

THE CULTIVATION OF TOBACCO WITH PARTICULAR REFERENCE TO CIGARETTE TOBACCO AND THE FLUE-CURING PROCESS—II

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FLUE-CURING OF TOBACCO

(I) FLUE-BARNs, THEIR DIMENSIONS AND CONSTRUCTION

SPECIAL curing facilities such as flue-barns are required in the production of high quality bright leaf cigarette tobacco.

A popular size of flue-barn suitable for the flue-curing of tobacco has the following dimensions: 16 feet long, 16 feet broad and 19 feet high with a single furnace. Other favoured barn sizes are 12 feet by 16 feet with single furnace; 16 feet by 20 feet or 20 feet by 20 feet or 20 feet by 24 feet with double furnaces. The material used for constructing the walls and roof of the barn may be mud and wattle, mud and poles, mud and coconut or arecanut logs or asbestos sheeting. A double roof is not essential. It is not intended to go into the detailed structure of a suitable barn here. This is a subject by itself upon which help can be obtained from the Agricultural Department. The essentials are the room or barn, with a furnace for heating the same.

Tiers of poles are arranged within the barn for holding the sticks on which the tobacco leaves are strung. Vertically the first tier should be 7 feet above the ground level and each successive tier 2 feet above the last; and horizontally the tiers should be 4 feet apart. A space of 2 feet 6 inches should be left between the topmost tiers and the roof of the barn. The sticks for stringing the leaves are 4 feet 6 inches long and are arranged 8 inches apart on the tiers.

(II) PREPARATION OF THE LEAVES FOR FLUE-CURING

In harvesting tobacco for flue-curing it should be remembered that the bottom leaves are the easiest to cure from a cigarette point of view; the leaves higher up the plant have more body and are therefore more difficult to cure, and the tip leaves are most difficult to flue-cure. As soon as the harvested leaves have been transported to the barn, they are carefully strung up on sticks 4 feet 6 inches long. The leaves are tied on in bunches of three alternately on either side of the stick. The leaves should be arranged so as to have the backs of their midribs touching one another. The leaves when held in the bunch should present a triangular appearance. There should be 28-30 bunches of leaves per stick, (*i.e.*, 14-15 bunches on each side). During this operation, any leaves unsuitable for flue-curing should be discarded. As each stick is completed it should be packed into the barn and arranged on the tiers, the distance between the sticks being 8 inches. A golden rule in flue-curing is to take particular care to see that the barn is completely filled before commencing to cure. When the barn is filled then the curing process is started by raising the temperature inside by means of the furnace.

(III) THE CURING PROCESS

(A) YELLOWING STAGE (80°F-90°F)

When the leaves are well ripe, the yellowing stage of the leaf takes 18-24 hours to be reached; if green, this stage may take as much as from 30-40 hours. There is no harm if the temperature rises to 100°F., but it is best maintained at 90°F. until the yellowing is complete. The leaves should not be allowed to get too yellow before commencing to "fix the colour". It is better to err on the green side, and any such green colour will disappear during the later stages of curing. Yellowing at 90°F. should be continued until as much of the leaves as possible have attained the right colour. During the yellowing stage all ventilators should be kept closed.

(B) FIXING STAGE (100°F-110°F)

As soon as the leaves have become sufficiently yellow, the next stage of fixing the colour should be commenced. Allow the temperature to rise gradually from 90°F.-100°F. and then half open the top ventilator. Then the temperature is raised at the rate of $2\frac{1}{2}^{\circ}$ per hour until 110°F. is reached when the fixing period ends. At $102\frac{1}{2}^{\circ}$ F the bottom ventilators should be

opened a couple of inches or so; at 105°F the top ventilators should be fully opened and the bottom ventilators half open; and at 107½°F. the bottom ventilators should be fully opened.

(C) DRYING THE WEB OF THE LEAF (110°F-140°F)

The most critical period in flue-curing is from 110°F. to 120°F. The temperature should be raised from 110°F. to 125°F. in stages of 2½° per hour. During this stage the temperature on no account should be allowed to fall else the tobacco will "sponge" badly. (Sponging is due to the failure to get rid of the moisture on the leaf as quickly as possible). In order to get the leaf accustomed to high temperatures, it is a sound flue-curing practice to maintain the temperature at 125°F. for 2-3 hours and then proceed to 130°F. when no further rise in temperature should be made until the web of the leaf is two-third dry. Then proceed to increase the temperature in stages of 3°-5° per hour until 140°F. is reached and complete the drying of the web of the leaf at this temperature. The top and bottom ventilators are fully open during this stage of curing.

(D) DRYING OF MIDRIB (140°F-165°F)

When the web of the leaf is dry the temperature should be raised by 5° stages. At 145°F. the bottom ventilators should be partly closed, and at 155°F. all ventilators should be fully closed. In new barns a decidedly foul smell of the tobacco may be noticed at the first curing due to moisture in the walls of the barn; if this be the case, the top ventilator should be opened for an hour or so to allow the foul air to pass out. The temperature on reaching 165°F. should be maintained at that until the leaf and midrib are dry. The fire is then drawn or allowed to die down. All ventilators and doors should be opened and the barn allowed to cool down. At 165°F. the leaves are very brittle and the aroma inside the barn resembles a biscuit factory.

