FODDER RESEARCH INSTITUTE, SARGODHA

INTRODUCTION

Economy of Pakistan is predominantly agriculture driven which not only contributes 19.8% to GDP but also provides jobs. Livestock is vital sub-sector of Agriculture contributing 11.6% to GDP which is 58.55% of the Agriculture's share to GDP (Economic Survey of Pakistan, 2015-16). It provides milk, meat and other by-products of animal origin for human nutrition. Pakistan which is at 4th position in milk production in the world produces 54,328 thousand tones of milk per year. The only value of milk is more than combined value of two major crops i-e wheat and cotton. Fodder is backbone of livestock as it can not survive without fodder. Fodder 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 186.2 million in Pakistan and 79.00 million in the Punjab.

In Pakistan, fodder crops which supplies 2-3 times cheaper animal feed than concentrate, have unique position in context of livestock. Fodders occupied an area of 2448.1 thousand ha and produced 55471.5 thousand tonnes of green fodder out of which Punjab province contributed 1829.3 thousand ha which is 74.7% of the area and 38707.8 thousand tonnes which is 70% of the production of the country.

In Punjab, fodder crops occupying 19% of the total cropped area are at third place after wheat and cotton with average fodder yield of 21.1 t/ha. Major Rabi fodder crops are Berseem, Lucerne and oats out of which Berseem alone contributes three forth of the total Rabi fodder crop's area.

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 finished, Animals are generally underfed and under-nourished which results in their poor performance. There is a short fall of 24% Total Digestible Nutrients (TDN) and 38% Digestible Protein (DP). 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 and it is only possible through evolution of high yielding, multicut varieties/hybrids of different fodder crops, standardization of their fodders and seed production technology both in public and private sectors. 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 long duration of fodder production especially in Berseem, having tolerance against major pests and diseases, good quality in terms of high out put of livestock production and also establishment of technology for seed production of improved varieties.

SALIENT ACHIEVEMENTS DURING 2015-16

BERSEEM

1 **Lines FB-44 & SB-112 yielded higher green fodder yield 69.74 t/ha & 69.42 t/ha. in National Uniform Fodder Yield Trial during 2014-15, whereas check variety Berseem Agaiti produced 63.02 t/ha average from 4 locations.**

2. **In adaptation experiment tested at 5 locations, advance line FB-1-13 & SB-3-13 produced highest green fodder yield 105.42 & 104.88 t/ha whereas check variety Anmol produced 101,88 t/ha.**

3. **In advance green fodder yield trial tested at 2 locations, line SB-01-14 gave maximum yield 113.36 t/ha while check variety Agaiti produced 110.45 t/ha.**

4. **Line SB-04-15 revealed highest green fodder yield 112.78 t/ha in preliminary green fodder yield experiment at two locations, while check variety Anmol produced 110.89 t/ha.**

OATS

1. **One oats promising line Sgd-1 contributed by Fodder Research Institute, Sargodha proved better yielder with respective yield of 34.54 t/ha, whereas check variety Sgd. Oat produced 24.96 t/ha at 3 different locations.**

2. **In Adaptability Green Fodder Yield Trials 3 promising lines "FRI-03, FRI-02 and FB-01 proved better yielder i.e. 63.15 t/ha, 62.94 t/ha and 61.05 t/ha respectively over two check varieties Sgd. 2000 and Sgd-2011 produced 59.01 t/ha and 56.54 t/ha respectively on an average of 5 different locations at Punjab level.**

3. **In Advance Green Fodder Yield Trials 4 promising lines Fsd-03-11, Sgd-46, Fsd-1-13 and No.75525 proved better yielder having average yields of 81.93 t/ha, 81.14 t/ha, 81.06 t/ha and 80.69 t/ha at 2 different locations whereas two check varieties Sgd. Oats 2011 and S-2000 produced 80.03 t/ha and 79.46 t/ha respectively.**

4. **Three line FRI-03, FRI-01 and No. 75525 revealed highest green fodder yield 86.07, 83.21 and 82.04 t/ha respectively in preliminary green fodder yield experiments at two locations, while two check varieties Sgd. Oats-2011 and S-2000 produced 75.27 t/ha and 70.61 t/ha respectively.**

LUCERN

1. **In advance green fodder trial, newly inducted line from germplasm, was significantly higher (GR-722 produced 55.70 t/ha whereas Sargodha Lucerne 2002 produced 46.79 t/ha. green fodder yield.**
2. **The new adopted three lines, FRI001 (75.97 t/ha), Silverado (74.67 t/ha), CUF-101 (73.46 t/ha.) & 5-IN-59 (72.49 t/ha) gave more yield not only from the check Sgd. Lucerne 2000 (48.96 t/ha) but also the line Oman (71.29 t/ha) which was the topper of the last year.**
3. **9 new lines will be inducted in the germplasm maintenance of Lucerne.**

ANNUAL RESEARCH PROGRAMME FOR RABI 2016-17

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 — **2016-17.**

LOCATION — **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY

No. of lines to be planted = 10

Check varieties	**=**	**B. Agaiti and Anmol**
Plot size	**=**	**4x30m.**
Fertilizer	**=**	**22-115-62 NPK kg/ha.**
Sowing time	**=**	**First fortnight of November**

Following characters will be recorded:-

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

PREVIOUS YEAR'S RESULTS — **Seed of 30 lines was collected, out of which 20 lines were preserved in cold store.**

S. No.	Parameters	Range
1	No. of days to flower	160-190 days
2	No. of days to maturity	190-215 days
3	Plant height	60-75 cm
4	Green fodder yield	60-90 t/ha.

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 Dr. Muhammad Shabbir Shakoor**

LOCATION — **Fodder Research Institute, Sargodha**

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

TREATMENTS/ METHODOLOGY — **500 desirable healthy capsules will be selected from open pollinated material, then seed of selected capsule will be bulked 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 — **2016-17**

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

TREATMENTS/ METHODOLOGY

Lines / varieties = 12

1)	**SB-1-16**	**2)**	**SB-2-16**
3)	**SB-3-16**	**4)**	**B. Agaiti (Check)**
5)	**Anmol (Check)**	**6)**	**FB-01-16**
7)	**FB-02-16**	**8)**	**FB-03-16**
9)	**SB-04-16**	**10)**	**SB-05-16**
11)	**SB-06-16**	**12)**	**SB-07-16**

Lay out	**=**	**RCBD**
Replications	**=**	**3**
Plot size	**=**	**3x5 m.**
Sowing method	**=**	**Broadcast**
Fertilizer	**=**	**22-115-0 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)**

PREVIOUS YEAR'S RESULTS

GREEN FODDER YIELD (t/ha.)

Sr. No.	Lines/ varieties	FRI, Sargodha	FRSS, F/Abad.	Avg.
1.	SB-4-15	131.56	94.00	112.78
2.	Agaiti (check)	127.34	95.78	111.56
3.	Anmol (Check)	128.23	93.55	110.89
4.	FB-3-15	130.45	90.22	110.78
5.	FB-1-15	124.00	96.22	110.11
6.	SB-05-15	131.56	90.22	108.78
7.	SB-1-15	128.89	86.88	107.88
8.	SB-2-15	124.23	90.22	107.22
9	FB-2-15	123.56	84.44	104.00
10	SB-3-15	125.56	91.11	103.67
	LSD (5%)	3.81	2.39	

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 — **2016-17**

LOCATION — **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY

Lines/ varieties = 10

1	SB-1-15	2	Agaiti (check)
3	SB-2-15	4	Anmol (check)
5	FB-01-15	6	FB-02-15
7	FB-03-15	8	SB-03-15
9	SB-04-15	10	SB-05-15

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**

PREVIOUS YEAR'S RESULTS

GREEN FODDER YIELD (t/ha.)

Sr.No.	Lines/ varieties	FRI, Sgd.	FRSS, F/Abad.	Av.
1.	SB-1-14	139.61	87.11	113.36
2.	SB-2-14	135.34	90.22	112.78
3.	FB-3-14	133.78	91.11	112.45
4.	FB-2-14	130.89	93.78	112.34
5.	FB-1-14	132.68	89.55	111.12
6.	SB-3-14	138.00	83.33	110.67
7.	Agaiti (check)	132.67	88.22	110.45
8.	Anmol (check)	133.54	84.44	108.99
9.	LSD 5%	1.74	2.63	

5. TITLE — **ADAPTATION 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, Ghulam Ahamd and Ch.Ghulam Nabi**

PROJECT DURATION — **2015-16**

LOCATION (S)

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

TREATMENTS/ — **Lines/ Varieties = 8**

1. FB-2-14
2. SB-1-14
3. Anmol (check)
4. FB-3-14
5. SB-2-14
6. Agaiti (check)
7. SB-03-14
8. FB-01-14

METHODOLOGY

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. **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**

PREVIOUS YEAR'S RESULTS

GREEN FODDER YIELD (t/ha.)

Sr. No	Lines / Varieties	FRI, Sargodha	FRS, Lahore	FRSS, F/Abad	ARS, B/Pur *	ESPU, Farooqabad	Av.
1.	FB-1-13	143.78	113.64	77.11	99.30	93.27	105.42
2.	SB-3-13	149.55	105.32	77.55	92.20	99.80	104.88
3.	FB-3-13	132.67	110.21	82.66	85.20	105.42	103.23
4.	FB-2-13	140.44	110.66	79.33	90.90	93.65	102.99
5.	Agaiti(check	127.55	116.66	81.78	85.70	102.34	102.81
6.	Anmol (check)	138.44	107.99	77.78	92.60	93.10	101.88
7.	SB-2-13	140.44	102.88	80.84	89.10	94.20	101.41
7.	SB-1-13	135.55	111.55	77.33	90.40	91.56	100.48
	LSD 5%	2.69		2.35		9.7	

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, Ghulam Ahamd and Ch. Ghulam Nabi**

PROJECT DURATION **2015-16**

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

Sr. No.	Name of Hybrids	Fodder Yield (Kg/ha)			
		NARC Islamabad	FRI Sarghodha	Tarnab Peshawar	Avg. (kg/ha)
1.	Samarqand Berseem	83889	104889	61158	83312
2.	Lyalpur late Berseem	69556	108222	63438	80405
3.	SB-11	80556	110222	58531	83103
4.	SB-8	75889	99556	59540	78328
5.	Sandal Berseem	76444	103111	62949	80835
6.	Agaiti (Check)	78222	104889	57840	80317
7.	SB-1-13	74556	104222	53184	77321
LSD (0.05)		7782	3636	1862	4427

OATS (*Avena sativa)* 2n = 42

7. TITLE — **MAINTENANCE AND EVALUATION OF GENEPOOL**

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

RESEARCH WORKERS — **Maqbool Hussain Anjum, Abdul Basit and Ghulam Nabi**

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

LOCATION — **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY

Germplasm lines /varieties

Previous	=	**95**
New collections	=	**21**
Total	=	**116**
Design	=	**Augmented**
No. of rows	=	**2**
Row length	=	**6 m**
Row spacing	=	**30cm.**
Fertilizer	=	**114-84-50 NPK kg/ha.**
Check Varieties	=	**S-2000, Sgd. Oats 2011 No 75525** ***After every ten lines, three checks will be sown)***
Sowing time	=	**November**

PREVIOUS YEAR'S RESULTS — **Seed of 95 lines was collected and preserved for next year sowing.**

S. No.	Parameters	Range
1.	Lodging	5-80%
2.	Days to heading	90-132
3.	Plant height	76-170 cm
4.	No. of tillers/plant	5-17
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 **Maqbool Hussain, Abdul Basit and Ch.Ghulam Nabi.**

PROJECT DURATION **2016-17**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY **36 crosses will be attempted**

Parental lines / varieties :-

1) FRI-01 **2) No.75525**
3) No. 632 **4) Sgd-1**
5) FRI-02 **6) Domount**
7) FRI-03 **8) Ck-1**
9) S-2000 (Check)

Crosses will be attempted following half diallel method.

No. of Rows = 2
Row length = 6 m
Row spacing = 60 cm.
Fertilizer = 114-84-50 NPK kg/ha.
Sowing time = November

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PREVIOUS YEAR'S RESULTS **36 crosses were attempted out of which 5 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 **Maqbool Hussain, Abdul Basit and Dr. Shabbir Shakoor**

PROJECT DURATION **2016-17**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS/ METHODOLOGY

Crosses to be studied:-

S. No.	Generations	No. of crosses
1.	F1	5
2.	F2	4
3.	F3	5
4.	F4	4
5.	F5	6
6.	F6	3
7.	F7	1

Row length = 6m
Row spacing = 60cm
Fertilizer = 114-84-50 NPK kg/ha.
Sowing time = November

F1 = Flanked with parents
F2 = 2 rows of each
F3-F6 = 3 rows of each single plant progeny

Check varieties = Sgd Oat 2011 and S-2000

Following data will be recorded.

