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KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF AGRICULTURE
VELLAYANI, KERALA.

ALL INDIA

CO-ORDINATED PROJECT FOR RESEARCH ON FORAGE
CROPS

ANNUAL REPORT 1975-'76.



INDIAN COUNCIL OF AGRICULTURAL RESEARCH.

206554

SUMMARY SECTION

The Vellayani Sub centre under the All India Co-ordinated Project for Research on Forage Crops was established in the College of Agriculture, Vellayani campus of the Kerala Agricultural University on 1st April, 1971.

The following experiments were conducted in this centre during the year under report:-

I. AGRONOMIC TRIALS

A. Perennial Fodder Crops.

- (i) Fertilizer-cut-interval of cutting trial on Guinea Grass under rainfed conditions (Continued from 1971).
- (ii) Spacing-cut-organic manure experiment on Guinea grass under rainfed conditions in Coconut gardens (Contd.. '71).
- (iii) Intercropping of pulses with Guinea grass in coconut gardens under rainfed conditions (Contd.... '71).
- (iv) Comparative performance of Guinea grass and Hybrid Napier in Coconut gardens and in the open under varying levels of nitrogen and cutting intervals.
- (v) Fodder production potential trial.
- (vi) Manurial trial on 3 promising Guinea grass types.
- (vii) Initial Evaluation trial of Hybrid Napier types for disease resistance and yield.

B. Annual Fodder Crops

- (viii) A: K1 - Comparative performance of 3 varieties of cowpea under different phosphate and potash manuring.
- (ix) A: K5 - Comparative performance of 3 varieties of Maize under different levels of nitrogen and potash manuring.

II. BREEDING TRIALS

- (x) BT - 24 - Evaluation trial on 5 varieties of Velvet beans.
- (xi) KBT - 3 - Evaluation trial on 13 varieties of cowpea.
- (xii) KBT - 4 - Evaluation trial on 14 varieties of *Pennisetum pedicellatum*.
- (xiii) KBT - 8 - Co-ordinated trial with 7 cultivars of Sorghum.
- (xiv) KBT - 9 - Co-ordinated trial with 5 cultivars of Maize, Teosinte and their Hybrids.

MAIN REPORT

1. INDIAN COUNCIL OF AGRICULTURAL RESEARCH
 ANNUAL REPORT OF THE AGRONOMIST/ASSISTANT
 PROFESSOR OF AGRONOMY, ALL INDIA CO-ORDI-
 NATED PROJECT FOR RESEARCH ON FORAGE CROPS
 FOR 1975-'76.

2. Project Code No. CS - 002.
 3. Report No. 4
 4. Location. Kerala Agricultural University
 College of Agriculture, Vellu-
 Trivandrum, Kerala.
 5. Project title. Co-ordinated project for re-
 search on Forage Crops.
 6. Objective. To carryout intensive research
 on agronomic aspects of pro-
 ducing forage crops.
 7. Present staff position

Sl. No.	Post	Name of personnel	Date of joining
1.	Agronomist/assistant Professor of Agronomy (1)	G. Raghavan Pillai	4-12-1975.
2.	Research Assistant/ Instructor (1)	Vacant	-
3.	Grade I Agricultural Demonstrators (2)	L. Indira R. Nelson	10-8-1975 9-1-1975
4.	Lower Division Clerk (1)	C. Suchetha.	30-1-1976
5.	Laboratory Attender (1)	Vacant	-
6.	Peon (1)	S. Sreedharan Nair	8-4-1976.

8. Total sanctioned grant for the centre.

Year	Recurring	Non-recurring
1975-'76	Rs.77,500.00	Nil

9. Total amount spent

Year	Recurring	Non-recurring
1975-'76	Rs.60,557.54	Nil

10.

APPROVED TECHNICAL PROGRAMME

I. AGRONOMIC TRIALS

A. Perennial Fodder Crops.

- (i) Fertilizer-on-Interval of cutting trial on Guinea grass under rainfed conditions.

