

AIR AND SUN CURING TOBACCO LEAF*

THOUGH an almost universal demand is at present made by Australian manufacturers for bright flue-cured tobacco, there is a limited market for leaf that is air or sun cured provided the smoking quality is satisfactory.

At present this class of leaf is almost wholly used in the manufacture of the cheapest brands of tobacco, but if leaf of sufficient quality, more especially of the White Burley variety, is produced, which will allow of satisfactory manufacture or of blending with flue-cured leaf for pipe or cigarette mixture, it is probable that sales would be more readily made and a more remunerative return secured.

The Department of Agriculture has not recommended the production of air-cured leaf of those varieties most suited for flue-curing, but has supplied seed of a variety known as White Burley, which is usually air or sun cured, and for which an increased demand is thought probable if leaf of acceptable quality can be produced.

In anticipation of a more informative article at a future date and to assist those growers of bright varieties who are compelled in the absence of a flue-curing barn to otherwise cure their leaf, as well as to inform those undertaking the production of White Burley, the following brief notes are submitted:

Air Curing Barns.—In order to secure the best results in air curing tobacco leaf it is important that the barn should be so constructed as to allow as nearly as possible a perfect control of ventilation, through which the curing and drying out of the leaf can be regulated.

Suitable material for curing barns will be found in bricks, concrete, pisé, corrugated iron, wood, and thatch. Of these no doubt most consideration will be given to corrugated iron and thatch; the former has a disadvantage, in that during dry, hot, and windy weather the leaf is apt to dry out too quickly and present a greenish colour which reduces its value while in the latter, if the weather is cool and moist, the leaf dries too slowly with a darkness in colour. In North Queensland it has been found that thatched barns—that is, those in which both walls and roof are so covered—have given more satisfactory cures than structures wholly sheeted and roofed with corrugated iron.

A satisfactory sized barn is suggested in a structure 20 feet wide by 16 feet high and 32 or more feet long. With tier poles spaced at intervals, horizontally, of 4 feet apart centre to centre and 2 feet 9 inches vertically, the bottom tier being 5 feet from the earthen floor, the capacity of a barn 32 feet long, allowing eight plants to a stick and the sticks 6 inches apart on the tier poles, would be 12,800 plants. With a structure twice the length the capacity would be doubled. Where, however, the plants are large as in the case of White Burley variety, it may be advisable to increase the distance between tiers to 3 feet 6 inches; generally, however, a space of 2 feet 9 inches will suffice if the method of harvesting, later described, is followed out.

* By N. A. R. Pollock, H.D.A., Senior Instructor in Agriculture, in the *Queensland Agricultural Journal*, XXXVII, Part 5, May, 1932.

The plan which was suggested for the curing of cigar leaf by the late R. S. Neville, when Instructor in Tobacco Culture for the Queensland Department of Agriculture, illustrates the method of ventilation. This plan with a modification of the distances between tiers as suggested will be found most suitable. It will be noted that provision is made for the tiers to be extended immediately under the roof, which, if thatched, will require a greater pitch and thus provide extra space. The site for an air-curing barn should be so well drained that the earthen floor will not become damp in any period of wet weather.

Harvesting.—Tobacco leaf should not be harvested when it is wet with rain or dew, nor should it be touched immediately after a heavy fall of rain; it should be left until the gummy matter is again apparent on the surface of the leaf, which is usually in two or three days.

While picking of single leaves can go on through the day provided they are protected from the direct rays of the sun before transfer to the barn or stringing shelter, it is not advisable to harvest the whole plant when the sun is very hot, as owing to its necessary exposure the leaf is liable to be scorched or so affected that greenish blotches will occur in the leaf however well cured.

On hot bright days the cutting of the whole plant should be deferred until about 3 o'clock in the afternoon or later if they can be sufficiently wilted to allow of placing on the sticks before darkness sets in.

When the days are hazy or cloudy without the likelihood of rain cutting can be accomplished as soon as the dew has disappeared.

