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A Note on J.75 (Fodder Sorghum) of the Agricultural Research Station, Guntur.

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Introduction: Ongole in Guntur District is the centre of the Ongole breed of cattle. The breeding tract of this type extends to the dry Taluks of Ongole, Bapatla, Narasaraopeta, Guntur and Vinukonda of the Guntur District and Darsi and Kandukur of Nellore District. The soils in these taluks are mostly heavy black soils, where sorghum grows well, yielding a good cattle feed. The hardiness and strong bony structure found in the Ongole breed is said to be due to sorghum fodder and abundant lime in the soils of Guntur. Ryots of this tract take much care in cattle-breeding and a fourth of their holding is usually left as pasture for cattle grazing, in addition to putting a good proportion of the cultivated area under fodder crops. With the increase in population, conditions have changed at present, and the grazing areas have been brought under the plough and converted into cultivated lands; thus the private grazing areas are reduced. In the case of cultivated lands, in spite of giving a prominent place to commercial crops like tobacco, chillies etc., ryots do take even now great care of their cattle and grow enough fodder crops for maintaining them in good condition. Of the total area of 4,21,090 acres under fodder crops normally grown in the province, 1,81,600 acres (or 43% of the total area) are in the Guntur and Kistna Districts.

Sorghum as a fodder crop: Among the fodders grown in the tract Sorghum is the most important. The cultivation of fodder sorghum as a rainfed crop is a common practice in the Guntur and Kistna Districts. The crop is grown during to early (May—September) season taking advantage of the south-west monsoon. During the growing period of the crop, about 20″ of rain are received, distributed over 40—50 rainy days and this fair distribution of rainfall facilitates the successful cultivation of the crop in drylands. The variety of jonna used for fodder crops is known as "*Pedda Jonna*" (long-duration variety as against "Gidda Jonna", a short duration one grown in the same season). The peculiarity of this "*Pedda Jonna*" is that its duration extends to 4½ to 5 months when sown in the early season, with a luxuriant vegetative growth, while the grain-set is poor; when the same variety is grown in the main season (*Pedda panta*, August—December) its duration is 4—4½ months and the grain set is fair, while in the late (Pyru, November—February) season, the duration of the variety is reduced to 3½ months and the grain-set is very good.

So the common practice by the ryot is to sow this variety early in the month of June (Mrugasira Karthi) for a fodder crop quite in advance of the usual main grain-crop season (August—December) and encourage its vegetative growth so as to have good out-turn of fodder. It is sown in seed drills (gorru) as a mixture with "Pillipesara" (Phaseolus trilobatus) using a seed rate of 40 to 50 pounds. Helped by rains, the crop comes up well. It is harvested when flowering is completed and the grain is in the dough-stage, since the popular belief is that it deteriorates in quality and does not stand stacking when harvested earlier. After harvest it is bundled and stooked till it is completely dry and finally stacked for use through the year. The yields of dry hay vary from 5,000 to 8,000 pounds per acre.

The "*Pedda Jonna*" variety is a quick-growing and well-tillering plant and gives good yields of fodder but the quality of the same is poor since it is a type with white mid-ribbed leaf and pithy stalk. Among sorghums, these types, with dull mid-ribs are associated with juiciness and among them those that have sweet stalks are good for fodder, compared to types with white mid-ribs and pithy non-sweet stalks. Attempts to replace this local type with reputed fodder types of other stations were made and the results of these trials are summarised in this paper.

Introduction of fodder types of other places: The popular variety grown for fodder purposes in Coimbatore is "Periamanjal Cholam". The variety was tried at Guntur to study its suitability for the tract, during the years 1926—29 along with "Ongole, and Local" varieties. The results are as below:

Varieties.	Yields of dry fodder in pounds per acre.		
	1926—27	1927—28	1928—29
1. Periamanjal	4,061	3,285	2,800
2. Ongole	3,163	2,835	discarded
3. Local	3,487	2,972	2,550

"Ongole variety" gave low yields and was discarded in the third year. Periamanjal was best in yield but it was lacking in quality. So, later, dull midribbed, juicy and sweet-stalked varieties from Hagari and Nandyal were tried. T. 1 and T. 12 of Hagari, N. 124, N. 159, N. 20/10 and N. 28/3 of Nandyal were compared along with maize, Teosinte and "Irungu" cholam during the years 1936—39. The trial showed that N. 23/10 and N. 124 were on a par with "local" in yield while the Hagari varieties were poorer than the local type.

