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THE JOURNAL
OF
**The Madras Agricultural Students'
Union.**

Vol. XII.

FEBRUARY 1924.

No. 2.

Tobacco in Guntur District.

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Introduction.

The cigarette is one of the many creations of the nineteenth century. Its powerful aid in developing the sociable qualities of men has won popularity for it wherever it has reached, so that it is now no exaggeration to state that it has over-run the whole world. The invention of the cigarette-making machine has enabled the production of the cigarette in its tens and hundreds of thousands and has led to the flooding of the markets of the world with its various brands.

Cigarette manufacture was first tried in India with the local varieties, but it resulted merely in the production of low-grade ones, so that it was found necessary to import from America the bright yellow, mild Virginian tobacco for making the high grade brands. This naturally increased the cost of production with the result that competition with the imported cigarettes became impossible. The Indian cigarette concerns formed the idea of growing the tobacco in India and utilising the produce. The After sowing the attempt of the attempts made in growing the Virginia until the entire Indian conditions. is very essential as

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tobacco, the climate imparts the flavour, and the methods of cultivation determine the colour, strength, elasticity and body of the cured leaf. The soil considered best for bright-coloured tobacco is a good retentive black soil with a fair proportion of sand and with a whitish tinge in it. Heavy clayey soils produce dark leaves.

After a careful study of tobacco growing tracts all over India, the Guntur tract was selected as the best for the trial of Virginian tobacco. There are other tracts also which produce fairly bright-coloured tobacco, but the soil condition of Guntur is such that it retains moisture for a very long period and tobacco can be grown as a dry crop. Generally under dry conditions, we get a bright coloured leaf. Moreover, the climate of Guntur is peculiarly suited for the adoption of the air-and sun-curing system, on account of the extreme dryness of the atmosphere during the period from January to May, for then there is no fear of damage from rains while the curing of a large quantity of leaf is in progress in the open air. Yet another reason for selecting Guntur is that this district alone is responsible for the production of nearly half the quantity of tobacco that Madras Presidency produces. During 1920 a small beginning was made near Guntur and two acres of Virginian tobacco was grown with very great success. In 1921 its cultivation was extended to 40 acres.

Preliminary Cultivation:—This consists in giving deep ploughing during June after the first rain, followed by another ploughing. This practice was adopted in order to make the soil absorb as much water as possible during the heavy rains of July and August. Then a third ploughing is given after the heavy rains are over by about the middle of September and two more ploughings follow. By about the first week of October, the fields are ready with lines marked 2'9" apart lengthwise and breadthwise to receive the seedlings at the junction.

Manuring:—Tobacco is a heavy feeder hence the question of its manuring is of vital importance as the quality of cured leaf depends on the form, quantity and quality of manure applied. It is important to avoid applying to the soil substances which might injure any desirable quality in the leaf. It is better to avoid the use of chlorides which injure the burning quality of the leaf. From last year's experience of manuring we learn that in plots with coarse form of nitrogenous manures such as castor cake, a manure (rubbish mixed with night soil) was applied, **D.**, cured leaf was very much affected. It strikes one that manures are applied they decompose with excess Nitrate of soda and sulphate of ammonia may be but for the following reasons:— (1) they are **venency**.

are very easily soluble and as such they are liable to leaching; (III) they are found always mixed with a certain quantity of common salt which is quite objectionable as it develops chlorine and thus spoils the burning quality of the leaf. For the same reasons potash salts and fish guano are not used. Large quantities of tobacco waste were applied to a major portion of my tobacco farm, individual plants being manured with the finest powder made out of these wastes. The result was very well seen in the crop. The plants grew and cured exceedingly well and surpassed all other plots. Now every effort is being made to preserve all available tobacco waste products for manure. Usually after the tobacco leaves are stripped for curing, the stems are pulled out and used as fuel. This year a compost was made of all these green tobacco stems. Stems were pulled and put into pits with a little water and covered with soil, layer after layer, and the material used after a period of about one year. The excellent manurial value of tobacco waste is known everywhere now and there is a good demand. The waste that could be bought at Rs. 2 a candy of 500 lbs. is now offered for sale at Rs. 10 a candy. Tobacco waste has been found good even for chillies.