This experiment was aimed to study the effect of graded dose of Nitrogen on the yield and quality of Guinea grass at different intervals of cutting.

Treatments:

1. Levels of nitrogen (3) - 100, 150 and 200 kg N/ha.
2. Schedules of nitrogen application (3)
 - i) Full basal
 - ii) $\frac{1}{2}$ dose in June + $\frac{1}{2}$ dose in October.
 - iii) Four equal instalments.
3. Levels of cutting (3) 30, 45 and 60 days.
4. Levels of lime (3)
 - i) Lime to correct soil pH to 6.5
 - ii) $\frac{1}{2}$ of the above dose.
 - iii) No lime

Design : 3^4 Factorial experiment.

Gross plot size : 4.5 x 4.2 ms.

- (ii) Spacing-on-organic manure experiment on Guinea grass under rainfed conditions in coconut gardens.

Treatments:

- Spacing (3)
 - i) 80 x 40 cm
 - ii) 60 x 30 cm.
 - iii) 40 x 20 cm.
- Manure (3)
 - i) No nitrogen
 - ii) 25 kg N/ha in organic form
 - iii) 50 kg N/ha in organic form

Design - Randomised Block Design.

Replication 4 (Four)

Plot size 4.8 x 4.8 ms.

- (iii) Intercropping of pulses with Guinea grass in coconut gardens under rainfed conditions.

Treatments:

- T1 Guinea grass alone
- T2 Guinea grass + Co-1 or cowpea C 15 - 2 + Horse gram.
- T3 Guinea grass + cowpea Russian giant + Horse gram.
- T4 Guinea grass + cowpea Co-1 or C 15 - 2 + Fallow.
- T5 Guinea grass + cowpea Russian giant + Fallow.
- T6 Guinea grass + Fallow + Horse gram

Design : Randomised Block Design.

Replication: 5 (Five). Plot size: 6.3 x 4.5 ms.

- (iv) Comparative performance of Guinea grass and Hybrid Napier in Coconut gardens and in the open under varying levels of nitrogen and cutting intervals.

The object of this experiment is to find out the production potential of Guinea grass and hybrid Napier when cultivated in the coconut gardens as an intercrop as well as in the open under identical conditions of management practices. Two sets of experiments with the following treatments were laid out one each in the existing coconut gardens and the other in the open field and their comparative performance being studied. Coconut gardens are also being reserved for studying the effect of continuous grass or maize on the yield of coconuts.

Treatments:-

- | | | |
|----|---------------------------|---------------------|
| A. | Crop varieties (2) | (i) Guinea grass |
| | | (ii) Hybrid Napier. |
| B. | Levels of nitrogen (3) | (i) 150 kg N/ha. |
| | | (ii) 200 kg N/ha. |
| | | (iii) 250 kg N/ha. |
| C. | Intervals of harvests (2) | (i) 30 days |
| | | (ii) 45 days. |

- | | | |
|--------------|---|---|
| Design | - | Randomised Block Design. |
| Replications | - | 3 (three) |
| Plot size | - | 4.8 x 4.8 ms. |
| Spacing | - | Guinea grass - 40 x 20 cm.
Hybrid Napier - 60 x 30 cm. |

Observations to be recorded:

- (i) Green matter yield of fodder.
- (ii) Dry matter yield of fodder.
- (iii) Leaf/Stem ratio.

- (v) Fodder production potential trial:

The objective of this experiment is to find out a suitable cropping pattern for fodder crops for obtaining high production per unit area per unit of time. This experiment was laid out with the following treatments.

Treatments:

- (i) Guinea grass - 8 - 10 cuts per year.
- (ii) Hybrid Napier - 8 - 10 cuts per year.
- (iii) Hybrid maize in June followed by cowpea in October.
- (iv) Hybrid maize + cowpea mixture in June followed by the same mixture in October.
- (v) Hybrid maize during June followed by Hybrid maize in October.

