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A progressive increase of germination with shallower sowings is observable, more noticeably in the heavy black than in the lighter red soils.

An examination of the ungerminated 4-inch depth sown pot of TABLE VI showed that out of 100 seeds sown, 62 sprouted, 18 of them giving an appreciable and measurable length of mesocotyl and coleoptile, whose average mesocotyl length was 1·62 inches, and average coleoptile length was 1·06 inches, their combined average lengths being 2·68 inches, which is 1·32 inches below the soil surface. This varietal difference in response to depths of sowing in terms of germination percentage is graphically brought out in this instance.

These studies reveal the importance of this early phase of the seedlings' existence and the need for their study in the general scheme of the evolution of a successful strain.

SUMMARY

Sowing depth in Sorghum varies with soil and moisture conditions. Successful germination is due to the combined effort of mesocotyl and coleoptile. This combined length is a varietal character and is elastic within limits. Appreciable differences are noticeable within strains. This aspect of a strain will have to be remembered in its evolution.

## A SHORT NOTE ON THE SUGARCANE CULTIVATION IN HINDUPUR TALUK

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My idea in writing this article is to popularize some of the methods adopted by the Hindupur ryots in growing sugarcane. Garden cultivation is important in this taluk and sugarcane forms the chief commercial crop which pays ready money to the ryot. Notwithstanding the various difficulties met with by the ryots in growing a crop of sugarcane every year they cultivate at least half an acre of sugarcane always.

**Varieties of sugarcane.**—The two popular varieties are 'Pedda Cheruku' and 'Chinna Cheruku' (big and small canes as literally translated). Pedda Cheruku is more juicy than the other, but on personal observation both the varieties yield 350 to 400 maunds of jaggery (1 maund=25 lbs.) per acre. The thinner variety resists drought better and gives a better quality of jaggery which fetches a higher price. Ryots are often impressed with the better tonnage of the canes and so Pedda Cheruku is more popular. Sometimes gardens can be seen where both the varieties are grown as a mixture in order to improve the quality of the jaggery.

**Rotations.**—There is a common belief that sugarcane after tobacco yields best and that a superior quality jaggery is obtained from such a crop. As tobacco is limited to particular areas the general rotation is paddy or ragi and sugarcane. Between paddy and ragi, ryots prefer paddy to precede sugarcane since they believe the soil improves in its condition after a paddy crop.

**Preparatory cultivation.**—The land is ploughed eight to twelve times with a wooden plough generally bigger than the ordinary country plough, to

produce a good tilth. The ryots according to the nature of the soil alternate the ploughings with the working of a heavy *Guntakka* (blade harrow) which levels the land and breaks the clods. Ridging is done two feet apart.

**Manures and manuring.**—Cattle manure is the most favoured manure. The ryots allow the manure to undergo complete decomposition for fear of white ants after application. A liberal dose at 60 cart-loads per acre is applied to the field. The manurial ingredients will constitute a very low percentage since lot of earth is added to the manure during preservation. A careful ryot, in addition to the cattle manure, applies 25 to 30 maunds of *Pungum* cake or occasionally castor cake and 150 cartloads of tank silt. The cake manure is usually applied first while ploughing takes place and the cake is applied along the ridges. Some ryots mix *Pungum* oil with irrigation water and are of the opinion that the jaggery outturn is more and will be of a high quality when the oil is used. It should be mentioned that there is absolutely no practice of applying the cake for a second time two or three months after planting.

**Planting setts.**—It is very encouraging to note the adoption of an economic seed rate in many of the villages of the taluk. The usual seed rate is 12,000 setts per acre. In the eastern portion of the taluk, i.e., in the villages of Gorantla, Palasamudram, Kodura, Chilamaturu and Kodikonda, the usual seed rate is 16,000 setts per acre. The ryots are quite aware of the importance of using the sugarcane tops for seed purposes. In some places they use the top canes for planting. This system is adopted especially when planting takes place after crushing. They preserve the tops under shade of some trees well covered with paddy straw and sugarcane trash.

It is interesting to note that the planting and milling of canes are done side by side and last from December to April.

**Irrigation.**—The first irrigation is given while planting. After 8 days the field receives a second irrigation and a third after 15 days of planting. A month after planting, digging and ridging takes place and afterwards the crop is irrigated once in four days according to the nature of the weather. On the whole the crop receives on an average 40 to 50 irrigations before it is harvested.

**Wrapping and roping.**—Wrapping is common but roping is new to many. The first wrapping takes place after three months and subsequent wrappings are done once in a month. Thus on the whole 8 to 9 wrappings are done.

Roping is an interesting operation. The Hindupur ryot is a very careful grower of sugarcane. With less cost he makes his canes proof against sudden gales. Even wind-breaks are not much in vogue. The roping operation does immense good. When the crop is 7 or 8 months' old, ten or twelve canes are tied together and several groups of canes are thus formed. If the crop does not grow very high, the crop is left with this. If it grows tall a rope made of aloe fibre is passed from group to group and sugarcane leaves are twisted against the rope along with it, which gives additional strength and firmness to the groups against sudden gales.

