SB-3-16	139.77	63.33	101.50
9.	Agaiti(Check)	135.05	67.77	101.41
10.	SB-5-16	135.05	64.66	99.85
11.	SB-6-16	127.50	67.55	97.52
12.	SB-1-16	131.65	60.00	95.82
	LSD (5%)	4.05	1.98	

4 TITLE: ADVANCED GREEN FODDER YIELD TRIAL OF BERSEEM

OBJECTIVE **To test lines selected from preliminary trials of Berseem for green fodder yield potential and other desirable characters.**

RESEARCH WORKERS **Amir Abdullah and Ghulam Ahmad**

PROJECT DURATION **2017-18**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY

Lines/ varieties = 08

1	**SB-2-16**	**2**	**Agaiti (check)**
3	**SB-3-16**	**4**	**Anmol (check)**
5	**FB-01-16**	**6**	**FB-02-16**
7	**SB-04-16**	**8**	**SB-07-16**

Lay out = RCBD
Replications = 3
Plot size = 3x5 m.
Sowing method = Broadcast
Fertilizer = 22-115-0NPK kg/ha.
Sowing time = Ist fortnight of October

Following observations will be recorded.

1. **Plant height**
2. **No. of tillers/plant**
3. **No. of days to flower**
4. **No. of days to maturity.**
5. **Disease incidence**
6. **Green fodder yield**
7. **Dry matter yield**

GREEN FODDER YIELD (t/ha.)

PREVIOUS YEAR'S RESULTS

Sr.No.	Lines/ varieties	FRI, Sgd.	FRSS, F/Abad.	Avg.
1.	SB-3-15	149.59	72.88	111.23
2.	FB-3-15	145.99	75.33	110.66
3.	SB-2-15	136.19	70.00	108.09
4.	FB-1-15	139.38	68.66	104.02
5.	SB-1-15	138.38	64.22	101.30
6.	Anmol (check)	138.38	63.11	100.74
7.	SB-6-15	136.78	64.44	100.61
8.	Agaiti (check)	135.00	63.11	99.05
9.	SB-4-15	134.39	58.66	96.52
10.	SB-5-15	135.59	55.77	90.68
	LSD 5%	7.53	1.39	

5. TITLE **ADAPTABILITY FODDER YIELD TRIAL OF BERSEEM**

OBJECTIVE **To assess green fodder yield potential of advanced lines against standard varieties under different agro-climatic conditions.**

RESEARCH WORKERS **Amir Abdullah and Ch. Ghulam Nabi**

PROJECT DURATION **2017-18**

LOCATION (S)

i.) FRI, Sargodha
ii) ARS, Bahawalpur
iii) FRSS, AARI, Faisalabad.
iv) ESPU, Farooqabad..

TREATMENTS/ METHODOLOGY

Lines/ Varieties = 7

1	**SB-1-15**	**2**	**SB-2-15**
3	**SB-03-15**	**4**	**FB-1-15**
5	**FB-3-15**	**6**	**Anmol (check)**
7	**Agaiti (check)**		

Lay out = RCBD
Replications = 3
Plot size = 3 x 5m.
Sowing method = Broadcast
Fertilizer = 22-115-0 NPK kg/ha.
Sowing time = Ist fortnight of October

Following observations will be recorded.

1. Plant height **2. Dry matter yield**
3 Disease incidence **4. 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	Av.
1.	SB-2-14	146.22	60.44	88.90	112.40	102.00
2.	FB-3-14	138.21	62.88	87.80	108.21	99.75
3.	FB-2-14	139.11	60.44	84.40	108.60	98.14
4.	Anmol (check)	136.1	62.66	84.00	103.20	96.52
5.	FB-1-14	133.10	58.44	84.20	107.10	95.66
6.	SB-1-14	136.89	54.00	80.40	111.11	95.60
7.	SB-3-14	132.21	55.11	83.10	105.00	93.85
8.	Agaiti(check)	136.00	56.00	76.40	100.40	92.20
	LSD 5%	6.65	1.79	3.89	5.95	

6. TITLE — **NATIONAL UNIFORM GREEN FODDER YIELD TRIAL OF BERSEEM**

OBJECTIVE — **To evaluate promising lines of berseem for green fodder yield potential under different agro-ecological zones of Pakistan**

RESEARCH WORKERS — **Amir Abdullah and Ch. Ghulam Nabi**

PROJECT DURATION — **2017-18**

LOCATION — **Fodder Research Institute, Sargodha,**

TREATMENTS/ METHODOLOGY — **The seed along with plan and methodology will be supplied by the coordinator (Fodder) NARC, I/Abad.**

PREVIOUS YEAR'S RESULTS — **Results awaited**

OATS (*Avena sativa)* 2n = 42

7. TITLE — **COLLECTION, EVALUATION, AND MAINTENANCE OF GENEPOOL OF OATS**

OBJECTIVE — **To collect, evaluate and maintain the gene pool for utilization in breeding programs.**

RESEARCH WORKERS — **Dr. Imtiaz Niazi, Muhammad Saleem Akhtar and Sikandar Hayat**

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

LOCATION — **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY

Germplasm lines /varieties

Previous	**= 105**
New collections	**= 25**
Total	**= 130**
No. of rows	**= 2**
Row length	**= 6 m**
Row spacing	**= 45 cm.**
Fertilizer	**= 114-84-50 NPK kg/ha.**
Date of sowing	**= November**

PREVIOUS YEAR'S RESULTS — **Seed of 105 lines was collected and preserved for next year sowing.**

S. No.	Parameters	Range
1.	Lodging	20-80%
2.	Days to heading	90-132
3.	Plant height	65-170 cm
4.	No. of tillers/plant	6-15
5.	Days to maturity	99-142

8. TITLE — **HYBRIDIZATION PROGRAMME**

OBJECTIVES

i) **New crosses will be attempted to improve the fodder yield, quality and resistance to disease.**

ii) **To create genetic variability and selection of desirable recombinants from different generations of oats.**

RESEARCH WORKERS — **Dr. Imtiaz Niazi, Sikandar Hayat, and Muhammad Saleem Akhtar**

PROJECT DURATION — **2017-18**

LOCATION — **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY — **30 crosses will be attempted**

Parental lines / varieties :-

1) FRI-01 **2) No.75525**
3) 75527 **4) Sgd-1**
5) FRI-02 **6) Domount**
7) FRI-03 **8) Ck-1**
9) S-2000

No. of Rows = 2
Row length = 6 m
Row spacing = 45 cm.
Fertilizer = 114-84-50 NPK kg/ha.
Date of sowing = November

PREVIOUS YEAR'S RESULTS — **36 crosses were attempted out of which 10 crosses remained successful.**

9. TITLE: **STUDY OF FILIAL GENERATIONS (F_1-F_6) OF OATS**

OBJECTIVES:
i) **To observe the genetic variability and select the desirable recombinants from different generations of oats.**
ii) **To select phenotypically superior uniform lines from advanced generations for further testing.**

RESEARCH WORKERS **Dr. Imtiaz Niazi, Sikandar Hayat and Muhammad Saleem Akhtar**

PROJECT DURATION **2017-18**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY

Crosses to be studied:-

S. No.	Generation's	crosses/ plant progenies
1.	F1	10 crosses
2.	F2	5 crosses
3.	F3	60 plant progenies
4.	F4	40 plant progenies
5.	F5	24 plant progenies
6.	F6	12 plant progenies

Row length	=	6m
Row spacing	=	60cm
Fertilizer	=	114-84-50 NPK kg/ha.
Sowing time	=	November
F1	=	Flanked with parents
F3-F6	=	3 rows of each single plant Progeny
Check varieties	=	Sgd oat 2011 and S-2000

PREVIOUS YEAR'S RESULTS

Fillial Generations	Entries Studied	Selected Progenies/Plants	Uniform Lines Selected
F1	5 crosses	5	-
F2	6 crosses	60 plants of 5 crosses	-
F3	50 plant progenies of 5 crosses	40 plants of 4 crosses	-
F4	32 plant progenies of 4 crosses	24 plants of 3 crosses	-
F5	18 plant progenies of 3 crosses	12 plants of 2 crosses	
F6	10 plants progenies of 2 crosses	-	2

10. TITLE: **PRELIMINARY FODDER YIELD TRIAL OF OATS**

OBJECTIVES: **To assess green fodder yield of newly selected lines/varieties of oats.**

RESEARCH WORKERS **Dr. Imtiaz Niazi and Sikandar Hayat**

PROJECT DURATION **2017-18**

LOCATION

i) Fodder Research Institute, Sargodha.
ii) Fodder Research Sub-station, AARI, Faisalabad.

TREATMENTS/ METHODOLOGY

No. of Entries = 14

i)	**No.75525**	**ii)**	**FRI-01**
iii)	**FRI-02**	**iv)**	**FRI-03**
v)	**Domovit**	**vi)**	**Sgd-1**
vii)	**Fsd. Oat-01-2015**	**viii)**	**Fsd. Oat-02-2015**
ix)	**Fsd. Oat-03-2015**	**x)**	**No.668**
xi)	**Sgd. Oats 2011(check)**	**xii)**	**S-2000 (check)**
xiii)	**No.689**	**xiv)**	**CK-1**

Layout	**=**	**RCBD**
Replications	**=**	**3**
Plot Size	**=**	**2.4x6m**
Row spacing	**=**	**30cm**
Fertilizer	**=**	**114-84-50 NPK kg/ha.**
Sowing Date	**=**	**November**

Following data will be recorded.

1.	**Plant height (cm)**	**2.**	**No. of tillers/ plant**
3.	**Lodging %**	**4.**	**Disease incidence**
5.	**Green fodder yield (t/ha)**	**6.**	**Crude protein**
7.	**Dry matter yield**	**8.**	**Crude fiber**

PREVIOUS YEAR'S RESULTS

S.No.	Line / Variety	FRI, Sargodha
1	677	94.53
2	SGD-41	92.46
3	SGD 1	91.08
4	FSD OAT	90.16
5	DOMOUNT	88.32
6	FSD OAT-3-16	88.09
7	CK-1	87.89
8	S-2000 (Check)	85.56
9	SGD OAT 2011(Check)	84.87
10	SGD 46	84.173
11	ERK	82.34
12	FSD OAT 3	80.5
13	NO 632	80.5
14	60-75525	77.58
LSD 5%	6.35	

11. TITLE: **ADVANCED GREEN FODDER YIELD TRIAL OF OATS**

OBJECTIVE: **To test lines selected from preliminary yield trials for green fodder and other desirable characters.**

RESEARCH WORKER **Dr. Imtiaz Niazi, Sikandar Hayat and Ghulam Nabi**

PROJECT DURATION **2017-18**

LOCATION
- **i) Fodder Research Institute, Sargodha**
- **ii) Fodder Research Sub-station, AARI, Faisalabad.**
- **iii) Experimental Seed Production Unit, Farooqabad.**

TREATMENTS/ METHODOLOGY

Varieties/lines = 12

i)	**FRI-01**	**ii)**	**No.677**
iii)	**FRI-02**	**iv)**	**Ck-1**
v)	**FRI-03**	**vi)**	**No75525**
vii)	**Fsd. Oat-01-2013**	**viii)**	**Fsd. Oat-02-2013**
ix)	**Fsd. Oat-03-2013**	**x)**	**ERK**
xi)	**Sgd. Oats 2011(check)**	**xii)**	**S-2000 (check)**

Layout	**=**	**RCBD**
Replications	**=**	**3**
Plot Size	**=**	**2.4 x 6m**
Row Spacing	**=**	**30 cm.**
Fertilizer	**=**	**114-84-50 NPK kg/ha.**
Sowing Date	**=**	**October**

Following data will be recorded.

