A NEW TYPE OF INFRA-RED MOISTURE TESTER—THE ASE MOISTURE BALANCE

E. L. Keegel

This instrument is similar in its operation to the 'Kaybee' infra-red moisture tester, details of which were published in the *Tea Quarterly*, Vol. XXV—Part 4—December, 1954. It has, however, a number of advantageous features not possessed by the latter. These are as follows:—

1. A built in automatic time switch, which switches off the lamp after the set period of drying.
2. A magnetic damping device, which brings the balance pointer to an almost immediate rest thus considerably shortening the weighing time.
3. A spirit level.
4. Easy adjustment for zero reading. Only one screw has to be turned, which is easily accessible.
5. All movable parts are enclosed, thus minimising the precautions necessary for protecting the instrument from dust and air currents.
6. A magnifying glass for more accurate readings.

A balance of the type almost identical with that shown in the accompanying photograph underwent many trials, and the results have proved to be satisfactory. It was found that for tea the optimum conditions of operation were:—

a. A sample weight of 10 gms.

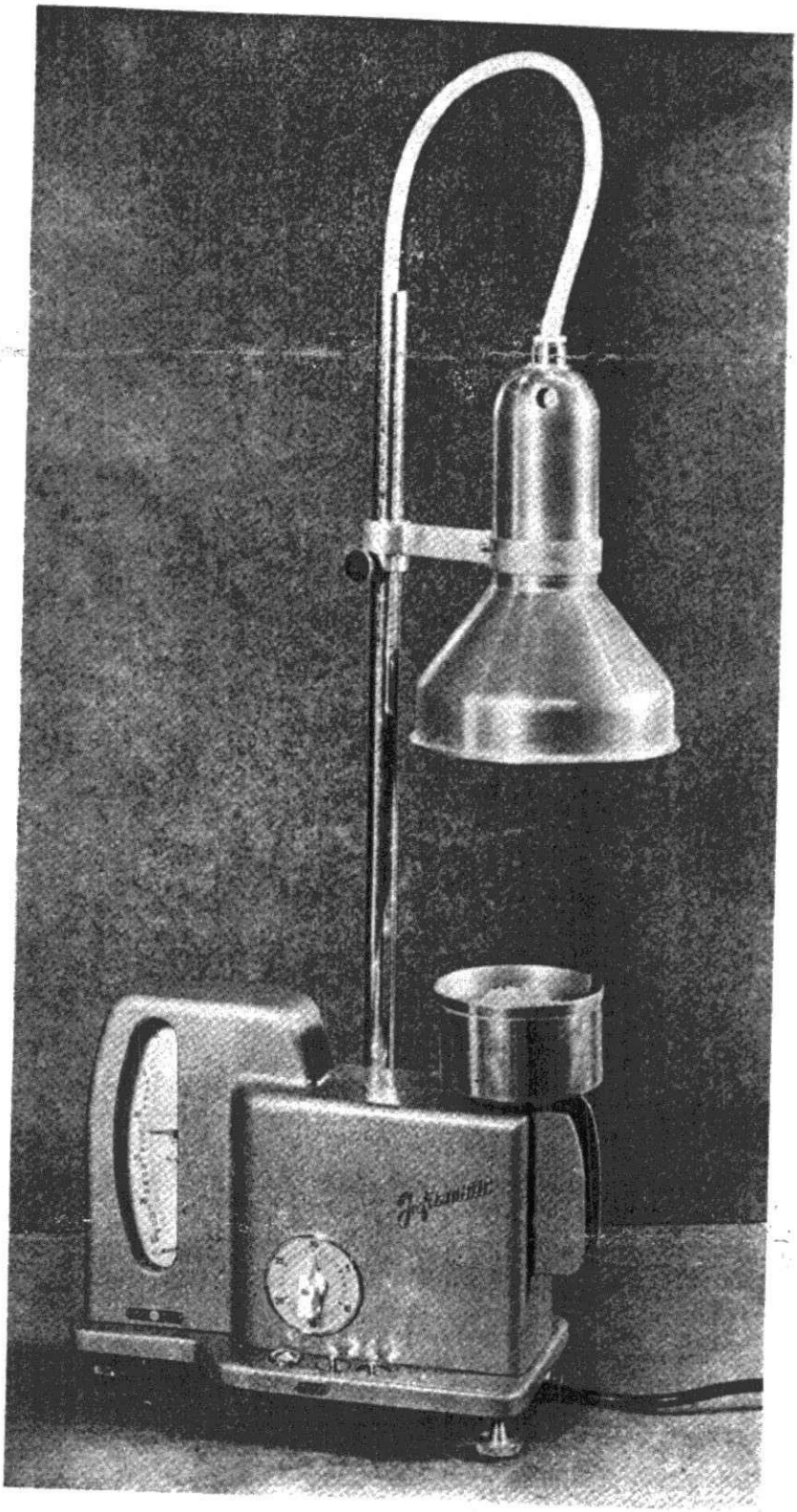
b. A drying period of 10 minutes.

c. A height of 15.5 cms. of lamp above the pan containing the sample when the balance pointer indicates zero on the scale. This corresponds to a setting of 4 on the rod carrying the lamp.