1. **Lodging**
2. **Disease resistance**

PREVIOUS YEAR'S RESULTS

Fillial Generations	Entries Studied	Selected Progenies/Plants	Uniform Lines Selected
F1	6	5	-
F2	5	38	-
F3	45	57	-
F4	73	85	-
F5	89	94	
F6	83	45	1

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

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

RESEARCH WORKERS **,Maqbool Hussain, Abdul Basit & Javed Yousaf**

PROJECT DURATION **2016-17**

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

TREATMENTS/ METHODOLOGY

No. of Entries = 14

i)	**No.75525**	**ii)**	**Erk**
iii)	**Sgd-4**	**iv)**	**No.677**
v)	**Domount**	**vi)**	**Sgd-1**
vii)	**Fsd. Oat-01-2016**	**viii)**	**Fsd. Oat-02-2016**
ix)	**Fsd. Oat-03-2016**	**x)**	**No.632**
xi)	**Sgd. Oats 2011(check)**	**xii)**	**S-2000 (check)**
xiii)	**Sgd-46**	**xiv)**	**CK-1**

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

Following data will be recorded.

1. **Leaf area**
2. **Plant height (cm)**
3. **Lodging %**
4. **Disease incidence**
5. **Green fodder yield (t/ha)**

PREVIOUS YEAR'S RESULTS

GREEN FODDER YIELD (t/ha.)

Sr. No.	Code	Line / Variety	FRI, Sargodha	FRSS, F/Abad	Av.
1.	D	FRI.03	83.72	88.42	86.07
2.	B	FRI.01	85.86	80.55	83.21
3.	J	No-75525	77.28	86.80	82.04
4.	E	SG.46	76.08	86.80	81.44
5.	C	FRI.02	88.01	70.36	79.19
6.	G	Fsd Oat 01-2015	70.20	84.72	77.46
7.	H	Fsd Oat 02-2015	72.38	81.02	76.70
8.	K	Sgd Oat 2011	70.22	80.32	75.27
9.	I	Fsd Oat 03-2015	64.68	82.17	73.43
10.	A	No.6015	73.32	70.36	71.84
11.	L	S-2000(ckech)	67.16	74.06	70.61
12.	F	Sgd-4	59.80	81.25	70.53
LSD 5%			4.23	1.55	

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 **Maqbool Hussain, Ghulam Nabi and Dr. M. Shabbir Shakoor**

PROJECT DURATION **2016-17**

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)	**No.75524**	**ii)**	**No.75527**
iii)	**DN-8**	**iv)**	**Ck-1**
v)	**Domount**	**vi)**	**No.75525**
vii)	**Fsd. Oat-01-2015**	**viii)**	**Fsd. Oat-02-2015**
ix)	**Sgd-1**	**x)**	**No.632**
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. **Lodging %**
2. **Plant height (cm)**
3. **No. of tillers/meter row**
4. **Disease incidence**
5. **Green fodder yield (t/ha)**

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

Sr. No	Line/ variety	FRI, Sgd.	FRSS, F/Abad	Av.
1.	Fsd-03-13	89.55	74.30	81.93
2.	Sgd 46	82.19	80.09	81.14
3.	Fsd-01-13	83.41	78.70	81.06
4.	No75525	90.77	70.60	80.69
5.	Sgd 0ats 2011 (check)	79.73	80.32	80.03
6.	No75524	79.12	80.55	79.84
7.	S-2000 (check)	77.89	81.02	79.46
8.	No75527	74.21	84.49	79.35
9.	Sgd -4	77.90	80.32	79.11
10.	Fsd-02-13	82.19	75.22	78.71
11.	No 632	85.25	59.25	72.25
12.	Erk	72.37	59.76	66.07
	LSD 5%	3.71	1.79	

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 **Maqbool Hussain, Abdul Basit and Dr. M. Shabbir Shakoor**

PROJECT DURATION **2016-17**

LOCATION (S)

i.) FRI, Sargodha
ii) ARS, Bahawalpur
iii) SSRI, Pindi Bhattian
iv) FRS, Lahore.
v) FRSS, AARI, Faisalabad

TREATMENTS/ METHODOLOGY

Varieties/lines = 12

i)	**FRI-02**	**ii)**	**FRI-03**
iii)	**No-632**	**iv)**	**CK-1**
v)	**No.75525**	**vi)**	**Fsd-1-2013**
vii)	**Fsd-2-2013**	**viii)**	**Fsd-3-2013**
ix)	**FRI-01**	**x)**	**S-2000 (check)**
xi)	**Domount**		
xii)	**Sgd. Oats 2011(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. **Leaf area**
2. **Plant height (cm)**
3. **Lodging %**
4. **Disease incidence**
5. **Green fodder yield (t/ha)**

PREVIOUS YEAR'S RESULT

GREEN FODDER YIELD (t/ha.)

Sr No	Line /Verity	FRI Sgd	FRSS F/Abbad	FRS Lahore	ARS B/Pur	ESPU Farooqabad	AV.
1.	FRI-03	63.39	67.89	65.11	57.0	*62.34*	63.146
2.	FRI-02	60.38	67.59	60.67	66.7	59.37	62.942
3.	FB-01	58.99	67.59	62.67	54.8	61.23	61.056
4.	CK-1	60.15	70.98	56.00	57.4	60.55	61.016
5.	Sgd Oat 2000 (check)	58.30	68.51	58.22	51.8	58.26	59.018
6.	S-08-12	61.30	66.66	52.00	56.7	55.87	58.506
7.	Lyallpr FB-02	55.29	69.44	48.00	61.1	*51.76*	57.118
8.	No 75525	62.00	73.45	46.00	42.2	60.55	56.840
9.	S-07-2012	58.99	68.51	50.22	47.0	59.22	56.788
10	Sgd Oat 2011 (check)	58.99	72.52	42.67	48.9	59.66	56.548
11	DN -8	57.37	66.66	44.89	52.6	54.33	55.170
12	Hori core	52.28	67.59	47.33	47.0	57.38	54.316
	LSD 5%	2.29	0.95	2.21	3.25	3.62	

Pooled analysis

LSD 5% for location = 5.93 LSD 5% for varieties = 4.71 LSD 5% for V x L = 6.03

***** ***The low yield at ESPU, Farooqabad was due to non availability of irrigation water.***

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

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 **Maqbool Hussain and Dr. M. Shabbir Shakoor**

PROJECT DURATION **2016-17**

LOCATION **FRI, Sargodha and others**

TREATMENTS/ **Seed and sowing plan will be supplied by the Coordinator,**

METHODOLOGY **(Fodder), NARC, Islamabad and the experiment will be laid out accordingly. Data will be recorded as per instructions. Fodder Research Institute, Sargodha will contribute the test entry** "Sgd-1".

PREVIOUS YEAR'S RESULTS

Sr. No.	Name of Hybrids	Oat Rabi Fodder Yield (t/ha)			
		FRI Sargodha	Tarnab Peshawar	Sariab Quetta	Avg.
1.	NARC-2011 (Check)	78.70	12.34	24.72	38.59
2.	SGD-1	70.37	16.97	16.29	34.54
3.	Wintroo	68.36	12.34	21.75	34.15
4.	No.632	68.51	10.49	17.19	32.06
5.	Faisalabad Oats	58.48	14.81	19.93	31.08
6.	No.97009	58.48	12.34	20.77	30.53
7.	Lyalpur late oats	54.63	11.11	21.26	29.00
8.	Domount	47.22	12.34	19.96	26.51
9.	No. 75525	48.14	11.11	15.80	25.02
10	Sargodha-2011 (Check)	49.53	8.02	17.34	24.96
LSD (0.05)		33.80	23.18	12.70	23.23
C.V (%)		6.87	14.56	12.76	11.39

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

Lines/entries	**=**	**30**
New lines	**=**	**9**
Row Spacing	**=**	**60cm.**
Row Length	**=**	**6m.**
No. of rows	**=**	**3**
Fertilizer	**=**	**23-115-62 NPK kg/ha.**
Sowing time	**=**	**First fortnight of October**

Following data will be recorded:-

1. Plant height **2. Culm thickness**
3. No. of tillers/meter row **4. Dry matter yield**
5. Green fodder yield (t/ha) **6. Crude Protein**

PREVIOUS YEAR'S RESULTS — **Seed of 30 lines was collected and preserved for next year sowing.**

Sr. No.	Parameters	Range
1	Plant height	85-95 cm
2	Culm thickness	0.23-0.36 cm
3	No. of tillers/plant	5.1 – 6.1
4	No. of tillers/Meter row	60-87

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 — **2016-17**

LOCATION — **Fodder Research Institute, Sargodha**

TREATMENTS METHODOLOGY

Total lines/entries	**=**	**12**
Lay out	**=**	**RCBD**
Replications	**=**	**3**

Plot size	**=**	**1.35x5m.**
Row spacing	**=**	**45cm.**
Fertilizer	**=**	**23-115-62 NPK kg/ha.**
Sowing time	**=**	**First fortnight of October**

Following data will be recorded.

1. Plant height 2. Stem thickness
3. No. of tillers/meter row 4. Dry matter yield
5. Green fodder yield (t/ha) 6. No. of cuttings

REVIOUS YEAR'S RESULTS

Sr.No	Lines / Varieties	GFY (t/ha.)
1.	FRI001	75.97
2.	Silverado	74.67
3.	CUF-101	73.46
4.	5-IN-59	72.49
5.	Oman	71.29
6.	SGS-82	51.49
7.	Sgd. Lucerne (check)	48.96
8.	SARD-10	47.76
9.	ICON-13	45.57
10.	No.7613	42.15
11.	No. 53	41.58
12.	Sunder	40.92
	LSD 5%	3.008

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 **2016-17**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS
METHODOLOGY

Total lines/entries	**=**	**6**
Lay out	**=**	**RCBD**
Replications	**=**	**3**
Plot size	**=**	**1.35x5m.**
Row spacing	**=**	**45cm.**
Fertilizer	**=**	**23-115-62 NPK kg/ha.**
Sowing time	**=**	**First fortnight of October**

Following data will be recorded.

1. Plant height 2. Stem thickness
3. No. of tillers/meter row 4. Dry matter yield
5. Green fodder yield (t/ha) 6. No. of cuttings

GREEN FODDER YIELD (t/ha.)

REVIOUS YEAR'S RESULTS

Sr.No	Lines / Varieties	GFY
1.	GR-722	55.70
2.	Sgd Lucerne(Check)	46.79
3.	Hunter River	44.32
4.	No.1103	42.77
5.	C-312	37.49
6.	GR-745	35.33
	LSD 5%	2.345

17. TITLE **BNS & PRE-BASIC SEED PRODUCTION**

OBJECTIVE **Production of BNS and Pre-basic Seed of Berseem, lucerne and Oats.**

RESEARCH WORKERS: **Ahmad Hussain, Sultan Ali Bazmi and M. Javed Yusuf**

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

LOCATIONS **Fodder Research Institute, Sargodha**

SOWING PLANE

Row distance = 60cm
No. of rows / block = 6
Row length = 5m
Sowing time = 15th to 30th November, 2016

SOWING METHOD

a. ***Inspection of nucleus two rows plots (Head - Row) and removal of off type throughout the season of growth from the seedling stage until maturity*: The nucleus plots will be examined critically. Differences in the habit of early plant growth, leaf color, date of growth, time of heading, height characteristic and disease reaction will be recorded. If a plot differs distinctly from the average in the pre-heading stage of the growth, it will be removed before heading.**

b. ***Harvesting and threshing of nucleus seed:*** **Each remaining plots will be harvested individually with a sickle and tied in a bundle and labeled and threshed individually.**

c. **Later seed will be cleaned by hand methods. The grain from each nucleus plot will be placed in piles on the seed table. All piles will be examined for approximate uniformity of seed appearance and any pile which appears to be off type, will be discarded. All the remaining piles of the seed will be treated with fungicide and insecticide and bagged, labeled and stored as breeder's stock seed for use in next year.**

d. Breeder stock seed from the nucleus will be sown (Row-block) on the clean, fertile land, which did not grow a crop of the same kind in previous year.

e. The field will be not only properly space isolated but also by a border of at least three rows of the same variety on all around four sides.

f. The best farm practices will be used in the sowing and harvesting of breeder seed.

g. The sowing will be done in such a way to make the best use of the limited amount of seed available and to facilitate sowing. The sow spacing (2ft) will be sufficient to permit examination of plants in rows for possible removal of off types.

h. *Roguing*: All plants not typical of the variety will be pulled and removed. The rouging will be done before the flowering as was done for the nucleus/ breeder, stock seed.

i. *Harvesting the breeder's stocks*: In the breeder's stock harvesting and threshing, the equipments used will be clean and free from seeds of any other varieties. The cleanliness will be extended to cards and bags as well as threshing machine itself. The seed will be about 99% pure as to a variety and ready for increase of foundation seed

PREVIOUS YEAR' S RESULT

Crop	Variety	Selected No. of Plants	Selected No. of Plant Rows	Selected No.of Rows Blocks	BNS (Kg)	Pre-basic (Kg)
Berseem	B.Agaiti	60	32/60	16/24	13.75	111
	B. Pachaiti	65	38/65	18/24	15.00	93
	Superlate	75	42/75	22/36	18.00	332
Oats	S-2000	55	21/55	09/18	32.00	988
	Sgd-201	55	26/54	10/18	34.00	443
Lucerne	Sgd Lucerne	50	32/50	28/40	16.00	170

AGRONOMY

18. TITLE — **EFFECT OF LAST CUTTING DATE ON SEED PRODUCTION OF BERSEEM**

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

RESEARCH WORKERS — **M. Riaz Gondal and Anees-ul-Husnain Shah**

PROJECT DURATION — **2016-17**

LOCATION — **Fodder Research Institute, Sargodha.**
Fodder Research Sub-station, AARI, Faisalabad.