1. **Plant height (cm)**
2. **Lodging %**
3. **No. of tillers/plant**
4. **Disease incidence**
5. **Green fodder yield (t/ha)**
6. **Crude protein**
7. **Dry matter yield**
8. **Crude fiber**

PREVIOUS YEAR RESULT

Sr.No.	Variety	AV t/ha
1.	SGD-1	83.95
2.	FSD-01-225	80.11
3.	NO 75527	77.74
4.	SGD OAT 2011(Check)	76.98
5.	FSD OAT-02-2015	76.97
6.	S-2000 (Check)	75.67
7.	CK-1	74.98
8.	DOUMONT	74.98
9.	NO 632	73.6
10.	NO 75524	71.73
11.	DN-8	70.05
12.	NO 75525	69.03
	LSD 5%	4.31

12. TITLE: ADAPTABILITY YIELD TRIAL OF OATS

OBJECTIVES **To evaluate the promising lines for their green fodder yield in different agro ecological zones of the province.**

RESEARCH WORKERS **Dr. Imtiaz Niazi, Sikandar Hayat and Ghulam Nabi**

PROJECT DURATION **2017-18**

LOCATION (S)

i.) FRI, Sargodha
ii) ARS, Bahawalpur
iii) ESPU, Farooq abad.
iv) FRSS, AARI, Faisalabad

TREATMENTS/ METHODOLOGY

Varieties/lines = 12

i)	**FRI-02**	**ii)**	**FRI-03**
iii)	**SGD-1**	**iv)**	**CK-1/5COH**
v)	**No.75525**	**vi)**	**S-07-2012**
vii)	**FRI-01**	**viii)**	**Fsd. Oat-03-2013**
ix)	**Sgd. Oats 2011(check)**	**xii)**	**S-2000 (check)**

Layout = RCBD
Replications = 3
Plot Size = 1.8x6m
Row spacing = 30cm
Fertilizer = 114-84-50 NPK kg/ha.
Sowing Time = October

Following data will be recorded.

1. **Plant height (cm)**
2. **Lodging %**
3. **No. of tillers/plant**
4. **Disease incidence**
5. **Green fodder yield (t/ha)**
6. **Crude protein**
7. **Dry matter yield**
8. **Crude fiber**

PREVIOUS YEAR'S RESULT

Sr No	Line /Verity	FRI Sgd	FRSS F/Abbad	ARS B/Pur	ESPU Farooqabad	Average (t/ha)
1	CK-1	83.39	110.97	53.2	89.19	84.19
2	FRI-02	86.79	106.95	47.8	89.50	82.76
3	FRI 03	95.38	87.10	55.2	92.89	82.64
4	FSD-01-2013	89.28	89.19	54.7	88.88	80.51
5	NO 75525	89.92	87.72	50.9	91.97	80.13
6	FRI-01	85.88	90.82	47.1	95.05	79.71
7	S-2000(Check)	56.21	115.32	49.9	95.37	79.20
8	FSD-2-2013	87.42	83.70	51.1	94.44	79.17
9	DOUMONUT	75.95	88.96	54.1	91.66	77.67
10	SGD OAT 2011(Check)	83.7	81.84	53.6	85.40	76.14
11	NO -632	68.37	88.35	51.3	90.74	74.69
12	FSD-03-2013	46.5	88.35	59.7	91.97	71.63

13. TITLE **NATIONAL UNIFORM GREEN FODDER YIELD TRIAL OF OATS**

OBJECTIVES: **Tto evaluate the elite lines for their green fodder yield potential at national level under different Agro-climatic conditions of the country.**

RESEARCH WORKER **Dr. Imtiaz Niazi, Sikandar Hayat.**

LOCATION **FRI, Sargodha and others**

TREATMENTS/ METHODOLOGY **Seed and sowing plan will be supplied by the Coordinator, (Fodder), NARC, Islamabad and the experiment will be laid out accordingly. Data will be recorded as per instructions. Fodder Research Institute, Sargodha.**

PREVIOUS YEAR'S RESULT **Results awaited**

LUCERNE (Medicago sativa L.) 2n = 32

14. TITLE **MAINTENANCE AND EVALUATION OF GERMPLASM**

OBJECTIVE **To collect, evaluate and maintain the germplasm for further utilization in Breeding Programme.**

RESEARCH WORKERS **Abdul Jabbar and Sikandar Hayat**

PROJECT DURATION **(Continuous nature)**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY

Total entries	**=**	**61**
Row Spacing	**=**	**60cm.**
Row Length	**=**	**5m.**
Sowing time	**=**	**First fortnight of October**

Following data will be recorded:-

1. Plant height	**2. Culm thickness**
3. No. of tillers/meter row	**4. No. of tillers/plant.**
5. No. of leaves / tiller	**6. No. of leaves/ plant.**
7. Dry matter yield	**8. Leaf area**
9. Crude Protein %	**10. Fat %**
11.Ash %	**12.Crude Fiber**

PREVIOUS YEAR'S CHARACTERIZATION[

Sr. No.	Parameters	Range
1.	Plant height	70-86 cm
2.	Culm thickness	0.40-0.86 cm
3.	No. of tillers/plant	8.66-13.33
4.	No. of tillers/Meter row	123-228
5.	No. of leaves / tiller	123-219
6.	Dry matter yield	22 - 25
7.	Leaf area	5.72-8.48 cm^2
8.	Crude Protein %	14.1-20.1
9.	Fat %	1.81- 3.0
10.	Ash %	11.45-14.86
11.	Crude Fiber	21.526.3

15 TITLE **PRELIMINARY GREEN FODDER YIELD TRIAL OF LUCERNE**

OBJECTIVES **To evaluate promising lines for high green fodder yield.**

RESEARCH WORKERS **Abdul Jabbar and Sikandar Hayat**

PROJECT DURATION **2017-18**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS **Total lines = 11**

METHODOLOGY

Lay out = RCBD
Replications = 3
Plot size = 1.8 x 5m.
Row spacing = 45cm.
Sowing time = First fortnight of October

Following data will be recorded:-

1. Plant height	**2. Culm thickness**
3. No. of tillers/meter row	**4. No. of tillers/plant.**
5. No. of leaves / tiller	**6. No. of leaves/ plant.**
7. Dry matter yield	**8. Leaf area**
9. Crude Protein %	**10. Fat %**
11.Ash %	**12.Crude Fiber**

REVIOUS YEAR'S RESULTS

Sr.No	Lines / Varieties	GFY (t/ha.)
1.	FRI001	58.00
2.	CUF-101	55.00
3.	Sunder	52.00
4.	Oman	51.00
5.	No. 53	49.00
6.	Sgd. Lucerne (check)	48.00
7.	5-IN-59	45.00
8.	SARD-10	43.00
9.	SGS-82	41.00
10.	ICON-13	41.00
11.	No.7613	39.00
12.	Silverado	38.00
	LSD 5%	1.67

16 TITLE **ADVANCED GREEN FODDER YIELD TRIAL OF LUCERNE**

OBJECTIVES: **To test different lines of Lucerne for green fodder yield and other desirable characters promoting from preliminary yield trial.**

RESEARCH WORKERS **Abdul Jabbar and Sikandar Hayat**

PROJECT DURATION **2017-18**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS METHODOLOGY

Total lines	**=**	**12**
Lay out	**=**	**RCBD**
Replications	**=**	**3**
Plot size	**=**	**1.8x5m.**
Row spacing	**=**	**45cm.**
Sowing time	**=**	**First fortnight of October**

Following data will be recorded:-

1. Plant height	**2. Culm thickness**
3. No. of tillers/meter row	**4. No. of tillers/plant.**
5. No. of leaves / tiller	**6. No. of leaves/ plant.**
7. Dry matter yield	**8. Leaf area**
9. Crude Protein %	**10. Fat %**
11.Ash %	**12.Crude Fiber**

REVIOUS YEAR'S RESULTS

GREEN FODDER YIELD (t/ha.)

Sr.No	Lines / Varieties	GFY
1.	GR-722	70.66
2.	Sgd Lucerne(Check)	53.28
3.	Hunter River	61.42
4.	No.1103	48.84
5.	C-312	64.74
6.	GR-745	61.79
	LSD 5%	1.51

17. TITLE **ADAPTABILITY YIELD TRIAL OF LUCERNE**

OBJECTIVE **To evaluation the promising lines of Lucerne for their green fodder yield in different ecological zones of the province of Punjab.**

RESEARCH WORKERS **Abdul Jabbar and Sikandar Hayat**

PROJECT DURATION **2017-18**

LOCATION (S)

i.) FRI, Sargodha
ii) ARS, Bahawalpur
iii) FRSS, AARI, Faisalabad
iv) ESPU, Farooqabad

TREATMENTS
METHODOLOGY

Total lines	**=**	**06**
Lay out	**=**	**RCBD**
Replications	**=**	**3**
Plot size	**=**	**1.8x5m.**
Row spacing	**=**	**45cm.**
Sowing time	**=**	**First fortnight of October**

Following data will be recorded:-

1. Plant height	**2. Culm thickness**
3. No. of tillers/meter row	**4. No. of tillers/plant.**
5. No. of leaves / tiller	**6. No. of leaves/ plant.**
7. Dry matter yield	**8. Leaf area**

REVIOUS YEAR'S RESULTS **New experiment**

18. TITLE **NATIONAL UNIFORM GREEN FODDER YIELD TRIAL OF LUCERNE**

OBJECTIVES: **To evaluate the elite lines for their green fodder yield potential at national level under different Agro-climatic conditions of the country.**

RESEARCH WORKER **Abdul Jabbar and Sikandar Hayat**

PROJECT DURATION **2017-18**

REVIOUS YEAR'S **New experiment.**

RESULTS **Seed of 02 advance lines "GR-745 & GR-722" has been sent to NARC, Islamabad for trial.**

19. TITLE **BNS AND BASIC SEED PRODUCTION**

OBJECTIVE **Production of BNS and Pre-basic seed of Berseem, Lucerne and Oats**

RESEARCH WORKER **Mr. Ahmad Hussain and Muhammad Riaz Gondal**

PROJECT DURATION **2017-2018**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY

Row distance **60 cm**

No. of rows per block **6**

Sowing time **15th October to 30th November 2017**

- **Individual plants of each variety from pre-basic Block will be selected for next year sowing of Plant-to-Row.**
- **True to type rows will be selected for next year swing of Row-to-Block.**
- **True to type Blocks will be threshed/ bulked for Breeder Nucleus Seed (BNS) used for next year sowing of Pre-basic Block.**

PREVIOUS YEAR'S RESULTS

Crop	Variety	Selected Number of plants	Selected Number of Plant rows	Selected Number of row blocks	BNS (kg)	Pre-basic (kg)
Berseem	Agaiti	100	45/60	26/32	48	850
	Pachaiti	100	36/65	24/38	42	800
Oats	S-2000	100	40/55	18/21	118	3400
	SGD-2011	100	45/55	21/26	156	3240
Lucerne	SGD-Lucerne 2002	100	40/50	24/32	14	430

AGRONOMY:

20 TITLE: **EFFECT OF LAST CUTTING DATE ON SEED PRODUCTION OF BERSEEM**

OBJECTIVE: **To determine the suitable date of last cutting for better seed production.**

RESEARCH WORKER **M. Riaz Gondal & Sultan Ali Bazmi**

PROJECT DURATION **2017-18**

LOCATION **Fodder Research Institute, Sargodha.**

TREATMENTS/ METHODOLOGY

A) VARIETIES
- **Superlate Fsd**
- **Berseem Agaiti**
- **SB-11**

Last Cutting Dates
- **10th March**
- **20th March**
- **30th March (Check)**
- **10th April**
- **20th April**

PLAN OF WORK

Sowing time	**=**	**2nd week of October**
Plot Size	**=**	**6m x 3m**
Lay out	**=**	**Split plot**
Replications	**=**	**3**

Observations to be recorded:

1.Number of plants/m^2, 2. No of heads/plant,
3.Seed yield (t/ha.), 4. Plant height (cm),
5.No of seeds/Capsule, 6. Fodder yield (t/ha.)

