

Ragi Co 11 An Early Maturing High Yielding Strain

N. SUNDARESAN¹, T. S. RAVEENDRAN², M. S. THANGAM³ and V. MYLSAMY⁴

Ragi EC. 4849, a brown grained selection from an Andhra Pradesh variety developed by pureline breeding was evaluated for yield and other economic attributes over several locations in the State of Tamil Nadu from 1971 to 1977. The selection matured in 90-95 days and found to be superior in grain yield to the high yielding ruling strain Co. 10 by 10 per cent in the research centres and 15 per cent in the cultivators' fields. In All India trials also the selection proved its superiority. It possessed saline tolerance and contained a higher percentage of protein (10.86). The ragi selection has thus, been released as a new high yielding strain Co 11 for general cultivation in the Tamil Nadu State.

The finger millet (*Eleusine coracana* Gaertn.) is cultivated in four lakh hectares in Tamil Nadu. The ruling strains take 100-140 days to mature excepting the recently released variety Ragi Co. 10 which matures in 90-95 days. With increased importance in multiple cropping, it is desirable to develop short duration strains with high yield. Apart from reducing the duration, the necessity for developing a non-photosensitive variety which could be raised successfully in both the monsoon and irrigated seasons without loss of yield was also felt essential. With this goal, breeding work was started at the Tamil Nadu Agricultural University Coimbatore and the results presented hereunder.

MATERIAL AND METHODS

The available genotypes in the germplasm bank maintained at the Millet Breeding Station, Tamil Nadu Agrl. University, Coimbatore were evaluated for yield and duration. This resulted in the isolation of four pureline selections maturing in 85 to 100 days. These were tested in preliminary and advanced yield trials from 1971-77 in both monsoon and summer seasons of this tract in comparison with Co. 10. Of these, the selection EC. 4849 (Punnalur, Andhra Pradesh) was found to be consistent in giving increased grain yield over the standard. This selection was also simultaneously tested in the pistrict trials in ryots holdings in Tamil

1 - 4 Department of Agricultural Botany,
Tamil Nadu Agricultural University, Coimbatore-641 003.

Nadu during 1973-75 using the local varieties as standards. This selection was compared with either Co. 7 or Co. 10 in as many as 47 centres. It also represented Tamil Nadu in All India Coordinated trials during 1976-77.

The disease reaction of this selection both under field and laboratory conditions was assessed. The analysis of protein and lysine fractions was also done. The level of salt tolerance was also determined using sodium chloride at the germination stage. The response of the selection to higher doses of Nitrogen was also assessed.

RESULTS AND DISCUSSION

In the replicated trials conducted during the years 1971-77 the selection EC. 4849 recorded a mean grain yield of 3960 kg/ha as against 3587 kg/ha recorded by Co. 10 registering an increase of 8.9 per cent over the latter.

In the scattered block trials conducted in the districts of Tamil Nadu from 1973 to 1975, this selection recorded yield increase ranging from 10.4 to 39.5 per cent over Co. 7 and an increase of 12.8 per cent to 19.5 per cent over Co. 10. The over all mean yield increase against Co. 7 was 22.5 per cent and against Co. 10 was 14.9 per cent which indicated its better adaptability in Tamil Nadu (Table II). The selection has also performed well in the states of Maharashtra and Gujarat recording an increase of 15.3 per cent over Co. 10.

In the disease reactions, the *Helminthosporium* leafspot and virus diseases were comparatively lower while the level of blast infection was more or less equal with Co. 10 under field conditions. However, when the pathogen was artificially inoculated, the selection recorded a low incidence of 8.5 per cent as against 10.0 per cent in Co. 10 and 21.0 per cent in the susceptible check IE. 546.

Though there is seasonal fluctuation in the protein content, the nutritive quality of the selection was consistently higher with high protein percentage (Table I). The lysine content was also slightly higher in EC. 4849 as estimated by the dye-binding test. The selection was also found to be tolerant to salinity under laboratory conditions. Under field conditions of 8.2 pH and 0.4 EC, this selection registered a grain yield of 3508 kg/ha. Even under this pH level it was able to respond well to 135 kg of Nitrogen per hectare to give the above said yield.

On account of the high yielding ability, early duration, good quality grains and disease tolerance, this selection EC. 4849 was considered superior to Co. 10 and was released by the Tamil Nadu Agricultural University Coimbatore as strain Co. 11. The morphological characters and yield potentialities of the variety are presented in Table I.

TABLE-I. The morphological description and yield potential of Co. 11 ragi

Habit	: Erect
Pigmentation	: Green throughout
Earhead	: Incurved
Grain colour	: Brown
Flag leaf	: Medium acute
Lodging	: Medium (Depending on seasonal factors)
Reaction to pests under field conditions	: No major pests
Adaptability	: Suited to Tamil Nadu, Maharastra and Gujarat
Quality of produce	: Readily marketable
Plant height	: 80-105 cm
Number of tillers	: 4-7
Earhead length	: 6-9 cm

Number of fingers	: 8-10
Duration in days	: 90-95
Weight of 1000 grains	: 2.36 g
Average grain yield	: 4000 kg/ha
Average straw yield	: 9000 kg/ha
Protein	: 10.86%

The authors express their sincere thanks to Prof. S. Kamalanathan Dr. R. Appadurai and Prof. A. Subramanian for their keen interest and encouragement in releasing this selection. Their thanks are also due to the Department of Plant Pathology, Plant Physiology and Agronomy for helping in testing the material and the Department of Biochemistry for helping in carrying out the analysis of the grain.

TABLE II. Yield Performance of Co. 11 Ragi (EC 4849)

Varieties	Mean yield kg/ha				Percentage increase on control				Disease Reactions in Percentage							Protein content Percentage
	District Trials				Replicated trials at Experiment stations	District trials		All India trials (Replicated)	Natural condition				Artificial condition			
	Replicated trial at Experiment stations	I Check Co. 10	II Check Co. 7			Blast	Leaf		Neck	Helminthosporium leafspot	Streak	Mosaic	Blast			
EC 4849	3960 (7)	3438 (15)	2825 (32)	2260 (5)	108.9	114.0	122.5	115.3	5.5	4.0	7.0	1.3	0.95	8.5	10.85	
Co.10	3587 (7)	2992 (15)	-	1963 (5)	100.0	100.0	-	100.0	6.75	3.0	10.0	3.2	6.4	10.0	9.15	
Co.7	-	-	2306 (32)	-	-	-	100.0	-	-	-	-	-	-	21.0	(in susceptible check IE. 546)	

* Figures in parentheses indicate the number of locations.