TOBACCO IN SOUTH INDIA—II

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SEASON

IT is only during the north-east monsoon under a rainfall of about 10-15 inches that tobacco is grown in South India. The crop is usually planted between the months of October and November but sometimes up to December while harvesting is carried out during the dry season from about the end of January to March. The meteorological data for three centres representing some of the important tobacco growing districts are given on the next page in a table in which the tobacco season is shown enclosed by heavy lines.

The rainfall during the first two months of the monsoon is not more than about 5-7 inches for each month but, thereafter, it falls off considerably and from January to March the precipitation is less than 1 inch per month. There are no heavy monsoonal rains as are experienced even in the dry zone of Ceylon and the crop is thus cultivated under a light rainfall which is most suited for its growth. Ripening and curing take place when dry weather is assured and there is no interference, again, from heavy or unseasonal rains. The whole crop is completed before the advent of the warm season when the temperatures become too high for optimum growth.

It is considered that the period when dew prevails from about November to February is of advantage in preventing the leaves undergoing ripening and curing from becoming too dry to be handled without damage. In the Guntur district, the presence of a moist, southerly wind known locally as *pairu gali* commencing about January and lasting usually until May is regarded as being greatly beneficial to the crop during its latter stages of growth when the weather conditions are even somewhat too dry then.

TABLE SHOWING THE METEOROLOGICAL DATA OF CERTAIN CENTRES IN SOUTH INDIA

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Guntur: Rainfall (ins.)	0·48	0·21	0·88	0·55	2·56	4·81	5·59	5·33	5·28	5·34	3·89	0·23	35·15
Temperature (°F.) ..													
Maximum	86·5	90·9	95·9	99·9	104·8	99·5	94·2	93·4	92·7	91·0	87·5	86·1	
Minimum	64·2	68·6	73·1	77·7	81·1	80·7	78·3	77·9	76·7	74·7	70·1	64·3	
Relative humidity at 8 hrs. (%) ..	86	85	84	83	72	72	78	77	81	83	82	83	
Coimbatore: Rainfall (ins.)	0·59	0·32	0·48	1·44	2·36	1·66	1·46	1·13	1·51	6·41	3·75	1·18	22·29
Temperature (°F.)													
Maximum	86·4	91·5	96·1	97·3	94·8	89·3	87·5	88·1	89·1	88·0	85·8	84·7	
Minimum	64·3	66·0	69·9	73·5	73·5	71·8	70·9	70·9	70·8	70·6	68·9	65·7	
Relative humidity at 8 hrs. (%) ..	82	80	78	79	80	80	81	83	83	84	83	82	
Trichinopoly: Rainfall (ins.)	0·68	0·56	0·43	1·65	3·14	1·41	1·57	3·83	4·83	6·90	5·57	2·61	33·18
Temperature (°F.)													
Maximum	87·5	92·4	97·7	101·1	101·6	99·0	97·3	96·6	95·2	91·2	87·2	85·4	
Minimum	67·7	68·9	72·8	77·8	78·8	78·6	77·9	76·9	75·8	74·4	72·1	69·3	
Relative humidity at 8 hrs. (%) ..	78	77	73	68	65	62	62	67	71	79	80	77	

SOIL CONDITIONS

The soils in which tobacco is cultivated vary in different districts but the most outstanding type is a black, clay loam. It is generally held that soil conditions affect the colour and texture of the leaf, the light soils producing mild, bright tobaccos and the heavier, dark soils coarse and dark types suitable for chewing and as fillers. If the soils are, moreover, rich in humus and plant food a thick, dark leaf results while those of poor fertility provided they do not limit growth are more suited to the production of light tobaccos.

In the Guntur district, Virginian tobacco is successfully grown on a black, clay loam which cracks deep in dry weather. The suitability of the soil for growing this type of tobacco is due to the fact that it is rich in lime, free lime even being found in nodules in the surface layers, thus rendering it friable. It also shows a high degree of moisture retentiveness enabling the crop to be cultivated without the aid of irrigation even if this was possible in the district. The crop grows partly on the moisture conserved in the soil from the south-west monsoon which is responsible for about two-thirds of the total rainfall in the district.