For air curing a usual practice is to harvest the whole plant in one operation, but better results can be expected when the leaves are picked singly as described under "Bright Tobacco." Under this latter system a better quality can be expected since the leaves would be harvested at a riper stage than would be possible with the former. For indications of ripeness in the harvesting of single leaves reference should be made to the Departmental publication "Tobacco Growing in Queensland", under "Ripening". When the whole plant is to be harvested care should be exercised in seeing that the top leaves are sufficiently matured to permit of a satisfactory cure. This would be suggested when a rough surface is presented accompanied by an extreme brittleness, the web of the leaf breaking readily on being doubled.

A combination of the two systems will probably be found most advantageous in securing the best quality without unduly prolonging the period of harvest. Thus the lower and middle leaves could be primed as they become ripe, and the upper leaves, later on, harvested with that part of the stem on which they are carried.

Priming.—Under this method the leaves are picked as they ripen and strung on sticks as described in "Tobacco Growing in Queensland" for flue curing. As picking can go on every day, provided the leaf is strung the same day, a better colouring on the plant can be secured than when, as in flue curing, a week or so must elapse before another picking can be made. In this manner over-ripeness in the leaf is avoided.

Cutting the Whole Plant.—The plants in any field will not all ripen at the same time, so in cutting a nice discrimination must be exercised in selecting only those that are sufficiently matured. It is far better to allow a plant to stand a little too long than to harvest it too soon, as green leaf brings the lowest price and is liable to rejection by the manufacturer.

In cutting the plant it is usual to split the stem from the top to within 3 or 4 inches of the lowest leaves, and then, while holding the top of the plant, to bend it slightly over and cut through the stem an inch or so below where the bottom leaf is attached. The plant is now turned over and laid gently on the hill and left until it is sufficiently wilted, usually in half-an-hour, to allow of handling without danger of breaking the leaves. A stout butcher's knife preferably with a skinning blade, is frequently used to cut tobacco plants, but a well-worn cane knife about $2\frac{1}{2}$ inches broad with the end well sharpened will be found effective. Probably a more satisfactory implement could be fashioned by taking half the length of the blade of a cane knife and attaching a handle shaped like a "T" or that of a saw which will be much easier on the hand.

As soon as the plants are sufficiently wilted to allow of careful handling without damage, they should be placed astride tobacco sticks thrust into the soil at an angle of about 45 degrees pending transfer to the barn or scaffold.

Tobacco sticks are usually about 4 feet 6 inches long so that they will rest securely on the tier poles placed four feet apart. Each stick will hold from five in the case of very large plants up to twelve of small plants, with an average of eight.

Air Curing.—In air curing, as practised by cigar leaf growers, the plants as soon as possible after being wilted, or the single leaves as soon as strung, are hung in the barn, the sticks being placed close together on the tier poles and the barn closed up for two or three days until the leaf shows a greenish yellow colour, when they are spaced further apart so that the air will freely circulate between. Sticks with the leaves strung thereon would then be spaced about 6 inches apart on the tier poles, while those carrying whole plants would be spaced from 8 to 10 inches.

The ventilators while the weather is favourable, are now kept fully open so that the tobacco will dry gradually. Should the weather be dry and hot with a drying wind the ventilators on the windward side should be closed and the others so regulated as to prevent a too rapid evaporation. If wet weather prevails and the air becomes charged with moisture it will be necessary to close all except the top ventilators, and if the leaf becomes very limp to introduce heat by burning some charcoal in holes or trenches cut in the floor so that the atmosphere will become drier.

The correct rate of curing allows the moisture, as it is transpired from the leaf, to be absorbed and carried off by the circulating air. If, as would be the case under a drying wind, the moisture in the leaf is evaporated too rapidly, a depreciation in quality would result, while if it remained in too moist an atmosphere, pole burn or a formation of fungus on the midribs of the leaf would occur.

Where the curing is nicely regulated the leaf will change from green to greenish-yellow, then to a clear-yellow, after which the brown appears. With whole plants a cure under satisfactory weather conditions can be effected in six to eight weeks, while with single leaves it will be much less. With the occurrence, however, of wet weather the time of curing will be prolonged and may occupy as long as twelve or fourteen weeks.

Sun Curing.—While cigar leaf is usually cured without exposure to the sun, other classes of tobacco in which a brighter colour in the leaf is desired are either cured partly or wholly under exposure to sunshine. In either case the leaves can be picked singly or the whole plant harvested.