PREVIOUS YEAR'S RESULTS

Sr. No	Lines / Varieties	Seed yield (t/ha.) FRI, Sgd.
1.	SB-11	0.6762
2.	Superlate Fsd.	0.6438
3.	B. Agaiti	0.6308

Sr. No	Cutting date	Seed yield (t/ha.) FRI, Sgd.
1.	10th March	0.8046 A
2.	20th March	0.8056 A
3.	30th March	0.6746 B
4.	10th April	0.6453 B
5.	20th April	0.321 C
	LSD 5%	0.0892

Interaction of Variety x Last Cutting dates ^{NS}

Variety	10 March	20 March	30 March	10 April	20 April
Super Late	0.750	0.893	0.633	0.608	0.335
SB-11	0.891	0.820	0.720	0.666	0.284
Berseem Agaiti	0.773	0.704	0.671	0.666	0.334

21 TITLE: **EFFECT OF SEED RATE ON SEED PRODUCTION OF BERSEEM LINE SB-11**

OBJECTIVE: **To find optimum seed rate to get maximum seed production of berseem**

RESEARCH WORKER **Sultan Ali Bazmi & M. Riaz Gondal**

PROJECT DURATION **2017-18**

LOCATION **Fodder Research Institute, Sargodha.**

TREATMENTS/ METHODOLOGY **SEED RATE (kg/ha)**

10.0
12.5
15.0
17.5
20.0
22.5
25.0

PLAN OF WORK	**Layout**	**=**	**RCBD**
	Plot size	**=**	**3m x 6m**
	Replication	**=**	**4**
	Sowing time	**=**	**2nd week of October**
	Variety/Line	**=**	**Line SB-11**

The following observations will be recorded

1.Plant height (cm) **2. No. of grains per head**
3.1000 grain weight (g) **4. Grain yield (t/ha.)**
5. Green Fodder Yield (t/ha)

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

22 TITLE **EFFECT OF SEED RATE ON SEED PRODUCTION OF ALFALFA NEW LINE**

OBJECTIVE **To find optimum seed rate to get maximum seed production of alfalfa**

RESEARCH WORKER **Anees-ul-Hussnain Shah**

PROJECT DURATION **2017-18**

LOCATION **FRI, Sargodha**

TREATMENTS/ METHODOLOGY

SEED RATE (kg/ha)

2.0

2.5

3.0

3.5

4.0

PLAN OF WORK	**Layout**	**=**	**RCBD**
	Plot size	**=**	**6m x 2.7m**
	Replication	**=**	**4**
	Sowing time	**=**	**2nd week of October**
	Row spacing	**=**	**45cm**
	Variety/Line	**=**	**New line to be provided by breeders**

Observations to be recorded

1. Plant height (cm) **2. No. of grains per pod**
3. 1000 grain weight (g) **4. Grain yield(kg/ha.)**
5. Fodder yield(t/ha)

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

23 TITLE **EFFECT OF LAST CUTTING DATE ON SEED PRODUCTION OF ALFALFA**

OBJECTIVE **To determine the suitable date of last cutting for better seed production.**

RESEARCH WORKER **Sultan Ali Bazmi & M. Riaz Gondal**

PROJECT DURATION **2017-18**

LOCATION **Fodder Research Institute, Sargodha.**

TREATMENTS/ METHODOLOGY

Last Cutting Dates

1. 1st March
2. 10th March
3. 20th March
4. 30th March
5. 10th April
6. 20th April
7. 30th April
8. 10th May

PLAN OF WORK

Sowing time **2nd week of October**

Plot Size = **6m x 2.7m**

Lay out = **RCBD**

Replications = **3**

Row Spacing = **45cm**

Observations to be recorded
1. Plant height **2. No. of grains per head**
3. 1000 grain weight **4. Grain yield(t/ha.)**

PREVIOUS YEAR'S RESULTS

Sr. No	Cutting date	Seed yield (kg/ha.)
1.	1st March	75.00 E
2.	10th March	76.25 E
3.	20th March	93.75 E
4.	30th March	132.50 D
5.	10th April	182.50 C
6.	20th April	270.00 B
7.	30th April	320.00 A
8.	10th May	257.50 B
	LSD 5%	19.773

24 TITLE **EFFECT OF PRE EMERGENCE WEEDICIDES FOR THE WEED CONTROL OF EARLY SOWN BERSEEM**

OBJECTIVE **To find out a suitable weedicide and time of application to control weeds in early sowing berseem**

RESEARCH WORKER **M. Riaz Gondal & Sultan Ali Bazmi**

PROJECT DURATION **2017-18**

LOCATION **FRI, Sargodha**

TREATMENTS/ METHODOLOGY

A-WEEDICIDES

1-Atrazine
2-Pendimethaline
3-Primextra
4-Dual gold
5- Control

B-TIME OF APPLICATION

1- 4 Days before sowing and incorporated in soil
2- 2 Days before sowing and incorporated in soil
3- Just before sowing and incorporated in soil
4- After sowing when there is no standing water

PLAN OF WORK

Variety	**Super Late Berseem**
Layout	**RCBD (for each weedicide and pooled analysis)**
Plot size	**4m x 6m**
Sowing time	**Last week of September**

Observations to be recorded

1. **Berseem germination/m2**
2. **No of weeds/m2**
3. **Green fodder Yield /t/ha**

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

25 TITLE **EFFECT OF DIFFERENT SEED RATES AND NPK DOSES ON SEED PRODUCTION OF BERSEEM**

OBJECTIVE **To Find Out The Optimum Seed Rate And NPK Doses To Get Maximum Seed of Berseem**

RESEARCH WORKER **M. Riaz Gondal & Sultan Ali Bazmi**

PROJECT DURATION **2017-18**

LOCATION **FRI, Sargodha**

TREATMENTS/ METHODOLOGY

A -Seed Rates (Sub Plot)

1-12.5 KG /ha
2-15 kg/ha
3-17.5 kg/ha
4-20 kg/ha
5-22.5 kg/ha

B-<u>FERTILIZER DOSES (Kg/ha) (MAIN PLOT)</u>

N	P	K
23	0	0
23	30	30
23	60	60
23	90	90

PLAN OF WORK

Layout	**=**	**Split Plot Design**
Plot size	**=**	**3m x 6m**
Replication	**=**	**4**
Sowing time	**=**	**2nd week of October**
Variety	**=**	**Super Late Berseem**

Observations to be recorded

1. Plant height (cm) **2. No. of grains per capsule**
3.1000 grain weight (g) **4. No. of tiller per m^2**
5.Grain yield(t/ha.) **6. Fodder yield(t/ha)**

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

26 TITLE **EFFECT OF SEED RATE AND ROW SPACING ON GREEN FODDER YIELD OF OATS LINE "SGD-1"**

OBJECTIVE **To find out optimum seed rate and row spacing for maximum green fodder yield.**

RESEARCH WORKER **Anees-ul-Hussnain Shah**

PROJECT DURATION **2017-18**

LOCATION **FRI, Sargodha**

TREATMENTS/ METHODOLOGY

A) ROW SPACING
1. 15cm
2. 30cm
3. 45cm

B) SEED RATE
1. 67.5 kg/ha.
2. 80.0 kg/ha.
3. 92.5 kg/ha.

PLAN OF WORK

Layout	=	**Split plot design**
Plot size	=	**3.6m x 6m**
Replication	=	**4**
Sowing time	=	**2nd week of October**
Fertilizer	=	**32-23-00**

Observations to be recorded
1.Plant height **2.No. of tillers/plant**
3.No. of leaves /tiller **4.Leaf Area (cm^2)**
5.Stem thickness (mm) **6. Fodder Yield (t/ha)**

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

27	**TITLE**	**EFFECT OF SEED RATE AND ROW SPACING ON GREEN FODDER YIELD OF OATS LINE "FR-03"**
	OBJECTIVE	**To find out optimum seed rate and row spacing for maximum green fodder yield.**
	RESEARCH WORKER	**Anees-ul-Hussnain Shah**
	PROJECT DURATION	**2017-18**
	LOCATION	**FRI, Sargodha**
	TREATMENTS/ METHODOLOGY	**A) <u>ROW SPACING</u> 1. 15cm 2. 30cm 3. 45cm B) <u>SEED RATE</u> 1. 67.5 kg/ha. 2. 80.0 kg/ha. 3. 92.5 kg/ha.**
	PLAN OF WORK	**Layout = Split plot design Plot size = 3.6m x 6m Replication = 4 Sowing time = 2nd week of October Fertilizer = 32-23-00 Observations to be recorded Plant height No. of tillers/plant No. of leaves /tiller Leaf Area (cm^2) Stem thickness (mm) Fodder Yield (t/ha)**
	PREVIOUS YEAR'S RESULTS	**New experiment**

SOIL SCIENCE

28. TITLE — **NUTRITIONAL QUALITY ASSESSMENT OF RABI FODDERS**

OBJECTIVE — **To find out the nutritional quality of new lines of Rabi fodders.**

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

PROJECT DURATION — **2017-18**

LOCATION — **Fodder Research Institute, Sargodha.**

TREATMENTS/ METHODOLOGY — **Initially the new rabi fodder lines of different crops will be selected for study. Plant sample will be collected and analyzed for their quality.**

Name of crop	Lines to be studied
Oats	5
Berseem	5
Lucerne	5

The following observations will be recorded.

1. **Dry matter percentage**
2. **Crude fiber**
3. **Crude fat**
4. **Crude protein**
5. **Ash**

PREVIOUSYEAR'S RESULTS; — **New experiment.**

29. TITLE — **STANDARDIZATION OF FERTILIZER DOSE FOR OATS (FRI-03) LINE TO OBTAIN MAXIMUM GREEN FODDER YIELD.**

OBJECTIVE — **To find out the best combination of NPK to obtain maximum green fodder yield.**

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

PROJECT DURATION — **2017-18**

LOCATION — **Fodder Research Institute, Sargodha.**

TREATMENTS/ METHODOLOGY

T1 = 00-00-00 (NPK kg/ha.)
T2 = 102-76-56
T3 = 108-80-59
T4 = 114-84-62
T5 = 120-88-65
T6 = 126-92-68

Lay out = RCBD
Replications = 3
Plot size = 18 m^2
Row spacing = 30 cm.
Line/varirty = FRI-03

Phosphorus and potash will be applied at sowing time. While nitrogen will be applied in two split doses; half at sowing time and the other half with 1st irrigation.

Following observations will be recorded.

1. **Plant height**
2. **Leaf area**
3. **No. of leaves/plant**
4. **Stem thickness**
5. **Green fodder yield (t/ha)**
6. **Quality analysis**
7. **Soil analysis before sowing**

PREVIOUS YEAR'S RESULTS

New experiment

30. TITLE

STANDARDIZATION OF FERTILIZER DOSE FOR OATS (SGD-01) LINE TO OBTAIN MAXIMUM GREEN FODDER YIELD.

OBJECTIVE

To find out the best combination of NPK to obtain maximum green fodder yield.

RESEARCH WORKERS

Abdul Razzaq, Asim Pervez and M. Shoaib Farooq

PROJECT DURATION

2017-18

LOCATION

Fodder Research Institute, Sargodha.

TREATMENTS/ METHODOLOGY

T1 = 00-00-00 (NPK kg/ha.)
T2 = 100-74-54
T3 = 107-79-58
T4 = 114-84-62
T5 = 121-89-66
T6 = 128-94-70

Lay out = RCBD
Replications = 3
Plot size = 18 m^2
Row spacing = 30 cm.

Line/variety = SGD-01
All P & K will be applied at sowing time, while nitrogen will be applied in two split doses; half at sowing time and half with 1st irrigation.

Following observations will be recorded.

1. **Plant height**
2. **Leaf area**
3. **No. of leaves/plant**
4. **Stem thickness**
5. **Green fodder yield (t/ha)**
6. **Quality analysis**
7. **Soil analysis before sowing**

PREVIOUS YEAR'S RESULTS **New experiment**

31. TITLE **STANDARDIZATION OF FERTILIZER DOSE FOR LUCERNE (GR-722) LINE TO OBTAIN MAXIMUM GREEN FODDER YIELD.**

OBJECTIVE **To find out the best combination of NPK to obtain maximum green fodder yield.**

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

PROJECT DURATION **2017-18**

LOCATION **Fodder Research Institute, Sargodha.**

TREATMENTS/ METHODOLOGY

T1 00-00-00 NPK kg ha^{-1}
T2 21-72-54
T3 22-76-57
T4 23-80-60
T5 24-84-63
T6 25-88-66

Lay out = RCBD
Replications = 3
Plot size = 18m^2
Row spacing = 30 cm.
Line/variety = GR-722

Following observations will be recorded.

1. **Plant height**
2. **No. of tillers/plant**
3. **Stem thickness**
4. **Green fodder yield (t/ha)**
5. **Quality analysis**
6. **Soil analysis**

PREVIOUS YEAR'S RESULTS **New experiment**

32. TITLE **STANDARDIZATION OF FERTILIZER DOSES FOR LUCERNE (GR-745) LINE TO OBTAIN MAXIMUM GREEN FODDER YIELD.**

OBJECTIVE **To find out the best combination of NPK to obtain maximum green fodder yield.**

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

PROJECT DURATION **2017-18**

LOCATION **Fodder Research Institute, Sargodha.**

TREATMENTS/ METHODOLOGY

T1 00-00-00 NPK kg ha^{-1}
T2 21-70-52
T3 22-75-56
T4 23-80-60
T5 24-85-64
T6 25-90-68

Lay out = RCBD
Replications = 3
Plot size = 18 m^2
Row spacing = 30 cm.
Line/variety = GR-745

Following observations will be recorded.

