MISCELLANEOUS NOTES ON MANUFACTURE

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Continuous Rolling.—A method of rolling that is becoming popular in up-country districts is one in which the dhool taken out at the end of each roll is replaced by withered leaf. The process is continued till the end of the day, and the big bulk finally reduced to a very small proportion of the day's make. This method should not be confused with another procedure of old standing in which the big bulk is continuously rolled.

To the inexperienced who contemplate adopting continuous rolling many pitfalls are likely to be encountered in the early stages and the following points should be carefully considered. First is the question of dhool outturns and next comes the question of fermentation. For continuous rolling to give staisfactory results these two must be examined in relation to the intake of the drier. Another and very important point to bear in mind is that the rollers should not be charged initially up to normal capacity. In fact the success of continuous rolling rests on manufacture being started with a roller partly full, because better rolling of the leaf is thus obtained. In normal orthodox rolling more machines will be required to fulfil these conditions. Finally, the intital charge should as far as possible not be greater than what the drier or driers can handle in 100 minutes. It will, of course, also depend on the rolling equipment and dhool producing capacity, but in any case should not exceed a 2 hours' drier intake.

For guidance as to the planning of a programme the following general rules may be found helpful (assuming rolling periods are to be of 30 minutes duration each, roll-breaking 10 minutes, and the charging interval 40 minutes):—

(1) First determine the drier intake in terms of pounds of withered leaf per hour.

(2) Then calculate the amount of withered leaf required to keep the drier full for 120 minutes, 100 minutes, 40 minutes and 35 minutes.

(3) The dhool which must be produced should then be approximately equal to the intake for either of the two shorter periods, and the initial charge to the intake for either of the two longer periods. That is to say, the dhool outturn should be 33 per cent., more or less.

(4) The weight of the intial charge should thus correspond to a drier intake of 100 minutes or 120 minutes or say, to some period between these two.

(5) Subsequent charges must be roughly equivalent to one third of the initial charge, and the dhool produced should also be near about this figure.

(6) In practice it will not be possible to obtain such a large dhool outturn in the early rolls, but if about 20 per cent. is taken out in the first rolls, and 25 per cent. aimed at in the next, a steady dhool outturn of about 33 per cent. of the intial charge can easily be obtained in subsequent rolls.

(7) It is not necessary to replace the dhool taken out with an exact amount of withered leaf. In any case it is not practicable. Neither is it absolutely necessary to have a constant charge, but dhool production is easier to regulate if a fixed amount of withered leaf is charged each time.

(8) The ultimate aim should be to get an amount of dhool that is not very much less than what the drier can handle for the interval between two successive rolls.

(9) The dhools are then fired in the order in which they are produced, keeping the drier continuously fed.

(10) The time firing should start must not be based on the fermentation required for the first dhool, as is generally done in orthodox rolling. If this practice is followed in the case of continuous rolling, the later dhools may not get the correct fermentation.

(11) The period of fermentation given to the first dhool must be such that the third and subsequent dhools do not get more than 2½ hours fermentation, unless colour in the liquor is the only consideration. By a suitable adjustment a balance can be struck between quality and colour, a matter that can only be decided by trial and error.

(12) Since the first dhool represents only a very small proportion of the total day's leaf, it will not matter what fermentation it receives so long as the correct fermentation is given to the rest of the leaf.

(13) Fermentation is also regulated by dhool outturn. Continuous rolling necessitates shortening of the fermentation towards the end of the day, and this is achieved by the simple expedient of getting a weight of dhool which will take a few minutes less to fire than the charging interval. If the drier is kept continuously loaded, fermentation will get shorter and shorter as manufacture proceeds. It may be necessary in some cases to come down to less than 2 hours and experience will show the lowest limit.

The system allows plenty of latitude, is actually simpler to operate than conventional rolling and can be recommended for estates which have difficulty in improving the colour and strength of liquors. It is not however very suitable during the 'flavoury' season.