Fertilizer doses:

	N	P	K
Guinea grass	250	80	80/year
Hybrid Napier	250	80	80/year
Hybrid maize	150	50	50/crop
Cowpea	20	90	30/crop.

Duration of the experiment :	3 years.
Design	Randomised Block Design.
Replication	4 (four)
Plot size	4.8 x 4.8 ms.
Spacing	Guinea grass -- 40 x 20 cm. Hybrid Napier -- 60 x 30 cm.
Seed rate	Cowpea = 40 kg/ha. Maize - 40 kg/ha.
Varieties	Guinea grass - local. Hybrid Napier - Dharwar Hybrid Maize - Ganga 5, Deccan or any other suitable variety. Cowpea - Co-1, Co-2, C-152 or any other suitable variety.

Observations (i) Green matter yield
(ii) Dry matter yield.

(vi) Manual trial on 3 promising Guinea grass types.

From a preliminary previous study (screening trial) on 30 types of Guinea grass, 3 types viz. FR-600, FR-599 and Mackueni have been found to be very promising. The object of this study is to assess the fodder production potential of these 3 promising Guinea grass types and to find out their nitrogen requirements.

<u>Treatments:</u> Varieties (3)	(i) FR-600. (ii) FR-599. (iii) Mackueni.
Levels of nitrogen (3)	150, 200 and 250 kg n/ha.
Design	Randomised Block Design.
Replications	Three (3).
Plot size	4.8 x 4.8 ms.
Spacing	40 x 20 cms.
Observations	(i) Green matter yield. (ii) Dry matter yield (iii) Leaf/Stem ratio.

- (vii) Initial Evaluation trial on hybrid maize for disease resistance and yield.

This experiment is having a collection of 2000 of hybrid maize was received from different centers. It is observed that hybrid maize is susceptible to diseases in this area. It has therefore become necessary to find varieties which are resistant to diseases. In order to test the disease resistance and the comparative yielding ability of different hybrids the present trial was undertaken.

II. ANNUAL FOOD CROPS

- (viii) At K4 - Comparative performance of 3 varieties of cowpea under different levels of phosphate and potash applied.

This trial was conducted with the following 3 varieties of cowpea, viz. (i) Russian giant (ii) Pusa-1, (iii) Calicut-78.

Levels of phosphorus: (4)	P ₀	-	0	P ₂ O ₅
	P ₁	-	30	kg P ₂ O ₅ /ha.
	P ₂	-	60	kg "
	P ₃	-	90	kg "
Levels of potash (2)	K ₀	-	0	K ₂ O
	K ₁	-	30	kg K ₂ O/ha.

- (ix) At K5 - Comparative performance of 3 varieties of maize under different levels of nitrogen and phosphate applied.

This trial was conducted with the following 3 varieties

- (i) Hybrid maize - Ganga - 5.
 (ii) Composite maize - Vijay
 (iii) Ganga Sated - 2

Levels of Nitrogen (4)	n ₀	-	0	Nitrogen
	n ₁	-	40	kg N/ha.
	n ₂	-	80	"
	n ₃	-	120	"
Levels of phosphorus (2)	P ₀	-	0	P ₂ O ₅
	P ₁	-	60	P ₂ O ₅ /ha.

B. BREEDING TRIALS

- (x) BT - 24 Evaluation Trial on 5 varieties of Velvet leaf

This experiment was conducted with 5 varieties. The seeds were procured from the previous season's crop. Only one cut was taken from this crop.

- (xi) KBT - 3 Evaluation Trial on 13 varieties of cowpea.

This experiment was conducted with the following 13 varieties:-

V1	=	UFC - 42	V8	=	MPKV-1
V2	=	UFC - 287	V9	=	Russian giant
V3	=	UFC - 5286	V10	=	JC - 1
V4	=	UPC - 9020	V11	=	JC - 21
V5	=	Eos - 1	V12	=	C - 1
V6	=	No. 10	V13	=	C - 28
V7	=	HTC - 42 - 1			

One cut was taken from this trial.

