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A Note on the Cultivation of *Dioscorea esculenta* in the Neighbourhood of Anakapalli

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Introduction *Dioscorea esculenta* Burk. is an economic plant largely grown by the vegetable gardeners in the neighbourhood of Anakapalli (Vizagapatam District). It is cultivated in some places in the north of the district also. The underground tubers which the plant produces are largely used in the district as an agreeable vegetable. Well-developed tubers resemble potatoes in many respects, except for the numerous root fibres on them. In taste they are somewhat sweeter than the common potato and easily lend themselves suitable for the preparation of a variety of dishes. It is, hence, commonly nick-named as the 'Indian potato'. It is a cheap root vegetable available in the local markets and is favoured universally by the rich and the poor. Its Telugu name is *silakadam.*

Botanical *Dioscorea esculenta* Burk. belongs to the family Dioscoreaceae. Like other members of the family the plant is a herbaceous annual with twining or procumbent stems bearing large or small subterranean tubers. The following is a complete botanical description of the plant.

Stems prickly, leaves simple, orbicular or reniform, accuminate or cuspidate, base cordate, 2 to 5 in. long; petioles about as long; spikes 6 to 18 in. long; flowers erect, with a disk within the 6 perfect stamens. Capsule oblong, slightly narrowed below, apex retuse, seeds broadly winged all round. Tubers numerous, edible, stalked, protected by root fibres, generally bearing spines up to 0·5 in. long. It is very variable under cultivation when it often loses the spines in the roots.

Soil and preparatory cultivation Soils of high fertility with free drainage, *e.g.*, sandy loams, are considered to be ideal for this crop. However, soils of medium fertility when well supplemented by organic manures give equally good results. But free drainage is of paramount importance. After the removal of the previous crop the preparatory cultivation commences. Eight to ten ploughings are considered necessary to bring the land to very fine tilth. In the bed system of planting the field is thrown into beds of 8 ft. square. Irrigation channels are formed between every set of two beds. Where planting is on the crest of ridges the plot is worked up into ridges and furrows with irrigation channels at 16 ft. length of the furrows. In the garden lands the crop comes in rotation with other vegetable crops like brinjal, *bendai*, etc., or *ragi*. It is also commonly grown mixed with other vegetable root crops like colocasia (Tel: *chama*) and *Dioscorea alata* (Tel: *pendalam*). It is a common practice to plant setts of tapioca around plots of this crop.

Manures and manuring The crop is one which shows marked response to good manuring. Sheep penning is generally resorted to besides

Dioscorea esculenta — tubers

he application of 15 cart loads of farm yard manure. Still higher doses of manure are considered to give economic yields.

Seed material and planting The preparation of the land which commences in March comes to a close by the end of April, and planting will be in progress towards the end of May or during the month of June soon after some showers of the south west monsoon are received. The seed material for planting consists of mature tubers taken from the previous crop and preserved with care. During the harvest in January good and healthy tubers are carefully selected to serve as seed material for the next year's crop. The seed material thus collected is stored in a cool place under a thatched shed.

The prepared seed beds or ridges and furrows, as the case may be, are first watered. Planting is done in rows 9 inches apart on square, one tuber at each sowing spot, and four to six inches deep in the soil. In the ridge system tubers are planted on the crest of the ridges 9 inches apart. About 1500 lb. of tubers are required to plant an acre of land.

Irrigation Maximum production calls for copious watering coupled with free drainage. On the whole the crop requires eight irrigations besides the rainfall received during the life of the crop. The practice of well irrigation with a *picotah* is very common with the growers.

After-care The tubers begin to germinate in about 10 to 12 days after planting, and in about six weeks the vines require strong support for rapid growth. At the centre of a set of four vines, each arising from one tuber, a single bamboo pole is planted and the set of four vines is trained on to it. Nearly 10,000 bamboos are required for propping a crop in one acre. Where holdings are small, extending over few cents, dried plant stems or any suitable material is used for the purpose. A fortnight after planting the plot is weeded and two weeks later the first hoeing is given. A second hoeing follows a month later. The plots are weeded as often as necessary. About three weedings and two hoeings in the duration of the crop, will ordinarily keep the field free of weeds.

Harvest The crop stands in the field for more than six months from the date of planting. The sign of maturity is that some of the older leaves turn yellow and begin to drop off. Further the cracking of the land round about the plants is an additional feature of maturity of the crop. The harvest commences in November and is carried on in stages till the end of January. The harvest consists in lifting of the entire vines by digging round the plants with a crow bar. Great care is exercised during the harvest to avoid injury to the tubers by way of cuts, as such tubers will have little market value. Each vine produces 3 to 6 tubers depending on the soil, season and manure applied. The tubers are separated from the plant and after a little drying they are shaken to remove the adhering soil. The roots of each tuber are removed with a knife and they are thus rendered fit for sale in the local markets.

