

Guinea grass Co-2 a high yielding fodder grass for Tamil Nadu

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Abstract: A new high yielding guinea grass culture TNGG-5 was developed through hybridisation between Co-1 x Centenario and released as Co-2 for general cultivation in Tamil Nadu. This new variety is shade tolerant, tall growing and profusely tillering. It produces 80-100 tillers per clump and grows to a height of 275 cm. It has more number of longer and broader leaves and non lodging. It has a green fodder yield potential of 270 tonnes ha⁻¹ year⁻¹. The dry matter, crude protein and mineral content are higher in the new variety than Co-1. (*Key words: Fodder grass, Guinea grass*).

Tamil Nadu has a large cattle population and consequent to the genetic upgradation of the local breeds of cattle through artificial insemination, the milk yielding potential of the animals has been considerably increased. However, the quality green fodder availability for these animals is very low. In Tamil Nadu there is a deficit of green fodder upto 80 per cent of the total requirements. Consequently the farmers resort to greater use of concentrated feeds which pushes up the cost of milk production which affects the farmers as well as consumers. Since to feed the teaming population is the primary objective of the country, land cannot be diverted for fodder production. The only alternative is to identify very high yielding fodder crop varieties with better quality parameters so that the genetically upgraded cattle can show their true milk yielding potential. New shade tolerant varieties which will come up well in coconut gardens and plantations need to be identified so that these areas can be further profitably used. Since guinea grass (*Panicum maximum*, Jacq) is a shade tolerant grass, attempts were made to evolve a new high yielding variety better than the existing Co-1 which was released earlier (Paramathma *et al.* 1994).

Materials and Methods

The guinea grass variety Co-1 was hybridised with the exotic germplasm culture Centenario

through contact method of crossing and the seeds were collected from the female parent. After the dormancy period was over, the seeds were sown in pots and later the seedlings were transplanted in the field singly at a wider spacing. True hybrid plants were identified through the marker character of light pink stem transferred from the male parent. Seeds were collected from these hybrid plants through selfing and were advanced upto F6. When the characters stabilized and not much of variation was noticed from generation to generation, vegetative multiplication through root slips was resorted. As a result of the testing over years a culture TNGG-5 was identified as high yielding and it was put to comparative yield trails with the already available Co-1. It was also tested under multilocation trials in six different research stations of the state. In addition seeds were distributed to seven different locations in the country and tested under All India Coordinated trials and compared with the national check PGG-9. It was also tested at 39 different locations in different districts of the State under Adaptive Research Trials. The results are summarised below.

Results and Discussion

The results of green fodder yield obtained in the Station trials over a period of three years is given in Table-1. The new culture TNGG-5 had recorded on an average 290.89 tonnes

Table 1. Green fodder yield of Guinea grass Co-2 in Station Trials

Year	Green fodder yield (t ha ⁻¹ yr ⁻¹)		Percent over check
	Co-2	Co-1	
1995 - 96	286.88	247.13	16.08
1996 - 97	296.27	251.55	17.78
1997 - 98	289.52	251.06	15.32
Mean	290.89	249.91	16.40

Table 2. Green fodder yield of Guinea grass Co-2 in Multilocation trials (t ha⁻¹ yr⁻¹)

Location	Co-2	Co-1
Aliyarnagar	212.68	153.32
Bhavanisagar	299.20	245.86
Killikulam	226.72	200.00
Paiyur	177.60	155.20
Vridhachalam	289.68	196.00
Coimbatore	283.52	257.02
Mean	248.24	201.24
Percent over check	23.36	

Table 3. Green fodder and dry matter yield of guinea grass Co-2 in All India Co-ordinated Trial IVT 1997-98 Kharif (q ha⁻¹)

	Green Fodder yield		Dry matter Yield	
	Co-2 (TNGG-5)	PGG-9 (NC)	Co-2 (TNGG-5)	PGG-9 (NC)
Kalyani	27.8	33.9	7.2	9.0
Ludhiana	175.9	117.5	41.6	27.9
Vellayini	366.0	152.0	130.0	55.0
Coimbatore	586.1	280.6	150.3	77.5
Palampur	200.0	206.2	35.4	35.0
Faizabad	391.7	550.8	93.8	137.4
Rahuri	342.7	403.6	82.2	88.7
All India Average	298.6	249.2	76.6	68.8

NC : National check

Table 4. Green fodder yield of Guinea grass Co-2 in selected locations under Adaptive Research Trials (t ha⁻¹)