(xii) KBT - 4 - Evaluation Trial on 14 varieties of Pennisetum Triticellatum

This experiment was conducted with the following 14 varieties.

V1	=	PP-3	V6	=	PP-H	V11	=	Pusa-38
V2	=	PP-5	V7	=	Pusa-1	V12	=	Pusa-42
V3	=	PP-10	V8	=	Pusa-3	V13	=	JP-12
V4	=	PP-15	V9	=	Pusa-6	V14	=	T - 13.
V5	=	PP-33	V10	=	Pusa-19			

Two cuts were taken from this trial.

(xiii) KBT-8 - Co-ordinated Trial with 7 cultivars of Sorghum

This experiment was conducted with the following 7 varieties.

V1	=	MP-Chari	V5	=	S-1049
V2	=	MP-Chari	V6	=	J5-3
V3	=	MPV-1	V7	=	A1-14-8
V4	=	J5-20			

Data from two cuts were taken from this trial.

(xiv) KBT-9 - Co-ordinated trial with 5 cultivars of Maize, Teosinte and their Hybrids.

This experiment was conducted with the following 5 varieties:-

V1	=	J (adv - 2)
V2	=	Deccan
V3	=	Ganra - 5
V4	=	Maize x Teosinte (Adv. generation)
V5	=	Teosinte

RESULTS AND DISCUSSION OF EXPERIMENT

11.

I. AGRONOMIC FACTORS

A. Percentage Fodder Crops.

Experiment (i) Fertilizer-cum-interval of cutting study on Guinea grass under rainfed conditions.

The mean yield of Guinea grass in tonnes/ha recorded from the experiment are furnished below (Table 1)

Treatments	Green matter yield in tonnes/ha			
	1972-73	1973-74	1974-75	1975-76
Levels of Nitrogen				
100 kg/ha	37.00	25.97	22.64	25.61
150 kg/ha	39.02	32.08	27.25	26.75
200 kg/ha	48.26	35.50	29.63	30.54
Schedule of Nitrogen application.				
Full basal	45.21	30.14	31.17	25.27
Two split doses	34.78	33.43	27.68	29.18
Four split doses	44.29	29.98	20.68	23.97
Levels of lime				
Lime required to correct the soil pH to 6.5	42.42	34.09	27.49	28.57
½ of - do -	41.23	31.31	26.83	24.75
No lime	40.64	28.16	25.21	21.70
Intervals of harvest				
30 days	43.64	33.31	25.93	25.76
45 days	42.48	31.92	24.56	23.30
60 days	38.17	28.34	29.05	28.99

The green fodder yield increased with increase in the level of nitrogen. A positive response to nitrogen was noticed throughout the experimental period. A maximum green matter yield of 30.54 Tonnes/ha was recorded for 200 kg N/ha during 1975-76. Two split applications of Nitrogen recorded the maximum yield of 29.18 Tonnes/ha during the year under study. Application of lime had significant influence on the green matter yield of Guinea grass. Lime applied as full dose to correct the soil pH to 6.5 recorded the maximum yield of 28.57 Tonnes/ha. Among the three intervals of harvest the 60 days interval of cutting recorded the maximum forage yield of 28.99 Tonnes/ha while 30 days and 45 days intervals of cutting recorded 25.76 Tonnes/ha and 23.30 Tonnes/ha.

Experiment (ii) Spacing-cum-organic manure experiment on Guinea grass under rainfed conditions in Coconut gardens.