Seedbeds:--No operation in the culture of tobacco is more important than that of the preparation of seedbeds and the sowing of seeds. Producing plenty of good, strong and healthy seedlings is the surest foundation for a good crop of tobacco. A plot with a slight slope, to ensure free drainage, free from trees within a circumference of 50 feet, and with a rich, friable, black, loamy soil forms the best place for raising seedlings. The selected plot is thoroughly ploughed many times until the soil is pulverised into an impalpable powder. When the soil is thus brought into this happy condition, beds are marked 5 feet wide and 30 yards long with footpaths 1 foot broad all round. Well-rotten cattle manure is spread over the beds, stones and roots are brushed and removed completely. The proper time for sowing seed is about the middle of August. Tobacco seedlings feed very well on manure and unless we apply a heavy dressing of manure, the young seedlings may not grow with vigour. Being small the seeds are sown at the rate of one table-spoonful for every 40 sq. yds. of seedbed. This gives enough seedlings to plant two acres. Before sowing it is usual to mix the seeds with a large quantity of very fine sand to secure even seeding and perfect sowing. After sowing it is not necessary to work the seed into the soil, if this is done, it will cover the seed too much, and the result is poor germination. After sowing the beds are best pressed with a board or with the feet until the entire surface is smooth and compact. Firming the soil is very essential as the compact surface retains the moisture which mainly assists the germination of the seeds and gives a firm footing

to the tiny seedlings. Generally a mistake is made in sowing too much seed. It is better to err by using too little. In the latter case, the plants will be large, healthy, low and stocky, and as such, they will withstand a very hot sun and can be set with very little moisture in the soil. When plants are crowded in the beds, the stems grow small, delicate and white, and perish in large numbers after transplantation. The few that survive take a very long time to show a healthy growth. After the soil is made compact, the beds are watered gently with a rose-can and the surface is not allowed to dry. Virginia seeds germinate on the 8th day whereas the local tobacco seeds germinate 2 days earlier, which is perhaps due to their bigger size. After germination, watering is regulated with great care, because with a slight excess of moisture in the bed, the seedlings perish all on a sudden. The nursery is weeded with great care and carefully watched from the attack of grasshoppers, flea-beetles etc. In about 45 days the seedlings are ready for planting. One important operation to be attended to during the growth of the seedlings is that of giving shade to protect the tender seedlings from the hot sun between 10 a. m. and 4 p. m. and also to keep away insects and prevent the accumulation of drifted leaves or trash in the beds. In America, costly muslins or canvas are used for this purpose, but in Guntur where bamboos or very cheap thatties were used with great advantage. These thatties were supported on pegs driven on the sides of the beds. Unprotected beds lost nearly 60 percent of the seedlings.

Transplanting, Watering and Cultivating:—After having prepared the field properly to receive the plants, the work of transplanting requires utmost care. Carelessness and neglect in transplanting tell seriously on the growth of the crop. Early planting is always good as it provides a long period of growth which gives tobacco ample time for the elaboration in its vesicular system of the oils, waxes and gums that contribute to its sweetness and fragrance. The usual time of planting country tobacco is about the middle of October, but Virginian tobacco was planted in the 1st week of October. Before the seedlings are pulled out, the seedbeds are thoroughly watered. They should be drawn one at a time so as to leave the smaller ones uninjured and so as not to injure the rootlets of the seedlings taken. The seedlings are kept in specially made well ventilated baskets and taken to the field for planting. A dropper with the basket containing the seedlings goes in advance dropping the seedlings in required places in 4 or 5 rows. A fairly long, smooth round peg about 2" in diameter, is used for making holes. The land is soft and moist as the planting time falls in the middle of the rainy season. Watering is however necessary just before planting in each hole and the plants