1. Plant height 2. No. of tillers/plant
3. Stem thickness 4. Green fodder yield (t/ha) 5. Quality analysis 6.Soil analysis before sowing

PREVIOUS YEAR'S RESULTS **New experiment**

33. TITLE **EFFECT OF 'P' ON SEED PRODUCTION OF BERSEEM**

OBJECTIVE **To find out the most economical level of 'P' for better seed production of berseem**

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

PROJECT DURATION **2015-17**

LOCATION **Fodder Research Institute, Sargodha.**

TREATMENTS/ METHODOLOGY

T1 = 23-00-32 (NPK kg ha^{-1})
T2 = 23-40-32
T3 = 23-60-32
T4 = 23-80-32
T5 = 23-100-32

Lay out = RCBD
Replications = 3
Plot size = 18 m^2
Row spacing = 30 cm.
Line/variety = SB-11

Following observations will be recorded.

1. **No. of grains/ 50 capsules**
2. **1000 grain weight**
3. **Stem thickness**
4. **Green fodder yield (t/ha)**
5. **Grain yield (kg/ha)**
6. **Soil analysis before sowing**

PREVIOUS YEAR'S RESULTS

TREATMENTS (Kg ha^{-1})	GFY(tha^{-1}) OF 3 CUTS	SEED YIELD ($kgha^{-1}$)
T_1 23-00-32	41.52	335.72
T_2 23-40-32	42.78	338.94
T_3 23-60-32	43.74	340.9
T_4 23-80-32	44.98	344.7
T_5 23-100-32	44.29	339
LSD 5%	0.74	3.14

SOILANALYSIS (before sowing)

Soil Texture	ECe ($mScm^{-1}$)	pH	Organic Matter %	Available phosphorous ($mg\ kg^{-1}$)
Silty Loam	0.74	8.2	0.62	6.8

34. TITLE **EFFECT OF FOLIAR SPRAY OF BORIC ACID ON SEED PRODUCTION OF LUCERNE**

OBJECTIVE **To find out the best economical dose of boric acid as foliar spray with basal dose to obtain maximum seed yield of Lucerne**

RESEARCH WORKERS **Abdul Razzaq, Asim Pervez, M. ShoaibFarooq**

PROJECT DURATION **2015-17**

LOCATION **Fodder Research Institute, Sargodha.**

TREATMENTS/ METHODOLOGY

T1 = 23-80-50 (NPK kg ha^{-1}basal dose)
T2 = 2gLit^{-1} boric acid foliar spray+ NPK basal dose
T3 = 4 g Lit^{-1} boric acid foliar spray+ NPK basal dose
T4 = 6 g Lit^{-1} boric acid foliar spray+ NPK basal dose
T5 = 8g Lit^{-1} boric acid foliar spray+ NPK basal dose
T6 = 10 g Lit^{-1} boric acid foliar spray+ NPK basal dose

Lay out = RCBD
Replications = 3
Plot size = 18m^2
Row spacing = 30 cm.
Line/variety = Sgd-lucerne

Phosphorous will be applied at the time of sowing while nitrogen will be applied in two split doses; half at sowing time and half at 1st irrigation. Two foliar applications, 1st at intensive plant growth stage and the 2nd application at the beginning of blossoming of crops.

Following observations will be recorded.

1. **Plant height**
2. **1000 grain weight**
3. **Stem thickness**
4. **Green fodder yield (tha^{-1})**
5. **No. of tillers/plant**
6. **Grain yield (kgha^{-1})**
7. **Soil analysis before sowing**

PREVIOUS YEAR'S RESULTS

TREATMENTS (Kg ha^{-1})	GFY(tha^{-1}) OF 5 CUTS	SEED YIELD (kgha^{-1})
T_1 23-80-50 (NPK kg ha^{-1}basal dose)	81.2	286.48
T_2 2gLit^{-1} boric acid foliar spray+ NPK basal dose	81.6	299.2
$T_3$4 g Lit $^{-1}$ boric acid foliar spray+ NPK basal dose	85.9	304.6
$T_4$6 g Lit $^{-1}$ boric acid foliar spray+ NPK basal dose	88.1	310.1
T_5 8g Lit $^{-1}$ boric acid foliar spray+ NPK basal dose	88.2	312.1
T_6 10 g Lit $^{-1}$ boric acid foliar spray+ NPK basal dose	81	306.3
LSD 5%	2.48	13.24

SOIL ANALYSIS (before sowing)

Soil Texture	ECe (mScm^{-1})	pH	Organic Matter %	Available phosphorous (mg kg^{-1})	Available potassium (mg kg^{-1})
SiltyLoam	0.62	7.9	0.69	6.9	125

35. TITLE: **DETERMINATION OF BEST COMBINATION OF PHOSPHORUS, AND POTASSIUM FERTILIZERS FOR LUCERNE SEED PRODUCTION.**

OBJECTIVE **To find out the best combination of P&K for obtaining potential seed yield of Lucerne**

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

PROJECT DURATION **2015-17**

LOCATION **Fodder Research Institute, Sargodha.**

TREATMENTS/ METHODOLOGY

T1	**00-00-00**
T2	**23-60-40**
T3	**23-80-40**
T4	**23-100-40**
T5	**23-60-60**
T6	**23-80-60**
T7	**23-100-60**
T8	**23-60-80**
T9	**23-80-80**
T10	**23-100-80**

Lay out = RCBD
Replications = 3
Plot size = 18 m^2
Row spacing = 30 cm.

Phosphorous and potash will be applied at the time of sowing while nitrogen will be applied in two split doses; half at sowing time and half at 1st irrigation.

Following observations will be recorded.

1. **Plant height**
2. **1000 grain weight**
3. **Stem thickness**
4. **Green fodder yield (tha^{-1})**
5. **No. of tillers/plant**
6. **Grain yield (tha^{-1})**
7. **Soil analysis before sowing**

PREVIOUS YEAR'S RESULT

TREATMENTS (Kg ha^{-1})	GFY(tha^{-1}) OF 4 CUTS	SEED YIELD (($kgha^{-1}$))
T_1 00-00-00	63.3	271.2
T_2 23-60-40	64.4	282.9
T_3 23-80-40	65	284.3
T_4 23-100-40	65.55	287.2
T_5 23-60-60	67.22	280.2
T_6 23-80-60	67.77	301.2
$T_7$23-100-60	67.22	292.*9
T_8 23-60-80	67.22	291.5
T_9 23-80-80	66.66	296.2
T_{10} 23-100-80	66.12	293.4
LSD 5%	3.28	2.50

SOIL ANALYSIS (before sowing)

Soil Texture	ECe ($mScm^{-1}$)	pH	Organic Matter %	Available phosphorous (mg kg^{-1})	Available potassium (mg kg^{-1})
Silty Loam	0.74	8.1	0.64	6.5	114

36. TITLE — **RESPONSE OF BERSEEM TO DIFFERENT CONCENTRATION OF NPK AS FOLIAR SPRAY**

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

RESEARCH WORKERS — **M. ShoaibFarooq, Abdul Razzaqand Asim Pervez,**

PROJECT DURATION — **2017-18**

LOCATION — **Fodder Research Institute, Sargodha.**

TREATMENTS/ METHODOLOGY

- **T1 = 23-80-50 (NPK kg ha^{-1}basal dose)**
- **T2 = 2gLit^{-1} NPK foliar spray+ NPK basal dose**
- **T3 = 4 g Lit^{-1} NPK foliar spray+ NPK basal dose**
- **T4 = 6 g Lit^{-1} NPK foliar spray+ NPK basal dose**
- **T5 = 8 g Lit^{-1} NPK foliar spray+ NPK basal dose**

Lay out	**=**	**RCBD**
Replications	**=**	**3**
Plot size	**=**	**3m x6 m**
Line/variety	**=**	**SB-11**
Sowing method	**=**	**Broadcast**

Phosphorous and potash will be applied at the time of sowing while nitrogen will be applied after 1st cut. Foliar applications will be applied after one week of each cut.

Following observations will be recorded:-

1. **Plant height**
2. **Stem thickness**
3. **Green fodder yield (tha^{-1})**
4. **No. of tillers/plant**
5. **Soil analysis before sowing**
6. **Dry matter %**

PREVIOUS YEAR'S RESULTS **New experiment**

37. TITLE **RESPONSE OF LUCERNE TO DIFFERENT CONCENTRATION OF NPK AS FOLIAR SPRAY**

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

RESEARCH WORKERS **AsimPervez , M. Shoaib Farooq and Abdul Razzaq,**

PROJECT DURATION **2017-18**

LOCATION **Fodder Research Institute, Sargodha.**

TREATMENTS/ METHODOLOGY

T1 = 23-80-50 (NPK kg ha^{-1}basal dose)
T2 = 2gLit^{-1} NPK foliar spray+ NPK basal dose
T3 = 4 g Lit $^{-1}$ NPK foliar spray+ NPK basal dose
T4 = 6 g Lit $^{-1}$ NPK foliar spray+ NPK basal dose
T5 =8 g Lit $^{-1}$ NPK foliar spray+ NPK basal dose

Lay out	**=**	**RCBD**
Replications	**=**	**3**
Plot size	**=**	**3m x6 m**
Sowing method	**=**	**Broadcast**
Line/variety	**=**	**Sgd-Lucerne**

Phosphorous and potash will be applied at the time of sowing while nitrogen will be applied after 1st cut. Foliar applications will be applied after one week of each cut.
Following observations will be recorded.

1. **Plant height**
2. **Stem thickness**
3. **Green fodder yield (tha^{-1})**
4. **No. of tillers/plant**
5. **Soil analysis before sowing**
6. **Dry matter %**

PREVIOUS YEAR'S **New experiment**

PLANT PATHOLOGY

38 **TITLE** **SCREENING OF BERSEEM GERMPLASM AGAINST ROOT ROT DISEASE**

OBJECTIVE **To evaluate berseem germplasm against Root Rot disease (*Fusarium moniliforme)***

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

PROJECT DURATION **2017-2018**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY

Varieties/lines	**Berseem germplasm**
Design	**RCBD**
Sowing method	**Broadcast**

PLAN OF WORK

The seeds of berseem germplasm will be infested with *Fusarium moniliforme* conidia @ 4000/ml water before sowing. The crop will be raised adopting standard agronomic practices. Disease incidence data will be recorded on appearance of the disease.