TREATMENT / METHODOLOGY

A) VARIETIES = 3

1. **Superlate Fsd.**
2. **Berseem Agaiti**
3. **SB-11**

B) LAST CUTTING DATES

1. **10th March**
2. **20th March**
3. **30th March (Check)**
4. **10th April**
5. **20th April**

Sowing time = 2nd week of October
Plot Size = 6m x 3m
Lay out = Split plot
Replications = 3
Fertilizer = 22-115-50 N-P-K kg/ha.

Following parameters will be recorded:-

(1) No of plants/m^2 **(4) Plant height**
(2) No of heads/plant **(5) No of seeds/Capsule**
(3) Seed yield (t/ha.) **(6) Fodder yield (t/ha.)**
(7) Metrological data

REVIOUS YEAR'S RESULTS

Sr.No	Lines / Varieties	Seed yield (kg/ha.) FRI, Sgd.	Seed yield (kg/ha.) FRSS, Fsd.
1.	Superlate Fsd.	269.47 a	659.13 a
2.	SB-11	254.95 a	595.60 b
3.	B.Agaiti	226.40 b	565.40 c
	LSD 5%	17.46	9.41

Sr.No	Cutting date	Seed yield (kg/ha.) FRI, Sgd.	Seed yield (kg/ha.) FRSS, Fsd.
1.	10th March	360.73 a	918.33 a
2.	20th March	344.62 b	764.33 b
3.	30th March	261.56 c	579.66 c
4.	10th April	222.34 d	454.67 d
5.	20th April	62.10 e	316.67 e
	LSD 5%	13.07	5.14

19. TITLE — **EFFECT OF SEED RATE ON INCIDENCE OF ROOT ROT DISEASE IN BERSEEM**

OBJECTIVE — **To find out the optimum seed rate of Berseem to minimize the incidence of root rot disease.**

RESEARCH WORKERS — **M. Riaz Gondal, Anees-ul-Husnain Shah, and M. Saleem Javed.**

PROJECT DURATRION — **2016-17**

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

TREATMENTS / METHODOLOGY

A) Varieties/Lines — **1-Superlate Fsd**
2-Chenab

B) Seed Rates (Kg/ha.)

(1) 10 Kg/ha (2) 12.5 Kg/ha
(3) 15 Kg/ha (4) 17.5 Kg/ha
(5) 20 Kg/ha(Standard) (6) 22.5 Kg/ha
(7) 25 Kg/ha

Layout = Split Plot
Plot Size = 3 x 6m
Replication = 3
Fertilizer = 22–79–0 N-P-K (kg/ha)
Sowing time = 2nd week of October

Following observations will be recorded.

1. No of plants/m^2 2 Plant height
3 No of leaves/plant 4 Stem thickness
5 % age of root rot attack 6. Green fodder yield (t/ha)

PREVIOUS YEAR'S RESULTS

Seed rate (kg/ha)	Fodder yield (t/ha.) Variety		Means	Root rot disease %age
	Superlate	Chenab		
10	148.47	159.33	153.90	2
12.5	144.00	150.87	147.43	1
15	142.67	149.50	146.08	4
17.5	143.33	146.87	145.10	1
20	136.87	141.00	138.93	3
22.5	130.00	131.00	130.50	5
25	128.67	132.83	130.75	2
Mean				
LSD 5%			8.41	

20. TITLE:- **EFFECT OF SEED RATE ON SEED PRODUCTION OF BERSEEM**

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

RESEARCH WORKERS **Muhammad Riaz Gondal and Anees-ul-Husnain**

PROJECT DURATION **2016-17**

LOCATION **FRI, Sargodha and FRSS, Faisalabad**

TREATMENTS/ METHODOLOGY

SEED RATE (kg/ha)

1. 10
2. 12.5
3. 15.0 (Standard)
4. 17.5
5. 20.0
6. 22.5
7. 25.0

Layout = RCBD
Plot size = 3 x 6m
Replication = 3
Sowing time = Ist Week of October
Variety = Berseem agaiti

The following observations will be recorded

1. Plant height
2. No. of grains per head
3. 1000 grain weight
4. Grain yield (t/ha.)
5. Green Fodder Yield (t/ha)

Meteorological data will be recorded.

PREVIOUS YEAR'S RESULTS

Sr.No	Seed Rate (kg/ha.)	Seed yield (kg/ha.) FRI, Sgd.	Seed yield (kg/ha.) FRSS, Fsd.
1.	10	364.00 b	898.33 a
2.	12.5	384.00 a	793.00 b
3.	15	359.00 c	747.00 c
4.	20	327.33 d	670.33 d
5.	17.5	252.67 e	558.00 e
6.	22.5	224.00 f	556.00 e
7.	25	223.00 f	517.67 f
LSD 5%		3.68	19.55

21. TITLE:- EFFECT OF ROW SPACING ON SEED PRODUCTION OF BERSEEM

OBJECTIVE To find optimum row spacing to get maximum seed production of berseem

RESEARCH WORKERS Muhammad Riaz Gondal and Anees-ul-Husnain

PROJECT DURATION 2016-17

LOCATION FRI, Sargodha and FRSS, Faisalabad

TREATMENTS/ METHODOLOGY

ROW SPACING (cm)

1. Broadcast
2. 15
3. 30
4. 45 (Standard)
5. 60

Variety: = Berseem Agaiti
Layout = RCBD
Plot size = 6m x 3.6m
Replication = 3
Sowing time = 2nd week of October

The following observations will be recorded

1. Plant height
2. No. of grains per head
3. 1000 grain weight
4. Grain yield (t/ha.)
5. Fodder yield (t/ha)
6. Metrological data

PREVIOUS YEAR'S RESULTS

Sr.No	Row spacing	Seed yield (kg/ha.) FRI, Sgd.	Seed yield (kg/ha.) FRSS, Fsd.
1.	Broadcast	334.93 a	606.00 a
2.	15cm apart line	312.00 b	587.67 b
3.	30cm apart line	268.30 c	510.33 c
4.	45cm apart line	250.00 d	475.33 d
5.	60cm apart line	230.67 e	403.67 e
	LSD 5%	16.00	03.25

22. TITLE **EFFECT OF SEED RATE ON SEED PRODUCTION OF ALFALFA**

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

RESEARCH WORKERS **Muhammad Riaz Gondal and Anees-ul-Husnain**

DURATION **2016-17**

LOCATION **FRI, Sargodha and FRSS, Faisalabad**

TREATMENTS/ METHODOLOGY

SEED RATE (kg/ha)

1. 2.5
2. 3.75
3. 5.00 (standard)
4. 6.25
5. 7.50

Layout = RCBD
Plot size = 6m x 2.7m
Replication = 4
Sowing time = 2nd week o October
Row spacing = 45cm
Variety = Sgd. Lucerne

The following observations will be recorded.

1. Plant height
2. No. of grains per head
3. 1000 grain weight
4. Grain yield(t/ha.)
5. Fodder yield (t/ha.)

PREVIOUS YEAR'S RESULTS

Sr.No	Seed Rate (kg/ha.)	Seed yield (kg/ha.)
1.	2.50	221.00 a
2.	3.75	197.67 b
3.	5.00	180.68 c
4.	6.25	169.67 d
5.	7.50	155.00 e
	LSD 5%	10.16

23. TITLE **EFFECT OF ROW SPACING ON SEED PRODUCTION OF ALFALFA**

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

RESEARCH WORKERS **Muhammad Riaz Gondal and Anees-ul-Husnain**

PROJECT DURATION **2016-17**

LOCATION **FRI, Sargodha and FRSS, Faisalabad**

TREATMENTS/ METHODOLOGY

ROW SPACING (cm)

1. 15
2. 30
3. 45 (standard)
4. 60
5. Broadcast

Layout	=	**RCBD**
Plot size	=	**6m x 3.6m**
Replication	=	**3**
Sowing time	=	**2nd week of October**
Variety	=	**Sgd. Lucerne**

The following observations will be recorded

1. Plant height
2. No. of grains per head
3. 1000 grain weight
4. Grain yield (t/ha.)
5. Fodder yield (t/ha.)
6. Metrological data

PREVIOUS YEAR'S RESULTS

Sr.No	Row spacing	Seed yield (kg/ha.)
1.	Broadcast	197.00 a
2.	15cm	180.70 b
3.	30cm	180.67 b
4.	45cm	171.00 b
5.	60cm	150.00 c
	LSD 5%	10.65

24. TITLE **EFFECT OF LAST CUTTING DATE ON SEED PRODUCTION OF ALFALFA**

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

RESEARCH WORKERS **Muhammad RiazGondal and Anees-ul-Husnain**

DURATION **2016-17**

LOCATION **FRI, Sargodha and FRSS, Faisalabad**

TREATMENTS/ METHODOLOGY

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

Variety = Sargpdha :Lucerne.
Layout = RCBD
Plot size = 6m x 2.7m
Row Spacing = 45 cm
Replication = 3
Sowing time = 2nd week of October.

The following observations will be recorded.

1. Plant height
2. No. of grains per head
3. 1000 grain weight
4. Grain yield (t/ha.)
5. Metrological data

PREVIOUS YEAR'S RESULTS

Sr.No	Cutting date	Seed yield (kg/ha.)
1.	1st March	48.67 g
2.	10th March	73.33 f
3.	20th March	101.00 e
4.	30th March	114.67 d
5.	10th April	130.33 c
6.	20th April	195.67 a
7.	30th April	199.67 a
8.	10th May	180.00 b
	LSD 5%	9.23

25. TITLE: **CHEMICAL CONTROL OF *CUSCUTA* IN ESTABLISHED CROP OF LUCERNE**

OBJECTIVE: **To study the efficacy of various weedicides for the control of cuscuta in established crop of Lucerne.**

RESEARCH WORKERS: **Muhammad Riaz Gondal**

DURATRION: **2016-17**

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

TREATMENTS:
T1= Pendimethaline @ 2.5 lit/ha. (Feb)
T2= Paraquat @ 2.5 lit/ha.
T3= Pendimethaline @ 2.5 lit/ha.+ Paraquat@2.5 lit/ha
T4= Glyphosate @ 50 gm a.i./ha.
T5= Glyphosate @ 100 gm a.i./ha.
T6= Glyphosate @ 150 gm a.i./ha.
T7=Pendimethaline@2.5lit/ha+Glyphosate@100gm a.i./ha
T8= T1-T7 + 2nd spray of Glyphosate @ 100 gm a.i./ha (after the appearance of weed)

METHODOLGY:

Design	**=**	**RCBD**
Replication	**=**	**4**
Plot size	**=**	**3 x 5 m**
Fertilizer	**=**	**22-114-00 NPK kg/ha**
Sowing Time	**=**	**November**
Sowing Method	**=**	**45 cm apart rows.**