The mean yield of Guinea grass obtained in Tonnes/ha from the experiment are furnished below (Table 2)

Treatments	Green matter yield in Tonnes/ha			
	1972-73	1973-74	1974-75	1975-76
<u>Spacing</u>				
80 x 40 cm	24.41	29.18	26.88	20.164
60 x 30 cm	27.32	29.25	28.74	22.516
40 x 20 cm	31.23	31.38	29.99	23.723
<u>Levels of organic form of Nitrogen</u>				
0 N/ha	25.93	28.43	24.66	21.197
25 kg N/ha	27.50	29.90	27.52	20.672
50 kg N/ha	29.53	31.48	31.02	24.543

The results indicated that maximum fodder yield of 23.72 Tonnes/ha of Guinea grass under Coconut garden conditions was recorded with a close spacing of 40 x 20 cm. 50 kg nitrogen/ha in the form of cattle manure recorded the maximum green fodder yield of 24.54 Tonnes/ha (All the plots received a uniform dose of 100 kg nitrogen/ha in inorganic form)

Experiment (iii) Intercropping of pulses with Guinea grass in Coconut gardens under rainfed conditions.

The mean yield of green fodder obtained from the experiment are furnished below (Table 3).

Treatments	Green matter yield in Tonnes/ha.			
	1972-73	1973-74	1974-75	1975-76
1) Guinea grass alone	17.77	26.59	25.43	19.17
2) Guinea grass + cowpea Co-1 or C-15-2 + Horse gram	19.88	29.13	29.22	22.10
3) Guinea grass + cowpea Russian giant + Horse gram	18.64	29.45	27.74	21.63
4) Guinea grass + cowpea Co-1 or C-15-2 + Fallow	19.57	29.48	26.82	19.46
5) Guinea grass + Cowpea Russian giant + Fallow	17.47	29.27	26.19	21.73
6) Guinea grass + Fallow + Horse gram	18.56	27.37	26.08	19.39

The results indicated that intercropping of pulses with Guinea grass increased the green matter yield recorded

22.10 Tonnes/ha. The treatment in which Lucerne was not intercropped recorded the minimum yield of 19.17 Tonnes/ha, indicating that the practice of growing legumes along with Guinea grass increases fodder yield.

Experiments (iv) Comparative performance of Guinea grass and Hybrid variety in coconut gardens and in the open under different levels of nitrogen and cutting intervals.

Only two harvests could be taken during the period and hence the data was not analysed.

Experiments (v) Fodder production potential trial

Only two harvests of grasses and one crop of other annuals were taken and hence the data was not analysed.

Experiments (vi) Manual trial on 3 promising Guinea grass types.

Data from 3 harvests could be collected during the period which indicated that Guinea grass variety Blacksmith obtained from the Fodder Research Station, Kitale, Kenya recorded the maximum green matter yield of 22.8 Tonnes/ha. Another two selections of Guinea grass viz. FR-599 and FR-600, yielded 22.3 Tonnes/ha and 20.65 Tonnes/ha of green fodder respectively. Response upto the maximum level of nitrogen (250 kg/ha) was observed recording 22.49 Tonnes/ha of green fodder in three harvests at 45 days intervals.

Experiment (vii) Initial Evaluation trial of Hybrid variety types for disease resistance and yield.

Preliminary observations indicated that varieties BN-5/1, BN-15 and BN-6, obtained from I A R I are not affected by fungus disease in this locality.

B. ANNUAL FODDER CROPS

Experiment (viii) Ag K1 - Comparative performance of 3 varieties of cowpea under different phosphate and potash manuring.

The mean yield of green matter and dry matter per hectare, Leaf/Stem ratio and Height of plants in Cm are presented in table 4.

Difference in the green matter yield was not significant. However maximum green matter yield of 10.069 Tonnes/ha was recorded by variety Calicut - 78 while FOS-1 and Bussiah giant recorded 9.33 Tonnes/ha and 9.0 Tonnes/ha respectively.