A particular type of soil found on old village sites and known as *parti* lands is regarded as being excellent for the cultivation of the local dark tobaccos. These lands command a high rental and the tobacco grown on them fetch correspondingly high prices. The soil is not as moisture retentive as the black clay soil of the Guntur district and the tobacco grown on it has, therefore, to be irrigated. Mention may be made of the tobaccos grown on the *parti* soils of Mustadabada in the Kistna district and of Chebrole in the Guntur district, the former having a high reputation as a snuff tobacco and the latter both as a cheroot and snuff tobacco. The relation between these soils and the quality of the tobacco produced on them is not clearly understood though it may possibly be due to a high potash content.

Certain areas are known to produce a better quality of tobacco than elsewhere around. In the Vedasandur-avarakurichchi tract between Dindigul and Trichinopoly the best cigar filler tobacco in South India is produced while in other centres such as Sivapuri in the Tanjore district and Meenam-

palayam in the Coimbatore district the highest quality of chewing tobacco known in South India is produced. The mapping out of such areas most suited to each type of tobacco together with an examination of the physical and chemical characteristics of the soil of these areas would be of great value.

MANURING

The tobacco crop is, generally, well manured either directly or indirectly, except in the case of the light tobaccos grown in the Guntur district. In certain areas such as between Dindigul and Trichinopoly it is considered preferable to manure the previous crop in the rotation such as *kurakkan* but this is not the general practice elsewhere and the land is well manured before planting tobacco.

Fertilisers are rarely used and the requirements of the tobacco crop in regard to the supply of nitrogen, phosphate and Potash and the effect of these on quality is little understood by the peasant cultivator.

The manuring consists of dressings of cattle manure and village refuse as well of penning cattle, goats or sheep in the field. The amount of manure used and the number of animals employed as well as the period during which they are penned depends to some extent on the type of tobacco grown, the fertility of the soil and the wealth of the cultivator.

Where the production of chewing tobacco is the chief object, intensive manuring is practised in order to produce a thick, heavy-bodied leaf considered so desirable by the cultivator in chewing types. The application of large quantities of organic manure leads to the development of a rather high nicotine and nitrogen content and especially with cattle manure to an excess of chlorides all of which are responsible for poor burning quality of the leaves. Hence in the cultivation of smoking tobaccos, and particularly of the light types, the quantity of organic manures applied should be small but this is not sufficiently realised by the growers of dark, smoking tobaccos.

In the tropics, owing to the high temperatures and the consequent rapidity in which the humus content of the soil is broken down, the presence of adequate quantities of organic matter is essential, especially in soils of poor moisture retentiveness, in order to maintain the fertility and texture of the soil.

The cultivator is, therefore, compelled to resort to heavy manuring but in order to produce a luxuriant growth which he considers desirable for most dark tobaccos he usually over-manures his crop even though it is grown primarily for smoking as cheroots. A reduction in the application of cattle manure and in the penning of cattle for smoking tobacco is thus necessary and where possible the use of green manures and compost should be encouraged.

Combustibility of the tobacco leaf is also associated with a high potash and low magnesium content. It is, generally, considered by growers of smoking tobacco that sheep or goat penning is more suitable for smoking tobacco than cattle penning and that while the former improves the quality of the tobacco, the latter is better for general growth. Cattle manure contains a high percentage of chlorides and has a lower potash content than sheep or goat manure. These factors, may therefore be responsible for this view. The importance of the relation between quality and the amount of potash available in the soil to the crop should be made clear to the grower and the use of potash fertilisers should be advocated for improving body, texture and burning quality of the better types of smoking tobacco.

IRRIGATION

With the exception of Guntur and Vizagapatam districts and the lankas (small islands) of the Godaveri and Kistna deltas, the tobaccos grown in most other districts are irrigated from wells. Where tobacco can be raised successfully without irrigation it is found to be of better quality for smoking purposes and especially for cigarette manufacture. The lanka tobaccos which are used as cheroots are thus superior to the irrigated tobaccos of the neighbourhood. Generally speaking, unirrigated tobaccos develop a lighter colour and thinner texture than when continuously irrigated. Virginian tobacco is, therefore, best grown without irrigation but where the soil conditions are such that the crop needs irrigation as was found to be the case when this type of tobacco was introduced in Mysore State the irrigation should be restricted and, preferably, confined to the earlier period of growth. . For chewing and dark tobaccos more frequent irrigation is practised resulting in thicker, heavier and darker leaves.