Following observations will be recorded

1. Germination of *cuscuta* 2. Weed Infestation
3. Weed control

PREVIOUS YEAR'S RESULTS **New Experiment**

SOIL SCIENCE

26. TITLE — **EFFECT OF PHOSPHOROUS AND POTASSIUM ON SEED PRODUCTION OF OATS (No. 75525)**

OBJECTIVE — **To find out the best economical combination of P and K to obtain maximum grain yield of oats**

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

PROJECT DURATION — **2013-16**

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

TREATMENTS/ METHODOLOGY

T1 = 114-00-00 (kg/ha.)
T2 = 114-42-62
T3 = 114-84-62
T4 = 114-42-93
T5 = 114-84-93

Lay out = RCBD
Replications = 3
Plot size = 3x6 m^2
Row spacing = 30 cm.
Line/varirty = No.75525

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. **100 seeds weight**
2. **Grain yield (t/ha)**
3. **Soil analysis (before sowing and after harvesting)**

PREVIOUS YEAR'S RESULTS

TREATMENTS (NPK kg ha^{-1})	SEED YIELD (t ha^{-1})
T_1 114-00-00	2.01
T_2 114-42-62	2.55
T_3 114-84-62	2.77
T_4 114-42-93	2.96
T_5 114-84-93	2.99
LSD 5%	0.16

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

SOIL ANALYSIS (after harvesting)

Tre.	ECe ($mScm^{-1}$)	pH	Organic Matter %	Available phosphorous ($mg\ kg^{-1}$)	Available potassium ($mg\ kg^{-1}$)
T_1	0.74	8.1	0.64	5.8	110
T_2	0.76	8.2	0.63	5.4	106
T_3	0.79	8.2	0.61	4.9	103
T_4	0.79	8.3	0.62	4.9	105
T_5	0.82	8.4	0.62	5.0	105
LSD 5%	0.024	0.28	0.02	0.16	2.76

27. TITLE **EFFECT OF FOLIAR SPRAY OF UREA ON GREEN FODDER YIELD OF OATS (No. 75525)**

OBJECTIVE **To find out the best economical dose of urea as foliar spray with or without basal dose to obtain maximum green fodder yield of oats**

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

PROJECT DURATION **2013-16**

LOCATION **Fodder Research Institute, Sargodha.**

TREATMENTS/ METHODOLOGY

T_1 = 114-84-00 (NP kg ha^{-1}basal dose)
T_2 = 57-42-00(½ NP kg ha^{-1}basal dose)
T_3 = 6 g Lit^{-1} urea foliar spray+ ½ basal dose
T_4 = 8 g Lit^{-1} urea foliar spray+ ½ basal dose
T_5 = 10 g Lit^{-1} urea foliar spray+ ½ basal dose

Lay out = RCBD
Replications = 3
Plot size = 3x6 m
Row spacing = 30 cm.
Line/variety = No.75525

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. Three foliar spray will be applied after 20 days interval.

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. **Dry matter (%)**
7. **Soil analysis (before sowing and after harvesting)**

PREVIOUS YEAR'S RESULTS

TREATMENTS	GFY(tha^{-1})	DM%
T_1 114-84-00	49.4	19.7
T_2 57-42-00	42.4	19.3
T_3 6 g Lit $^{-1}$ urea foliar spray + ½ NP basal dose	49.8	19.5
T_4 8 g Lit $^{-1}$ urea foliar spray + ½ NP basal dose	51.2	19.5
T_5 10 g Lit $^{-1}$ urea foliar spray + ½ NP basal dose	50.3	19.4
LSD 5%	2.14	0.15
Two bags of Urea 1 ½ bag of DAP were saved/ha.		

SOIL ANALYSIS (before sowing)

Soil Texture	ECe (mScm^{-1})	pH	Organic Matter %	Available phosphorous (mg kg^{-1})
Silty Loam	0.79	8.0	0.64	6.7

SOIL ANALYSIS (after harvesting)

Tre.	ECe (mScm^{-1})	pH	Organic Matter %	Available phosphorous (mg kg^{-1})
T_1	0.83	8.2	0.62	5.4
T_2	0.79	8.1	0.62	5.5
T_3	0.80	8.1	0.61	5.1
T_4	0.79	8.1	0.62	5.2
T_5	0.78	8.0	0.62	5.1
LSD 5%	0.025	0.29	0.028	0.15

28. 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 **Asim Pervez, M. Shoaib Farooq and Abdul Razzaq**

PROJECT DURATION **2016-18**

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 = 3x6 m^2
Row spacing = 30 cm.
Line/variety = SB-11

Following observations will be recorded.

1. No. of grains/ 50 capsules
2. 100 grain weight
3. Stem thickness
4. Green fodder yield (t/ha)
5. Grain yield (t/ha)
6. Soil analysis (before sowing and after harvesting)

PREVIOUS YEAR'S RESULTS

TREATMENTS (Kg ha^{-1})	GFY(tha^{-1}) TOTAL OF 4 CUTS	SEED YIELD (kgha^{-1})
T_1 23-00-32	58	356
T_2 23-40-32	60	362
T_3 23-60-32	63	377
T_4 23-80-32	66	393
T_5 23-100-32	66	383
LSD 5%	3.60	0.66

SOIL ANALYSIS (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

SOIL ANALYSIS (after harvesting)

Tre.	ECe (mScm^{-1})	pH	Organic Matter %	Available phosphorous (mg kg^{-1})
T_1	0.74	8.2	0.63	5.5
T_2	0.73	8.1	0.63	5.4
T_3	0.73	8.0	0.63	5.1
T_4	0.73	7.8	0.64	5.0
T_5	0.73	7.9	0.64	5.0
LSD 5%	0.024	0.27	0.026	0.17

29. 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. Shoaib Farooq**

PROJECT DURATION **2015-18**

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

Lay out = RCBD
Replications = 3
Plot size = 3x6 m^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. **100 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 and after harvesting)**

PREVIOUS YEAR'S RESULTS

TREATMENTS (Kg ha^{-1})	GFY(tha^{-1}) TOTAL OF 4 CUTS	SEED YIELD (kgha^{-1})
T_1 23-80-50 (NPK kg ha^{-1}basal dose)	58	256
T_2 2gLit^{-1} boric acid foliar spray+ NPK basal dose	60	262
T_3 4 g Lit $^{-1}$ boric acid foliar spray+ NPK basal dose	63	277
T_4 6 g Lit $^{-1}$ boric acid foliar spray+ NPK basal dose	66	223
LSD 5%	3.60	0.16

SOIL ANALYSIS (before sowing)

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

SOIL ANALYSIS (after harvesting)

Tre.	ECe ($mScm^{-1}$)	pH	Organic Matter %	Available phosphorous ($mg\ kg^{-1}$)	Available potassium ($mg\ kg^{-1}$)
T_1	0.74	8.3	0.4	5.4	111
T_2	0.78	8.0	0.63	5.9	109
T_3	0.73	8.1	0.68	5.1	102
T_4	0.75	8.3	0.62	4.9	108
LSD 5%	0.024	0.28	0.02	0.16	2.76

30. 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 **2015-18**

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 = 3x6 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. **100 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 and after harvesting)**

PREVIOUS YEAR'S RESULTS	TREATMENTS (Kg ha^{-1})	GFY(tha^{-1}) TOTAL OF 4 CUTS	SEED YIELD (kgha^{-1})
SOIL ANALYSIS (before sowing)	T_1 00-00-00	58	256
	T_2 23-60-40	60	262
	T_3 23-80-40	63	277
	T_4 23-100-40	66	223
	T_5 23-60-60	66	293
	T_6 23-80-60	66	200
	T_7 23-100-60	78	201
	T_8 23-60-80	77	202
	T_9 23-80-80	65	209
	T_{10} 23-100-80	77	299
	LSD 5%	3.60	0.96

SOIL ANALYSIS (before harvesting)

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

SOIL ANALYSIS (after harvesting)

Tre.	ECe (mScm^{-1})	pH	Organic Matter %	Available phosphorous (mg kg^{-1})	Available potassium (mg kg^{-1})
T_1	0.74	8.1	0.64	5.8	110
T_2	0.76	8.2	0.63	5.4	106
T_3	0.79	8.2	0.61	4.9	103
T_4	0.79	8.3	0.62	4.9	105
T_5	0.77	8.4	0.62	5.0	105
T_6	0.75	8.2	0.66	5.2	104
T_7	0.78	8.1	0.61	5.1	102
T_8	0.73	8.4	0.61	5.0	106
T_9	0.72	8.1	0.64	5.5	101
T_{10}	0.74	8.4	0.62	5.1	103
LSD 5%	0.026	0.29	0.02	0.16	2.76

PLANT PATHOLOGY

31. TITLE: **SCREENING OF BERSEEM GERMPLASM AGAINST THE ROOT ROT DISEASE (*Fusarium moniliforme*)**

OBJECTIVE **To evaluate varieties/lines of berseem germplasm against the root rot disease caused by *Fusarium moniliforme.***

RESEARCH WORKERS **Aftab Ahmad Khan, Muhammad Saleem Javed and Dr. Saleem IL Yasin.**

PROJECT DURATION **2016-17**

LOCATION **Fodder Research Institute, Sargodha.**

TREATMENTS/ METHODOLOGY

Varieties/ lines = All germplasm lines / varieties
Design = RCBD
Sowing method = Broadcast

The seeds will be infested with spore load of (*Fusarium moniliforme*) @ 4000/ml of water before sowing. The crop will be raised adopting standard agronomic practices. Incidence of diseases will be recorded on appearance of symptoms. Metrological data will be recorded.

PREVIOUS YEAR'S RESULTS

Sr.No	Varieties/Lines	Disease %age
1	SB-11	3.00
2	SB-12	3.33
3	B. Againti (check)	4.67
4	B. Pachati (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

LSD =1.691

32.	**TITLE**	**SCREENING OF OAT VARIETIES AGAINST DRECHSLERA SP.**		
`				
	OBJECTIVE	**To find out the resistant material in Oat varieties against Drechslera leaf spot disease**		
	RESEARCH WORKERS	**Aftab Ahmad Khan, Muhammad Saleem Javed, and Dr. Saleem IL Yasin**		
	PROJECT DURATION	**2016- 17**		
	LOCATION	**Fodder Research Institute, Sargodha.**		
	TREATMENTS/	**Varieties/ lines**	**=**	**All germ plasm lines/ varieties provided by breeders**
	METHODOLOGY	**Design**	**=**	**RCBD**
		Line (Length x width) =		**5m x 30Cm**
		Check varieties=		**S-2000**
		Method of sowing	**=**	**Line sowing**
		The different Oat varieties/lines seeds will be sown in field in a plot size specified in methodology using recommended design with check variety (S-2000). The crop will be raised adopting standard agronomic practices. Disease incidence data will be recorded on appearance of disease symptoms.		
	PREVIOUS YEAR'S RESULTS	**New Experiment**		
33.	**TITLE:**	**EVALUATION OF ALFALFA GERMPLASM AGAINST ANTHRACNOSE CAUSED BY *COLLETOTRICUM TRIFOLLII***		
	OBJECTIVE	**To evaluate varieties/ lines of alfalfa against Anthracnose disease caused by *Colletotricum trifollii.***		
	RESEARCH WORKERS	**Aftab Ahmad Khan, Muhammad Saleem Javed and Dr. Saleem IL Yasin**		
	DURATION	**2015 -16**		
	LOCATION	**Fodder Research Institute, Sargodha.**		

TREATMENT / METHODOLOGY

Varieties/lines	**=**	**All germplasm lines / varieties**
Method of planting	**=**	**Broadcast**
Plot size	**=**	**5 x 3m**
Design	**=**	**RCBD**

The seed will be infested with inoculum of *Colletotricum trifollii* before sowing. The crop will be raised adopting standard agronomic practices. Anthracnose disease and metrological data will be recorded

PREVIOUS YEAR'S RESULTS

Resistant	Moderately Resistant		Moderately Susceptible
China	Oman	Cheronia	No.7613
No.1107	No.1103	Lucernal	Viger-1
GR-800	Con-B	Sunder	Viger-2
Viger-5	5-1N-59-E		
Laghka	Silverado		
African pop	Sard-10		
Pumpa	R-739		
Sgd Lucerne-2002	No.53		
	No.64 (USA)		
	Turkish pop		
	Persian		
	KQS-Alfa alfa-02		
	GR-722		
	Hunter River		
	Flenish pop		
	GR-745		

ENTOMOLOGY

34. TITLE **CHEMICAL CONTROL OF ARMYWORM IN BERSEEM SEED CROP.**

OBJECTIVES **To evaluate the most effective insecticides for the control of armyworm**

RESEARCH WORKER(S): **Abdul Khaliq**

DURATION: **2015-17**

LOCATION: **FRI, Sargodha**

TREATMENTS/ METHODOLOGY

Sowing = broadcast method
Design = RCBD
Replications = 3
Plot size = 3 x5 m
Sowing time = November

T1=Control
T2=Methoxyfenozide 240 SC @ 200ml/acre.
T3=Emamectin benzoazte 1.9 EC @ 200ml/acre.
T4=Lufeneuron (Marshal)50 EC @ 200ml/acre
T5=Flubendiamide(Belt)480 SC@ 50ml/acre
T6=Chlorantraniliprole (Coragen) 20 SP @ 80 ml/acre

Insecticides will be applied as a foliar spray at the time of pest appearance with the help of knapsack hand sprayer. All the standard agronomic practices will be kept the same. For recording the larval population of armyworm one sq. ft. samples at random across the field from each treatment would be examined. Armyworm infestation will be recorded before treatment and 24hrs, 72hrs, 7 days and 10 days after insecticide application and then after weekly interval.