Yield and marketing A successful crop yields 8,000 lb. of marketable tubers and an average yield can be taken to be 7000 lb. per acre. Still higher yields would be obtained during seasons of normal and well distributed rainfall. The tubers are available for sale from November to February. They command a fair sale in the local markets. It is at present not available in large quantities for export to distant markets. The price varies within a wide range from 8 annas to a Re per maund of 24 lb. The price is usually at its maximum during October and at its minimum in December.

Economics of Cultivation The cost of cultivation comes to Rs. 142—6—0 per acre. Taking an average crop to yield 7000 lb. per acre and the produce valued at 6 ps. per lb. the gross income from an acre will be Rs. 218—12—0, with a net gain of Rs. 76—6—0. Under the contract system of disposal of the standing crop, common with many of the farmers, the *ryot* realises a net gain of Rs. 60 per acre, the harvest and cleaning charges being borne by the contractor.

Cost of cultivation per acre—Details.

Preparatory cultivation, 8 ploughings and ridging ...	Rs.	10	0 0
15 cart loads of cattle manure and sheep penning ...		20	0 0
Seed material (1500 lb.) and planting—10 men ...		49	6 0
8 irrigations		24	0 0
After care (2 hoeings and 3 weedings)		7	0 0
Harvesting and cleaning—30 men		7	8 0
Assessment on land, etc.		4	8 0
10,000 short bamboos for propping— proportionate cost per year ...		20	0 0
Total cost of cultivation per acre		142	6 0
Yield—7,000 lb. valued at Rs. 0—0—6 per lb. ...		218	12 0
Net gain per acre		76	6 0

Note:—Agricultural holdings of this particular crop are mostly small varying from 5 to 50 cents. Small holdings as these can easily be managed by a farmer and his family without any additional cash expenditure. Hence the total income forms a net gain to the farmer. In the case of larger holdings of one acre and more cash expenditure will be as high as Rs. 54 per acre. Many a farmer of the area cite this as an important reason for raising the crop on small holdings.

Conclusion In and around Anakapalli the crop is commonly grown by the market gardeners. The average holding of a *ryot* with reference to this particular crop ranges from 5 to 50 cents. Only a few *ryots* grow it on an acre scale. At present there has not been any appreciable demand for the tubers from outside the production zone. This is largely due to its being little known in many parts of our presidency. In view of the decent profits arising out of the cultivation of this crop it should be an attractive proposition for market gardeners in the neighbourhood of urban areas to take to its cultivation.

If at the present juncture as a part of the "Grow More Food" campaign advantage is taken to raise this cheap yet delicious root vegetable in all suitable localities, the object of this short note will be more than achieved.

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Improved Agricultural Practices Introduced in Hindupur Taluk

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***Pillipesara* in *Ragi* as a means of grow more food** In the taluk of Hindupur of the Anantapur District it is a general practice to grow a crop of *ragi* from March—April to August—September or June—July to October—November in the *ayacut* under tanks aided by wells, instead of paddy because of the insufficient supply of water in the early part of south west monsoon. The crop is invariably transplanted either in beds or in rows and before the end of a month after transplantation, a hoeing or two is given to remove weeds. A few days later in case of failure of rains a light irrigation is given wherever possible. On the small ridges formed at intervals of 3 to 5 feet lablab is raised. Two to four months after the harvest of *ragi* the lands lie fallow but for lablab. A portion of the early planted field is set apart for sugarcane planting. The rest of the whole area or a part of it, is put to paddy depending upon the quantity of water available in tanks.

By way of an improvement of the existing conditions *pillipesara (phaseolus trilobus)* was inter-sown in two years at 25 lb. per acre at the time of the final hoeing instead of lablab which resulted in :—

(i) The yield of *ragi* was about 5 % higher than the one without it.

(ii) After the harvest of *ragi* 1 to 3 cuttings of *pillipesara* forage was obtained depending upon the duration of the fallow period. Fifteen to twenty animals could be fed continuously on one acre produce with the result that there could be a 50 % higher yield in milk not to speak of the improved condition of the animals and (iii) The subsequent growth when ploughed in was manure to the next crop.

Sugarcane planting. Sugarcane is a paying crop which the *ryots* grow to get money to meet their various items of expenditure. It has been the endeavour of the Agricultural Department to improve it in all aspects viz., varietal, cultural and manurial. One of the methods of planting is to have the setts end to end in the row. With the same number of setts per acre, instead of their being in the line end to end if planted slantingly at about 45 degrees to the sides of the furrow and all in one direction, good results are obtained.