(IV) SHINGLING

When a good cure results the leaves should be yellow and the midribs should snap with a crack when bent, but the leaves however should not split. The leaves should be slightly flaccid before they are removed from the barn but not too much. After the barn has cooled down sufficiently, and when the leaves could be handled without damaging, the sticks are carefully removed with the leaves still attached and arranged on the floor on newspaper in a dry room. The sticks should be so placed that one stick will overlap one-third the leaves of the previous stick.

In this manner the tobacco is piled up into a neat heap which is covered over with some hessian or mats and left for some days, particularly if the weather conditions happen to be too humid and rainy. If the leaves are removed from the sticks under such humid conditions they are apt to become moist and will be difficult to dry again. The colour will also be affected. The process of removal of the leaves from the barn and storing as described above is known as "shingling". Under favourable weather conditions the leaves could be detached from the sticks even on the day following the shingling.

(V) CONDITION OF LEAF

The leaf should be sufficiently damp so as to be pliable and not break in handling. On the other hand the leaf should never be wet or too soft. If the leaf should become too soft, it should be dried out by hanging in the shade exposed to the air until sufficient moisture has gone out of the leaf so as to leave it in proper condition for grading and bulking. If a number of leaves is gathered together in the hand by grasping the butts of the leaves and these are then shaken out and held upright, and if the leaves remain more or less erect it is a rough indication that the tobacco is in a safe keeping condition; if on the other hand the leaves droop like the leaves of a palm, it is unsafe to handle the tobacco. Again if the tobacco is in proper condition the midrib will easily break when held between the thumb and forefinger. If the midrib is soft and pliant, usually the leaf is in an unsafe keeping condition.

In case the tobacco has to be transported prior to grading, the leaves should be carefully removed from the sticks and packed into a baling press of the following dimensions:

24 inches wide

34 inches long

18 inches deep

The leaves must not be packed too tightly. The bale should weigh about 150 lb. and not more. A baling box 36 inches high with the other internal dimensions stated above will give a bale of tobacco weighing approximately 150 lb. provided the box is loosely filled. The bale should be wrapped in hessian or dry matting to prevent undue drying and damage by handling.

(VI) GRADING

Grading performs two important functions:

- (a) It allows the tobacco to show up in the best light and so affords the grower a better chance for bargaining with the prospective buyer.
- (b) It gives the grower as well as the prospective buyer a more or less correct idea as to the percentage of the various grades.

In the case of cigarette tobacco, colour is the sole criterion or guide upon which to grade. After grading according to colour, it is usual, from the point of view of quality to make different grades of the same colour.

A greenish tinge (*i.e.*, a yellow leaf with a greenish tinge near the veins) to bright cigarette tobacco is desirable for the following reasons: viz: it is often necessary to keep the cured leaf 5-8 weeks before it can be marketed; and during this time should the leaf become too moist, a loss of colour will result. When a greenish tinge is present this loss of colour is less, and the change that takes place will be a loss of the greenish tinge in the leaf resulting in a brighter leaf than would be the case had the tobacco been cured without the greenish tinge.

Flue-cured tobacco is usually graded as follows:

Grade I.—Bright lemon coloured leaf.

Grade II.—Bright orange coloured leaf but not so clear as Grade I. This grade will include slightly sponged or blotched leaves but should show good colour.

Grade III.—Leaves with a fair amount of colour but not good enough for inclusion in Grades I or II. These leaves could carry a trace of green.

Grade IV.—Carries the bright green leaves which should be free of serious sponging. These leaves if kept in proper condition will after a few weeks improve in colour considerably and can then be regarded into Grades I and II.

Grade V.—Consists of all leaves that cannot be included in the above 4 grades. The leaves in this grade will show very little colour and will carry sponged and dark leaf. The leaves should have all dead and perished leaves discarded (*i.e.*, leaves with no stretch).

Grade VI.—Into this grade will be put all dark brown and deep green leaves which are unsaleable from a cigarette point of view. If the picking and curing have been properly done, there will be no need for this grade.

(VII) BULKING

After grading, the leaves in each grade are made into small hands of 18-30 leaves depending on the size of the leaves. One of the leaves should be used for tying together the leaves of a hand. The various grades are kept separately in a single bulk, the division between the grades being maintained by pieces of string.

The buyer usually redries the tobacco either by special machinery or in specially constructed rooms with steam coils. When the leaf is quite dry it is reconditioned by the manufacturer by putting back a certain amount of moisture, varying in amount from 10 per cent. to about 13 per cent., to suit the special requirements of the various grades.

The tobacco is finally kept by the manufacturer and allowed to mature for a period of 2-2½ years when it is ready for the manufacturers' purposes.

(VIII) YIELD

1 acre of tobacco should yield about 750 lb. of cured leaf.

ACKNOWLEDGMENT

The writer wishes to acknowledge the great help rendered by Mr. F. H. Cooper in the compilation of these notes.