PREVIOUS YEAR'S RESULT

Treatments	Before Spray	After Spray	% control
T1=Control	6.75	9.91	
T2=Methoxyfenozide	3.68	1.07	74.68
T3=Emamectin benzoazte	3.70	1.31	68.30
T4=Lufeneuron	2.89	0.51	85.25
T5= Flubendiamide(Belt)	3.20	0.44	89.45
T6=Chlorantraniliprole (Coragen)	3.75	0.56	88.82

LSD = 0 .25

35. TITLE **CHEMICAL CONTROL OF ARMYWORM IN LUCERNE SEED CROP.**

OBJECTIVES **To evaluate the most effective insecticides for the control of armyworm**

RESEARCH WORKER(S): **Abdul Khaliq**

DURATION: **2015-17**

LOCATION: **FRI, Sargodha**

TREATMENTS/ METHODOLOGY

Sowing = Line sowing
Design = RCBD
Replications = 3
Plot size = 3 x5 m
Sowing time = November

T1=Control
T2=Chlorfenapyr 36 SC @ 80 ml/acre.
T3=Emamectinbenzoazte 1.9 EC @200ml/acre.
T4=Lufeneuron(Match) 50 EC @200ml/acre
T5=Flubendiamide(Belt) 480 SC @ 50ml/acre
T6=Chlorantraniliprole (Coragen) 20 SP @ 80 ml/acre

Insecticides will be applied as a foliar spray at the time of pest appearance with the help of knapsack hand sprayer. All the standard agronomic practices will be kept the same. For recording the larval population of armyworm one sq. ft. samples at random across the field from each treatment would be examined. Armyworm infestation will be recorded before treatment and 24hrs, 72hrs, 7 days and 10 days after insecticide application and then after weekly interval.

PREVIOUS YEAR'S RESULT

Treatments	Before Spray	After Spray	% control
T1=Control	7.32	10.14	
T2=Chlorfenapyr	3.87	0.73	85.52
T3=Emamectinbenzoazte	3.61	1.44	63.70
T4=Lufeneuron	3.43	0.48	89.57
T5=Flubendiamide(Belt)	3.95	0.47	92.05
T6=Chlorantraniliprole (Coragen)	3.75	0.91	79.38
LSD= 0.91			

36. TITLE	**CHEMICAL CONTROL OF LYGUS BUG IN LUCERNE SEED CROP.**
OBJECTIVES	**To evaluate the most effective insecticides for the control of Lygus Bug**
RESEARCH WORKER(S):	**Abdul Khaliq**
DURATION:	**2016-18**
LOCATION:	**FRI, Sargodha**
TREATMENTS/ METHODOLOGY	**Sowing = Line sowing** **Design = RCBD** **Replications = 3** **Plot size = 3 x5 m** **Sowing time = November** **T1=Control** **T2=Diafenthiuron(Polo)500 SC @ 200 ml/acre** **T3=Carbosulfan (Advantage) 20%EC @200ml/acre.** **T4=Dimethoate (Danadem) 40%EC @200ml/acre** **T5= Chlorfenapyr (Pirate) 36 SC @ 80 ml/acre** **T6=Bifenthrin (Talstar)10%EC @ 300 ml/acre** **Insecticides will be applied as a foliar spray at the time of pest appearance with the help of knapsack hand sprayer. All the standard agronomic practices will be kept the same. The data will be recorded just before spray and then after 24 hrs, 72 hrs and 7 days of treatment by observing 10 randomly selected plants per plot later on the percent mortality will be calculated and data so obtained will also be analyzed statistically.**
PREVIOUS YEAR'S RESULT	**New experiment**

37. TITLE	**STUDY THE EFFECT OF HONEY BEE POLLINATION ON SEED PRODUCTION OF BERSEEM**
OBJECTIVES	**To find out the impact of honey bee on seed production**
RESEARCH WORKER(S):	**Abdul Khaliq**
DURATION:	**2016-18**
LOCATION:	**FRI, Sargodha**
TREATMENTS/ METHODOLOGY	**Sowing = Broadcast method** **Design = RCBD** **Replications = 4** **Plot size = 01 acre** **Sowing time = November** **Berseem seed crop will be sown on area of one acre keeping natural condition (without honey bee hives) for pollination and one acre seed crop will be sown by keeping honey bee hives to trigger pollination. The distance between natural and artificial honey bee treated plots will be kept one kilometer. For this purpose one acre field will be divided into four sub plots and data of produced seed will be recorded from each sub plot after harvest. The seed yield data so obtained will be analyzed statistically.**
PREVIOUS YEAR'S RESULT	**New experiment**

DAIRY TECHNOLOGY

38. TITLE **EFFECT OF BERSEEM AND LUCERNE HAY ON MILCH ANIMALS**

OBJECTIVE **To analyze the effect of feeding berseem and lucerne hay on milch animals.**

RESEARCH WORKERS **Muhammad Abdullah**

PROJECT DURATION **2016-17**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS

1. **Berseem hay (100 %)**
2. **Berseem Fodder (52 Kg) + Wheat straw (3 kg)**
3. **Lucerne hay (100%)**
4. **Lucerne fodder (52kg) + Wheat straw (3 kg)**
5. **Berseem hay (50 %) + Lucerne hay (50%)**

METHODOLOGY **Hay of Berseem and Lucerne was prepared by standard method and fed to buffaloes to determine the effect of hay on milk production. Green fodder plus wheat straw were used as standard. Dry matter was estimated for daily requirement of animals. Fifteen buffaloes of almost similar stage and lactation no. were selected and fed berseem hay, lucerne hay and berseem hay plus lucerne hay on dry matter basis. Daily feed intake and milk yield were recorded. Data was analyzed statistically.**

PREVIOUS YEAR'S RESULTS

S.No	Diet	Quantity (Kg)	
		Fed	Intake
1	Berseem hay (100%)	15.00	10.00^{C}
2	Berseem Fodder (52 Kg) + Wheat straw (3 kg)	55.00	49.00^{A}
3	Lucerne hay (100%)	15.00	9.00^{C}
4	Lucerne Fodder (52 Kg) + Wheat straw (3 kg)	55.00	44.00^{B}
5	Berseem hay (50 %)+ Lucerne hay (50%)	15.00	9.50^{C}
		LSD 0.05	1.52

S.No	Diet	Milk Production (Liters)	
		Before trial	After trial
1	Berseem hay (100%)	7.00	7.30^{A}
2	Berseem Fodder (52 Kg) + Wheat straw (3 kg)	7.00	6.98^{A}
3	Lucerne hay (100%)	7.00	6.50^{AB}
4	Lucerne Fodder (52 Kg) + Wheat straw (3 kg)	7.00	6.00^{B}
5	Berseem hay (50 %) + Lucerne hay (50%)	7.00	6.70^{AB}
		LSD 0.05	0.89

Diet	Quality Parameters	Milk Quality	
		Before trial	After trial
Berseem hay (100%)	Protein	4.2	3.9^{B}
	Fat	6.5	6.1^{AB}
	SNF	9.5	9.2^{AB}
Berseem Fodder (52 Kg) + Wheat straw (3 kg)	Protein	4.0	4.1^{AB}
	Fat	6.2	6.0^{AB}
	SNF	8.8	8.4^{C}
Lucerne hay (100%)	Protein	4.2	4.4^{AB}
	Fat	5.5	5.6^{B}
	SNF	9.2	9.4^{AB}
Lucerne Fodder (52 Kg) + Wheat straw (3 kg)	Protein	3.7	4.1^{AB}
	Fat	6.2	6.3^{A}
	SNF	8.4	8.8^{BC}
Berseem hay (50 %)+ Lucerne hay (50%)	Protein	4.2	4.5^{A}
	Fat	5.5	5.8^{AB}
	SNF	9.1	9.6^{A}
LSD 0.05	Protein		0.51
	Fat		0.59
	SNF		0.73

39. TITLE **COMPARATIVE EFFECT OF FEEDING RHODE GRASS ON MILK YIELD AND QUALITY**

OBJECTIVE **To analyze the effect of feeding various lines of Rhode grass on milch animals.**

RESEARCH WORKERS **Muhammad Abdullah and Ghulam Nabi**

PROJECT DURATION **2016-17**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS

1. **Toro (55Kg)**
2. **Tolgar (55 Kg)**
3. **Sabre (55 Kg)**
4. **Katem Bora (55Kg)**

METHODOLOGY

Four lines of Rhode grass planted at Farm Area of FRI, Sargodha were harvested, chopped and fed to buffaloes to determine their effect on milk production and quality. Dry matter was estimated for daily requirement of animals. Twelve buffaloes of almost similar stage and lactation no. were selected and fed 4 various lines of Rhode grass on dry matter basis. Daily feed intake and milk yield were recorded. Data was analyzed statistically.

PREVIOUS YEAR'S RESULTS

S.No	Diet	Quantity (Kg)	
		Fed	Intake
1	Toro	55	46.9^{A}
2	Tolgar	55	45.1^{B}
3	Sabre	55	43.4^{C}
4	Katem Bora	55	44.9^{B}
		LSD 0.05	0.36

S.No	Diet	Milk Production (Liters)	
		Before trial	After trial
1	Toro	7.00	7.6^{A}
2	Tolgar	7.00	7.2^{AB}
3	Sabre	7.00	6.8^{B}
4	Katem Bora	7.00	6.1^{C}
		LSD 0.05	0.69

S.No	Diet	Quality Parameters	Milk Quality	
			Before trial	After trial
1	Toro	Protein	4.1	4.2^{AB}
		Fat	5.8	6.5^{A}
		SNF	11.0	9.5
		T. Solids	16.8	16.0
2	Tolgar	Protein	4.4	3.7^{B}
		Fat	6.7	6.1^{AB}
		SNF	10.8	10.6
		T. Solids	17.5	16.7
3	Sabre	Protein	3.8	4.0^{AB}
		Fat	4.9	5.4^{B}
		SNF	12.0	10.6
		T. Solids	16.9	16.1
4	Katem Bora	Protein	4.5	4.5^{A}
		Fat	5.9	6.1^{AB}
		SNF	11.3	10.6
		T. Solids	17.2	16.7
LSD 0.05		Protein	0.55	
		Fat	0.82	
		SNF	1.24	
		T. Solids	1.95	

40. TITLE **EFFECT OF DIFFERENT COMBINATIONS OF BERSEEM, LUCERNE AND RHODE GRASS ON MILK YIELD AND QUALITY**

OBJECTIVE **To analyze the effect of feeding different combinations of berseem, lucern and rhode grass on milch animals.**

RESEARCH WORKERS **Muhammad Abdullah and Ghulam Nabi**

PROJECT DURATION **2016-17**

LOCATION **Fodder Research Institute, Sargodha**

TREATMENTS

1. Berseem (70%)+ Lucerne (30%) + Wheat straw (5Kg)
2. Berseem (60%)+ Lucerne (40%) + Wheat straw (5Kg)
3. Berseem (50%)+ Lucerne (50%)+ Wheat straw (5Kg)
4. Berseem (100%) + Lucerne (0%)+Wheat straw (5Kg)
5. Berseem (0%)+Lucerne (100%)+Wheat straw (5Kg)
6. Berseem (100%)+Lucerne (0%)+Wheat straw (0Kg)
7. Berseem (0%)+Lucerne (100%)+Wheat straw (0Kg)
8. Berseem (70%)+ Rhode grass (30%)+Wheat straw (0Kg)
9. Rhode grass (30%)+Lucerne (70%)+Wheat straw (0Kg)

METHODOLOGY

Different combinations of berseem, lucerne and rhode grass were prepared and fed to buffaloes to determine the effect on milk production and quality. Dry matter will be estimated for daily requirement of animals. Fifteen buffaloes of almost similar stage and lactation no. were selected and fed various combinations of berseem, lucerne and rhode grass on dry matter basis. Daily feed intake and milk yield were recorded. Data was analyzed statistically.