Under these conditions the error was negligible for a moisture range of 2 to 9%. In view of the satisfactory performance of the instrument and relative ease of operation it is strongly recommended for use in the tea industry.

Since tea, whether it be graded or not, is never uniform in size and character, possible errors in sampling should not be overlooked. It is therefore particularly useful to repeat a test on a duplicate sample, and the average figure taken. This precaution has been found necessary even in the case of moisture determinations by standard oven methods.

It will be noted from the photograph of the instrument that the scale reading is from 0–25%. This has been a recent modification, but models having a scale calibrated 0–20% with sub-divisions of 0.1% are also available. The latter type, which was tested, would be preferable since the scale in the former is sub-divided 0.2%. More changes have been made in the instrument since the first one received by us was tested, presumably with a view to extending its use. For example, the 15 minute timer has been replaced by a 30 minute unit.



At the same time two important additions have been made to increase the accuracy of the instrument. These are:—

1. A thin metal cowling is arranged around the pan, the purpose of which is to reduce disturbances due to air currents. This clips into holes on the housing, and has to be withdrawn before the front cover can be removed.
2. A cowling has also been arranged around the zero adjustment screw. In practice this does occasionally become disturbed by the operator. The photograph shows the latest model with all these modifications incorporated. The magnifier to the scale is not shown.

The balance is manufactured in Germany and the suppliers are the Shandon Scientific Company Ltd., 6, Cromwell Place, London, S.W.7 from whom further particulars can be obtained. Current prices are:—

Moisture balance complete, scale calibrated 0–25% with sub-divisions of 0.2% readable to 0.1%	£ 37	16	0	
Moisture balance complete, scale calibrated 0–20% with sub-divisions of 0.1% readable to 0.05% ...	42	16	0	
Spare stainless steel sample pan	—	8	0	each
Spare stainless steel sample pan—per dozen	4	15	0	
Spare infra-red lamp 250 Watts, 240 Volt A.C. ...	2	10	0	
Packing and delivery charges f.o.b. Hamburg will amount to	4	10	0	

If the lamp is to be operated from a D.C. mains, the timer will have to be omitted. This will reduce the cost of the instrument by £.3.10.0.

MISCELLANEOUS NOTES

REVISED SUGGESTIONS FOR DOLOMITE AND MAGNESIUM SULPHATE APPLICATIONS TO TEA

J. A. H. Tolhurst

We have decided to make slight alterations in the recommendations regarding the application of dolomite, and the following notes are based on the assumption that dolomite will be used as part of the standard manuring policy on all tea.

1. Soil pH

As a result of experiments we do not now consider it necessary to check the soil acidity before dolomite is applied, *unless* it is known that limestone rock outcrops occur in particular areas. In such instances soil samples may be taken for pH test, at varying distances below visible outcrops. The effect of such limestone on the soil acidity is not normally appreciable outside a fifty yards radius, unless small boulders or stones have become detached from the outcrop and moved downhill.

2. Mature tea

As a general guide to rates of application the following table is given:—

Yield of tea Cycle average, lbs./acre/annum	Dolomite lbs./acre/annum
Up *to* 750	70
750 to 1,200	100
Over 1,200	130

These rates are intended to be associated with normal applications of the standard N.P.K. mixture (*e.g.* T.500 and variants), and may be altered whenever considered desirable. They should be regarded as prudent minimum doses.

3. Young tea

When replanting tea it is suggested that dolomite should be broadcast before holes are cut for the young tea plants, and that the middle category of the above table represents a reasonable dose. In view of the slowness of action of dolomite, and the demands made on magnesium supplies by rapidly growing young plants we suggest that magnesium sulphate be added to the N.K.P. manure in the following proportions, assuming that the magnesium sulphate used contains 24% MgO.

Manure	Additional magnesium sulphate as lbs. per 100 lbs. of N.P.K. mixture
Inorganic, *e.g.* Young Tea Mixture (T. 175 or 180)	14
Organic, *e.g.* balanced animal meals. Various trade names	14

This proportion is approximate, and we do not claim that the above ratio of magnesium to any other nutrient in the mixture is of fundamental importance. Varying effects of the soil colloids in different areas, and the varying ability of different clones to absorb the nutrients supplied will mean that no single mixture would be optimum for all situations. It is wiser to give a provisional magnesium application which, it is believed, is on the generous side, rather than to draw on the preliminary soil analyses so far available and attempt at the moment to give a scientifically based proportion which may later prove to be inadequate under some conditions.

4. Application

The application of magnesium sulphate to young tea is, naturally, inseparable from the application of the N.P.K. manure. Dolomite, although the dose has been expressed on an annual basis, may still be applied *once per cycle*, or even once every other cycle where the cycle is of two years duration or less. If the standard manure is broadcast it would be desirable to allow a few showers of rain to fall before broadcasting the dolomite. Apart from this stipulation no other precautions are necessary and no separate cultivation is required for a dolomite application.

References

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