

ANNUAL ABRIDGED REPORT 2016-17



INTRODUCTION

The economy of Pakistan is predominantly agriculture oriented and it contributes 19.5% of GDP. Livestock is an important sector of agriculture in Pakistan, which accounts for 11.4 % of overall GDP and 58.33% of agriculture (*Economic survey of Pakistan 2016-17*). The role of livestock in rural economy may be realized from the fact that 70% of our population living in rural areas is engaged in livestock as a primary source of food as well as income. It provides milk, meat and other by-products of animal origin for human nutrition. The population of Pakistan is expected to reach 218 million by 2020. Fodder crops have pivotal position in context of livestock development and promotion. In Punjab, fodder crops occupy 19% of total cropped area. During 2016-17 fodder crops occupied about 1.81 million hectares and produced about 39.20 million

tones of green fodder with an average yield of 21.60 t/ha.

Animals are underfed and under nourished which results in their poor performance.

In order to narrow the gap between the demand and supply of fodder, there is a dire need for development of high yielding, highly nutritive, multicut varieties / hybrids of different fodder crops, standardization of their production and protection technology along with seed production of fodder crop varieties / hybrids to meet the domestic requirements. The concerted efforts of breeders and scientists of the allied disciplines have developed new varieties of berseem and guar (Lyalpur late and BR-2017) and promising lines of oats (FRI-01, FSD-03-13&FRI-03), Berseem (SB-11), Lucerne (CUF-101) and maize (No.1501)

BERSEEM

(*Trifolium alexandrinum*)



a) PRELIMINARY GREEN FODDER YIELD TRIAL ON BERSEEM.

Preliminary green fodder yield trial consisting of 10 entries along with two checks was laid out in RCBD with three replications having plot size 3x5m. The line SB-2-16 gave significantly high green fodder yield (107.36 t/ha) followed by FB-3-16 (107.18 t/ha) as compared to check variety "Agaiti" (101.41 t/ha)

b) ADVANCE GREEN FODDER YIELD TRIAL ON BERSEEM

Eight promising lines along with 2 checks were tested for their fodder yield at two locations. The experiment was laid out in RCBD with 3 replications having plot size 3x5m. On an average, the entries SB-3-15 and FB-3-15 produced significantly high green fodder yield 111.23 t/ha and 110.66 t/ha respectively as compared to check variety "Agaiti Berseem" (99.05 t/ha).

c) ADAPTABILITY GREEN FODDER YIELD TRIAL OF BERSEEM

The trial was conducted at 4 different locations to evaluate 6 berseem lines along with 2 checks for green fodder yield. The trial was laid out in RCBD with 3 replications keeping plot size 3x5m. The line SB-2-14 and FB-3-14 showed best performance by producing 102 t/ha and 99.75 t/ha green fodder yield as compared to check variety "Agaiti Berseem" (92.20 t/ha).

OATS

(*Avena sativa* L.)



a) PRELIMINARY GREEN FODDER YIELD TRIAL

Fourteen entries were tested in preliminary green fodder yield trial with 2 check. The trial was laid out in RCBD with 3 replications having plot size 6x2.4m with row spacing 30cm apart. Observation pertaining to germination %age, plant height, No. of tillers, plant / m², No. of leaves / plant and green fodder yield were recorded at 50% heading. The line NO.677 produced maximum green fodder yield (94.53 t/ha) as compared to check varieties S-2000 (85.56 t/ha.) and Sgd-Oats-2011 (84.87t/ha)

b) ADVANCE GREEN FODDER YIELD TRIAL OF OATS

In Advance green fodder yield trial 12 entries with 2 checks were tested for their green fodder yield. The trial was laid out in RCBD with 3 replications having plot size 6x2.4m with row spacing 30cm apart. The line SGD-01 produced maximum green fodder (83.95 t/ha.) as compared to check varieties Sgd-Oats-2011 (76.98 t/ha) and S-2000 (75.67 t/ha.).

c) ADAPTATION / ZONAL GREEN FODDER YIELD TRIAL OF OATS

Adaptability trial was conducted at 4 locations for testing of 12 entries along with 2 checks for green fodder yield. The experiment was laid out in RCBD with 3 replications having plot size 6x1.8m, with row spacing 30cm apart. The observation pertaining to germination %age, plant height, No. of tillers, No. of plants / m², No. of leaves / plant and green fodder yield were recorded at 50% heading. The line CK-1 and FRI-03 produced high green fodder yield 84.19 and 82.76 t/ha respectively as compared to check S-2000 (79.20 t/ha.) and Sgd-Oats-2011 (76.14 t/ha)

LUCERNE

(*Medicago sativa* L.)