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PREVIOUS YEAR'S RESULTS

S.No	Diet	Quantity (Kg)	
		Fed	Intake
1	Berseem (70%)+ Lucerne (30%) + Wheat straw (5Kg)	55	50.00^{BC}
2	Berseem (60%)+ Lucerne (40%) + Wheat straw (5Kg)	55	49.50^{C}
3	Berseem (50%)+ Lucerne (50%)+ Wheat straw (5Kg)	55	44.80^{E}
4	Berseem (100%) + Lucerne (0%)+Wheat straw (5Kg)	55	49.40^{C}
5	Berseem (0%) + Lucerne (100%)+Wheat straw (5Kg)	55	42.80^{F}
6	Berseem (100%) + Lucerne (0%)+Wheat straw (0Kg)	75	52.90^{A}
7	Berseem (0%) + Lucerne (100%)+Wheat straw (0Kg)	65	47.90^{D}
8	Berseem (70%) + Rhode grass (30%)+Wheat straw (0Kg)	55	50.90^{B}
9	Rhode grass (30%)+ Lucerne (70%)+Wheat straw (0Kg)	55	44.80^{E}
		LSD 0.05	1.13

S.No	Diet	Milk Production (Liters)	
		Before Trial	After Trial
1	Berseem (70%)+ Lucerne (30%) + Wheat straw (5Kg)	8.00	9.00^{A}
2	Berseem (60%)+ Lucerne (40%) + Wheat straw (5Kg)	8.00	8.30^{ABC}
3	Berseem (50%)+ Lucerne (50%)+ Wheat straw (5Kg)	8.00	8.20^{BCD}
4	Berseem (100%) + Lucerne (0%)+Wheat straw (5Kg)	8.00	8.40^{AB}
5	Berseem (0%) + Lucerne (100%)+Wheat straw (5Kg)	8.00	7.80 ^{BCD}
6	Berseem (100%) + Lucerne (0%)+Wheat straw (0Kg)	8.00	7.90 ^{BCD}

7	Berseem (0%) + Lucerne (100%)+Wheat straw (0Kg)	8.00	7.60^{CD}
8	Berseem (70%) + Rhode grass (30%)+Wheat straw (0Kg)	8.00	8.40^{AB}
9	Rhode grass (30%)+ Lucerne (70%)+Wheat straw (0Kg)	8.00	7.50^{D}
		LSD 0.05	0.80

S.NO.	Diet	Quality Parameters	Milk Quality	
			Before trial	After trial
1	Berseem (70%)+ Lucerne (30%) + Wheat straw (5Kg)	Protein	4.1	4.3^{A}
		Fat	6.5	5.9^{A}
		SNF	8.5	10.1^{AB}
		Total Solids	15.0	16.0^{AB}
2	Berseem (60%)+ Lucerne (40%) + Wheat straw (5Kg)	Protein	4.0	4.4^{A}
		Fat	5.1	5.1^{B}
		SNF	10.0	10.5^{A}
		Total Solids	15.1	15.6^{AB}
3	Berseem (50%)+ Lucerne (50%)+ Wheat straw (5Kg)	Protein	4.5	4.4^{A}
		Fat	6.2	6.0^{A}
		SNF	9.4	9.2^{B}
		Total Solids	15.6	15.2^{B}
4	Berseem (100%) + Lucerne (0%)+Wheat straw (5Kg)	Protein	3.9	4.1^{A}
		Fat	5.5	5.1^{B}
		SNF	10.6	10.5^{A}
		Total Solids	16.1	15.6^{AB}
5	Berseem (0%) + Lucerne (100%)+Wheat straw (5Kg)	Protein	3.8	4.3^{A}
		Fat	6.1	6.1^{A}
		SNF	9.0	9.5^{AB}
		Total Solids	15.1	15.6^{AB}
6	Berseem (100%) + Lucerne (0%)+Wheat straw (0Kg)	Protein	4.6	4.5^{A}
		Fat	6.5	6.4^{A}
		SNF	9.0	9.2^{B}
		Total Solids	15.5	15.6^{AB}
7	Berseem (0%) + Lucerne (100%)+Wheat straw (0Kg)	Protein	4.3	4.5^{A}
		Fat	6.3	6.5^{A}
		SNF	9.6	9.9^{AB}
		Total Solids	15.9	16.4^{A}
8	Berseem (70%) + Rhode grass (30%)+Wheat straw (0Kg)	Protein	4.4	4.5^{A}
		Fat	6.3	6.4^{A}
		SNF	9.5	9.7^{AB}
		Total Solids	15.8	16.1^{AB}
9	Rhode grass (30%)+ Lucerne (70%)+Wheat straw (0Kg)	Protein	4.2	4.3^{A}
		Fat	6.2	6.1^{A}
		SNF	9.6	10.1^{AB}
		Total Solids	15.8	16.2^{AB}
LSD 0.05		Protein		0.63
		Fat		0.62
		SNF		1.23
		Total Solids		1.04

FODDER RESEARCH SUB-STATION, AARI, FAISALABAD

BERSEEM (*TrifoliumAlexandrium L.)*

41. TITLE	**MAINTANCE AND EVALUATION OF BERSEEM GERMPLASM**
OBJECTIVE	**To maintain and purify the promising lines of berseem germplasm and record the data for various distinct morpho-physiological traits, biotic and abiotic stresses.**
RESEARCH WORKER(S)	**Qamar Shakil** **Dr. M.ShahidChohan** **Ahmed Hassan Khan**
PROJECT DURATION	**Continuous Nature**
LOCATION	**Fodder Research Sub-Station, AARI Faisalabad.**
TREATMENT/ METHODOLOGY	**No. of entries 4** **(L-44, Giza, L-37, Faisalabad-II)** **Area 5 Marlas each** **Plant Time Mid October** **In order to maintain maximum purity, isolation barrier will be provided by planting each lineon scattered places of various Directorates at AARI, Faisalabad and out stations.**
PREVIOS YEAR'S RESULTS	**L-94 was ear marked for good forage and seed yield. Seed of 4 lines was obtained and stored at low temperature at Oil Seed Research Institute, AARI, Faisalabad.**
42. TITLE	**PRELIMINARY GREEN FODDER YIELD TRIAL ON BERSEEM.**
OBJECTIVE	**To assess high green fodder yield potential of various lines of berseem selected on the basis of their distinct morpho physiological traits.**
RESEARCH WORKER(S)	**Dr. M.ShahidChohan,Qamar Shakil and Ahmed Hassan Khan**
PROJECT DURATION	**2016-17**
LOCATION	**Fodder Research Sub-Station, AARI Faisalabad.**

TREATMENT/ METHODOLOY

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-01-16**
2) **FB-02-16**
3) **FB-03-16**

PREVIOS YEAR'S RESULTS.

Sr.No	Coded varieties	Green Fodder yield(t/hac 4 cuts)
1.	FB-1-15	96.22
2.	Agaiti (check)	95.78
3.	SB-4-15	94.00
4.	Anmol (Check)	93.55
5.	SB-2-15	91.78
6.	SB-3-15	91.11
7.	FB-3-15	90.22
8.	SB-05-15	90.22
9.	SB-1-15	86.88
10.	FB-2-15	84.44
Cd_1		2.39

43. TITLE **ADVANCED GREEN FODDER YIELD TRIAL ON BERSEEM.**

OBJECTIVE **The objective of the trial is to assess the following desirable parameters:**

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

RESEARCH WORKER(S) **Ahmed Hassan Khan, Qamar Shakil and Dr. M.ShahidChohan**

PROJECT DURATION **2016-17**

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

TREATMENT/ METHODOLOY **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-01-2015 2) FB-02-2015

PREVIOS YEAR'S RESULTS.

Sr.No.	Lines/ varieties	Green Fodder yield (t/ha.)
1.	FB-2-14	93.78
2.	FB-3-14	91.11
3.	SB-2-14	90.22
4.	FB-1-14	89.55
5.	Agaiti (check)	88.22
6.	SB-1-14	87.11
7.	Anmol (check)	84.44
8.	SB-3-14	83.33
9.	LSD 5%	2.63

44. TITLE **ADAPTATION 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 WORKER(S) **Dr. M.ShahidChohan**
Qamar Shakil
Ahmed Hassan Khan

PROJECT DURATION **2016-17**

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

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

1) FB-01-2014
2) FB-02-2014
3) FB-03-2014

PREVIOS YEAR'S RESULTS.

Sr. No	Lines / Varieties	Green fodder yield (t/ha.)
1.	FB-3-13	82.66
2.	Agaiti(check	81.78
3.	SB-2-13	80.84
4.	FB-2-13	79.33
5.	Anmol (check)	77.78
6. 1	SB-3-13	77.55
7.	SB-1-13	77.33
8.	FB-1-13	77.11
	LSD 5%	2.35

45. TITLE **NATIONAL UNIFORM GREEN FODDER YIELD TRIAL ON BERSEEM.**

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

RESEARCH WORKER(S) **Qamar Shakil**
Ahmed Hassan Khan
Dr. M.ShahidChohan

PROJECT DURATION **2016-17**

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

TREATMENT **The seed along with sowing plan and methodology will be**

METHODOLOY **received from NARC, Islamabad. This station will contribute with the following promising lines.**

1. **Lyallpur late berseem**
2. **Samarqand berseem**

PREVIOS YEAR'S RESULTS.

Sr. No.	Name of Hybrids	Fodder Yield (Kg/ha)			
		NARC Islamabad	FRI Sarghodha	Tarnab Peshawar	Avg. (kg/ha)
1.	Samarqand Berseem	83889	104889	61158	83312
2.	SB-11	80556	110222	58531	83103
3.	Sandal Berseem	76444	103111	62949	80835
4.	Lyalpur late Berseem	69556	108222	63438	80405
5.	Agaiti (Check)	78222	104889	57840	80317
6.	SB-8	75889	99556	59540	78328
7.	SB-1-13	74556	104222	53184	77321
LSD (0.05)		7782	3636	1862	4427

OATS (*Avena Sativa*)

46. TITLE **COLLECTION AND MAINTANCE OF OATS GERMPLASMN AND HYBRDIZATION PROGRAMME**

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 forage yield potential lines.**

RESEARCH WORKER(S) **Ahmed Hassan Khan, Qamar Shakil, Dr. M.ShahidChohan**

PROJECT DURATION **Continuous Nature**

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

TREATMENT/ METHODOLOY **50 elite lines of oats will be maintained by selfing.**

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

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

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

RESEARCH WORKER(S) **Qamar Shakil. Dr. M.ShahidChohan and Ahmed Hassan Khan**

PROJECT DURATION **2016-17**

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

TREATMENT/ METHODOLOY **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**

1) **FSDOATS-01-2016**
2) **FSD OATS-02 -2016**
3) **FSD OATS-03-2016**

PREVIOUS YEAR'SRESULTS.

Sr. NO	VARIETIES	GREEN FODDER YIELD (T/HAC)
1	FRI.03	88.42
2	SG.46	86.80
3	No-75525	86.80
4	Fsd Oat 01-2015	84.72
5	Fsd Oat 03-2015	82.17
6	Sgd-4	81.25
7	Fsd Oat 02-2015	81.02
8	Sgd Oat 2011(check)	80.32
9	S-2000(check)	74.06
10	No.6015	70.36
11	FRI.02	70.36
12	FRI.01	`80.55
	Cd_1	1.55

48. TITLE **ADVANCED GREEN FODDER YIELD TRIAL OF OATS.**

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

RESEARCH WORKER(S) **Dr. M.Shahid Chohan**

Qamar Shakil

Ahmed Hassan Khan

PROJECT DURATION **2016-17**

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

TREATMENT/ METHODOLOY **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. **FSD OATS-14** 2. **FSD OATS-14**

PREVIOS YEAR'S RESULTS.

