

## The Improvement of the Quality of Straw in *Talaivirichan Cholam* (*Sorghum Roxburghii*) in Madras State

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**Introduction:** *Talaivirichan Cholam* (*Sorghum Roxburghii* var *hians* Stapf), (Snowden 1936) is one of the important Sorghum varieties in the Madras State. It has got rather a discontinuous distribution, being cultivated on the hill slopes of Visakhapatnam and East Godavari districts and after a long gap occurring again in the Central districts of Chittoor, North Arcot, South Arcot, eastern portions of Salem and in the north-eastern portions of Tiruchirapalli districts.

The stalks of *Talaivirichan Cholam* grow to a thickness of nearly  $1\frac{1}{2}$ " diameter and are very coarse and pithy. The straw of this variety is not relished by cattle because of its coarseness, and it is generally used only for thatch and fuel purposes. There are no naturally occurring juicy-stalked types in this variety or in the varieties allied to it. The problem of improving the quality of straw to make it fit for fodder was taken up as one of the items of work in the improvement of Sorghums of Madras State.

With this object a juicy-stemmed type, A. S. 5945, isolated from a cross was selected as a parent and some of the high yielding *Talaivirichan cholam* varieties were crossed with it in 1938. During the subsequent generations selections were made and purified to obtain pure-breeding forms of juicy-stalked *Talavirichan cholam*.

The  $F_1$  plants from the above crosses were all white-mid-ribbed, since white midrib, which is indicative of pithy-stalked condition, is a simple dominant to dull green colour of the midrib, which indicates the juicy condition of the stalk (Rangaswamy Iyengar et al 1936). From the  $F_2$  generation onwards segregations were obtained for juiciness and for certain other characters in which the parents were differing from each other. The process of selection from each generation was continued to obtain pure breeding forms for all characters including the juiciness of stalk. A. S. 7657, was finally selected as the best recombination. The first yield trial with it was conducted in 1950 main season with Co. 3 - the standard-strain of *Talaivirichan Cholam*. The results of the trial are presented below:

TABLE I

Selection	A. S. 7657	Co. 2	A. S. 8008	Co. 3	Critical difference
Grain yield as percent- age of Co. 3 ..	132	116	115	100	16.1
Straw yield as percent- age ..	102.2	96.1	97.6	100	Not significant

Note: Co. 2 and A. S. 8008, two other Talaivirichan Cholam selections were also included in the yield trial.

From the above four selections juice was extracted at the time of flowering and analysed for sucrose and glucose. The data are presented below as total sugars:

TABLE II

Selection No.	Extraction percentage	Total sugars in 100 lb. of stalks
A. S. 7657 ..	22.5	0.9225 lb.
Co. 2 ..	10.0	0.47 lb.
Co. 3 ..	7.5	0.3728 lb.
A. S. 8008 ..	10.0	0.558 lb.

To find out the relative food value of the selections and strains the straw was chemically analysed and the results of analysis are presented below:

TABLE III

(Results are expressed as percentages)

Particulars	Varieties							
	Co. 3		Co. 2		A. S. 8008		A. S. 7657	
	a	b	a	b	a	b	a	b
Moisture ..	6.84	..	7.17	..	7.35	..	7.88	..
Ash ..	7.34	7.88	6.86	7.39	7.35	7.94	9.65	10.47
Crude protein ..	2.73	2.93	3.82	4.12	4.29	4.64	6.04	6.56
Ether extractive ..	2.21	2.37	2.54	2.74	2.42	2.62	3.04	3.30
Crude fibre ..	28.72	30.83	21.24	22.89	25.05	27.03	22.31	24.42
Carbohydrates by difference ..	52.16	55.99	58.37	62.86	53.54	57.07	51.08	55.45
Total ..	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Lime (CaO) ..	0.15	0.16	0.26	0.28	0.67	0.73	0.93	0.10
Phosphoric acid P <sub>2</sub> O <sub>5</sub> ..	0.26	0.28	0.61	0.66	0.25	0.27	0.57	0.82
Nutritive ratio ..	20.98 : 1		16.78 :		13.74		9.61	

(a) Air-dry basis.

(b) Oven-dry basis.

From the point of view of feeding, variety A. S. 7657 is the best of the lot, followed by A. S. 8008, Co. 2 and Co. 3 in descending order of merit.

It will be seen from Table I that the selection A. S. 7657 is significantly superior in grain yield to the standard Co. 3. In straw yield it was equal to the standard, with the advantage that the stalks are juicy.

The data in Table II show that the juicy-stalked selection A. S. 7657 has almost double the quantity of total sugars as in strain Co. 2 and nearly one and a half times more total sugars to that contained in Co. 3. The chemical analysis of straw presented in Table III showed that A. S. 7657 has the best fodder value. Feeding trials conducted with the straw of A. S. 7657 and the *Talaivirichan* cholam selections Co. 2 and Co. 3 indicated that the cattle relished the improved type better than the ordinary strains of *Talaivirichan* cholam.

**Summary:** *Talaivirichan* cholam is one of the important dry-land cholam varieties of Madras State. Its straw is inferior, being thick, coarse and pithy. To improve the fodder quality it was crossed with a juicy-stalked type and by selecting from the hybrid material through subsequent generations, one selection A. S. 7657, breeding pure for juiciness of stalk and other characters has been evolved. Its grain yields have been found to be significantly better than the standard. Its straw yield was equal to the standard and has the advantage of being juicy. It has practically double the quantity of total sugars to those of the standard, and has a better fodder value and palatability, as assessed by chemical analysis of straw and feeding trials.

**Acknowledgments:** The authors are indebted to the Government Agricultural Chemist for the analysis of the straw samples, for estimation of sugar and fodder value. The authors also express their thanks to Sri M. A. Sankara Ayyar, who effected the first cross.

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