SUMMARY OF RESULTS.

Varieties.	Yield of fodder in pounds per acre.		
	1936—37	1937—38	1938—39
1. N. 23/10	5,933	29,100	32,600
2. Local	6,700	28,810	20,017
3. N. 124	6,466	25,700	21,433
4. N. 28/3	5,566	27,500	17,433
5. N. 159	6,700	24,360	16,633
6. Irungu	4,600	21,980	15,317
7. T. 1	5,217	20,460	20,950
8. T. 12	4,400	21,110	15,133
9. Maize	1,566	10,610	11,783
10. Teosinte	3,417	6,970	7,167
Critical difference	1,210	4,104	2,140

Conclusions:

1936—37: 2, 5, 3, 1, 4, 7, 6, 8, 10, 9

1937—38: 1, 2, 4, 3, 5, 6, 8, 7, 9, 10

1938—39: 1, 3, 2, 4, 5, 6, 8, 9, 7, 10

Thus no variety was found good enough to replace the "Local" as yields were not high when quality was present and quality was lacking when yield was satisfactory.

Selection work on the station: In consideration of the importance of fodder types of the tract, selection work was started for evolving fodder types in jonna simultaneously with grain types. J. 75 is a promising grain variety with white midrib, pithy and non-sweet stalk. In 1936—37, in a population of this grain type, a few dull-midribbed plants were noticed. The proportion of these dull-midribbed plants was very low (0·05%) and definitely these off-types did not arise by segregation. These dull-midribbed plants were kept under observation and they were found to resemble the rest of the population in every respect excepting in mid-rib colour and sweetness of stalk. These were expected to prove good progenitors of a superior fodder type. As such these were separated and given numbers from J. 1265 to J. 1301 for studying their behaviour in the subsequent seasons with the object of isolating a good fodder strain. Three of the promising selections were compared with "local", "Pedda jonna bulk" for yield of fodder, during 1939—40 and 1940—41 and the results are summarised below.

Varieties.	Yield of fodder in pounds per acre.	
	1939—40	1940—41
1. J. 1289	21,164	10,049
2. J. 1279	21,150	10,073
3. J. 1281	20,044	10,245
4. Local	16,064	9,003
Critical difference	1,645	1,000
Conclusion.	1, 2, 3, 4	3, 2, 1, 4

All the selections gave significantly higher yields than "Local" but the differences in yield among the selections were not significant. A mixture of these dull midribbed, sweet and juicy stalked selections was made since they did not differ either morphologically or in yield and under the name J. 75 (fodder type) the seed has been under distribution for purposes of fodder cultivation. Since this J. 75 (fodder type) seed had its orgin from J. 75, the pyru jonna strain, the former can be used for growing a fodder crop in the early season and a grain crop in the main and late seasons in the same way as the ryots do with "Pedda" jonna. Thus the long-felt want for a fodder type of high quality, to replace the "Local Pedda Jonna" type was satisfied by the isolation of J. 75 (fodder type).

Summary.

(i) Cultivation of fodder crops in a cattle breeding tract is a vital necessity and in the Ongole tract sorghum fodder is much valued, being grown on an extensive scale under rainfed conditions.

(ii) The variety of sorghum used for fodder cultivation is one popularly known as "Pedda Jonna". Though a quick-growing and high-yielding variety, it lacks quality, since it is a white-midrib variety, with pithy and non-sweet stalk.

(iii) Attempts made to replace the local type by suitable fodder types of other places were not successful, since the yield was poor when quality was good and quality was poor when yield was satisfactory.

(iv) Selection work at the Agricultural Research Station, Guntur, for fodder types resulted in securing sweet-stalked mutants from J. 75, a grain type of late (pyru) season, and these mutants gave better yields of good quality fodder than the local *Pedda Jonna*. A mixture of these mutants under the name of J. 75 (fodder types) is given out for distribution in the district. This fodder type can be used for growing a fodder crop in the "Early" season and a grain crop in the late (pyru) season, just like "Pedda Jonna" and can thus replace the later type completely.