

showed that 8 per cent were fully contabescent. These invariably shed when selfed. About 22 per cent were sectorially contabescent. In these flowers the stigmatic lobes near the contabescent portions of the androecium have no chance of self-pollination. But insects crawling about the stigma unwittingly effect a scattering of the available pollen all over, and thus will counteract the tendency towards skewness. In the absence of such an agency such flowers develop skew bolls. On selfing, the sectorially contabescent flowers produce skew bolls invariably. Thus, while skewness is facultative in open pollinated flowers it is obligate in selfed flowers. It is not improbable that the 3·4 per cent of skew bolls observed in nature is due to the fact that the flowers from which they matured are all sectorially contabescent and are not visited by insects. (The selfed flowers suffer from a disadvantage in that the contabescent flowers do not have a chance of pollination by insects. This may account for the numerical preponderance of skew bolls from selfed flowers over those from open pollinated flowers. The conclusion drawn is that skewness is brought about by the non fertilisation of ovules in particular locules.)

Further studies into the causes of the skewness are in progress and their results will be discussed in another paper.

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#### Reference.

Doak, Clifton C. The pistil anatomy of cotton as related to experimental control of fertilisation under varied conditions of pollination, *Amer. Jour. Bot.* 24: (1937) 187—194.

### Palmyra Fibre Industry.

By A. SANKARAM, B. Sc. (Ag.)

**Introduction.** In many of the villages of the Vizagapatam district extraction of palmyra fibre is an important cottage industry. The industry is fairly an old one. As a typical cottage industry it provides sufficient employment to the ryot during his spare time and supplements his income from cultivation. Of the different sources of brush fibre, the palmyra palm is easily the cheapest as it grows extensively on waste dry lands and on many field bunds. The technique of extraction is simple and does not involve the use of any costly appliances.

Narasimham (1) has dealt about the industry with special reference to Golukonda taluk of the Vizagapatam district. In the present article an account of the different phases of the industry is given, with particular reference to the economic aspect. The industry is mostly concentrated on

the east coast of the Presidency. The three districts, viz., Vizagapatam, East and West Godavaries, chiefly supply the raw material to the several factories located along the coast. The supplies are more or less regular throughout the year, but usually there is a slight increase during the dry months:— i. e. December to June. It is only during this period that a ryot can take it up as a side industry without prejudice to his main occupation.

**Extraction of fibre.** Leaf sheaths (basal portion of the leaf stalks) of palmyra palm trees are cut in lengths varying from 20 to 26 inches. They are split into two and the sharp edges and the thin layer of the inner side are removed. The portion remaining is beaten while it is wet with a wooden hammer on a hard floor, until the fibres get separated. They are then combed through sharp tines fixed to a flat wooden plank in two alternating rows of six each. The preliminary combing is not perfect as a part of the non-fibrous material still adheres to the fibres. The combed stuff is next bundled and taken to weekly shandies for sale.

**Preparation for the factory.** The local dealer who purchases this crude stuff gets it thoroughly cleaned, combed and dried in the sun. It is next graded into two classes—the thick black and the thin brown. Each class is separately made up into small bundles of 2 to 2½ inches in diameter. The material is then ready for transport to the factory.

**The process at the factory.** The material received at the factory is subjected to a lengthy process before it is made ready for export to foreign countries. Preparation of dye solution\* is an important item in the whole process. There are different dyes used by different factories, but in main all the factories use a mixture of Cutch (an inferior variety of catechu), Congo red (a patent dye preparation), and Myrobolan (*Terminalia chebula*). The fibre is then steeped in an iron receptacle, containing the dye and boiled for about 12 hours. The stuff is then removed and heaped on the floor. It is allowed to remain for about 3 to 4 days, in that state, without any further treatment. During this period the fibres absorb the dye. Finally they are dried and bundled.

The bundles are then heaped up in a circular fashion on a floor. The individual fibres are then graded according to their length, combed, bundled, weighed and packed into bales each weighing one cwt., for export.

**Export.** There is a good demand for the palmyra fibre in foreign countries especially England, Denmark, Japan and France. The standard specifications are fixed by the foreign buyers with reference to the length and thickness of the fibre. The material for export is prepared accordingly. It must be noted that all the material produced has to be exported, as there is no demand for the product in this country.

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\* Fourteen lbs. of Congo red and 14 lbs. of Myrobolan are added to 100 lbs. of water and thoroughly mixed, the undissolved portions being left in the solution itself. To the above solution are added 2 to 5 tolas of Cutch and about ½ lb. of washing soda.

**Quality of the fibre.** There appears to be a good deal of variation in the quality of fibre supplied to the factory. This is mainly due to the age and varietal differences of the tree, the soil in which it grows, the method of extraction adopted etc. The longer and thicker the fibre the better the value. An ideal fibre should possess the following qualities:—

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|-----------------|--|
| 1. Colour.      | Black.                                     |
| 2. Size.        | 16" to 18" long (fairly thick).            |
| 3. Cleanliness. | Should be free from all extraneous matter. |
| 4. Moisture.    | Completely sun and air dried.              |
| 5. Condition.   | Free from all fungus growth.               |

**Labour and wages.** The industry gives employment to a large number of labourers, mostly women. Wages are usually paid mostly on a contract basis according to the nature and amount of work turned out. For sorting, sizing and combing of the fibre women are employed who are paid 10 to 14 annas per cwt., according to the quality of the fibre sorted out. A woman can turn out one cwt. of the finished material in about 1½ to 2 days. On an average she earns Rs. 10 per month. All wages are paid in cash only. There are no fixed hours for the women coolies but they do their work in their leisure hours.

**Possibilities of a side industry.** During December to May, there is very little work to be done on dry lands. Agriculturists and labourers depending on such lands for their livelihood can profitably engage themselves by taking this industry, as a subsidiary occupation. They can take on lease the palmyra palm trees, cut the leaf sheaths, extract the fibre and sell the stuff in the nearest *shandy* where there is a market. On a modest estimate, a family with two adult members can extract 1,200 to 1,500 lb. of fibre in one year which will fetch about Rs. 24/- to Rs. 30/-. Deducting one-fourth as the lease amount, the balance can be taken as the net gain. It may, however be stated that considering the profits earned by the middlemen and the factory owners, the remuneration received by the primary producers is very inadequate. From the view point of the primary producer, the industry provides him with some kind of work for his leisure hours and a small source of income in cash.

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#### Reference.

1. Narasimham P. L. The palmyra fibre industry in the Golukonda taluk Vizagapatam District. *Mad. Agr. Jour.* 20: 235—236.