Sl. No	Location	Co-2	Co-1
1	Kalathoor (Pudukkottai) 2 cuts	52.50	47.00
2	Walaja (Vellore) 2 cuts	42.50	36.90
3	Pazathinpatti (Namakkal) 2cuts	48.99	47.66
4	Dindugal (Dindugal) 2 cuts	86.00	80.00
5	Palani (Dindugal) 2 cuts	80.00	85.50
6	Pudukkottai (Pudukkottai) 2 cuts	35.00	27.50
7	Sikkayagoundanur (Dindugal) 2 cuts	85.00	79.00
8	Kanakkupatti (Dindugal) 2 cuts	89.00	84.00
9	Aramathapalayam (Namakkal) 2 cuts	43.21	34.28
10	Chiranadan (Namakkal) 2 cuts	31.94	33.34
11	Anaikudi (Nagapattinam) 3 cuts	205.00	196.50
12	Kancheepuram (Kancheepuram) 2 cuts	41.28	40.97
13	Uthiramerur (Kancheepuram) 2 cuts	29.88	27.63
14	Maduranthagam (Kancheepuram) 2 cuts	38.90	35.10
15	Chilapakkam (Kancheepuram) 2 cuts	35.25	34.75
16	Arcot (Vellore) 2 cuts	35.00	38.12
17	Chidambaram (Cuddalore) 2 cuts	37.50	32.20
18	Kanjakollai (Cuddalore) 2 cuts	37.00	32.00

Table 5. Quality parameters and biometrical details of Guinea grass Co-2

Particulars	Co-2	Co-1
<i>Quality Parameters</i>		
Dry Matter (per cent)	25.94	25.65
Crude protein (per cent)	8.92	8.07
Crude fibre (per cent)	34.64	35.42
Crude fat (per cent)	1.6	1.71
Nitrogen free extract (per cent)	40.68	41.55
Total ash (per cent)	14.00	13.25
Calcium (per cent)	0.59	0.56
Phosphorus (per cent)	0.29	0.26
Magnesium (per cent)	0.38	0.35
Potassium (per cent)	1.86	1.78
<i>Biometric details</i>		
Plant height (cm)	250-275	175-200
No. of tillers per clump	80-100	40-50
Panicle length (cm)	45-50	30-40
Leaf length (cm)	65-75	50-60
Leaf width (cm)	2.5-2.9	2.0-2.5
Leaf / stem ratio	0.45	0.53
Stem thickness (mm)	6-8	5-7

of green fodder per hectare per year which was 16.40 per cent higher than that of the check Co-1. In Multilocation trials conducted at six different research stations of the University, it recorded on an average 248.24 tonnes of green fodder per hectare per year which was 23.36 per cent higher than that of Co-1 (Table-2). Similarly in the All India Co-ordinated trials conducted at seven different states of the country, the culture TNGG-5 recorded a mean green fodder yield of 298.6 q ha⁻¹ in two cuts while the National check PGG-9 had recorded only 249.2 q ha⁻¹. The dry matter yield of the new culture was 76.6 q ha⁻¹ while that of the National check was 68.8 q ha⁻¹ (Table 3).

In the adaptive research trials conducted over 39 locations in the State in farmers fields with the help of the extension staff of the State Department of Agriculture, the culture TNGG-5 recorded a mean green fodder yield of 245.30 tonnes per hectare per year compared to 235.00 t ha⁻¹ year⁻¹ by Co-1.

The green fodder yield of the new culture TNGG-5 in comparison with Co-I in selected locations of the Adaptive Research Trial is given in Table 4. Over all in all the trials i.e., Station

trials, MLT, All India Trials and ART, the new variety had recorded a mean green fodder yield of 270.76 t ha⁻¹ yr⁻¹ which was 15.79 per cent higher than that of the check Co-1. In view of the superiority of the new culture, it was approved by the State Variety Release committee to be released as Co-2 during January 2000.

The other important biometrical parameters and quality characteristics of the new variety are given in Table 5. It was observed that it has higher crude protein content (8.92%), crude fat (1.76%), total ash content (14.00%), calcium (0.59%), phosphorus (0.29%), magnesium (0.38%) and potassium (1.86%) than Co-1. It is tall growing (250-275 cm) with more number of tillers (80-100 per clump), with longer panicles (45-50 cm), longer leaves (65-75 cm) and broader leaves (2.5-2.9 cm).

References

- Paramathma, M., Sukanya Subramanian, N., Sivasamy, A.K., Fazlullah Khan, M., Stephen Durairaj and Amirthadevarathinam, A. (1994). Co-1 Guinea grass (*Panicum maximum*, Jacq). 1994. *Madras Agric. J.* 81:62-63.

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