Table 4

Treatments	Green matter yield in Tonnes/ha.	Dry matter yield in Tonnes/ha.	Leaf/Stem ratio	Height of plants in cm.
Varieties				
Russian giant	9.007	2.154	0.629	89.19
FOS-1	9.335	2.203	0.703	87.63
Calicut-73	10.069	2.664	0.701	85.73
CD	1.567	0.732	N.S	5.076
Levels of Potash				
0 kg/ha	7.522	2.018	0.694	83.35
30 kg/ha	11.419	2.662	0.661	91.69
CD	1.230	0.595	-	9.946
Levels of Phosphorus				
0 kg/ha	8.216	2.218	0.670	87.11
30 kg/ha	9.404	2.148	0.708	88.52
60 kg/ha	9.672	2.323	0.736	85.92
90 kg/ha	10.776	2.671	0.597	88.53
CD	1.336	0.340	-	4.531

The effect of levels of phosphorus and potash on green matter yield was significant. Maximum green matter yield of 10.776 Tonnes/ha was recorded by the maximum level of 90 kg P_2O_5 /ha while the highest level of 30 kg K_2O /ha recorded 11.419 Tonnes/ha. of green fodder yield.

Varieties did not show any significant difference in dry matter yield. However the maximum dry matter yield of 2.664 Tonnes/ha was recorded by cowpea variety Calicut-73. Levels of phosphorus and potash significantly influenced the dry matter yield. Maximum dry matter yield of 2.671 Tonnes/ha was recorded by 90 kg P_2O_5 /ha and 2.662 Tonnes/ha by 30 kg K_2O . The 3 varieties of cowpea were not significantly different in leaf/stem ratio and height of plants. Levels of potash and phosphorus also had no significant influence on leaf/stem ratio.

Experiment (ix) At K-5 - Comparative performance of 3 varieties of Maize under different nitrogen and phosphate manuring.

The mean yield of green matter, dry matter, leaf/stem ratio and height of main shoots are presented below in table 1.

Treatments	Green matter yield in Tonnes/ha.	Dry matter yield in Tonnes/ha.	Leaf/stem ratio	Plant height in cm.
Varieties				
Hybrid Maize Ganga-5	9.14	2.92	0.485	171.5
Composite maize Vijay	12.41	3.89	0.659	171.5
Ganga safed-2	9.94	3.38	0.554	171.5
CD	4.611	1.171	0.263	28.6
Levels of Nitrogen				
0 kg	4.39	1.75	0.711	171.5
40 kg/ha	4.42	3.15	0.504	171.5
80 kg/ha	12.39	4.02	0.451	171.5
120 kg/ha	15.23	4.65	0.528	171.5
CD	4.82	1.569	0.227	15.5
Levels of phosphorus				
0 kg/ha	10.10	3.23	0.604	171.5
60 kg/ha	10.90	3.50	0.528	171.5
CD	-	-	-	15.5

The 3 varieties were not significantly different in green matter yield. However the maximum green matter yield of 12.41 Tonnes/ha was recorded by composite maize Vijay, while Ganga safed-2 and H.M. Ganga-5 recorded 9.94 and 9.14 tonnes of green matter yield. Nitrogen levels significantly influenced the green matter yield. The maximum green matter yield of 15.23 Tonnes/ha was recorded by the highest level of Nitrogen (120 kg/ha).

Varieties and levels of phosphorus did not show any significant difference in dry matter yield of Maize. Nitrogen levels had significant influence on dry matter yield recording a maximum of 4.65 Tonnes/ha by 120 kg N/ha.

Leaf/stem ratio was not influenced by varietal difference or levels of phosphorus. Nitrogen levels had significant influence on leaf/stem ratio. 0.451 was the lowest leaf/stem ratio recorded by 80 kg N/ha.

No significant difference in plant height was observed among the varieties. The increase in plant height was

progressive with increase in the levels of Nitrogen with a maximum height of 161.04 cm by 120 kg N/ha. While the control plot recorded a plant height of 127.56 cm, the plots which received 60 kg P₂O₅/ha recorded 149.18 cm.

B. BREEDING TRIALS

Experiment (x) BT - 24 - Evaluation trial on 5 varieties of Velvet Beans.

