

Tennai Co. 5 - A High Yielding Rust Resistant Variety Suitable for Tamil Nadu

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Tennai (fox-tail millet) variety Si 76/4 is a derivative from the cross between Co 1 and Japanese variety A 113/2. This selection has been found to be resistant to rust disease and has recorded a mean yield of 1049 kg/ha in the station trials which is an increase of 10.2 per cent over the mean yield of 952 kg/ha of Co 3. In the All India trials, Si 76/4 recorded an increased yield of 29.0 per cent over Co 3, having given a mean yield of 1268 kg/ha as against 900 kg/ha registered by Co 3. This was released as Co 5 by Tamil Nadu Agricultural University in 1979.

FOX-TAIL millet (*Setaria italica* Beauv.) popularly known as tenai in Tamil Nadu is mainly a dryland cereal cultivated in soils with poor fertility and meagre rainfall. By virtue of its high resistance to drought and early maturity, this crop can be sown late in the monsoon season and harvested successfully. The present popular cultivar in Tamil Nadu is Co 3 while another strain Co 4, maturing in 65 days, was released from Coimbatore to suit the mixed and multiple cropping systems.

Evolution of a rust resistant variety was thought of when the variety Co 4 was found to be highly susceptible to this disease. Therefore, breeding work was taken up at the Millet Breeding Station, Coimbatore with the objective of evolving a variety having higher yield potential than Co 3 and rust resistance.

MATERIAL AND METHODS

Crossing programme was initiated using Co 1 as female parent and a rust

resistant variety, A 113/2, from Japan as male parent. The F₁ and F₂ of the above cross were raised without selection. In the F₃ generation, selection was exercised to obtain recombinants with high yield and rust resistance. This resulted in the isolation of a culture Si 76/4. This was tested in yield trials under rainfed conditions during 1972 to 1978. Trials were conducted under irrigation also in 1970-71 and 1975-76 using Co 3 as the check variety. The derivative was also tested in the All India trials in 12 locations during 1976 to 1978. The intensity of rust pustules in Si 76/4 was compared with reference to Co 4, the susceptible check, under natural conditions in the field in both summer and main seasons during 1977 and 1978.

RESULTS AND DISCUSSION

In the replicated yield trials conducted under irrigation during 1970-71 at Coimbatore, Si 76/4 gave a mean

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TABLE I Yield Performance of Si 76/4 (Co 5) in Tamil Nadu

Year	Grain yield (kg/ha)			% on control
	Si 76/4	Co 3	Co 1*	
COIMBATORE				
Irrigated				
1970-71	2737	—	1672	163.6
1975-76	3407	2107	—	165.5
Rainfed				
1972-73	1058	1111	—	95.2
1973-74	845	762	—	110.9
1975-76	2740	2340	—	117.1
1976-77	771	892	—	86.4
1977-78	739	490	—	151.0
KOVILPATTI				
1977-78	138	119	—	116.0
Mean	1049	952	—	110.2

* Co 1 was used as control in 1970-71

yield of 2737 kg/ha with an increase of 63.6 per cent over Co 1. When tested against Co 3, under irrigation, during 1975-76, it recorded a mean grain yield of 3407 kg/ha which was 65.5 per cent higher than Co 3. This selection registered a mean yield of 1049 kg as against Co 3 with 952 kg under rainfed conditions at Coimbatore during 1972-78. (Table I).

This selection also performed well in Andhra Pradesh, Bihar, Karnataka, Madhya Pradesh and Rajasthan. On an average it recorded an increase of 29.0 per cent over Co 3 in the trials conducted in these states (Table II). This selection exhibited complete resistance



TABLE II Performance of Si 76/4 (Co 5) in All India Trials

S No	Centre	Grain yield (kg/ha)		
		Si 76/4	Co 3	% on Co 3
1	A.P., Guntur	1570	1380	113.8
2	A.P., Guntur	1940	1800	107.8
3	Bihar, Dholi	1700	1700	100.0
4	Bihar, Dholi	2129	1040	204.7
5	Bihar, Kanke	580	480	120.8
6	Karnataka-Bangalore	600	570	105.3
7	Karnataka-Raichur	748	570	131.2
8	M.P., Dindori	1067	787	135.6
9	M.P., Jabalpur	209	165	126.7
10	M.P., Rewa	3130	1990	157.3
11	M.P., Rewa	1040	946	109.9
12	Rajasthan-Jodhpur	501	361	136.1
	Mean	1268	983	129.0

to rust during summer seasons. In winter, the level of infection was 1.4 (mean grade value) whereas the check Co 4 was graded 4.6.

TABLE III Rust reaction of Si 76/4 (Co 5) under field conditions (Mean grade values)

Variety	1977		1978	
	Sum-mer	Win-ter	Sum-mer	Win-ter
Si 76/4 (Co 5)	0.0	1.5	0.0	1.3
Co 4 (Susceptible check)	2.8	5.0	2.5	4.2

APPENDIX

The Morphological Description and Yield Potentiality of Tenai-Co 5

Duration	...	: 90 - 95 days
Pigmentation	...	: Green throughout
Earhead	...	: Medium compact with distinct branches
Grain	...	: Yellow and round
Bristles	...	: Medium
Flag leaf :		
Length	...	: 30 to 50 cm
Breadth	...	: 3 to 5 cm
Lodging	...	: Non-lodging under normal conditions
Reaction to diseases under field Resistant to rust conditions		
Plant height	...	: 120 - 140 cm
Number of productive tillers		: 4 - 7
Number of leaves on main stem		: 10 - 13
Length of earhead		: 20 - 30 cm
Number of branches per earhead		: 60 - 80
Number of grains per branch		: 70 - 140
Weight of 1000 grain		: 2.9 g
Average grain yield		: 1300 kg/ha

The selection Si 76/1 was thus superior to Co 3 on account of its high yield and resistance to rust and was proposed for release by the Tamil Nadu Agricultural University as Co 5 and was released by the state variety release committee during 1979. The morphological characters of Co 5 variety are given in appendix.

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