A wilting room or room in which the passage of air can be prevented will be found a convenience. In this the tobacco is placed until the leaf changes to a greenish-yellow colour and is then transferred to the scaffold.

If such a room, however, is unavailable the sticks carrying the strung leaf or plants, as the case may be, are placed close together on scaffolds and covered until the desired yellowish colour is obtained. The sticks are then spread out 6 to 10 inches apart and exposed to the sun until the leaf is thoroughly dry. The scaffolds are formed of poles (preferably running north to south) in parallel lines 4 feet apart supported by trestles or forks or posts sunk in the ground.

During the process of sun curing it is advisable to have some form of covering to break the sun's rays in the middle of the day when scorching is liable to occur and to throw off any light shower that may fall, as well as the dew at night. Hessian, calico, or canvas, supported on an overhead wire a foot or so above the sticks and carried on wires at either side will give shades when required and some protection against rain while allowing ease of removal and replacement.

While a light dampening from a shower of rain if dried off immediately will not be very detrimental, a thorough wetting with heavy or prolonged rain can be calculated to seriously reduce the value if not to ruin the leaf.

Varied Curing.—Where it is not practicable to completely sun cure the leaf it can, after becoming nicely yellowed on the scaffold, be removed to the barn and allowed to dry naturally, or the drying can be accelerated by small charcoal fires or the use of a heating flue.

As many growers will be unable to provide the type of curing barn recommended, other buildings or open sheds will be brought into requisition. With these a partial sun curing should be accomplished before the leaf is transferred to the shed, which if open will be improved by walling with hessian or otherwise protecting the sides on which rain is likely to be driven.

The time required for sun curing varies according to atmospheric conditions and the size of the leaf from two to three weeks with primed leaves and from four to six weeks when the whole plant is cured.

-Conditioning.—After the tobacco has been cured, which is denoted by the brittleness of the midribs of the leaf and the dryness of the stem, it must be brought into condition before it can safely be handled without damage.

Very frequently during cool nights when there is heavy dew the leaf is sufficiently ordered by early morning. Where this occurs it is advisable to take the sticks of leaf or plants down from the tier poles and to shingle them to form a bulk, which should be covered with a tarpaulin, bags, rugs, or such like, to prevent the leaf becoming too dry before stripping and grading are completed. Where atmospheric conditions will not allow of conditioning in this manner a conditioning collar could be excavated or the leaf ordered by the use of steam as suggested with flue-cured tobacco.

Stripping and Grading.—Stripping the leaf is merely pulling it from the stalks, commencing with the lowest on the stem. Opportunity should now be taken to class the leaves into several grades, which are largely determined by their situation on the plant as well as by their colour, length, and freedom from damage. Thus the lower leaves will be of much the

same texture and size and could be placed in two piles according to their freedom from damage. Similarly the middle leaves, which are the finest on the plant, as well as the top leaves can be divided in their turn, and later, if thought fit, further classified according to length and colour before being tied into hands.

With leaf primed before curing classing can be as easily effected on removal of the strings, as the sticks, if taken in their order of filling, will carry leaf from the same position on each plant.

A rougher classification, however, could be adopted by assorting merely into colour, undamaged and damaged. Thus a bright yellow colour would indicate the first grade, red to reddish-brown the second, and a darker colour the third grade.

It should be remembered that more accurate the classification of leaf the better the price it will realise, so a little extra time and care spent in that direction will be well repaid.

After the leaves have been tied into hands they should be strung on sticks and given as much sun as possible on scaffolds outside the barn for a few days in the case of sun-cured, and for a couple of weeks in the case of air-cured tobacco other than cigar leaf (which is not sunned), and then brought back into the barn and hung until the whole of the crop is ready for bulking.

Bulking.—In bulking air and sun cured leaf for pipe or cigarette the same procedure is adopted as with flue-cured leaf, no rise of temperature in the bulks being desired. In this connection it is advisable for the leaf, especially the sun cured, to carry just sufficient moisture to allow of safe handling.

The bulking of cigar leaf in which a fermentation with rise of temperature occurs is not referred to, as it requires considerable experience and close attention.

Growers of cigar leaf on experimental areas should pack their tobacco with as little moisture as possible, so that the manufacturer could attend to the fermentation and storage to his own satisfaction.