

EFFECT OF MANURIAL TREATMENT OF PLOTS ON TEAS MADE*

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It was not possible during the first stage of the experiment to deal with the crop from every treatment, and it was thus decided to compare the effect of nitrogenous manuring on the quality, etc., of the teas made. The leaf harvested at each pluck from the control plots which received no nitrogen, and from plots which received a double quantity of nitrogen was sent to the factory and manufactured into tea under controlled conditions. During the first year samples were drawn from the fines by sifting out an equal quantity of tea on a hand sieve, and these samples were sent to the tasters for report. The average value for all samples during 1931 was 100 cents per pound for both the no nitrogen and the double nitrogen teas.

The teas made in 1932 from the manurial plots were graded according to the standard factory practice in St. Coombs, and a B.O.P. sample representing 40-50 per cent of the tea was sent for report. Pekoe grades were also sent occasionally but it was found that the pekoes always varied in the same way as the B.O.P., and the practice of sending Pekoe as well as B.O.P. samples was discontinued.

The usual method of reporting on teas did not show very clearly in what way the teas differed from each other, and it was very difficult to record the remarks made for reference.

This difficulty has been partly overcome by adopting a new system of reporting on the samples, and I am very grateful to all the tasters who reported on the teas for their willingness to adopt this method in spite of the extra trouble.

Briefly the method consists in comparing the experimental tea samples against a sample of factory B.O.P. which is given an arbitrary number of marks for colour, strength, pungency, quality and flavour. The liquors of the experimental samples are then given more or less marks for these characteristics according to the way they compare with the standard samples in these respects. Recently the marking system has been strengthened by the additional support of a trade valuation of the samples. In this way at least

This paper, read during the afternoon Session by Dr. Evans is published here for convenience of reference.

three different series of marks are obtained for each set of experimental samples, and when the marks for the month are compounded and the average taken the resulting marks represent 9-12 reports.

The total average number of marks gained by the tea samples in 1932 were as follows:—

	No. Nitrogen.	Double Nitrogen.
Colour ...	332·0	309·5
Strength ...	367·0	366·5
Pungency ...	402·0	385·6
Quality ...	438·0	427·7
Flavour ...	346·0	362·2

The difference is not very great, but the no nitrogen teas have beaten the double nitrogen teas in respect of colour, pungency and quality, but remarkably enough the double nitrogen teas held the field where flavour is concerned. There does not seem to be much difference in strength as a result of manuring.

Another peculiar result is that the double nitrogen teas were preferable to the ordinary nitrogen teas in pungency and quality during the rush growth in April, and it will be interesting to see whether the effect will be reproduced in 1933.

At present these investigations are being extended so as to include a comparison of the effect of inorganic nitrogen such as Sulphate of Ammonia, and Cyanamide against Blood Meal, but the number of samples so far reported upon are too few to be dealt with.

DISCUSSION

Mr. P. A. Keller, in opening the discussion, said that Mr. Eden had given them an interesting account of the first manuring experiment carried out by the Institute, and although the experiment was still in its early stages, he was sure they were agreed that the results were of considerable interest, and they were much indebted to Mr. Eden for his paper.

He thought they would all have expected increased yields such as had been recorded in the second year, but the absence of response to manuring in the first year came as rather a surprise. Mr. Eden suggested that last year's abnormal weather might be the cause, and he was inclined to agree. However willing one might be to seem to evade responsibility by blaming the weather, it would be somewhat remarkable if it were proved that under normal weather conditions, a response to manuring followed during the three tipping rounds, extending over a period in this experiment of some 7 weeks and none during the rest of the 12 months. It would hardly be in accordance with estate experience, and as last year's weather was distinctly abnormal, judgment should be reserved regarding these first year results until the experiment has been longer continued.

It would be interesting if one could form an opinion whether any improvement in wood-growth had resulted from the first manurial application, but

wood-growth comparisons in a tea bush were difficult to make and hitherto one had had to be content with noting a gradual improvement, or otherwise, over a period of years.