Conservation of Flavour.—Just as for the development of quality in a high grown tea, the essential requirement for getting the best results when flavour is present is hard rolling. At the same time fermentation should be short. It is still the practice on some estates to have a different rolling programme for the 'flavoury' season, in the belief that flavour is lost by hard rolling. Softer withers are also taken with one objective in view, namely to keep the temperature of the leaf as low as possible in the rollers. At times the total rolling period is also shortened for fear that flavour will be ruined by even the smallest rise in temperature during rolling. Undoubtedly, the greatest enemy of flavour is excessively high temperatures, but this exaggerated fear of heat in rolling has unfortunately in many cases resulted in the adoption of light rolling with detriment to the development of flavour.

Experimental evidence of the influence of temperature has always indicated the desirability of warmth in rolling (vide *Tea Quarterly*, Vol. XXVI, Part III, pages 96-107) and to confirm the results obtained, with respect to flavour, an experiment on a full commercial scale was carried out in February this year at St. Coombs, at a time when most estates in the Dimbula districts were producing really fine teas. The hardest possible rolling was given to the leaf, so much so that its temperature at

the end of each roll was not less than 85°F. Fermentation was accordingly shortened, and the result was a tea that evoked the highest praise from tea tasters in Colombo and London. It threw into the shade some of the best teas made during this "vintage" season.

Details of the manufacture may be of interest to the reader:—

PERIOD OF WITHER:—morning leaf 10 hours (approx.)
noon leaf 7 ,, ,,
evening leaf 4 ,, ,,

DEGREE OF WITHER:—46 per cent. outturn of made tea to withered leaf. Great care was taken to prevent the leaf from over-withering in order to reduce greenness of liquor, a characteristic generally prevelent in very dry weather.

ROLLING:—4 × 30 minute rolls.
% DHOOL OUTTURN:— 1 — 20
2 — 24
3 — 28
4 — 14
BB — 8
Loss — 6

TEMPERATURE:— at end of 1st. roll — 85°F
(OF LEAF) ,, 2nd. ,, — 85°F
,, 3rd. ,, — 87°F
,, 4th. ,, — 88°F
(average rolling room temperature — 65°F (dry): 60°F (wet)).

ORDER OF FIRING DHOOLS:—1.2.3.4. BB.

OVERALL PERIOD OF FERMENTATION:—2½ — 3 hours.

TEMPERATURE OF FIRING:—190°F.

% OUTTURN OF B.O.P.:—68.

It is worth mentioning that the B.O.P. from an invoice made on these lines fetched in auction Rs. 6.25, the highest price ever paid for a St. Coombs' tea.

Increasing Outturns of O.P. and Fannings Grades.—Of late the demand for O.P. and fannings by the trade has led to another change in rolling technique and in the desire to increase the outturns of these two grades some estates appear to have overlooked the influence on the other grades.

In the low-country, which normally produces the highest outturn of O.P., the temptation to make still more of this grade is always present. The greatest care must, however, be taken to see that this result is not obtained by under-rolling. A very satisfactory outturn of O.P. may more often than not be procured at the expense of some of the other grades, which as a result of under-rolling will suffer in appearance and liquor.

In a few up-country factories the other extreme of over-rolling is resorted to with a view to getting unduly high fannings outturns. Not only is very small roll-breaker mesh employed, but the tea is also sometimes cut to excess. Here again appearance of the tea is sacrificed and the liquoring properties of the B.O.P. grade are naturally adversely affected, due to some of the finer leaf going into the fannings grade. The improved liquor of the latter may lead to a false sense of values.

It is strongly urged that both these extremes be avoided.

The Infra Red Moisture Tester.—This instrument, on account of its simplicity and reliability, has now come to be a recognized part of the accessory equipment in a tea factory.

The importance of checking the moisture content of teas leaving the factory need hardly be stressed, and, if the instrument is to serve this very useful purpose as accurately as possible, it must be used strictly in accordance to the instructions supplied by the agents.

One very important point apt to be overlooked when setting the lamp is the locking of the stop ring. If the screw holding it is not sufficiently turned the position of the ring will shift with use and the height of the lamp above the pan will thus be altered. It is necessary therefore to check from time to time the distance between the lowest point of the lamp and the upper edge of the housing, as indicated in the instruction schedule.

Another thing which should be watched is that part of the instrument housing the pendulum and knife edges. These should always be free from dust and before a moisture determination is made it is also advisable to make sure that no particles of tea have accidentally fallen on the beam while the pan is loaded.