Sr .No	Varieties	Green fodder yield t/hac
1	No75527	84.49
2	S-2000 (check)	81.02
3	No75524	80.55
4	Sgd -4	80.32
5	Sgd 0ats 2011 (check)	80.32
6	Sgd 46	80.09
7	Fsd-01-13	78.07
8	Fsd-02-13	75.22
9	Fsd-03-13	74.30
10	No75525	70.60
11	Erk	59.76
12	No 632	59.25
Cd_1		1.79

49. TITLE **ADAPTATION GREEN FODDER YIELD TRIAL OF OATS.**

OBJECTIVE **To evaluate the promising/Candidates lines of oats for their green fodder yield in different agro-ecological zones of the province Punjab.**

RESEARCH WORKER(S) **Dr. M.ShahidChohan**

Ahmed Hassan Khan

Qamar Shakil

PROJECT DURATION **2016-17**

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

TREATMENT METHODOLOY **The packed seed will be received from Director, Fodder Research Institute Sargodha along with sowing plan and methodology. Three Oats lines will be contributed by this section.**

1. **FSD OATS-15**
2. **FSD OATS-15**
3. **FSD OATS-15**

PREVIOUS YEAR'SRESULTS

Sr. No	Coded Varieties	Green fodder yield t/hac
1.	No 75525	73.45
2.	Sgd Oat 2011(check)	72.52
3.	CK-1	70.98
4.	Lyallpr FB-02	69.44
5.	S-07-2012	68.51
6.	S-2000(check)	68.51
7.	FRI-03	67.89
8.	FB-01	67.59
9.	FRI-02	67.59
10.	Hori core	67.59
11.	DN -8	66.66
12.	S-08-12	66.66
Cd_1		0.95

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

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

RESEARCH WORKER(S) **Ahmed Hassan Khan, Qamar Shakil & Dr. M.ShahidChohan**

PROJECT DURATION **2016-17**

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

TREATMENT/ MEHODOLOGY **The packed seed will be received from Coordinator NARC Islamabad along with sowing plan and methodology. (Faisalabad Oats-III and Faisalabad Oats-IV)**

PREVIOUS YEAR'S RESULTS.

Sr. No.	Name of Hybrids	Oat Rabi Fodder Yield (t/ha)			
		FRI Sargodha	Tarnab Peshawar	Sariab Quetta	Avg.
11.	NARC-2011 (Check)	78.70	12.34	24.72	38.59
12.	SGD-1	70.37	16.97	16.29	34.54
13.	Wintroo	68.36	12.34	21.75	34.15
14.	No.632	68.51	10.49	17.19	32.06
15.	Faisalabad Oats	58.48	14.81	19.93	31.08
16.	No.97009	58.48	12.34	20.77	30.53
17.	Lyalpur late oats	54.63	11.11	21.26	29.00
18.	Domount	47.22	12.34	19.96	26.51
19.	No. 75525	48.14	11.11	15.80	25.02
20.	Sargodha-2011 (Check)	49.53	8.02	17.34	24.96
LSD (0.05)		33.80	23.18	12.70	23.23
C.V (%)		6.87	14.56	12.76	11.39

AGRONOMIST (FORAGE PRODUCTION)

AYUB AGRICULTURAL RFESEARCH INSTITUTE, FAISALABAD

51. TITLE:	**EFFECT OF NITROGEN & PHOSPHORUS FERTILIZERS ON GREEN FODDER YIELDOFRYEGRASS.**
OBJECTIVE:	**To determine the optimum dose of Nitrogen and phosphorus fertilizer for maximum green fodder yield of rye grass.**
RESEARCH WORKERS:	**Muhammad Arshad and Dr. Naveed Akhtar**
DURATION:	**2016-2019**
LOCATION:	**Agronomy (Forage Production) Section AARI, Faisalabad**
TREATMENTS:	**Factor I. (Main Plot)** **Phosphorus** **P_1: 90 kg/ha** **P_2: 120 kg/ha** **P_3: 150 kg/ha** **Factor II (Sub plot)** **Nitrogen** **N_1=75 kg/ha** **N_2=100 kg/ha** **N_3=125 kg/ha** **N_4=150 kg/ha**
METHODOLOGY:	**Layout= RCBD with split arrangement** **Replication=3** **Plot size= 3m x7m** **Sowing method= Broad cast in standing water.** **Seed Rate = 30 kg ha $^{-1}$**
Observations	**Number of plants m^{-1}, Number of tillers/plant, plant height at harvests, number of leaves per plant, Green fodder yield/ha**
PREVIOUS YEAR RESULTS	**New experiment**

52. TITLE:	**GREEN FODDER YIELD RESPONSE OF RYEGRASS TO DIFFERENT SEED RATES AND SOWING METHODS.**
OBJECTIVE:	**To determine the optimum seed rate and best sowing method for maximum green fodder yield of rye grass.**
RESEARCH WORKERS:	**Muhammad Arshad and Dr. Naveed Akhtar.**
DURATION:	**2016-2019**
LOCATION:	**Agronomy (Forage Production) AARI, Faisalabad**
TREATMENTS:	**Factor A (Main Plots)** **Sowing method** **S_1: Broadcast** **S_2: Line Sowing (30 cm)** **S_3: Line Sowing (45 cm)** **S_4: Augmented with furrow** **Factor B (Sub- Plots)** **Seed rate** **T_1=8 kg/acre** **T_2=12 kg/acre** **T_3=16 kg/acre**
METHODOLOGY:	**Layout= RCBD with split arrangements** **Replication=3** **Plot size= 3m x 7m** **Fertilizer = 115-90 kg NP ha^{-1}**
Observations	**Number of plants m^{-1}, Number of tillers/plant, plant height at harvests, number of leaves per plant, Green fodder yield/ha**
PREVIOUS YEAR'S RESULTS:	**New experiment**

53. TITLE:	**EFFECT OF BORON ON GREEN FODDER AND SEED YIELD OF RYEGRASS**
OBJECTIVE:	**To find out the effect of Boron on green fodder and seed yield of ryegrass (RG-1).**
RESEARCH WORKERS:	**Muhammad Arshad and Dr. Naveed Akhtar**
DURATION:	**2016-2019**
LOCATION:	**Agronomy (Forage Production) Section AARI, Faisalabad.**
TREATMENTS:	**Foliar application of Boron (1%)** **T_1 10 Days after last cut** **T_2 20 Days after last cut** **T_3 30 Days after last cut**
METHODOLOGY:	**Layout= RCBD with split arrangement** **Replication=3** **Plot size= 3m×6m** **Sowing method= Broad cast in standing water.** **Seed Rate = 30 kg ha $^{-1}$** **Fertilizer = 115-90 kg NP ha^{-1}** **1 Kg/ha of Boron will be applied as basal dose.** **Date of last cut: Mid April**
Observations =	**Yield attributes, green fodder yield and seed yield/ha.**
PREVIOUS YEAR RESULTS :	**New experiment**

54. TITLE: **COMPARISON OF THE PRODUCTIVITY OF PURE AND MIXED RABI FODDERS**

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

RESEARCH WORKERS: **Arbab Jahangeer and Dr. Naveed Akhtar**

DURATION: **2016-2019**

LOCATION: **Agronomy (Forage Production) AARI, Faisalabad**

TREATMENTS:

- **T_1: Berseem 100%**
- **T_2: Berseem 100% + oats 25%**
- **T_3: Berseem 75% + oats 25%**
- **T_4: Berseem 100% + Berley 25%**
- **T_5: Berseem 75% + Barley 25%**
- **T_6: Berseem 75% + oats 12.5% + barley 12.5%**

METHODOLOGY: **Layout= RCBD**

Replication=3

Plot size= 3m x7m

Sowing method= Broad cast in standing water.

Fertilizer = 30-60 kg NP ha^{-1}

Observations = **Number of plants m^{-1}, number of tillers/plant plant height at harvests, number of leaves per plant, Green fodder yield/ha,**

PREVIOUS YEAR RESULTS : **New experiment**

55. TITLE: **EFFECT OF STAGE OF CUTTING ON CRUDE PROTEIN, FIBER CONTENT AND DRY MATTER YIELD OF ALFALFA (*MEDICAGO sativa L.*)**

Objective: **To investigate the effect of stage of cutting of alfalfa on crude protein, fiber content and dry matter yield.**

RESEARCH WORKERS: **Arbab Jahangeer , Dr. Naveed Akhtar, Maryyam Sarfaraz. ARO, Biochemistry.**

DURATION: **2015-2017**

LOCATION: **Agronomy (Forage Production) AARI, Faisalabad**

TREATMENTS: **Cutting Intervals**

T_1. Continuous cuttings after every 20 Days

T_2.Continuous cuttings after every 30 Days

T_3.Continuous cuttings after every 40 Days

METHODOLOGY:

The experiment will be sown in 30 cm apart rows during first 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.

OBSERVATIONS: **Number of plants m^{-1}, plant height, number of tillers per plant, No of nodes per plant ,leaf to stem ratio, Green fodder yield/ha, crude protein (%), total crude protein (Kg/ha), fiber content (%).**

PREVIOUS YEAR RESULTS:

Treatment	Green Fodder Yield (t/ha) 3 cuttings
T_1. Continuous cuttings after every 20 Days	54.8
T_2.Continuous cuttings after every 30 Days	62.5
T_3.Continuous cuttings after every 40 Days	66.25

56. TITLE: **EFFECT OF BORON ON GREEN FODDER AND SEED YIELD OF BERSEEM**

OBJECTIVE: **To find out the effect of Boron on green fodder and seed yield of Sandal and Super Berseem (Check).**

RESEARCH WORKERS: **Arbab Jahangeer, Dr. Abid Niaz and Dr. Naveed Akhtar**

DURATION: **2014-2017**

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

TREATMENTS:

A) Varieties (Main Plots)

i) **Super Berseem (Check)**

ii) **Sandal berseem**

B) **Foliar application of Boron (1%) (Sub plots)**

i) **10 Days after last cut**

ii) **20 Days after last cut**

iii) **30 Days after last cut**

METHODOLOGY:

Layout **= RCBD with split arrangement**

Replication **=3**

Plot size **= 3m×6m**

Sowing method **= Broad cast in standing water.**

Seed Rate **= 20 kg ha $^{-1}$**

Fertilizer **= 30-60 kg NP ha^{-1}**

1 Kg/ha of Boron will be applied as basal dose.
Date of last cut: Mid April

Observations = **Yield attributes, green fodder yield and seed yield/ha.**

PREVIOUS YEAR RESULTS :

Green fodder Yield (t/ha)

Variety/Boron	T_1	T_2	T_3	
Super	65.667	78.000	73.000	72.222
Sandal	69.000	76.333	75.000	73.444
	67.333	77.167	74.000	

LSD Value for Varieties=N.SInteraction=N.S

Seed Yield (t/ha)

Variety/Boron	T_1	T_2	T_3	Means
Super	0.8067 d	0.8100 d	0.8467 cd	0.8211 b
Sandal	0.9367 bc	0.9533 b	1.0567 a	0.9822 a
Means	0.8717 b	0.8817 ab	0.9517 a	

LSD Value for interaction = 0.1056 Varieties =0.0335 Boron= 0.0747

57. TITLE: **Collection and maintenance of grass gene pool**

OBJECTIVE: **To develop and maintain gene pool of different grasses for agronomic studies**

RESEARCH WORKERS:

Dr. Abdul Majid, Muhammad Arshadand Dr. NaveedAkhtar

DURATION: **Continuous nature**

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

TREATMENTS: **20 grass cultivars**

3 rows/grass

METHODOLOGY:

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.

Observations **Following characters will be recorded:-**
1. Number of plants/m^2 2. Number of tillers/plant
3. Number of leaves/plant 4. Plant height 5. Green fodder yield

PREVIOUS YEAR RESULTS: **New experiment**

AGRICULTURAL RESEARCH STATION, BAHAWALPUR

LUCERNE (*Medicago sativa*L.)

58. TITLE — **NATIONAL UNIFORMFODDER YIELD TRIAL OF LUCERNE**

OBJECTIVE — **To evaluate different lines/varieties of Lucerne for green fodder and other desirable characters at different locations.**

RESEARCH WORKERS — **Dr. Lal Hussain Akhtar and Muhammad Shahjhan Bukhari**

PROJECT DURATION — **2016-17**

LOCATION — **Agricultural Research Station, Bahawalpur**

TREATMENTS/ METHODOLOGY — **Trial will be provided by the Coordinator (Fodder), National Agricultural Research Centre, Islamabad**
Layout : As per directions received from Coordinator (Fodder).
Data on fodder yield and related traits will be recorded.