The lack of difference in yields from organic and inorganic sources of nitrogen was not, as Mr. Eden has pointed out, very surprising. Weather conditions influenced these results in that they influenced the rate of decomposition of the fertilisers concerned, and it was conceivable, for instance, though not certain, that if conditions had been markedly in favour of the nitrification of sulphate of ammonia this fertiliser might have shown an increase in yield compared with the others.

With regard to the potash applications the chief interest lay, he thought, in determining how long they could be withheld without harm. Potash starvation brought many evils in its train, but if they were a long way from the starvation stage with regard to this or any other element none of them wished, especially at the present time, to spend money on applications which would, under these circumstances be unnecessary. It was hardly open to doubt that the nitrogen was the limiting factor in the yield of tea under ordinary Ceylon conditions and that a condition of nitrogen-starvation was easily arrived at, but regarding potash and phosphoric acid they knew very little.

There was, however, another action of potash which was he thought in most people's minds either well to the fore or in the background, but still there, and that was its action on quality. Whether it had any or not he did not know, and he would be very glad to learn. This same question of quality was also in most people's minds when considering the use of organic or inorganic sources of nitrogen. It seemed to him unlikely that either class of fertiliser had much influence on the intrinsic quality of the leaf although they might differ in the amount of leaf they produced and he suggested that by far the strongest factor in the question of quality was their old friend the weather.

A further point was whether the cyanamide offered a strict comparison with the other fertilisers because of its lime content. Cyanamide contained some 22 per cent of free lime, and tea was particularly susceptible to its action.

He looked forward with interest however as he was sure all of them did, to hearing anything which Mr. Evans might have to say on that subject that afternoon.

Mr. T. Eden, in reply, agreed with Mr. Keiller's opinion that wood-growth measurements would be very advantageous, but he regretted that he could hold out no hopes at present for the perfection of a technique of measurement that would give anything approaching reliable results. With regard to growth response in the tipping period the effect was not quite so transient as Mr. Keiller had suggested since the tipping represented growth over a period of more than five months.

He did not share Mr. Keiller's fears about the influence of the lime in cyanamide. Cyanamide was chosen because it represented an intermediate stage between sulphate of ammonia and blood meal from the point of view of the complexity of the decomposition processes. It was of course a well ascertained fact that alkalinity of tea soils was detrimental, but the quantity of lime applied was only some 50 pounds for the higher dose. When one considered that the amount of lime a temperate rainfall of 28 inches could remove annually from

the soil was several hundredweights per acre, he was not unduly perturbed. He was surprised at the small effect on soil reaction that moderate doses of lime had on Ceylon soils. He was not advocating the indiscriminate use of lime.

He emphasised the point that the data for nitrogen types brought them back to the consideration of whether the availability hypothesis in respect of organic and inorganic nitrogen would not have to receive drastic revision. He had spoken on another occasion of Dr. Joachim's data and these would take a lot of getting over. He thought that further field experimentation would give them a better clue than the more artificial and delicate work in the laboratory.

AFTERNOON SESSION.

Chairman.—Sir H. Marcus Fernando, Kt., M.D., B.Sc.,
Chairman, Low-Country Products Association of Ceylon.

Mr. R. G. Coombe said that it gave him great pleasure to express his gratification on being able to welcome such an outstanding member of the Ceylonese community as Sir Marcus Fernando. Sir Marcus had been a planter before a good many of them were born, and it was very gratifying to find that he had been able to accept their invitation to preside at the deliberations that afternoon.

CHAIRMAN'S ADDRESS.

Sir Marcus Fernando said that it gave him very great pleasure to come among them and to see them gathered in such large numbers at that Conference. He had never realised until that afternoon that there was such a keen interest displayed by the tea planting community of Ceylon in the excellent work that was being done by the Tea Research Institute. It was very gratifying to him to see that, and he was very pleased to testify from what he had heard about the work of the Institute that it was doing most excellent work to help the tea industry in the near, as well as the remote, future.

He called upon Dr. Evans to read his paper.