PREVIOUS YEAR'S RESULTS

S. No.	Lines/varieties	Disease incidence (%)
1	SB-11	3.00
2	SB-12	3.33
3	B. Agaiti (check)	4.67
4	B. Pachaiti (check)	4.67
5	SG-07-I	4.67
6	SB-8	5.00
7	SB-10	5.00
8	B-1-2012	5.33
9	SG-07-II	6.00
10	SB-III	7.00

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TITLE	**CHEMICAL CONTROL OF BERSEEM ROOT ROT (*Fusarium moniliforme)* DISEASE**
OBJECTIVE	**To find a suitable fungicides for the control of Berseem root rot.**
RESEARCH WORKER	**Mr. Aftab Ahmad Khan and Dr. Saleem Il Yasin**
PROJECT DURATION	**2017-2018**
LOCATION	**Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY

Treatments (Fungicides)	Dose
Derosal (Carbendazim)	500 g/acre
Topsin-M 70 WP (Thiophanate methyl)	600 g/acre
Copper oxychloride	500 g/acre
Benlate 50WP (Benomyl)	300 g/acre
Dithane M-45 80 WP (Mancozeb)	800 g/acre
Trifort 25 WP (Triadimefon)	200 g/acre
Treaty 6 ME (Tebuconazole)	750 ml/acre
Ridomil Gold 68 WG (Mancozeb + Metalaxyl)	250 g/acre
Control	Untreated
Test variety	Berseem Agaiti
Design	RCBD
Replications	4
Plot size	3 m x 5 m

PLAN OF WORK	**The berseem variety Berseem Agaiti will be sown in the 3rd to 4th week of November. Standard cultural and agronomic practices will be adopted to raise the crop. The crop will be treated with the fungicides through soil drenching. Observations on the disease incidence will be recorded at maturity stage.**
PREVIOUS YEAR'S RESULTS	**This is first year of the experiment.**

40

TITLE	**EVALUATION OF ALFALFA GERMPLASM AGAINST ANTHRACNOSE (*Colletotrichum trifolii*)**	
OBJECTIVE	**To evaluate alfalfa varieties/lines against *Colletotrichum trifolii***	
RESEARCH WORKER	**Mr. Aftab Ahmad Khan and Dr. Saleem Il Yasin**	
PROJECT DURATION	**2017-2018**	
LOCATION	**Fodder Research Institute, Sargodha**	
TREATMENTS/ METHODOLOGY	**Varieties/lines**	**Germplasm entries**
	Sowing method	**Broadcast**
	Design	**RCBD**
	Plot size	**5 m x 3 m**
	Replications	**3**
PLAN OF WORK	**The seed the germplasm entries will be infested with the inoculum of *Colletotrichum trifolii* before sowing. The infested seed will be sown and crop will be raised adopting standard agronomic practices. Anthracnose disease incidence data will be recorded at appearance of the disease.**	

PREVIOUS YEAR'S RESULTS

Reaction	Number of Lines/ varieties	Designation
Resistant	**27**	**China, No.1107, GR-800, Viger-5, Laghka, African pop, Pumpa, Sgd Lucerne-2002, Oman, Cheronia, No.1103, Lucernal, Con-B, Sunder, 5-1N-59-E, Silverado, Sard-10, R-739, No.53, No.64 (USA), Turkish pop, Persian, KQS-Alfalfa-02, GR-722, Hunter River, Flenish pop and GR-745**
Moderately Resistant	**3**	**No.7613, Viger-1 and Viger-2**
Moderately Susceptible	**-**	**-**
Susceptible	**-**	**-**

41	**TITLE**	**EVALUATION OF OATS GERMPLASM AGAINST RUST DISEASE (*Puccinia coronata* f. sp. *avenae*)**	
	OBJECTIVE	**To find out the resistant material in oats germplasm entries against Rust disease**	
	RESEARCH WORKER	**Mr. Aftab Ahmad Khan and Dr. Saleem Il Yasin**	
	PROJECT DURATION	**2017-2018**	
	LOCATION	**Fodder Research Institute, Sargodha**	
	TREATMENTS/ METHODOLOGY	**Varieties/lines**	**Oats germplasm**
		Design	**Augmented**
		Line spacing	**30 cm**
		Check variety	**S-2000**
	PLAN OF WORK	**Methodology** **The seeds of all the germplasm entries will be sown in field with two rows per entry. S-2000 will be sown as check variety after every 30 entries. 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.**	
42	**TITLE**	**CHEMICAL CONTROL OF RUST (*Puccinia coronata* f. sp. *avenae*) OF OATS (*Avena sativa*)**	
	OBJECTIVE	**To find a suitable fungicides for the control of rust disease of oats**	
	RESEARCH WORKER	**Mr. Aftab Ahmad Khan and Dr. Saleem Il Yasin**	
	PROJECT DURATION	**2017-2018**	
	LOCATION	**Fodder Research Institute, Sargodha**	

TREATMENTS/ METHODOLOGY

Treatments (Fungicides)	Dose
Trifort 25 WP (Triadimefon)	200 g/acre (2 g/litre)
Rally 40 WSP (Myclobutanil)	20 g/acre (0.2 g/litre)
Treaty 6 ME (Tebuconazole)	750 ml/acre (7.5 ml/litre)
Tilt 250 EC (Propiconazole)	200 ml/acre (2.0 ml/litre)
Success 72 WP (Chlorothalonil 64%; Metalaxyl 8%)	250 g/acre (2.5 g/litre)
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)
Control	Untreated
Test variety	SGD-2011
Design	RCBD
Replications	4
Line spacing	50 cm
Plot size	3 m x 3 m

PLAN OF WORK

The oats variety Sargodha 2011 will be sown in the 3rd to 4th week of November. Standard cultural and agronomic practices will be adopted to raise the crop. The crop will be sprayed at two weeks interval starting from 15th February. Observations on the disease incidence will be recorded at flowering stage. The data on grain yield will also be recorded.

PREVIOUS YEAR'S RESULTS

This is first year of the experiment.

ENTOMOLOGY

43 TITLE **COMPARATIVE EFFICACY OF COMMONLY USED INSECTICDES ON *HELICOVERPA ARMIGERA* (LEPIDOPTERA:NOCTUIDAE) ON SEED CROP OF BERSEEM (*TRIFOLIUM ALEXANDRINUM*L.)**

OBJECTIVE **To evaluate best insecticides against Heliothis**

RESEARCH WORKER **Abdul Khaliq and Dr Haider Karar**

PROJECT DURATION **2017-18**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY

TRT	INSECTICDES	DOSE/ACRE
T1	Spintor 480SC (spinosad)	40 ml
T2	Coragen 20SC (chlorantraniliprole)	25 ml
T3	Marshal 5EC (lufenuron)	200 ml
T4	Runner 280SC (methoxyfenozide)	100 ml
T5	Emamectin 1.9 EC (emamectin benzoate)	200 ml
T6	Belt 48SC (flubendiamide)	50 ml
T7	Steward (indoxacarb) 150SC	175 ml
T8	Volium flexy (chlorantraniliprole+thiamethxiam 300EC)	80ml
T9	Fipronil (fipronil) 25EC	480 ml
T10	Pirate (chlorfenpyr) 360 SC	320 ml
T12	Delegate (spintoram) 25 WG	60 gm
T13	Control	

PLAN OF WORK

Lay out	=	RCBD
Replications	=	3
Plot size	=	3mx5m
Sowing method	=	Broadcast
Sowing time	=	Oct

After the last cutting, the crop will be regularly observed to measure the larval abundance of *H. armigera* . The data regarding larval population will be recorded from one square meter before and then 3, 5 and 7 days after treatment from each plot. Spraying will be done with a manually operated hand knapsack sprayer.

Percent mortality will be calculated by using the below mentioned formula:

%M=100 × (Nbs – Nas) ÷ Nbs
where,
%M - Percent mortality; Nbs - Insect abundance before spray; Nas – Insect abundance after spray

PREVIOUS YEAR'S RESULTS

Sr #	Insecticides	Mean insect abundance (Number of larvae /m^2) PT	Dose / Acre (ml)	Mean* percent mortality of *H. armigera* on the indicated days post treatment		
	Trade Name			3 days	5 days	7 days
1	Lufenuron 5EC	11.00	200 ml	35.44 d	36.74 c	11.46 c
2	Runner 280SC	7.00	100 ml	60.83 c	33.84 c	29.28 b
3	Spinosad 480SC	13.00	40 ml	92.04 a	87.77 a	75.28 a
4	Emamectin 1.9 EC	13.00	200 ml	91.74 a	88.89 a	79.57 a
5	Coragen20SC	11.00	25 ml	67.42 b	63.04 b	29.08 b
6	Belt 48 SC	8.33	50 ml	93.07 a	84.23 a	31.26 b
7	Control	12.67	-	3.05 e	1.69 d	1.87 d
LSD Value at 0.05				5.80	9.96	5.31
F-Value				327.26	107.54	298.03

44. TITLE: **SCREENING OF SOME OP'S, PRYTHROIDS, NEONICOTONIDES AND CARBAMATES INSECTICDES AGAINST STINK BUG ON SEED CROP OF LUCERNE**

OBJECTIVE **To evaluate best insecticides against stink bug**

RESEARCH WORKERS **Abdul Khaliq and Dr Haider Karar**

PROJECT DURATION **2017-18**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY

Treatments		Dose per acre (ml)
T1=	Malathion 57 EC	500
T2=	Chlopyrifos 40 EC	500
T3=	Acephate 75SP	400
T4=	Dimethoate 40EC	400
T5=	Bifenthrin 10 EC	300
T6=	Lambdacyhalothrin 2.5 EC	300
T7=	Deltamethrin 2.3 EC	400
T8=	Acetamiprid 20SP	125
T9=	Imidacloprid 20SL	250
T10=	Carbosulfan 20EC	500

Variety = SGD-Lucerne 2002
Lay out = RCBD
Replications = 3

After the last cutting, on flowering the crop will be observed regularly to measure the abundance of stink bug. When the attack of stink bug will be observed in the field, the population will be counted by ten net sweeps from each plot before and then after one, three, five and seven days after treatment. Spraying will be done with a manually operated hand knapsack sprayer.
The data will be subjected to analysis

Percent mortality will be calculated by using the below mentioned formula:
$\%M = 100 \times (Nbs - Nas) \div Nbs$
where,
%M - Percent mortality; Nbs - Insect abundance before spray; Nas – Insect abundance after spray

Statistical analysis:
The data will be subjected to analysis of variance (ANOVA) using Statistix version 9 (www.statistix.com/free trial.html) (Lawes Agricultural Trust Rothamsted Experimental Station, Rothamsted, UK). The means will be separated by LSD.

PREVIOUS YEAR'S RESULTS

New Experiment

45. TITLE: **CHEMICAL CONTROL OF ARMYWORM (*SPODOTERA EXIGUA*) ON LUCERNE CROP**

OBJECTIVE **To evaluate best insecticides against armyworm**

RESEARCH WORKERS **Abdul Khaliq and Dr Haider Karar**

PROJECT DURATION **2017-18**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY

Treatments	Insecticides	Dose / acre (ml)
T1	Lufenuron 5EC	200
T2	Runner 280SC	100
T3	Spinosad 480SC	40
T4	Emamectin 1.9EC	200
T5	Coragen 20SC	25
T6	Belt 48SC	50
T7	Control	-

Variety = SGD-Lucerne 2002
Lay out = RCBD
Replications = 3
Plot size = 3mx5m

The lucerne crop will be observed regularly to measure the larval abundance of *S. exigua*. When the attack of young larvae of the insect will be observed in the field, the crop will be sprayed. The data regarding larval population will be recorded by counting larvae from 10 tillers per plot and then 3, 5 and 7 days after treatment. The spray will be repeated as per need when the larval population again increasing.
The data will be compiled and subjected to statistical analysis.

Percent mortality will be calculated by using the below mentioned formula:

$$\%M = 100 \times (Nbs - Nas) \div Nbs$$

where,

%M - Percent mortality; Nbs - Insect abundance before spray; Nas – Insect abundance after spray

STATISTICAL ANALYSIS

The data will be subjected to analysis of variance (ANOVA) using Statistix version 9 (www.statistix.com/free trial.html) (Lawes Agricultural Trust Rothamsted Experimental Station, Rothamsted, UK). The means will be separated by LSD.

