NOTE ON 'POTASH DEFICIENCY IN TEA CULTIVATION' IN RELATION TO CEYLON CONDITIONS

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The following addendum to Dr. Bond's review of the research carried out at the Proefstation voor de Thee, West Java, is based on results which the Agricultural Chemistry Department has been accumulating from the multiple factor experiment on nitrogen, potash and phosphate which, as far as the first two nutrients are concerned, has been in operation since 1930. These results are at present very far from complete. Their history is as follows: After six years of experimental treatment (*i.e.*, at the end of the pruning cycle ending in April, 1937) samples of pruning leaf and pruning wood were taken from the fifty-four plots of which the experiment consists. Their original purpose was to contribute to our knowledge of the nitrogen balance sheet of the experiment, a preliminary example of which was given in the annual report for 1934, Bulletin No. 12, p. 46. The experiment is a fully replicated one, there being a total of 18 plots devoted to each of the three levels of nitrogenous and potash manuring that form the basis of the trial.

On this occasion only nitrogen analyses were carried out on the whole range of samples. These analyses showed that manuring with nitrogen and potash respectively produced small but consistent changes in the nitrogen content of the leaf. The differences in values were not sufficiently great to be indisputably reliable, but they indicated a distinct possibility that addition of nitrogen as manure increased the nitrogen content of the foliage leaf, and that increments of potash had the opposite effect. This tentative conclusion is borne out by the Dutch work which shows a corresponding increase in nitrogen content under conditions of potash deficiency or, where deficiency symptoms are not actually in evidence, on plots where potash supply is at a minimum.

As a result of these data a limited number of potash analyses were carried out on the same material. These were restricted to the two sets which received

(a) the highest nitrogen and the lowest potash (N. 40 lb. per acre ; Potash nil)
(b) the lowest nitrogen and the highest potash (N. nil ; Potash 40 lb. per acre)

These showed small but entirely reliable increases in potash content of the leaf where potash fertilisers were given and nitrogen withheld. Expressed in the same terms as are used in the Java paper, *i.e.*, percentage of potash in the ash, there was an increase under the stated conditions from 13.26 per cent for (a) to 17.12 per cent for (b). This again is in agreement with the Java results.

The paper under review states limits for potash content of the leaf which define conditions of both deficiency and sufficiency judged according to foliage symptoms. How far these can be taken as valid under our conditions is problematical. But assuming that the conditions of sampling were similar (the Java paper does not define mature leaf) it is noteworthy that the samples from our plots that had been without potash manuring for six years, are still above the level set for a definite deficiency symptom; whilst those receiving potash fall within a range that includes both healthy and slightly affected bushes. The high potash contents quoted in the paper for healthy leaves are achieved only as a result of prodigiously heavy manuring (330 lb. of potash per acre or the equivalent of 660 lb. of muriate of potash.)

On the subject of soil values we have no comparable indications. Such analyses as we have carried out have not been done by the corresponding chemical method, and therefore do not offer a basis for discussion. Symptoms such as the Java paper describes are not prevalent in Ceylon. They are so characteristic of potash starvation, as understood in such crops as fruit and potatoes, as to have made their detection inevitable had they been common. In confirmation of this the results of the pruning weighments at the end of the 1937-40 cycle may be quoted. Whereas in Java potash deficiency reduces the prunings by more than 50 per cent the difference caused in our case is only 2.5 per cent.

At the date of receipt of the Java paper a full set of analyses for nitrogen, potash and phosphate was in progress for the more recent cycle, 1937-40. This cycle should show up even more clearly any compositional defects as regards potash in foliage leaf. The results will be reported in due course along with corresponding soil data. In the meantime, in view of the potash fertiliser situation, we may say that since nine years' cessation of manuring with potash have not diminished yield of flush nor wood and have not reduced over a six-year period our foliar diagnosis figure to the deficiency level, there is little danger to be anticipated in Ceylon from the lower degree of potash manuring that is at present unavoidable.