THE BLISTER BLIGHT CONTROL CAMPAIGN.

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The first thing I wish to say about the blister blight control campaign is that it is a planned undertaking, and I would like to remind you of the plan. When blister blight first arrived in Ceylon fears were expressed that a repetition of the coffee crash would result from the invasion. Dr. Gadd very quickly reassured you on this point and stressed the fact that, whereas the coffee leaf disease attacked mature foliage leaves, thereby destroying the livelihood of the coffee bush, blister blight only attacked the immature leaf of the tea bush, the greater part of which is normally removed by plucking. Dr. Gadd refused to make any prognosis, but warned you that the battle against blister blight would resolve into a battle for the maintenance of foliage leaf. The first tactic, which was devised by Dr. Gadd and Dr. Tubbs, was to change pruning periods so that recovery takes place in the period most unfavourable to the enemy.

It is essential constantly to bear in mind that 50% of the crop of the tea bush comes from the air, and that foliage is responsible for the absorption of the carbon dioxide which is turned into carbohydrates and other constituents of the crop. It is equally vital to recognise the fact that the carbohydrate or starch reserves upon which the bush draws to make a recovery from pruning, also are manufactured from carbon dioxide.

Next, we must examine the disposition of our defences. By the Ceylon system of bush management two leaves and a bud are harvested and a third leaf is left to mature and to provide the means for absorption of carbon dioxide. If the enemy penetrates the outer defences and gains the two leaves and a bud, no more harm is done to the bush than normally results from plucking. If blister blight gains the third leaf, the inner defences are penetrated and a seige is laid upon the bush resulting in slow starvation.

We may, therefore, call the fight against blister blight the battle for the third leaf. Generally speaking, we have won the preliminary skirmish by the dry weather pruning tactic but heavy attacks of blister blight are in the worst affected areas, impeding the food supplies and causing malnutrition of the bushes. At the end of this S. W. monsoon many estates in the S. W. zone looked thin and ragged.

The plan of the campaign is divisible into distinct stages —

Firstly, a complete study of the nature and course of the disease which was carried out by Dr. Gadd and Mr. Loos between 1946 and 1949.

Secondly, a reconnaisance of the weak points of the enemy which was carried out last year by preliminary experiments, culminating in the Symposium at which advice from experts experienced in fighting plant diseases was obtained.

Thirdly, the planning of the attack. At this stage a report was submitted to the Tea Controller and funds obtained for the campaign. A special vote of Rs. 150,000 was made for 1950 which we understand to be the first of a four-year plan. I take this opportunity for acknowledging our appreciation of this special vote. I must also refer with appreciation to the support given by Government in agreeing to waive duties on crop protection equipment imported for the use of the Tea Industry.

Fourthly, the counter attack which was started this year and which we hope will grow in scope and intensity.

Having outlined the plan of the blister blight campaign I now wish to say that all the information we have to give you today is the result of team work amongst the whole staff of the Institute. There have been periods during the past month when almost every member of the staff has been engaged directly or indirectly upon some aspect of crop protection investigations. The work has been divided into a series of papers, as we cannot all speak together, but we have given more consideration to the best method of presentation, than to individual responsibilities for the work described.

We are confident that we have made substantial progress and acknowledge our appreciation of all the ready assistance we have received from many individuals, many estates, all agency houses, and many commercial interests. Although it is very difficult to make distinctions we feel that we should acknowledge the especially large amount of assistance we have received from Mr. B. D. Garnier, the Superintendent of Kataboola Estate, the Consolidated Estates Co., Ltd., and Messrs. George Steuart & Company in connection with three main experiments covering a total area of 406 acres of Kataboola Estate.

We do not claim to have made any fundamental scientific advance. In all essentials we have merely adopted methods used by other agriculturists for many years past. There is no novelty about the introduction of crop protection methods to the tea industry, but there are certain features which distinguish crop protection against blister blight. I think I can quite fairly say that when crop protection experts visited Ceylon last year they were all appalled by the terrain and the weather conditions as well as the necessity for repeated protective measures at intervals as close as 10 days. Had we not been spurred on by necessity, I feel we might have given the job up as hopeless. There was no alternative to spraying during rain, and a novel feature has, as a result, emerged from our work, for the success of spraying and dusting during relatively heavy downpours of rain, and the retention of fungicides on tea leaf under such conditions, is at least surprising. We are under the impression that successful protection of a crop by fungicides, under the conditions in which we have worked, is a distinct development in crop protection technique.