a) PRELIMINARY GREEN FODDER YIELD TRIAL OF LUCERNE

12 promising lines of Lucerne were tested for their green fodder yield potential. The experiment was laid out in RCBD with 3 replications having plot size 1.8x6m. The entries Cuf-101 and Oman out yielded the check by producing 73.46 t/ha and 71.29 t/ha green fodder yield while check variety Sgd Lucerne produced 48.96 t/ha.

b) ADVANCE GREEN FODDER YIELD TRIAL OF LUCERNE

Advance green fodder yield trial consisting of 6 varieties/ lines was laid out in RCBD with 3 replications having plot size of 1.8x6m. Line GR-722 gave maximum green fodder yield of 55.78 t/ha while check variety Sgd Lucerne produced 46.79 t/ha.

c) COLLECTION AND MAINTINANCE OF GERMPLOSM OF LUCERNE.

Germplasm consisting of total 30 lines of Lucerne were maintained for the characters plant height, No of leaves per plant, No of tillers per plant, stem thickness, grain & green fodder yield.

SORGHUM

(*Sorghum bicolor* L. Moench)



a) COLLECTION AND MAINTINANCE OF GERMPLOSM OF SORGHUM.

Germplasm consisting of total 120 lines of Sorghum, lines were maintained for the characters plant height, No of leaves per plant, No of tillers per plant, stem-thickness, leaf area, days to heading, days to maturity and TSS.

b) PRELIMINARY GREEN FODDER YIELD TRIAL ON SORGHUM.

The trial was conducted to evaluate 14 promising lines of sorghum on basis of green fodder yield. The trial was laid out in RCBD with 3 replications having plot size 1.8x5m. The green fodder yield data were recorded at 50% heading. The results revealed that line F-04-16 gave significantly high green fodder yield (86.08 t/ha.) as compared to check variety JS-2000 (76.50 t/ha).

c) ADVANCE GREEN FODDER YIELD TRIAL OF SORGHUM

Trial comprising 08 promising lines of sorghum was conducted in RCBD with 3 replications having plot size of 1.8x5m with 30cm apart rows. Line I-6 out yielded by giving maximum green fodder yield (84.35 t/ha.) while check variety Sargodha-2011 produced 76.44 t/ha.

d) ADAPTABILITY GREEN FODDER YIELD TRIAL ON SORGHUM.

The experiment was conducted at 4 different locations to evaluate 8 different lines/ varieties for green fodder yield. The trial was laid out in RCBD with 3 replications having a plot size of 1.8x5m.

The line S-9901 out yielded by giving 66.99 t/ha green fodder yield while check gave 57.82 t/ha green fodder yield.

e) NATIONAL UNIFORM GREEN FODDER YIELD TRIAL ON SORGHUM.

The National Uniform Green Fodder Yield Trial consisting of 10 sorghum lines/ varieties was laid out in RCBD with 3 replications having plot size of 1.8x6m. Line SGD-013-1 out yielded by giving maximum green fodder yield (58 t/ha.) while check Sargodha 2011 gave 57 t/ha green fodder yield. The results were significant.

PEARL MILLET

(*Pennisetum americanum*)



a) COLLECTION AND MAINTINANCE OF GERMPLASM OF PEARL MILLET.

Germplasm consisting of total 65 lines of pearl millet, were maintained for the characters plant height, No of leaves per plant, No of tillers per plant.

b) PRELIMINARY GREEN FODDER YIELD TRIAL ON PEARL MILLET.

To test 13 varieties/ lines of pearl millet for their green fodder yield, the trial was conducted in RCBD with 3 replications having plot size of 1.8x6m with 30cm apart rows. The line Y-84 out yielded by giving 80.86 t/ha green fodder yield while check variety Sgd.Bajra.2011 produced 76.85 t/ha.

c) ADVANCE GREEN FODDER YIELD TRIAL OF PEARL MILLET

Trial comprising 08 promising lines of pearl millet was laid out in RCBD with 3 replications to check the green fodder yield potential. The results indicated that Composite-II showed best performance by producing maximum green fodder yield of 79.32 t/ha as compared to check variety Sgd. Bajra 2011 (74.07 t/ha).

d) ADAPTABILITY GREEN FODDER YIELD TRIAL ON PEARL MILLET.

The experiment was conducted at 4 locations to evaluate 9 lines / varieties of pearl millet for green fodder yield. The trial was laid out in RCBD with 3 replications having plot size of 1.8x6m. On an average, No 8781 out yielded by giving 70.14 t/ha green fodder yield while check variety Sgd. Bajra 2011 gave 64.64 t/ha.