PREVIOUS YEAR'S RESULTS

S #	Insecticides	Mean insect abundance (Number of larvae /10 tillers) PT	Dose / acre (ml)	Mean* percent mortality of *S. exigua* on the indicated days post treatment		
				3 days	5 days	7 days
1	Lufenuron 5EC	24.33	200	98.63 a	95.89 b	93.27 b
2	Runner 280SC	36.33	100	96.33 b	98.44 ab	100 a
3	Spinosad 480SC	26.00	40	100 a	100 a	100 a
4	Emamectin 1.9EC	43.33	200	100 a	100 a	100 a
5	Coragen 20SC	37.33	25	100 a	98.21 ab	88.33 c
6	Belt 48SC	42.67	50	100 a	100 a	100 a
7	Control	68.33	-	9.51 c	7.63	8.91 d
		LSD Value at 0.05		2.04	2.90	1.81

46. TITLE: **COMPARATIVE EFFICACY OF BAIT VS GRANULAR INSECTICDES AGAINST SNAILS ON LUCERNE CROP**

OBJECTIVE **To evaluate best treatment against snails**

RESEARCH WORKERS **Abdul Khaliq and Dr Haider Karar**

PROJECT DURATION **2017-18**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY

Treatments	Insecticides	Dose / acre
T1	Task (Metaldehyde) 6% G	1.5 kg
T2	Chlorguard (Chlopyrifos) 10% G	6 kg
T3	Fertera (chlortraniliprole) 0.4% G	4 kg
T4	5% Nacl	
T5	Control	

		On the appearance of snails the baits as well as granules chemicals will be spread in lucerne crop. The population will be counted by five net sweeps from each plot before and then after three, five and seven days after treatment.
	PREVIOUS YEAR'S RESULTS	**New Experiment**

DAIRY TECHNOLOGY

47	**TITLE**	**EFFECT OF BERSEEM AND ALFALFA HAY ON MILK PRODUCTION AND COMPOSITION OF DAIRY BUFFALOES**
	OBJECTIVE	**To evaluate nutritive value of berseem and alfalfa hay.**
	RESEARCH WORKER	**Muhammad Shakeel Hanif**
	PROJECT DURATION	**2017-18**
	LOCATION	**Fodder Research Institute, Sargodha**
	TREATMENTS/ METHODOLOGY	**T1. Hay of Berseem** **T2. Hay of Alfalfa** **The hay of Berseem and Alfalfa will be prepared by standard method and will be analyzed for proximate composition and ADF and NDF. The produced hay will be fed to buffaloes to determine the effect of hay on milk production and Milk composition (fat, SNF, Total Solids, Protein, pH, Acidity). Six dairy buffaloes of almost similar stage and lactation no. will be selected and fed on different types of berseem and alfalfa hay at ad-libitum. Daily feed intake and milk yield will be recorded. The data will be analyzed statistically.**
	PREVIOUS YEAR'S RESULTS	**New Experiment**

48	**TITLE**	**FEEDING EVALUATION OF DIFFERENT OATS LINES IN LACTATING BUFFALOES**
	OBJECTIVE	**To study the effect of feeding various lines of Oats on milch animals**
	RESEARCH WORKER	**Muhammad Shakeel Hanif**
	PROJECT DURATION	**2017-18**
	LOCATION	**Fodder Research Institute, Sargodha**
	TREATMENTS/ METHODOLOGY	**T1. FRI-03** **T2. SGD-1** **Two different advance lines of Oats will be planted at Farm Area of FRI, Sargodha and at optimum maturity will be harvested and chopped and fed to buffaloes to evaluate the effect on milk production and quality. The chopped green fodder will be analyzed for proximate composition and for ADF and NDF. The milk will be analyzed for (fat, SNF, Total Solids, Protein, pH, Acidity). Six buffaloes of almost similar stage and lactation no. will be selected and 2 lines of oats will be fed at ad-libitum. Daily feed intake and milk yield will be recorded. Data will be analyzed statistically.**
	PREVIOUS YEAR'S RESULTS	**New Experiment**

FODDER RESEARCH SUB-STATION, AARI, FAISALABAD

1. BERSEEM (*Trifolium Alexandrium L.)*

49	**TITLE**	**MAINTANCE OF BERSEEM GERMPLASM**
	OBJECTIVE	**To maintain the elite lines of Berseem germplasm and record the data for various distinct morpho-physioligial traits, biotic and a biotic stresses.**
	RESEARCH WORKERS	**Dr.Qamar Shakil , Mr.Ahmed Hassan Khan, Mr. Suleman Raza**
	PROJECT DURATION	**Continue Nature**
	LOCATION	**Fodder Research Sub-Station, AARI Faisalabad.**
	TREATMENTS/ METHODOLOGY	**No. of entries 4 (P-22, L-94, P-206 and Giza)** **Area 5 Marlas each** **Plant Time Mid October** **In order to maintain maximum purity, isolation barrier will be provided by planting each line on scattered places of various Directorates at AARI, Faisalabad and out stations.**
	PREVIOUSYEAR'S RESULTS	**L-37 was ear marked for good forage and seed yield and seed of 4 lines was obtained and preserved in cloth bags for further study.**
50	**TITLE**	**PRELIMINARY GREEN FODDER YIELD TRIAL ON BERSEEM**
	OBJECTIVE	**To assess high green fodder yield lines of berseem selected on the basis of their significant traits.**
	RESEARCH WORKERS	**Mr.Ahmed Hassan Khan, Dr.Qamar Shakil, Mr. Suleman Raza**
	PROJECT DURATION	**2017-18**
	LOCATION	**Fodder Research Sub-Station, AARI Faisalabad.**
	TREATMENTS/ METHODOLOGY	**The packed seed will be received from Director, Fodder Research Institute Sargodha along with sowing plan and methodology.**

The following new advance lines will be incorporated from Fodder Research Sub-Station, AARI, Faisalabad.

1) **FB-01-17**
2) **FB-02-17**
3) **FB-03-17**

PREVIOUSYEAR'S RESULTS

Sr#	Coded varieties	Green Fodder yield (t/hac 3 cuts)
1	FB-3-16	76.66
2	FB-1-16	75.55
3	SB-2-16	75.33
4	FB-2-16	74.00
5	Anmol (Check)	70.44
6	SB-4-16	70.00
7	SB-7-16	68.00
8	Agaiti(Check)	67.77
9	SB-6-16	67.55
10	SB-5-16	64.66
11	SB-3-16	63.33
12	SB-1-16	60.00
LSD 0.05		1.98

51 TITLE — **ADVANCED GREEN FODDER YIELD TRIAL ON BERSEEM.**

OBJECTIVE — **The aim of the trial is to evaluate the following parameters:**

1. **Fast establishment**
2. **High green fodder yield potential**
3. **Long duration (heat tolerance)**
4. **Multicut in nature**
5. **Digestibility and palatability**
6. **Good forage quality**

RESEARCH WORKERS — **Dr.Qamar Shakil, Mr. Suleman Raza**

PROJECT DURATION — **2017-18**

LOCATION — **Fodder Research Sub-Station, AARI Faisalabad.**

TREATMENTS/ METHODOLOGY — **The packed seed will be received from Director, Fodder Research Institute Sargodha along with sowing plan and methodology.**

The following new advance lines will be incorporated from Fodder Research Sub-Station, Faisalabad.

1) **FB-01-2016**
2) **FB-02-2016**

PREVIOUSYEAR'S RESULTS

Sr#	Coded variétés	Green Fodder yield (t/hac)
1	FB-3-15	75.33
2	SB-3-15	72.88
3	SB-2-15	70.00
4	FB-1-15	68.66
5	SB-6-15	64.44
6	SB-1-15	64.22
7	Anmol (check)	63.11
8	Agaiti (check)	63.11
9	SB-4-15	58.66
10	SB-5-15	55.77
LSD 0.05		1.39

52 TITLE — **ADAPTABILITY GREEN FODDER YIELD TRIAL ON BERSEEM**

OBJECTIVE — **To evaluate green fodder yield potential of advance lines against commercial varieties under different agro climatic conditions in central Punjab.**

RESEARCH WORKERS — **Mr.Ahmed Hassan Khan , Dr. Qamar Shakil , Mr. Suleman Raza**

PROJECT DURATION — **2017-18**

LOCATION — **Fodder Research Sub-Station, AARI Faisalabad.**

TREATMENTS/ METHODOLOGY — **The packed seed along with sowing plan and methodology will be received from Director, Fodder Research Institute Sargodha However, this Sub-Station will be put in its following promising advance lines.**

i) **FB-01-2015**
ii) **FB-03-2015**

PREVIOUSYEAR'S RESULTS

Sr#	Coded varieties	Green Fodder yield(t/hac)
1	FB-3-14	62.88
2	Anmol (check)	62.66
3	SB-2-14	60.44
4	FB-2-14	60.44
5	FB-1-14	58.44
6	Agaiti(check)	56.00
7	SB-3-14	55.11
8	SB-1-14	54.00
LSD 0.05		1.79

53 TITLE — **NATIONAL UNIFORM GREEN FODDER YIELD (A) TRIAL ON BERSEEM**

OBJECTIVE — **To test elite varieties of berseem developed by breeders of the country under cooperating units of coordinated programme on fodder Islamabad.**

RESEARCH WORKERS — **Mr.Ahmed Hassan Khan , Dr. Qamar Shakil , Mr. Suleman Raza**

PROJECT DURATION — **2017-18**

LOCATION — **Fodder Research Sub-Station, AARI Faisalabad.**

TREATMENTS/ METHODOLOGY — **The seed along with sowing plan and methodology will be received from NARC, Islamabad.**

PREVIOUSYEAR'S RESULTS — **Results awaited**

54 TITLE — **NATIONAL UNIFORM GREEN FODDER YIELD (B) TRIAL ON BERSEEM.**

OBJECTIVE — **To test elite varieties of berseem developed by breeders of the country under cooperating units of coordinated programme on fodder Islamabad.**

RESEARCH WORKERS — **Mr. Ahmed Hassan Khan , Dr. Qamar Shakil , Mr. Suleman Raza**

PROJECT DURATION — **2017-18**

	LOCATION	**Fodder Research Sub-Station, AARI Faisalabad.**
	TREATMENTS/ METHODOLOGY	**The seed along with sowing plan and methodology will be received from NARC, Islamabad.**
	PREVIOUSYEAR'S RESULTS	**Results awaited**

2. ALFALFA

55	**TITLE**	**CHARECTERIZATION AND MAINTANCE OF ALFALFA GERMPLASM**
	OBJECTIVE	**To maintain the elite lines of alfalfa germplasm collected from Uc-Davis, California, USA under UPS-PCAS project and record the data for various distinct morpho-physioligial traits, nutritional quality, biotic and abiotic stresses.**
	RESEARCH WORKERS	**Mr.Ahmed Hassan Khan , Dr. Qamar Shakil , Mr. Suleman Raza**
	PROJECT DURATION	**Continue Nature.**
	LOCATION	**Fodder Research Sub-Station, AARI Faisalabad, in collaboration with biochemistry section, PHRC, Faisalabad**
	TREATMENTS/ METHODOLOGY	**The seed along with sowing plan and methodology will be received from NARC, Islamabad.**

No. of entries = 200
No. of rows = 2
R x R distance = 60cm
Row length = 5m each
Planting Time = October
Design = Augmented

Data to be recorded Initially 50 genotypes will be analyzed for the following parameters

1. **Proximate analysis**

a. Crude Protein b. Crude Fiber
c. Crude Fat d. Carbohydrates
e. Dry Matter yield f. Total Minerals

2. Morpho-physiological traits

a. Plant height (cm) **b. No. of tillers /plant**
c. No. of stems **d. Leaf size**
e. Total no of cuts per annum **f. Leaf to stem ratio**
g. forage yield **h. Seed yield**

3. DISEASE

a. Fusarium wilt
b. Phytophthora root rot.

PREVIOUSYEAR'S RESULTS **New experiment**

3. OATS (*Avena Sativa*)

56 TITLE **COLLECTION AND MAINTANCE OF OATS GERMPLASM**

OBJECTIVE **To screen the exotic as well as local lines for direct introduction in order to get disease free, more leafy, stay green with maximum fodder yield potential.**

RESEARCH WORKERS **Mr.Ahmed Hassan Khan , Dr. Qamar Shakil , Mr. Suleman Raza**

PROJECT DURATION **Continue Nature**

LOCATION **Fodder Research Sub-Station, AARI Faisalabad.**

TREATMENTS/ METHODOLOGY **50 elite lines of oats will be maintained by selfing.**

No. of rows	**=**	**2**
R x R distance	**=**	**60cm**
Row length	**=**	**5m each**
Planting Time	**=**	**October**
Design	**=**	**Augmented**

PREVIOUSYEAR'S RESULTS **Seeds of the selfed plants were stored in the paper bags for next year study.**

57 TITLE **PRELIMINARY GREEN FODDER YIELD TRIAL OF OATS.**

OBJECTIVE **To evaluate the green fodder yield performance of newly selected lines/varieties of oats on the basis of their desirable characters.**

RESEARCH WORKERS **Mr.Ahmed Hassan Khan , Dr. Qamar Shakil , Mr. Suleman Raza**

PROJECT DURATION **2017-18**

LOCATION **Fodder Research Sub-Station, AARI Faisalabad.**

TREATMENTS/ METHODOLOGY **The packed seed will be received from Director, Fodder Research Institute Sargodha along with sowing plan and methodology. And this station will contribute the following promising oats lines (F-440, F.443 and F.446)**

PREVIOUSYEAR'S RESULTS

Sr#	Coded varieties	Green fodder yield (t/hac)
1.	Fsd. Oats-2-16	87.50
2.	No. 632	86.34
3.	SGD-1	84.95
4.	SGD-4	83.79
5.	CK-1	80.78
6.	No. 677	78.47
7.	Domount	76.85
8.	Fsd.oats	76.62
9.	No. 75525	76.15
10.	Erk	75.92
11.	S-2000	73.61
12.	Fsd.oat.03	71.99
13.	Sgd.oat.2011	69.44
14.	Sgd. 46	56.94
	LSD 0.05	1.752