5 varieties of Velvet beans were tried in plots of size 3 x 2.7 ms. The mean yield of green matter dry matter, and leaf/stem ratio are presented in the table below (Table 6)

Varieties	Green matter yield in Tonnes/ha	Dry matter yield in Tonnes/ha	Leaf/Stem ratio
V1	7.25	0.92	1.689
V2	15.74	1.89	1.942
V3	12.96	1.60	1.216
V4	10.80	1.32	1.834
V5	12.31	1.60	1.364
CD	3.061	0.446	0.848

The five varieties of Velvet beans were significantly different in green matter yield. The maximum green fodder yield of 15.74 Tonnes/ha was recorded by variety V2 followed by 12.96 tonnes/ha by variety V3. The five varieties were significantly different in dry matter yield also recording a maximum dry matter yield of 1.89 tonnes/ha by V2. The varieties did not show any difference in their leaf/stem ratio.

Experiment (xi) FBT - 3 - Evaluation trial on 13 varieties of cowpea.

Thirteen varieties of cowpea were tried in plots of size 3 x 2.7 ms. The green matter yield, dry matter yield, leaf/stem ratio and height of plants are presented in table 7.

The cowpea varieties were significantly different in green matter and dry matter yield. Maximum green matter yield of 18.51 Tonnes/ha was recorded by variety C-28 and maximum dry matter yield of 2.5 Tonnes/ha was recorded by variety H-9 - 5286. Varieties showed significant difference in leaf/stem ratio with a highest ratio of 1.813 by variety Kusabau 91 mt.

Table 7

Varieties	Green matter yield in tonnes/ha	Dry matter yield in tonnes/ha	leaf/stem ratio	Plant height in cm
V1 - UPC - 42	9.049	1.301	1.113	125.00
V2 - UPC - 287	12.666	2.156	1.199	125.00
V3 - UPC - 5286	17.493	2.507	1.202	132.00
V4 - UPC - 9020	9.049	1.127	1.186	121.00
V5 - Pusa-1	9.066	1.149	1.216	119.00
V6 - Ho. 10	12.135	1.522	0.778	125.00
V7 - UPC-42-1	9.135	0.583	0.397	111.00
V8 - PPV-1	9.765	0.602	1.301	111.00
V9 - Russian giant	12.262	1.587	1.813	125.00
V10 - JC-1	11.723	1.711	1.465	150.00
V11 - JC-31	10.283	1.322	1.230	125.00
V12 - C-1	9.376	1.419	0.523	132.00
V13 - C-28	18.513	2.422	0.763	131.00
CD	6.111	0.830	0.457	2.77

Experiment (iii) - PP-1 - Evaluation trial on 14 varieties of Pennisetum polycollatum

Fourteen varieties of Pennisetum polycollatum were raised in plots of size 3.6 x 3 m. Two cuts were taken from the trial and the third one was left for collecting seeds. The data collected from this experiment are presented in Table 8.

The 14 varieties of Deenanath grass did not show any significant difference in green matter and dry matter yield. However the maximum green matter yield of 65.43 tonnes/ha and dry matter yield of 9.60 tonnes/ha was recorded by variety Pusa-1. Varieties were not significantly different in leaf/stem ratio. However the highest leaf/stem ratio of 1.301 was recorded by variety PP-15 in the first cut while the lowest variety recorded the lowest ratio of 0.410 in the second cut. Highest ratio of 0.778 was recorded by variety Pusa-42 in the second cut.

The varieties showed significant difference in plant height. Variety T-13 was the highest among the test varieties with 154.33 cm while variety PP-10 was the lowest with 82.53 cm. In the second cut no significant difference in plant height was noticed.