MAIZE

Zea mays L.



a) COLLECTION , MAINTENANCE AND EVALUATION OF MAIZE GERMPLASM

Maize germplasm comprising of 30 lines/varieties were maintained and characterized for plant height, stem thickness, No. of leaves per plant, leaf area and leaf color.

b) PRELIMINARY GREEN FODDER YIELD TRIAL OF MAIZE.

Preliminary trial of maize was conducted to evaluate 10 entries including one check for green fodder yield. The Trial was laid out in RCBD with three replications keeping plot size 1.8m x 5m. The line MS-01-2016 gave maximum green fodder yield (65.12 t/ha) followed by MS-07-2016 (63.58 t/ha) as compared to check variety Sgd.2002 (58.64 t/ha).

c) ADVANCE FODDER YIELD TRIAL OF MAIZE

The trial comprising 06 entries of maize including one check was laid out in RCBD with three replications keeping plot size of 1.8m x 5m to find out best entries for green fodder yield. Results showed that the line MS-03-2015 produced significantly high green fodder yield (68.51 t/ha) as compared to check variety Sgd.2002 (64.19 t/ha).

d) ADAPTABILITY TRIAL OF MAIZE

The trial was conducted at 4 locations to evaluate 8 lines / varieties of maize for green fodder yield. The trial was laid out in RCBD with 3 replications having a plot size of 1.8x6m. On an average the line No. 1501 gave higher green fodder yield (61.26 t/ha) followed by check variety Sgd.2002 (57.95 t/ha).

f) NATIONAL UNIFORM FODDER YIELD TRIAL OF MAIZE

Trial was laid out to evaluate 09 different lines/ varieties for green fodder yield as purposed by NARC, Islamabad. On an average, The line MS.2010 gave high green fodder yield (61 t/ha) followed by No.1501 (59 t/ha) as compared to check variety Sgd.2002 (50 t/ha).

COWPEAS

(*Vigna unguiculata*)



a) EVALUATION OF DIFFERENT LINES / VARIETIES OF COWPEAS FOR FODDER PRODUCTION.

The green fodder yield trial on 10 promising lines was conducted in RCBD with 4 replications having plot size of 3x6m. The crop was harvested at 50% flowering stage for green fodder. The results revealed that line IT-84-D-709 gave the maximum green fodder yield of 48.20 t/ha followed by line No.1 (47.30 t/ha.) as compared to check variety Cowpeas-2003 (35.10 t/ha).

GUAR

(*Cyamopsistetragonoloba*L.)



a. COLLECTION AND MAINTENANCE OF GERMPLASM

About 193 collections were maintained under close observation. A wide range of values for various characteristics was observed in all the genotypes like 50% flowering (40-60 days), 90% maturity (115-140 days), Plant Height (50-225cm), Branches/Plant (0-15), Clusters/plant (8-35), Pods/Plant (50-400), Pods/Cluster (3-14), Pod Length (4-8cm) Grains/Pod (4-10), 1000-Grain weight (24-40gm), Green fodder yield (10-38 tons ha⁻¹) and Grain Yield (300-2000 Kgha⁻¹). Seed of all the lines/varieties was harvested on maturity and was preserved for further studies.

b. PRELIMINARY GUAR YIELD TRIAL

A-I trial consisting of 14 strains including one check was sown on 25.05.2016. The experiment was laid out according to RCBD having 3 repeats and plot size of 2.7m x 7.2m. The experiment was harvested during November, 2016 and yield data were recorded. The line S-6384 gave maximum grain yield (2658 kg/ha) followed by S-6159 (2521 kg/ha) as compared to check. Highly significant differences were found among the mean values of the genotypes.

c. ADVANCE GUAR YIELD TRIAL

An experiment consisting of 10 strains was sown on 3.6.2016. Experiment was laid out according to RCBD having 3 replications and plot size of 2.7m x 7.2m. The strain S-5885 produced maximum grain yield of 2803 kg/ha which was 61.9% higher than check BR-99. Statistical analysis revealed highly significant differences mean values.

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METEOROLOGICAL DATA DURING RABI SEASON

SARGODHA

Month	2016-17		Rainfall Total (mm)
	Min. Temp °C	Maxi temp. °C	
July, 16	26.41	35.97	41.2
August, 16	23.22	34.89	68.07
September, 16	23.76	35.30	2.00
October, 16	19.61	34.32	-
November, 16	11.97	26.23	-
December, 16	9.68	23.83	-
January, 17	7.54	18.73	23.36
February, 17	9.60	22.67	12.32
March, 17	15.76	29.71	22.03
April, 17	18.91	33.24	39.06
May, 17	25.68	40.11	21.08
June, 17	24.95	37.60	118.11

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