58 TITLE — **ADVANCED GREEN FODDER YIELD TRIAL OF OATS.**

OBJECTIVE — **To evaluate green fodder yield performance of newly selected lines/varieties of oats.**

RESEARCH WORKERS — **Mr.Ahmed Hassan Khan , Dr. Qamar Shakil , Mr. Suleman Raza**

PROJECT DURATION — **2017-18**

LOCATION — **Fodder Research Sub-Station, AARI Faisalabad.**

TREATMENTS/ METHODOLOGY — **The packed seed will be received from Director, Fodder Research Institute Sargodha along with sowing plan and methodology.**

This station will contribute the following promising oats lines:

1. **FBO-01-2016**
2. **FBO-02-2016**

PREVIOUSYEAR' RESULTS

Sr .No	Coded Varieties	Green fodder yield (t/ha.)
4.	No. 75527	88.88
3.	Sgd.oat-2011	84.25
1.	Fsd.01-2015	83.56
5.	Ck-1	78.70
2.	Sgd-1	76.85
6.	No.75525	71.99
LSD 0.05		4.232

59 TITLE — **ADAPTABILITY GREEN FODDER YIELD TRIAL OF OATS.**

OBJECTIVE — **To evaluate the promising/Candidates lines of oats for their green fodder yield in different agroecolgical zones of the provinces.**

RESEARCH WORKERS — **Mr.Ahmed Hassan Khan , Dr. Qamar Shakil , Mr. Suleman Raza**

PROJECT DURATION — **2017-18**

LOCATION — **Fodder Research Sub-Station, AARI Faisalabad.**

TREATMENTS/ METHODOLOGY

The packed seed will be received from Director, Fodder Research Institute Sargodha along with sowing plan and methodology. Oats lines F-4381, F-115 will be contributed by this section.

PREVIOUSYEAR' RESULTS

Sr#	Coded Varieties	Green fodder yield (t/ha.)
1.	S-2000	114.81
2.	CK-1	110.49
3.	FRI.02	106.79
4.	FSD.-1-2013	98.77
5.	FRI-01	90.43
6.	Demount	88.58
7.	Fsd.3-2013	87.96
8.	No. 632	87.96
9.	No. 75525	87.35
10.	FRI 03	86.73
11.	Fsd.02.2013	83.33
12.	Sgd. Oats. 2011	81.48
LSD 0.05		4.029

60 TITLE **NATIONAL UNIFORM GREEN FODDER YIELD (A) TRIAL OF OATS.**

OBJECTIVE **To test the elite varieties of oats developed by the breeders of country.**

RESEARCH WORKERS **Mr.Ahmed Hassan Khan , Dr. Qamar Shakil , Mr. Suleman Raza**

PROJECT DURATION **2017-18**

LOCATION **Fodder Research Sub-Station, AARI Faisalabad.**

TREATMENTS/ METHODOLOGY **The packed seed will be received from Coordinator NARC Islamabad along with sowing plan and methodology.**

PREVIOUSYEAR'S RESULTS **Results awaited**

61	**TITLE**	**NATIONAL UNIFORM GREEN FODDER YIELD (B) TRIAL OF OATS**
	OBJECTIVE	**To test the elite varieties of oats developed by the breeders of country.**
	RESEARCH WORKERS	**Mr.Ahmed Hassan Khan , Dr. Qamar Shakil , Mr. Suleman Raza**
	PROJECT DURATION	**2017-18**
	LOCATION	**Fodder Research Sub-Station, AARI Faisalabad.**
	TREATMENTS/ METHODOLOGY	**The packed seed will be received from Coordinator NARC Islamabad along with sowing plan and methodology.**
	PREVIOUSYEAR'S RESULTS	**Results awaited**

AGRONOMY (FORAGE PRODUCTION), AARI, FAISALABAD

62

TITLE	**EFFECT OF CLIMATE CHANGE ON PLANTING TIME OF DIFFERENT VARIETIES OF BERSEEM FOR MAXIMUM GREEN FODDER YIELD**
OBJECTIVE	**To determine the best planting /sowing date for maximum green fodder yield potential of different Berseem varieties.**
RESEARCH WORKER	**Arbab Jahangeer , Muhammad Arshad, Tariq Mahmood and Dr. Abdul Majid**
PROJECT DURATION	**2017-2019**
LOCATION	**Agronomy (Forage Production) Section AARI, Faisalabad.**
TREATMENTS/ METHODOLOGY	**A) Varieties (Main Plots)** **i) Anmol Berseem (Check)** **ii) Sandal Berseem** **iii) Super Late Berseem** **B) Sowing Dates (Sub plots)** **i) 1st October** **ii) 15th October** **iii) 30th October** **vi) 15th November** **Layout = RCBD with split plot arrangement** **Replications = 4** **Plot size = 3m×6m** **Sowing method = Broad cast in standing water.** **Seed Rate = 20 kg ha -1** **Fertilizer = 30-60 NP kg /ha-1** **Following observations will be recorded.** **1. Plant height** **2. No. of leaves per plant** **3. No. of tillers per plant** **4. No. of tillers m-2** **5. Green fodder yield**
PREVIOUSYEAR' RESULTS	**New Experiment**

63	**TITLE**	**MILK YIELD AND ANIMAL HEALTH RESPONSE TO DIFFERENT BERSEEM VARIETIES**
	OBJECTIVE	**To determine the response of different berseem lines/varieties to milk yield and composition and animals health to different varieties/lines of berseem fodder.**
	RESEARCH WORKER	**Arbab Jahangeer , Muhammad Arshad, Tariq Mahmood and Dr. Abdul Majid**
	PROJECT DURATION	**2017-2020**
	LOCATION	**Dairy Section at Agronomy (Forage Production) Section AARI, Faisalabad**
	TREATMENTS/ METHODOLOGY	**TREATMENTS:** **T1= Anmol Berseem** **T2= Super Late Berseem** **T3= Sandal Berseem** **Six buffaloes with similar stage of lactation will be selected and fed green fodder of berseem @ 80 Kg/animal/day as per treatment in 3 replications in Switch Over design for a week.** **The following data will be recorded and analyzed statistically** **1) Palatability** **2) Digestibility** **3) Daily milk yield and composition** **4) Anti nutritional factors** **5)Animal health**
	PREVIOUSYEAR' RESULTS	**New Experiment**

64

TITLE	**COMPARATIVE STUDY ON FORAGE YIELD AND QUALITY OF DIFFERENT OAT ELITE LINES UNDER AGRO-ECOLOGICAL CONDITIONS OF FAISALABAD**
OBJECTIVE	**To determine nutritive value and maximum green fodder yield of elite oat lines under Faisalabad agro-ecological conditions**
RESEARCH WORKER	**Muhammad Arshad, Arbab Jahangeer, Tariq Mahmood and Dr. Abdul Majid**
PROJECT DURATION	**2017-2019**
LOCATION	**Agronomy (Forage Production) Section AARI, Faisalabad**
TREATMENTS/ METHODOLOGY	**TREATMENTS:** **T1= FRI-3664/15** **T2= FRI-3007** **T3= FRI-034** **T4= Line No -75525** **T5= Line No-707** **T6= Horcon** **T7= Line No 75527** **T8= CK-I** **Layout = RCBD** **Replications = 4** **Plot size = 3m x6m** **Sowing method = Broadcast** **Seed Rate = 80 kg ha -1** **Fertilizer = 80-60 kg/ha** **Following observations will be recorded.** **1) Number of plants m-2** **2)plant height** **3) number of leaves per plant** **4)Green fodder yield** **5) crude protein (%)** **6) crude fiber (%)** **7) ash (%)**
PREVIOUSYEAR' RESULTS	**New Experiment**

65

TITLE	**MILK YIELD AND ANIMAL HEALTH RESPONSE TO DIFFERENT OAT ELITE LINES**
OBJECTIVE	**To determine the response of different oat lines/varieties to milk yields and composition and animals health to different elite/promising lines of oat.**
RESEARCH WORKER	**Dr. Abdul Majid, Arbab Jahangeer, Muhammad Arshad and Tariq Mahmood**
PROJECT DURATION	**2017-2020**
LOCATION	**Dairy Section at Agronomy (Forage Production) Section AARI, Faisalabad**
TREATMENTS/ METHODOLOGY	**TREATMENTS:** **T1= FRI-3664/15** **T2= FRI-3007** **T3= FRI-034** **T4= Line No -75525** **T5= Line No-707** **T6= Horcon** **T7= Line No 75527** **T8= CK-I** **Eight buffaloes with similar stage of lactation will be selected and fed green fodder of three high yielding oats lines @ 70Kg/animal/day as per treatment in 3 replications in Switch Over design for a week.** **The following data will be recorded and analyzed statistically** **1) First Year** **a. Palatability b. Digestibility** **2) Second Year** **a. Palatability b. Digestibility** **c. Daily milk yield and composition d. Antinutritional factors** **e. Animal health**
PREVIOUSYEAR' RESULTS	**New Experiment**

66 **TITLE** **CUTTING FREQUENCIES RESPONSE ON SEED YIELD POTENTIAL OF BERSEEM**

OBJECTIVE **To determine the response of cutting frequencies on seed yield potential of Berseem Super Late**

RESEARCH WORKER **Muhammad Arshad, Arbab Jahangeer, Tariq Mahmood and Dr. Abdul Majid**

PROJECT DURATION **2017-2019**

LOCATION **Agronomy (Forage Production) Section AARI, Faisalabad.**

TREATMENTS/ METHODOLOGY

TREATMENTS:

T_1= No cut
T_2= one cut
T_3= two cuts
T_4= three cuts
T_5= four cuts

Layout = RCBD
Replications = 4
Plot size = 3m×6m
Sowing method = Broad cast in standing water
Date of Sowing = Second week of October
Seed Rate = 20 kg ha $^{-1}$
Fertilizer = 30-60 NP kg /ha^{-1}
Date of first cut = 60 DAS

Following observations will be recorded.

1) Green fodder Yield t/ha 2) Number of penicles per plant
3) Number of seeds /penicle 4) 1000 seed/grain weight
5) Seed yield kg ha $^{-1}$

PREVIOUSYEAR' RESULTS **New Experiment**

67 **TITLE** **COMPARISON OF THE PRODUCTIVITY OF PURE AND MIXED RABI FODDERS**

OBJECTIVE **To determine the best combination of fodders for maximum biomass.**

RESEARCH WORKER **Arbab Jahangeer, Muhammad Arshad, Tariq Mahmood and Dr. Abdul Majid**

PROJECT DURATION 2017-2019

LOCATION Agronomy (Forage Production) Section AARI, Faisalabad.

TREATMENTS/ METHODOLOGY

T_1= Berseem 100%
T_2= Berseem 100% + oats 25%
T_3= Berseem 75% + oats 25%
T_4= Berseem 100% + Barley 25%
T_5= Berseem 75% + Barley 25%
T_6= Berseem 75% + oats 12.5% + barley 12.5%

Layout = RCBD
Replication = 3
Plot size = 3m x7m
Sowing method = Broadcast in standing water.
Fertilizer = 30-60 kg NP ha^{-1}

Following observations will be recorded.

1) Number of plants m^{-2} 2) Number of tillers/plant
3) Plant height at harvest 4) number of leaves per plant
5) Green fodder yield t/ha

PREVIOUSYEAR' RESULTS

Green Fodder Yield (t/ha)

T_1= Berseem 100%	55.54 d
T_2=Berseem 100% + oats 25%	65.23 bc
T_3=Berseem 75% + oats 25%	59.93 cd
T_4=Berseem 100% + Barley 25%	70.25 ab
T_5=Berseem 75% + Barley 25%	66.23 ab
T_6=Berseem 75% + oats 12.5% + barley 12.5%	73.98 a

LSD value: 8.3818

68

TITLE Effect of stage of cutting on crude Protein, Fiber content and Dry matter yield of Alfalfa

OBJECTIVE To investigate the effect of stage of cutting of alfalfa on crude protein, fiber content and dry matter yield of Sargodha Lucern.