Table 8

Varieties	Green matter yield in tonnes per hect. two cuts	Dry matter yield in tonnes/ha two cuts	Leaf/stem ratio		Height of plants in cm.	
			I cut	II cut	I cut	II cut
V1-PP3	57.10	8.69	0.571	0.547	140.47	96.37
V2-PP5	60.43	8.04	0.685	0.633	146.33	97.73
V3-PP10	47.99	1.89	0.323	0.472	82.53	111.67
V4-PP15	60.13	7.77	1.301	0.110	133.70	95.60
V5-PP22	61.81	8.39	0.711	0.539	108.73	105.13
V6-PP-H	51.55	8.83	0.737	0.146	129.30	109.50
V7-Puca-1	65.13	8.60	0.612	0.112	113.83	109.47
V8-Puca-3	53.33	8.22	0.956	0.116	126.70	117.00
V9-Puca-6	51.99	7.52	1.080	0.715	127.23	89.90
V10-Puca-13	57.17	8.04	0.991	0.571	123.07	90.67
V11-Puca-33	53.62	8.10	0.941	0.598	126.73	94.23
V12-Puca-12	51.57	8.00	1.027	0.778	121.80	98.17
V13-J-12	61.11	9.56	0.612	0.561	133.77	110.77
V14-T-13	56.33	8.37	0.713	0.354	134.43	91.63
CD	-	-	-	0.298	25.51	-

Experiment (xiii) V-3 - Co-ordinated trial with cultivars of sorghum.

Seven varieties of sorghum were tried in plots of size 3 x 3 m. The cuts were taken from this trial. The green matter yield, dry matter yield, leaf/stem ratio and height of plants were recorded and presented in the table below (Table 9).

Varieties	Green matter yield in tonnes/ha.	Dry matter yield in tonnes/ha.	Leaf/stem ratio	Height of plants
V1 - AT-Good	15.93	6.403	0.361	250.0
V2 - AT-Good	15.93	5.821	0.308	211.3
V3 - AT-1	15.93	7.161	0.407	251.9
V4 - AT-20	15.93	4.505	0.328	236.6
V5 - AT-100	15.93	5.100	0.305	211.1
V6 - AT-3	15.93	10.117	0.597	300.0
V7 - AT-11-8	15.93	4.341	0.398	220.0
CD	1.51	2.056	0.195	38.11

Significant difference in green matter and dry matter yield was observed. Maximum green matter yield of 34.75 ton/ha was recorded for the variety JS-3 followed by 29.5 ton/ha by the variety MPV-1. Similarly highest dry matter yield of 10.117 tonnes/ha was recorded by JS-3 and 7.46 tonnes/ha by MPV-1. The difference in leaf/stem ratio was also significant. The highest ratio of 0.597 was noted in the case of JS-3. The same variety recorded the maximum height of 30.26

Experiment (xiv) - 9 - Co-ordinated trial with culturing of maize, Teosinte and their hybrids.

The experiment was conducted with 5 cultivars in plots of size 4 x 3 m. The mean yield of green matter, dry matter, leaf/stem ratio and height of main shoot are presented in the table below (table 10).

Varieties	Green matter yield in Tonnes/ha.	Dry matter yield in Tonnes/ha.	Leaf/stem ratio	Height of main shoot in cm.
V1 - J Agr (2)	23.54	5.57	0.634	229.75
V2 - Deccan	23.75	6.27	0.717	220.55
V3 - Ganga-5	23.58	6.46	0.634	230.45
V4 - Maize x Teosinte (Adv. generation)	33.33	5.98	0.713	217.63
V5 - Teosinte	22.75	5.65	0.468	230.25
CD	-	-	-	-

The varieties were not significantly different in green matter and dry matter yield. However the maximum green matter yield of 33.33 Tonnes/ha was recorded by the hybrid Maize x Teosinte (Adv. generation). The varieties did not show any significant difference in either leaf/stem ratio or in the height of main shoot.

18.

TECHNICAL SUMMARY

Altogether 14 experiments were conducted in this centre as part of the technical programme. Of this 7 experiments were on perennial fodder crops. Three experiments are being continued from 1971 onwards and the pooled analysis of these experiments will be taken up later. Two economic experiments one on 3 cowpea varieties and the other on 3 maize varieties and 5 experiments were breeding trials on Velvet beans, cowpea, Doonanth grass, cultivars of Sorghum and cultivars of Maize, Doonanth and their hybrids. The results and significant findings of all these experiments are furnished under section 11.

19. Remarks

Nil

11. Operational difficulties were experienced due to the late sowing of the seeds during the year.

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