Perhaps a word of praise for the estate labourer would not be out of place here as the success of crop protection methods applied during rain depends on labourers who are prepared to stay on the job.

The papers to be read during the day will give you a fairly complete account of the more practical aspects of our work. We must, however, think two or three years ahead. Todays work in the laboratory may develop into small scale field trials next year and into large scale trials the year after. There is insufficient time to explain all the long term work and plans in detail, and I must now in order to complete my account of our work as a whole, resort to a condensed form of report.

1. An Engineering Department of the Institute came into being when Mr. James Landreth joined our staff in March 1950 after a short "busman's holiday" in the U.K. during which time he visited the crop protection sections of the Long Ashton Research Station, the Shell Laboratories in Amsterdam, Plant Protection Ltd., and Pest Control Ltd., as well as a member of manufacturers of crop protection equipment. Mr. Landreth also purchased precision

workshop equipment while he was in the U.K. The delivery of this equipment has unfortunately been very slow but a temporary workshop has been set up in the laboratory. A simple form of knapsack equipment designed to suit our requirements, which we hope can be produced and maintained cheaply, has already been developed. This equipment is available for inspection later in the day. A great deal of new equipment, including three machines for large scale work, is coming to the Tea Research Institute for trial. Mr. Landreth will be largely occupied with such trials in the future months.

2. Following Dr. Swarbrick's visit to Ceylon last year the Shell Company loaned us the services of Dr. Pfaeltzer from their Amsterdam laboratories. Dr. Pfaeltzer arrived in April and has carried out an intensive field trial of proprietary fungicides gathered from all over the world as well as a number of substances being developed by the Shell laboratories. 58 different fungicides in 188 different formulations were each tested on 20 bushes. A large number of control rows were dispersed over the whole area which contained 296 units covering 1½ acres.

Some of the more promising fungicides were later tested on a larger scale over a total area of 8¾ acres.

It is undesirable and even dangerous to give you any further details. I can, however, safely say that copper based fungicides are the obvious choice for present use and that the possible development of a systemic fungicide, one application of which may immunise bushes for a considerable period, is not a forlorn hope. Encouraging results have been obtained, and nothing more than that, may be said at present.

Dr. Pfaeltzer also found time to study the conditions required for the germination of blister blight spores.

We are greatly indebted to the Shell Company for their co-operation and have found Dr. Pfaeltzer a most interesting and stimulating colleague.

3. Expert help with knapsack spraying has also been available to us through the much appreciated assistance of Plant Protection Ltd. who have hired us the services of Mr. C. L. Scoles for six months. Mr. Scoles has given us valuable advice and assistance with all our spraying experiments and is also assisting us in the search for nozzles which are most suitable for spraying tea under the various conditions encountered.

4. Dr. Dike of Universal Crop Protection may now be called a regular visitor to the Tea Research Institute. Dr. Dike came out to the symposium last year, returned in May with a dusting machine, and stayed with us until August. During this period he made very considerable progress with dusting and you will hear more about this later.

Dr. Dike has just flown back to Ceylon again and I have much pleasure in welcoming him to this Conference. I hope he will give us a short address during the afternoon.

5. It is my pleasant duty to welcome Dr. Greenslade and Mr. Bals both of whom attended the symposium. Both these gentlemen have brought new machines out for trial and I hope they will tell us something about them this afternoon.

6. During the year we made a preliminary essay at training superintendents and labourers in crop protection methods. 12 superintendents concerned in our extensive experiments attended a 3 day course of lectures and practical work. 86 labourers from the same estates were trained in spray gangs.

If crop protection methods are adopted by estates we feel that superintendents' courses should be provided next year. A course for conductors and intelligent K.Ps may also be sound policy, but it will be impracticable to train large numbers of labourers. We can, however, include advice on the training of spray gangs in the courses for superintendents and conductors.

7. In order to keep all estates concerned with crop protection methods fully informed about developments, modifications, etc. we intend issuing periodical circulars to all who register their names for the purpose. *Will you please write to us if you wish to receive these circulars.*

Finally, I also warmly welcome a number of other visitors who have travelled long distances to attend the Conference. Dr. Van Emden and Dr. Van Hell have come from Indonesia, Mr. P. de Jong from the Scientific Station of the United Planters' Association of Southern India, Mr. A. Johnstone from the Department of Agriculture, Malaya, Mr. R. V. M. Jodrell of Universal Crop Protection, Ltd., from London, Mr. R. Coleman of Imperial Chemical Industries, from Madras and Mr. R. W. Thorpe, Director of Tea Estates India Ltd., from South India.