RESEARCH WORKER Arbab Jahangeer , Muhammad Arshad, Tariq Mahmood, Dr. Abdul Majid and Maryyam Sarfaraz. (ARO, Biochemistry)

PROJECT DURATION 2015-2017

LOCATION Agronomy (Forage Production) Section AARI, Faisalabad.

	TREATMENTS/ METHODOLOGY	**TREATMENTS** **T1 = Continuous cuttings after 3 weeks** **T2 = Continuous cuttings after 4 weeks** **T3 = Continuous cuttings after 5 weeks** **T4 = Continuous cuttings after 6 weeks** **The experiment will be sown in 30 cm apart rows during last week of October with recommended fertilizer dose (NPK 22-115-00 Kg ha-1) having plot size 3m × 6m in RCBD with 4 replications. All Agronomic practices will be kept uniform. Seed rate will be 10-12 kg/ha. First cut will be taken 60 days after sowing.** **Following observations will be recorded** **1) Number of plants m^{-2} 2) Number of tillers per plant** **3) Plant height 4) No. of nodes per plant,** **5) Green fodder yield/ha 6) Crude protein (%)** **7) Fiber contents (% ADF, % NDF).**
	PREVIOUSYEAR' RESULTS	**New Experiment**
69	**TITLE**	**Collection and maintenance of grass gene pool**
	OBJECTIVE	**To develop and maintain gene pool of different grasses for agronomic studies**
	RESEARCH WORKER	**Dr. Abdul Majid, Arbab Jahangeer, Tariq Mahmood and Muhammad Arshad**
	PROJECT DURATION	**Continuous nature**
	LOCATION	**Agronomy (Forage Production) Section AARI, Faisalabad.**

TREATMENTS/ METHODOLOGY

20 grass cultivars
3 rows/grass

Layout = Augmented design

Plot size = 3m x6m

Sowing method = cuttings/stools in 30 cm apart lines.

Fertilizer = 200-200 NP kg/ha.

All P will be applied at the time of sowing. N will be applied in 5 equal doses. First at sowing, and then after every cut will be applied.

Following observations will be recorded

1) Number of plants/m^2
2) Number of tillers/plant
3) Number of leaves/plant
3) Plant height
4) Green fodder yield will

PREVIOUSYEAR' RESULTS

Continuous nature.

AGRICULTURAL RESEARCH STATION, BAHAWALPUR

1. LUCERNE (*Medicago sativa* L.)

70. TITLE — **NATIONAL UNIFORM FODDER YIELD TRIAL OF LUCERNE**

OBJECTIVE — **To evaluate different lines/varieties of Lucerne for green fodder yield at different locations in Pakistan.**

RESEARCH WORKERS — **Dr. Lal Hussain Akhtar and Rashid Minhas**

PROJECT DURATION — **2017-18**

LOCATION — **Agricultural Research Station, Bahawalpur**

TREATMENTS/ METHODOLOGY — **Seed and methodology of the Trial will be received from the Coordinator (Fodder), National Agricultural Research Centre, Islamabad**

Data on fodder yield will be recorded.

Data recorded on green fodder yield (3-cuttings) are given as under:

PREVIOUSYEARS RESULTS

Varieties	Fodder Yield (t ha-1)
E1	52.9
E2	56.0
E3	59.6
E4	56.0

The coded data were sent to the Coordinator (Fodder), National Agricultural Research Centre, Islamabad.
The decoded data is still awaited.

71. TITLE — **ADAPTABILITY TRIAL ON LUCERNE**

OBJECTIVE — **To evaluate different lines/varieties of Lucerne for green fodder yield at different locations in Punjab.**

RESEARCH WORKERS — **Dr. Lal Hussain Akhtar and Rashid Minhas**

PROJECT DURATION — **2017-18**

LOCATION — **Agricultural Research Station, Bahawalpur**

TREATMENTS/ METHODOLOGY — **Seed and methodology of the trial will be received from the Director, FRI, Sargodha.**

Data on fodder yield will be recorded.

2. BERSEEM (*Trifolium elexandrinum*)

PREVIOUS YEARS RESULTS	**First year**

72. TITLE — **ADAPTABILITY FODDER YIELD TRIAL OF BERSEEM**

OBJECTIVE	**To assess green fodder yield potential of advanced lines against standard varieties under different agro climatic conditions.**
RESEARCH WORKERS	**Dr. Lal Hussain Akhtar and M.Shajahan Bukhari**
PROJECT DURATION	**2017-18**
LOCATION	**Agricultural Research Station, Bahawalpur**
TREATMENTS/ METHODOLOGY	**Seed and methodology of the trial will be received from the Director, FRI, Sargodha.** **Data on fodder yield will be recorded**

PREVIOUS YEAR'S RESULTS

Data recorded on green fodder yield (3-cuttings) are given as under:

The coded data were sent to the Director, FRI, Sargodha.

Varieties	Green Fodder Yield (t ha-1)
SB-2-14	88.90
FB-3-14	87.80
FB-2-14	84.40
Anmol (check)	84.00
FB-1-14	84.20
SB-1-14	80.40
SB-3-14	83.10
Agaiti(check)	76.40
LSD (0.05)	3.89

3. OATS (*Avena sativa* L.)

73. TITLE — **ADAPTABILITY GREEN FODDER YIELD TRIAL OF OATS**

OBJECTIVE — **To evaluate the promising/candidate lines of oats for green fodder yield**

RESEARCH WORKERS — **Dr. Lal Hussain Akhtar and Muhammad Zubair**

PROJECT DURATION — **2017-18**

LOCATION — **Agricultural Research Station, Bahawalpur**

TREATMENTS/ METHODOLOGY — **Seed and methodology of the trial will be received from the Director, FRI, Sargodha.**
Data to be collected = Green fodder yield
Data recorded on green fodder yield of adaptation yield trial of oats are given as under:

PREVIOU YEAR'S RESULTS

Varieties	Green Fodder Yield (t ha-1)
FSD-2-2013	51.1
FRI-01	47.1
Domount	54.1
SGD-Oats-2011 (Check)	53.6
FRI-03	55.2
CK-1	53.2
FSD-1-2013	54.7
FSD-3-2013	59.7
S-2000 (Check)	49.9
FRI-02	47.8
No.632	51.3
No.75525	50.9
LSD(0.05)	5.14

The data recorded were sent to the Director, Fodder Research Institute, Sargodha.

74. TITLE **SEED PRODUCTION OF LUCERNE, BERSEEM AND OATS CROPS**

OBJECTIVE **To produce pre-basic seed of approved varieties of Lucerne, Berseem & Oats crops to meet the requirement of seed companies/ growers/farmers of the southern Punjab.**

RESEARC WORKERS **Dr. Lal Hussain Akhtar, Rashid Minhas, Muhammad Shahjhan Bukhari and Muhammad Zubair**

PROJECT DURATION **2017-18**

LOCATION **Agricultural Research Station, Bahawalpur**

TREATMENTS/ METHODOLOGY

Lucerne

Variety = Sargodha Lucerne
Area = 6 Acres
Sowing method = Line Sowing
Row to Row distance = 60cm

Berseem

Variety = Berseem Agaiti
Area = 10Acres
Sowing method = Broadcast

Oats

Name of variety = SGD-Oats-2011, S-2000
Area = 5Acres
Sowing method = Line Sowing
RxR = 30cm

PREVIOUS YEAR'S RESULTS

Results	Lucerne	Berseem	Oats
No. of Capsules selected for capsule to row planting	120	140	-
No. of capsule to rows selected for planting in Blocks	80	90	-
No. of Blocks selected	24	20	-
BNS Kg	50	50	-
Pre-basic (Kg)	950	150	2800
Basic (Kg)	-	1500	-

EXPERIMENTAL SEED PRODUCTION UNIT, FAROOQABAD

75 TITLE **Adaptability yield trial of berseem**

OBJECTIVE **To evaluate promising lines/varieties of berseem for green fodder yield.**

RESEARCH WORKER **Mr. Nadeem Rehman**

PROJECT DURATION **2017-2018**

LOCATION **Experimental Seed Production Unit (ESPU), Farooqabad**

TREATMENTS/ METHODOLOGY

Lines/varieties	**As provided by the Director, FRI, Sgd.**
Design	**RCBD**
Replications	**3**
Plot size	**3m x 5 m**
Sowing method	**Broadcast**

PLAN OF WORK **The lines/varieties will be sown using Randomized Complete Block Design (RCBD) with 4 replications. The crop will be raised adopting standard agronomic practices. Data on green fodder yield of each cutting will be recorded. Five cuts of the crop will be received and data will be analysed statistically.**

PREVIOUS YEAR'S RESULTS

S. No.	Code of Lines/varieties	Green Fodder Yield (t/ha)
1	SB-2-14	112.40
2	SB-1-14	111.11
3	FB-2-14	108.60
4	FB-3-14	108.21
5	FB-1-14	107.10
6	SB-3-14	105.00
7	Anmol (check)	103.20
8	Agaiti(check)	100.40
	LSD	5.95

76	**TITLE**	**National Uniform Green fodder yield trial of berseem**	
	OBJECTIVE	**To evaluate the entries of National Uniform Green Fodder Yield of berseem for green fodder yield.**	
	RESEARCH WORKER	**Mr. Nadeem Rehman**	
	PROJECT DURATION	**2017-2018**	
	LOCATION	**Experimental Seed Production Unit (ESPU), Farooqabad**	
	TREATMENTS/ METHODOLOGY	**Lines/varieties**	**As provided by the National Agricultural Research Centre, Islamabad.**
		Design	**RCBD**
		Replications	**4**
		Plot size	**3m x 5 m**
		Sowing method	**Broadcast**
	PLAN OF WORK	**The lines/varieties will be sown using Randomized Complete Block Design (RCBD) with 4 replications. The crop will be raised adopting standard agronomic practices. Data on green fodder yield of each cutting will be recorded. Five cuts of the crop will be received and data will be analysed statistically.**	
	PREVIOUS YEAR'S RESULTS	**Results are awaited.**	
77	**TITLE**	**Adaptability yield trial of Oats**	
	OBJECTIVE	**To evaluate promising lines/varieties of oats for green fodder yield.**	
	RESEARCH WORKER	**Mr. Nadeem Rehman**	
	PROJECT DURATION	**2017-2018**	
	LOCATION	**Experimental Seed Production Unit (ESPU), Farooqabad**	
	TREATMENTS/ METHODOLOGY	**Lines/varieties**	**As provided by the Director, FRI, Sgd.**
		Design	**RCBD**
		Replications	**3**
		Plot size	**1.8 m x 6 m**
		Sowing method	**Line sowing**

	Observations to be recorded	**Plant height** **Number of tillers per square meter** **Green fodder yield**

PLAN OF WORK

The lines/varieties will be sown using Randomized Complete Block Design (RCBD) with 3 replications. The crop will be raised adopting standard agronomic practices. Data will be recorded and analysed statistically.

PREVIOUS YEAR'S RESULTS

S. No.	Code of Lines/varieties	Green Fodder Yield (t/ha)
1	Fsd.2-2013	94.44
2	FRI-01	95.06
3	Demount	91.66
4	Sgd. Oats 2011	85.49
5	FRI.03	92.90
6	CK-1	89.19
7	Fsd. 01-2013	88.88
8	Fsd.3-2013	91.97
9	S-2000	95.37
10	FRI.02	89.50
11	No. 632	90.74
12	No. 75525	91.97
	LSD	5.16

78 TITLE **National Uniform Green fodder yield trial of Oats**

OBJECTIVE **To evaluate the entries of National Uniform Green Fodder Yield Trial of oats for green fodder yield**

RESEARCH WORKER **Mr. Nadeem Rehman**

PROJECT DURATION **2017-2018**

LOCATION **Experimental Seed Production Unit (ESPU), Farooqabad**

TREATMENTS/ METHODOLOGY	**Lines/varieties**	**As provided by the National Agricultural Research Centre, Islamabad.**
	Design	**RCBD**
	Replications	**3**
	Plot size	**1.8 m x 6 m**
	Sowing method	**Line sowing**

	Observations to be recorded	**Plant height** **Number of tillers per square meter** **Green fodder yield**
PLAN OF WORK	**The lines/varieties will be sown using Randomized Complete Block Design (RCBD) with 3 replications. The crop will be raised adopting standard agronomic practices. Data will be recorded and analysed statistically.**	
PREVIOUS YEAR'S RESULTS	**Results are awaited.**	