TEA WITHERING. MECHANICAL INNOVATIONS.

The following is a summary of information concerning two recent innovations claimed to facilitate the withering of green leaf, and to make the process independent of climatic conditions, while effecting a saving in personnel, withering space and power.

In *De Bergcultures*, No. 34, February, 1928, an article by Herr Hoekstra, entitled, "Droog-en Verflenstoren. O.A., No. 546 Ind.," describes a chimneyed tower of square or rectangular section, which can be used for drying rubber, coffee, copra, and also for withering tea leaf.

The size of the tower, which is surrounded by heat insulating material, depends on the crop to be dried and the capacity required. Where more than one tower is needed to deal with the crop, a series of towers may be built in a group in such a way as to be supplied with hot air from the same pipe. The cost of one tower including racks for withering, but without hot air oven, and capable of withering about 1200 lb. of green leaf in 15 hours is given as 4,750 florins.

The tower may be easily filled and emptied through two sliding doors at the bottom; and, when used for withering purposes, the leaf introduced through these doors is spread on racks fixed in cages, each of which is suspended through its central axis from a shaft, the ends of which are fixed in the links of two endless chains travelling up and down on opposite sides of the tower. In this way the cages ascend the tower on one side and descend on the other, the resulting circulation of the load ensuring uniform treatment of all the leaf. The vertical equilibrium of the cages is maintained by placing a heavier load in the bottom half, so that when the cage is tilted over through half a revolution and then allowed to return to its stable position the leaf on the racks is turned over. This can be done at any time, while the cages can be emptied at the bottom of the tower by a similar operation, when the withered leaf falls out through one of the two doors.

The chain wheels are set in motion by turning an extra-mural wheel, which is so geared as to require little power, and the tension set up by the loaded cages on the axles of the upper chain wheels is taken by laminated springs, whose movements are recorded on two dials fixed on the outside of the tower, thus indicating the weight of leaf carried at any time. The driving wheel may be turned by the use of electric power, in which case the load can be determined by means of an ampere-meter, so that the rate of loss of moisture or degree of wither is easily determined.

Inspection and ventilating doors are fixed at various heights, and allow examination of the product at any time.

Preheated or dried air can be brought from a separate drier to the bottom of the tower by means of a pipe, which is connected with flues running up the sides on which the cages travel. It is possible to control the total amount of air drawn into the flues by the draught of the chimney, and the draw of the chimney may be augmented by the use of a fan. The air from the flues enters the tower at different heights through traps which can be opened and closed at will.

The advantages claimed for the tower are:—

(1) It is possible to spread the leaf thickly without danger of stewing, but this has not been demonstrated.
(2) Saving in personnel.
(3) The leaf undergoes uniform treatment.
(4) The rate and degree of wither can be accurately gauged.
(5) The temperature during withering can be easily controlled.
(6) The natural draught created by the chimney does away with the use of powerful fans, while the draw of a fan, if used, will be more effective than in a wide loft.

A tea withering machine built by Messrs. Marshall, Sons & Co., Ltd., of Gainsborough, U.K. is described in Tropical Life, No. 273, March, 1928. The product of this machine has been tested, and it is claimed to be practically the same as tea made after a natural wither.

The witherer, which is similar in design to a drier, is made in two sizes, 9 ft. and 6 ft. wide—the output of the 9 ft. type being 1200 lb. of withered leaf per hour with an expenditure of 12½-15 B.H.P., while the smaller machine turns out 800 lb. withered leaf for an expenditure of 5½-6½ B.H.P. The best way of withering is to spread the leaf overnight, and then pass it through the machine early next morning. The leaf is then fed from a raised platform on to travelling trays which occupy the whole width of the machine, the feed opening being at the top of the machine. The trays containing the leaf travel to and fro in the machine on roller-type chains at certain definite speeds which can be regulated so that the leaf takes 13, 18, 24 or 35 minutes to complete the circuit, before it finally emerges at the bottom of the witherer and is collected in a trolley ready for the rollers.

Tubular stoves are recommended as a source of hot air, which is forced into the withering machine by a fan placed at the bottom, while another fan placed on the top draws out the moisture, the temperature of the ingoing air being recorded on a thermograph.

The advantages claimed for the machine are:—

(1) A saving in capital outlay, lower production costs, and a greater convenience in factory working.

(2) A saving in spreading or rack area of 75%.

It is understood that this machine is under trial on a Ceylon estate.

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