which are then placed in position are pressed compactly. As planting is done in the rainy season, the sun is not severe and no shading is necessary; but it is better to plant always in the evenings. If the weather is cloudy, planting may be done throughout the day. Careful planting is essential to ensure a good stand. The plants wilt down during the day, but if they look fresh in the morning it is a sign of perfect setting. Further watering should be done for 2 or 3 days after planting, in the early mornings when the plants are rigid. If watering is done late in the day or in the evening while the plants show a wilting, the result is that mud will cover the leaves and buds and the seedlings die without setting. If it rains soon after the plants are set, they will soon strike root and commence growing and a good stand will be ensured. In this case there will be no need for pot watering on the 2nd and the 3rd day. Much depends upon having a good setting. Replanting of missing holes ought to be done as early as possible. Good seedlings should be used for this purpose and great effort made to give every plant an even start. As the soil in this tract is very retentive, the crop grows luxuriantly despite changes in the weather. Cigarette tobacco should be grown only as a dry crop in order to preserve the colour. Irrigation makes the leaf darker and heavier, injuring its burning qualities as well as its flavour and aroma. In this district the rains cease in November and from December a kind of sea-breeze known as "*Payirogali*" blows in the evenings, This breeze acts like a magic wand and produces a marked change in the progress of the crop. The plants grow vigorously and healthily. As a matter of fact last year, i. e., in 1921, there was practically no rain from the middle of October and yet the plants grew high and measured after topping nearly 5 to 5½ feet with 15 to 18 leaves (average size 30" x 15") in each. A fortnight after the plants have been set, intercultivation is commenced and continued as long as the size of the plants permits. This operation is done by the bullock hoe. The implements used are known as "*Potti gorru*" and "*Potti guntaka*". The former is a wooden implement with 3 tynes which exactly fits the interspace between rows, and is worked lengthwise and breadthwise. Subsequently, the *potti guntaka*, a wooden implement having with an iron blade is worked and this levels the stirred soil and removes weeds. This kind of cultivation is repeated twice or thrice as the case may be. Cultivation should be shallow especially in the later stages of growth to avoid injury to the plant. Ordinary surface cultivation to maintain a fine mulch about the plant with frequent hoeings to keep down weeds as described above is quite essential.]

Topping and Suckering:—When about 50% of the plants in the field have developed flower heads, and before these have bloomed, topping is done. It is done by nipping off the terminal buds leaving a certain number of leaves say 15 to 18 in number, so as to allow the

plant to develop more fully the lower leaves. Carelessness in topping impairs the value of the crop, for if more leaves are left on one plant than on another, plants will ripen unevenly, which is bad. The topping operation should be so skilfully performed as to enable all the plants to ripen uniformly, and thus secure a uniform quality in the cured product. When the seedheads are topped, the plant makes vigorous efforts to reproduce itself and every bud at the axils of the leaves begins to produce subsidiary branches. These branches must be diligently removed; otherwise, the development of the leaves will be retarded.

Diseases:—Grasshoppers attack this crop both in the nursery and in the full-grown stage. In the nursery the top coverings protect the seedlings to a great extent. The grasshoppers that attack this crop are sluggish in their movements, handpicking and destroying is very effective. Soon after planting, a black beetle known as 'mahila' cuts the plant at the junction of the root and the shoot. The attack is not very severe and such plants can be easily replaced. Tobacco worm (a sphinx? caterpillar) appeared last year in our crop. These are voracious feeders which devour the tobacco leaf in no time. These caterpillars are also very sluggish and hence hand-picking and destroying is the best method. Brown rust and a mildew appear in stray plants. The attack is not severe and the affected plants can be easily pulled out and destroyed. The parasite (*Orobanche nicotiana*) appears in badly cultivated fields and the shooting inflorescences may be pulled out whenever they make their appearance. By a regular rotation the attack may be completely prevented.

Harvesting and curing.—Nearly a month after topping, *i. e.*, by about the beginning of February, the plants are ready for harvesting. Locally tobacco is harvested from top to bottom with a curved knife in one and the same day with a little stem also attached to the leaves and then stringed. But in the case of Virginian tobacco the leaves are stripped from below as they mature, first the bottom 8 to 10 leaves and after a week or 10 days, the top leaves; thus a uniform quality in the cured leaf is secured. The stringing in three-ply jute twine measuring 7 feet long should be done thinly in the case of Virginian tobacco as this requires free ventilation for its proper curing. If this is done closely, it badly affects the colour of the cured product. Another important point to be considered in harvesting is that, unlike the country tobacco, this variety should not be exposed to the sun soon after harvest even for a few minutes. If this is done, the leaf being very thin and delicate turns dark and becomes unfit. The method of curing varies with the kind of leaf grown and the object for which it is used. Different types of tobacco are differently cured, but I confine myself to the curing of