The view is generally held by growers in the areas where tobacco is irrigated from wells that the water should be " brackish " while wells which contain " sweet " water are not utilised in tobacco cultivation. " Brackish " water is considered to give rise to a better quality of smoking tobacco of the dark types and also to the development of larger and broader leaves in the plant. Some unpublished analyses carried out by the Agricultural Chemist, Coimbatore showed that the water from certain " brackish " wells was comparatively high in potash—about 2-3 parts in 100,000 parts of water—and low in chlorides, factors which are responsible for the improvement of burning quality in tobacco. " Brackishness " according to the information given by some cultivators varies with wells of close proximity and hence the quality of the tobacco produced depends on the particular well used for irrigating it. It is even said that the type of " brackishness " of the water from wells which irrigate some of the best chewing tobaccos differs from that for smoking tobaccos. More analyses of well waters used for irrigating the best tobaccos of different types are desirable in order to understand the relationship between " brackishness " in water and quality of tobacco, for, as usually understood, the term " brackishness in waters " is associated with the presence of chlorides and for smoking tobacco at any rate such waters would adversely affect the burning quality of the crop which is irrigated.

METHODS OF CURING

The following methods of curing tobacco are adopted in South India :—

(1) Flue-curing
(2) Sun-curing
(3) Air-curing

Flue curing is only undertaken for Virginian tobacco and is carried out in special barns in which humidity and temperature are controlled by ventilators, one fixed on top of the roof and others at the base of the walls of each barn as well as by flue pipes through which heat passes from a furnace built in one of the walls. There are at present about 30,000 flue-curing barns in the Guntur district and the peasant cultivators are now quite conversant with the method of their construction and operation. In flue-curing which aims at the production of a lemon yellow colour in the leaf, the temperature within the barn is raised at

varying intervals, until a maximum of about 165° F. is reached, the humidity being controlled by the opening and closing of the ventilators. The object of this is to drive off the moisture from the leaves and also when they have turned yellow on quick drying to fix this colour by maintaining a high temperature in the barn. In the Guntur district good quality, lemon yellow leaves of Virginian tobacco are produced without difficulty by flue-curing.

Sun-curing results in semi-bright or light brown leaves and is carried out for the production of light tobaccos such as are used in the manufacture of cheap brands of cigarette, pipe, some cheroot, snuff and chewing tobacco. In this method the drying of the leaf and fixing of the colour is brought about by exposing it to the direct rays of the sun either immediately after harvesting or after allowing it first to yellow in the shade. The process in the sun takes about three weeks after which the cured leaves are removed only early in the morning when they have absorbed sufficient moisture from the atmosphere to allow of their being handled without damage. The sun-curing method is adopted for some of the Virginian tobacco that is not suitable for flue-curing and for the country tobacco grown in the Guntur district where these are exported to the United Kingdom and Japan as cheap, light tobaccos. A type of sun-curing is also carried out for a low grade of chewing tobacco which is consumed chiefly by the depressed classes in South India. After allowing the plants to wilt in the field as soon as they are harvested they are placed in pits for fermentation for a number of days. They are then exposed to the sun for a few days and bulked in sheds.

Air-curing is carried out for cigar filler and cheroot tobaccos. This is the commonest and oldest method of curing tobacco in South India. Whole plants are usually harvested and allowed to wilt over-night after which they are stocked or bulked in small circular heaps for 1-3 days. They are then hung in racks in the shade as they are or after the leaves are stripped. The curing process is very gradual, the leaf passing through the yellow stage and then becoming brown with slow drying which is complete within 3-6 weeks.

The subsequent handling of the cured tobacco in which the operations of bulking, grading and baling are carried out requires great care and in these experience plays an important part. After curing is complete, the crop requires to be conditioned so

as to make it sufficiently soft for handling. In most cases this is done by allowing the leaves to absorb atmospheric moisture over-night. They are then bulked and during this stage certain chemical changes take place which bring out the aroma of the tobacco. Rebulking is done at varying intervals depending on the type of tobacco, the method of curing and the condition of the leaf in order to prevent too great fermentation taking place. When this is complete the leaves are graded and then tied into hands containing a sufficient number of leaves to make the butt end of each hand about 1 inch in diameter, after which they are again bulked or stored until there is sufficient quantity of each grade for baling. Particular care is taken especially in the case of flue-cured Virginia to see that the leaf is in correct condition before it is baled for export, the percentage of moisture being usually 13 per cent. This is done by passing the leaves through a rehandling plant installed in the stores of tobacco exporters.