This operation is quite peculiar to the tract and worthy of imitation as it involves a small expenditure of only Rs. 5 or 6 per acre. No propping is done.

**Harvesting.**—The crop comes to maturity after 11 months as elsewhere. Harvesting, milling and planting take place simultaneously in many places. Six men harvest one acre of cane crop within 15 days. They are not always engaged in harvesting. They help in jaggery boiling also.

**Milling of canes.**—The three-roller iron mill is used. The country mill is practically absent. The juice is collected in a conical receiver (similar in shape to a flower pot) which is buried flush with the ground and the juice is carried to the pan by means of pots.

**Jaggery making.**—At every charge 2 to 2½ maunds of jaggery are obtained. Sometimes three maunds are obtained. Moulds are not employed. The jaggery is made into balls. When the jaggery is about to solidify the semi-solid jaggery is poured into a wooden pit one yard square and 6 inches deep, made for the purpose. While the stuff is still hot it is made into balls. Two men prepare into balls in half an hour, 2½ maunds of jaggery. Moulds are not preferred because balls withstand transit better than moulds. The latter breaks often and fetches a low price. Hindupur supplies jaggery to all the four Ceded Districts.

**Studies in cost of cultivation.**—Mr. Nanjappa is a retired village schoolmaster much esteemed for his three R's. He has seven acres of garden land in Hindupur and grew one acre of sugarcane this year. I collected the following facts and figures from him which are very near to the average figures I collected from many parts of the taluk.

Mr. Nanjappa used the Sindwahi furnace and pan for the preparation of jaggery with the help of the Agricultural Department last year and this year and he is quite convinced of the benefits of using the Sindwahi furnace and pan.

The local furnace consists of a pit wherein the heavy local pan rests three-fourths to its height and there is a vertical distance of 1½ feet from the bottom of the pan to the bottom of the furnace. There is a hole of three inches diameter in the centre for the ashes to escape into a diagonal hollow of 6′ long dug for the purpose. The labour taken for constructing such a furnace is 8 men who are paid eight annas a day and thus the total cost comes to Rs. 4.

The local pan costs about Rs. 35.

Let me work out the economic saving as accepted by Mr. Nanjappa by adopting the Sindwahi furnace.

| ..... | Local furnace and pan. | Sindwahi furnace and pan. |
|---|---|---|
| Number of boilings per day ... ... ... | 6 | 8 |
| Taking three maunds of jaggery are obtained per boiling, number of days required to mill an acre would be (Yield of 350 maunds of jaggery per acre) ... ... ... ... ... | 20 days | 15 days |
| Labour required (for one day for harvesting, milling, boiling, etc., 9 men are required) ... ... | 180 | 135 |
| Cost of labour ... ... ... ... | Rs. 56-4-0 | Rs. 42-3-0 |

Thus there is a saving of Rs. 14-1-0 in boiling alone. There is a saving in fuel also in the improved furnace which will amount to Rs. 5 and only three men are required for constructing the furnace and hence an extra saving of Rs. 2-5-0. Thus the saving on the whole is Rs. 21-9-0 by using the Sindwahi furnace.

## POULTRY AS A SIDE LINE

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In nearly every civilized country the egg has been recognized as a wholesome food. The demand for the article is so great that nearly every country is paying a great deal of attention to poultrying. Apart from mere production, marketing has become highly efficient. In Europe, especially in Denmark eggs are collected, each egg marked as to the number of Co-operative Society concerned, etc. and packed efficiently so that it may reach the market some hundreds of miles away with as little breakage as possible. From the East, China is able to produce large quantities of eggs for the market in England and make a decent profit, despite the distance the eggs have to travel. Assam is also making strenuous efforts in the marketing of eggs.

It is a well-known fact that various breeds of fowls have originated from the red jungle fowl (*Gallus Bankiva*) which ranges from the north of India to south-east Asia as far as the Phillipines. Though breeds apparently find their origin in India yet the Indian ryot cannot boast of maintaining a respectable breed. Generally the breed found in the villages are hardly pure and as for system of keeping, there is none. The economic conditions in India are simply pitiable and it is time that the ryot thought of giving more attention to poultry management, and earn a few more annas, which are no doubt most welcome in these hard times. The more advanced type of ryot, or the educated classes which are apparently interested in agriculture can easily organize poultry farming, and in course of time not only supply the markets in India but also the one in London.

Poultrying in Europe, is a woman's job on most farms. The farmer's wife generally manages the poultry and for her trouble keeps the earnings to herself. There is no doubt that similar system exists in this country wherever fowls are kept, and I hope earnestly that the women in this country would be as much interested in this side of Industry as her sisters in Europe. I am hereunder making some notes for the benefit of those, who wish to interest themselves in poultry, but it must be remembered these observations are in no way complete. For instance, feeding of poultry is still empirical and it is likely that we shall know more about the nutrition of poultry when Belfast, Harper Adams College and Cambridge poultry sections have completed their investigations. In the near future the Live-stock section will, I hope, be in a position to carry out feeding tests with local grains etc., and give the public useful advice.

### Choice of breed.

Choice of breeds greatly depends on the purposes of the breeder. For egg production, one may choose either the Leghorns or the Ancona, for