yellow tobacco suitable for cigarettes. Curing of yellow tobacco requires very good judgment. Slow curing develops colour and rapid process destroys it. There are 4 different methods of curing in the case of yellow tobacco. (1) By means of flues in timber houses. The temperature is so adjusted that the whole curing is finished in about 5 or 6 days. The leaves cured in this way are considered to be very good and they fetch a very high price; but the process is very costly. (2) By means of open fire. In this case the pores of the leaf are filled with carbonaceous matter which preserves all the good qualities in the leaves. As the porous system is filled with creosotic compounds the absorptive capacity of the leaf when artificial flavours are added, is very much diminished. Hence this system has very little following. (3) The tobacco ropes are tied firmly to the tier poles and then arranged in racks inside open sheds with free ventilation and cured. All the above three systems of curing are never tried in Guntur tract with country tobacco as they are too costly for the Guntur ryot to follow. (4) The sun curing method. In this case the whole process is done in the open field under the direct influence of the sun. This is cheap and hence this system is the only system followed by all the ryots of the Guntur tract. In both the air and sun cured tobacco the natural flavour of the leaf is better preserved and its porous system is greatly developed to absorb artificial flavourings with which it is treated in the process of manufacturing. But Virginian tobacco was cured by the combination of the air and sun curing methods and the following are the details of the process:—The stringed ropes 7 feet long are tied to a tier pole 9 feet long leaving 1 foot on either side. The tier pole is a thin bamboo to which the tobacco rope is tied and kept well stretched without hanging in the middle. These ropes on the tier poles are taken and arranged on racks inside the sheds closely. In this manner it is kept for nearly 24 hours and the leaves turn yellow after that period. This process is called 'the yellowing process.' After this the tier poles are arranged on racks 6 inches apart so as to allow free ventilation and kept in this manner exposed to the sun for nearly 48 hours. This fixes the yellow colour. The racks are covered with mats during nights to prevent the leaves from the attack of dew which affects the colour of the leaves. In this way it is kept exposed to the sun for nearly a fortnight. The moisture from the leaves and midribs will gradually pass away and then the ropes are subjected to the bleaching process. This is done by spreading the ropes on the floor and allowing the rays of the sun to have full play on the leaves for nearly 36 hours. This process improves the colour considerably. After this process on a fine morning the ropes are removed when they are soft, folded and bulked in an ill-ventilated room. The bulks are shifted very often, say once in 2 days, for nearly a month, and only during this process the tobacco develops its maximum colour, aroma and all the other good qualities

chiefly due to the action of bacteria. This bulking requires good judgment and only expert hands should attempt this work. Carelessness in bulking will bring in disastrous results. After a month's bulking the tobacco is ready for use. The leaves are removed from the strings and graded according to size and colour and then pressed into bales weighing 200 to 250 lbs. in hand presses inlaid with mat and covered with gunnies. These bales are sent to the factory for being manufactured into cigarettes. Last year on an average 800 lbs. of cured, butted and picked leaf was obtained per acre. The cost of cultivation amounted to 5 annas per lb. and even valuing this Guntur grown Virginia at Re. 1 per lb. it gives a nett profit of nearly 11 annas per lb. or in other words Rs. 550 an acre.

This experiment has proved a big success. The opinions of the manufacturers are favourable. They have reported that the sample of tobacco sent to them looked exceedingly good, that the cigarettes made out of the Virginian tobacco grown in Guntur were exceedingly nice, and that the colour as well as the taste of the tobacco were excellent. This achievement will, it is hoped, revolutionise the tobacco industry of this tract and ultimately it may also help the cigarette trade of India to develop in the course of a few years.

Random Thoughts.

Patience is holding on. perseverance is holding out. faith is holding up.

How may a man attain to self-knowledge? By contemplation? Certainly not; but by action. Try to do your duty and you will find what you are fit for. But what is your duty? The demand of the hour.

Goethe.

Charity:-

Never to despise, never to judge rashly, never to interpret other men's actions in an ill sense; but to compassionate their infirmities, bear their burdens, excuse their weaknesses, make up and consolidate the breaches of charity happened by their fault, to hate imperfections, and ever to love men, yea, even your enemies: therein the touchstone of true charity is known.

Caussin.
(From *Great Thoughts.*)