PREVIOUS YEARS RESULTS — **Data recorded on green fodder yield (3-cuttings)is given as under:**

Varieties	Fodder Yield (t ha^{-1})
C	58.8
A	55.9
B	52.1
D	48.6

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

59. TITLE: — **SEED MULTIPLICATION OF LUCERNE**

OBJECTIVE — **Production of breeder nucleus, pre-basic and basic seed of Lucerne under ADP Project to meet the requirement of seed companies/growers/farmers of the southern Punjab..**

RESEARCH WORKERS — **Dr. Lal Hussain Akhtar and Muhammad Shahjhan Bukhari**

PROJECT DURATION	**2016-17**
LOCATION	**Agricultural Research Station, Bahawalpur**
TREATMENTS/ METHODOLOGY	**Name of variety = Sargodha Lucerne** **Area of seed multiplication = 25 Acres** **Sowing method = Line Sowing**
PREVIOUS YEARS RESULTS	• **150 capsules were selected from pre-basic blocks for this year capsule to row planting.** • **Out of 140 capsules to row planted last year, 65 true to type rows were selected, which will be planted in blocks this year.** • **Out of 12blocks planted last year, 8 true to type blocks were selected, harvested and bulked which produced 12Kg BNS seed for this year.** • **215Kg of pre-basic seed was produced from last year, BNS seed planted on 11 Kanals.** • **420 Kg of basic seed was produced from last year pre-basic seed planted on 20 kanals.**

BERSEEM (*Trifolium elexandrinum*)

60. TITLE:	**ADAPTATION 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 Rashid Minhas**
PROJECT DURATION	**2016-17**
LOCATION	**Agricultural Research Station, Bahawalpur**
TREATMENTS/ METHODOLOGY	**Trial will be provided by Director, FRI, Sargodha** **Layout : As per directions received from Director, FRI, Sargodha.** **Data on fodder yield and related traits will be recorded**

PREVIOUS YEAR'S RESULTS **Data recorded on green fodder yield (5-cuts) are given as under:**

Sr. No	Lines / Varieties	Green fodder yield (t/ha.)
1.	FB-1-13	99.30
2.	Anmol (check)	92.60
3.	SB-3-13	92.20
4.	FB-2-13	90.90
5.	SB-1-13	90.40
6.	SB-2-13	89.10
7.	Agaiti(check	85.70
8.	FB-3-13	85.20
	LSD 5%	

61. TITLE: **SEED MULTIPLICATION OF BERSEEM**

OBJECTIVE **To produce breeders nucleus seed, pre-basic and basic seed Berseem under ADP project to meet the requirement of seed companies/growers/farmers of the southern Punjab.**

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

PROJECT DURATION **2016-17**

LOCATION **Agricultural Research Station, Bahawalpur**

TREATMENTS/ METHODOLOGY

Name of variety = Berseem Agaiti, Superlate Fsd.
Area = 15Acres
Sowing method: = Broadcast

PREVIOUS YEAR'S RESULTS

- **170 capsules were selected from pre-basic blocks for this year capsule to row planting.**
- **Out of 150 capsules to row planted last year, 90 true to type rows were selected, which will be planted in blocks this year.**
- **Out of total planted,16 blocks, 12true to type blocks were selected, harvested and bulked which produced 16Kg BNS seed for this year.**
- **930 Kg of pre-basic seed was produced from last year BNS seed planted on 4 acres.**
- **1254Kg of basic seed was produced from last year, pre-basic seed planted on 7 acres.**

1. OATS (*Avena sativa* L.)

62. TITLE: **ADAPTATION 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 **2016-17**

LOCATION **Agricultural Research Station, Bahawalpur**

TREATMENTS/ METHODOLOGY

Trial will be provided by Director, FRI, Sargodha

Layout : As per directions received from Director, FRI, Sargodha.

Data to be collected = Green fodder yield and related traits.

Data recorded on various traits of adaptation yield trial of oats are given as under:

PREVIOUS YEAR'S RESULTS

Varieties	Plant height (cm)	No. of tillers/ plant	Green Fodder Yield (t ha^{-1})
FRI-02	92.9	9	66.7
Lyallpr FB-02	104.1	10	61.1
CK-1	90.6	8	57.4
FRI-03	57.1	7	57.0
S-08-12	89.5	10	56.7
FB-01	69.2	8	54.8
DN -8	72.7	9	52.6
S-2000 (check)	90.7	8	51.8
Sgd Oat 2011 (check)	85.7	10	48.9
S-07-2012	73.6	9	47.0
Hori core	78.2	8	47.0
No 75525	55.9	8	42.2
APSI (FDP)	68.3	9	40.4

63. TITLE: **SEED MULTIPLICATION OF OATS**

OBJECTIVE **To produce certified seed of approved varieties ofOats under ADP Project to meet the requirement of seed companies/growers/farmers of the southern Punjab..**

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

PROJECT DURATION **2016-17**

LOCATION **Agricultural Research Station, Bahawalpur**

TREATMENTS/ METHODOLOGY

Name of variety = SGD-Oats-2011

Area = 10Acres

Sowing method = Line Sowing

PREVIOUS YEAR'S RESULTS **First year**

EXPERIMENTAL SEED PRODUCTION UNIT, FAROOQABAD

64. TITLE **TESTING AND EVALUATION OF PROMISING BERSEEM VARIETIES/LINES FOR BETTER GREEN FODDER YIELD.**

OBJECTIVE **In order to select Berseem varieties/lines showing better and higher green fodder yield.**

RESEARCH WORKERS **Shamsa Kanwal and Syed Sultan Ali**

PROJECT DURATION **2016-17**

LOCATION **Experimental Seed Production Unit, Farooqabad.**

TREATMENT **Any 8 to 10 promising Berseem varieties/Lines as provided by the Directorate of Fodder Research Institute, Sargodha.**

PLAN OF WORK **The Experiment will be sown in three replications using randomized complete block design at Experimental Seed Production Unit, Farooqabad keeping the size of plot 3 meter x 5 meter. Recommended package of production technology will be applied equally to all the treatments.**
Data for green fodder yield of each cutting for five cuttings will be recorded at appropriate time intervals and statistically analyzed.

PREVIOUS YEAR'S RESULTS

Sr. No	Lines / Varieties	ESPU, Farooqabad
1.	FB-3-13	105.42
2.	Agaiti(check	102.34
3.	SB-3-13	99.80
4.	SB-2-13	94.20
5.	FB-2-13	93.65
6.	FB-1-13	93.27
7.	Anmol (check)	93.10
8.	SB-1-13	91.56
	LSD 5%	9.7

65. TITLE **ADAPTABILITY TRIAL OF PROMISING OAT VARIETIES FOR FODDER PRODUCTION.**

OBJECTIVET **To select high green fodder yielding Oats varieties/ Lines and to check their adaptability under local conditions.**

RESEARCH WORKERS **Shamsa Kanwal and Syed Sultan Ali**

PROJECT DURATION **2016-17**

LOCATION **Experimental Seed Production Unit, Farooqabad.**

TREATMENTS **Any promising Oats varieties/lines which will be provided by the of Fodder Research Institute, Sargodha**

PLAN OF WORK **The Experiment will be conducted at Experimental Seed Production Unit, Farooqabad using randomized complete block design with three replications keeping the size of plot 1.8 meter x 6 meter. Recommended package of production technology will be applied equally to all the treatments. Data for the following traits will be recorded and statistically analyzed:-**

1- Plant height
2- Number of tillers per square meter
3- Green fodder yield at 50 percent heading stage
Significant at 5% LSD Value 3.62

PREVIOUS YEAR'S RESULT

Sr No	Line /Verity	Green Fodder Yield (t/ha.)
1.	FRI-03	*62.34*
2.	FB-01	61.23
3.	CK-1	60.55
4.	No 75525	60.55
5.	Sgd Oat 2011(check)	59.66
6.	FRI-02	59.37
7.	S-07-2012	59.22
8.	S-2000 (check)	58.26
9.	Hori core	57.38
10.	S-08-12	55.87
11.	DN -8	54.33
12.	Lyallpr FB-02	*51.76*
LSD 5%		3.62

FODDER RESEARCH STATION, LAHORE

66. TITLE: **ADAPTABILITY TRIAL OF BERSEEM RABI (2016-17)**

OBJECTIVE: **To assess the green fodder yield of Berseem varieties and to compare promising lines of Berseem with the existing cultivars**

RESEARCH WORKERS: **Raja Javed-ur-Rehman and Aniqa Mubeen**

DURATRION: **2016-17**

LOCATION: **Lahore District/Region**

TREATMENTS: **Newly evolved lines/varieties of Berseem will be compared with the standard cultivars.**

TREATAMENTS / METHODOLGY

Varieties /Lines =8(A-H)
Design = RCBD
Replication = 3
Plot size = 3 x 5 m
Seed rate = 20 kg/ha
Fertilizer = 22-114-00 NPK kg/ha
Sowing Time = Mid October
Sowing Method = Broadcast

Following observations will be recorded

1. **Germination**
2. **Plant Height**
3. **Disease incidence**
4. **Green fodder yield (t/ha)**

GREEN FODDER YIELD

PREVIOUS YEAR RESULTS

Sr. No.	Varieties/Lines	Green Fodder Yield (t/ha.)
1	Agaiti (check)	116.66
2	FB-1-13	113.64
3	SB-1-13	111.55
4	FB-2-13	110.66
5	FB-3-13	110.21
6	Anmol (check)	107.99
7	SB-3-13	105.32
8	SB-2-13	102.88
LSD 5%		

67. TITLE: **ADAPTABILITY TRIAL ON OATS RABI 2016-17**

OBJECTIVE: **To assess green fodder yield of Oats varieties /lines at different locations and to compare their varietal performance with the standard cultivars**

RESEARCH WORKERS: **Raja Javed-ur-Rehman and Aniqa Mubeen**

DURATRION: **2016-17**

LOCATION: **Lahore District/Region**

TREATMENTS: **Newly evolved lines/varieties of Oats will be compared With the standard cultivars.**

TREATAMENTS / METHODOLGY

Line/varieties = 12 (V1-V12)

Design	**=**	**RCBD**
Replication	**=**	**3**
Plot size	**=**	**1.8 x 6 m**
Row spacing	**=**	**30cm**
Sowing Time	**=**	**Mid October**
Fertilizer	**=**	**80-57-00**

Following observations will be recorded

1 .Plant Height(cm)
2 .Disease data
3 .Leaf size (Length x width)
4 .No of leaves/main tiller
5 Green fodder yield at 50% flowering

PREVIOUS YEAR'S RESULT

Sr No	Code	Line /Verity	Green fodder yield (t/ha.)
1.	B	FRI-03	65.11
2.	A	FB-1	62.67
3.	C	FRI-02	60.67
4.	J	Sgd Oat 2000	58.22
5.	D	CK-1	56.00
6.	L	S-08-12	52.00
7.	F	S-07-2012	50.22
8.	H	Lyallpr FB-02	48.00
9.	G	Hori core	47.33
10.	E	No 75525	46.00
11.	K	DN -8	44.89
12.	I	Sgd Oat 2011	42.67
LSD 5%			2.21

METEOROLOGICAL DATA DURING RABI SEASON

SARGODHA

Month	2013-14		Rainfall (mm)
	Min temp. ^{o}C	Maxi temp. ^{o}C	
October, 2013	19.13	31.97	115.90
November, 2013	10.34	26.76	-
December, 2013	07.15	21.37	-
January, 2014	05.93	19.44	06.39
February, 2014	08.82	19.73	16.37
March, 2014	08.64	19.50	20.70
April, 2014	17.63	34.39	85.09
May, 2014	21.16	32.38	39.40
June, 2014	26.62	39.23	39.00

Month	2014-15		Rainfall (mm)
	Min temp. ^{o}C	Maxi temp. ^{o}C	
October, 2014	18.67	28.74	14.20
November, 2014	11.20	26.41	02.35
December, 2014	05.51	20.55	-
January, 2015	05.34	18.56	17.20
February, 2015	08.60	20.39	14.50
March, 2015	12.00	23.06	147.20
April, 2015	17.70	29.80	48.30
May, 2015	21.73	35.27	03.20
June, 2015	24.14	37.10	45.20

Month	2015-16		Rainfall Total (mm)
	Min. Temp ^{0}C	Maxi temp. ^{o}C	
July, 15	24.9	33.7	55.20
August, 15	22.7	31.9	123.7
September, 15	21.2	33.1	81.0
October, 15	17.5	29.0	42.3
November, 15	11.03	23.63	01.7
December, 15	5.8	19.8	Nil
January, 16	6.2	17.9	0.02
February, 16	6.52	19.72	1.01
March, 16	13.69	25.81	21.00
April, 16	16.83	31.43	1.41
May, 16	22.64	36.38	137.16
June, 16	23.40	35.53.	82.79
July, 16	24.32	35.29.	117.35mm