

SUMMARY AND CONCLUSIONS

BY

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The world is fast becoming full of specialists, and it is no easy matter for a scientist in one particular field to summarise and critically assess papers read on various subjects, outside his speciality, and assess the significance of the proceedings of a conference, such as the one that has just been concluded, where 25 papers were read, covering various aspects of the biology of the crop as well as on the chemistry of the product. Therefore, the following remarks will be made entirely on the basis of the significance of the papers, as they appear to me, a biologist.

Rubber is a unique crop in that in the last 40 years or so, its acreage yields have been increased some seven-fold by plant breeding methods. Mr. L. B. Chandrasekera, dealt with the improvements in yields of rubber that can be achieved by the introduction of new clones, such as RRIC 36, 89, 100 and 101. These have the potential capacity to yield between 2,000 and 3,000 lb per acre, a far cry from the 300-400 lb per acre obtained from selected seedlings. If these clones are responsive to stimulation they may even yield 5,000 lb per acre, as Malaysia has obtained under experimental conditions. However, my assessment is that long-term consistent yields of 5,000 lb per acre, although possible, will not be achieved within the next decade.

One of the drawbacks to rapid progress in breeding high-yielding clones is the long period required for testing clones. In this context the paper by Mr. D. M. Fernando, was of real interest as he has found a new method of predicting yields of the mature tree at the seedling stage. When this work is developed, we look to a time when the progress in *Hevea* breeding will be very rapid.

The exploitation of the rubber tree over a long period of years is very important and the paper presented by Mr. Tang Hong Tong of the Chemara Research Station, Malaysia, on super high tapping techniques, where the trees are tapped at heights of 8—10 ft, and the latex drips into cups along long strings, was particularly interesting. It is claimed that the tapping life of the tree can be increased by 4—8 years by this technique. This is of immediate interest to Ceylon, as our soils and terrain do not lend themselves to replanting in short cycles.

The latex flow pattern of clones, which is closely correlated with yields and yield predictability, and the genetic variation between buddings and clonal seedling rootstocks, which has a bearing on the yield of budded rubber trees, were discussed by our Messrs. U. P. de S. Waidyanatha and N. E. M. Jayasekera, and Mon. du Plessix of the I.R.C.A. While Mr. Jayasekera dealt at length on the variability of the rootstock and the importance of culling, Mon. du Plessix spoke on the importance of the physiological age and position of buds, which go to produce the tree. Mr. Waidyanatha's paper gave rise to some lively discussion, showing the interest it created.

The latest studies on the classification of *Hevea* soils and weed control under this crop were discussed by Messrs. C. G. Silva and N. Yogaratnam. The guest speaker in this session, Dr. M. Mohinder Singh, of the Rubber Research Institute of Malaya, discussed the use of appropriate fertilizers for rubber, based on leaf and soil nutrient surveys, which is the method used in Malaysia. He said that in some respects Ceylon has more information on leaf nutrient status than the RRIM, so that the prospects of the technique being used in Ceylon, are very real. We expect to take early action on this matter.

The Plant Pathology Department of the Institute, which has always brought out something novel and controversial at these conferences, discussed the general subject of new and improved methods of disease control — methods that will always prove economical to the industry. Dr. (Mrs.) V. Satchuthananthavale, spoke on the use of sulphur for the control of White Root disease and the latest recommendations for Bark Rot control. It is now quite clear that the control of Bark Rot is mainly an assay in common sense. Don't give the fungus the opportunity to infect and you control the disease. It is as simple as that. The problem of *Oidium* leaf disease control was critically analysed by Mr. A. de S. Liyanage, who has found that the disease need be controlled only at higher elevations in some districts and that the expenditure on control of the disease on PB 86 is generally not warranted. Mr. H. L. Munasinghe gave a lucid well-illustrated account on the diagnosis and control of Black Root disease, which has caused quite some interest in the Kegalle District recently. Mr. T. M. Fernando's interesting studies on spore content in the atmosphere will be of direct interest to planters, as his results will indicate to them the methods of disease forecasting. I trust that Mr. W. C. Dayaratne's paper on the control of an old enemy, mould contamination of prepared rubber, will have the desired effect. I hate treading on other people's pet corns, but this country cannot afford to waste its assets, and the avoidable waste on mouldy rubber calls for quick remedial action.

In the sessions on rubber chemistry some extremely valuable papers were read, with Mr. S. W. Karunaratne assessing the possibilities of preparing crumb rubber from fractionated latex and Mr. M. Nadarajah, Dr. A. S. L. Tirimanne and others speaking on antioxidants in natural rubber latex. Mr. M. T. Veerabangsa and his colleague suggested various methods for the improvement in the manufacture of general purpose Ceylon rubber. The Government should pay special heed to this paper as it is suggested that the switch over to new process rubbers must be given the necessary impetus from the public sector.

There were two thought-provoking papers in this session, contributed by a Botanist and a Plant Pathologist, Dr. & Dr. (Mrs.) R. Satchuthananthavale. They presented the preliminary results of their studies on bacterial coagulation of latex and the possibilities of using this method in new process rubber manufacture. The estimated savings on foreign exchange on acids for coagulation alone, make this method worthy of careful study and development, apart from the technological improvements it may bring about in the prepared rubber and the vistas the method opens in the ease of collection.

Dr. E. G. Cockbain, of the Natural Rubber Producers' Research Association, spoke on NR latex applications and developments. He said that there were five major uses of NR ; carpet backing, dipped goods, latex thread, adhesives and moulded foam. In two of these areas of usage, namely, dipped goods and thread, NR is more than holding its own against synthetics, in the others it is facing severe competition.

The conference was concluded with a timely paper by Mr. A. B. Dissanayake, who spoke on the future prospects of the rubber industry. This paper discussed the present position of NR and suggested that all the prophets of doom who forecast the end of the industry a decade ago have been proved wrong. NR is still the best general purpose elastomer available in the polymer field—there is nothing wrong with it. We must take the necessary action to produce it correctly and present it for sale in an attractive form. In short, the time we thought of rubber as an agricultural product is dead; it is an industrial raw product, and must be treated so. If this is done, the future for NR is bright and will remain so.

I should like to take some time to deal with the papers read by Dr. Sekhar and Mon. Leveque.

One of the most important advances in rubber research in recent years has been the development of new process rubbers. Therefore, the address made at this conference by Dr. B. C. Sekhar, Director, Rubber Research Institute of Malaya, is both timely and of the first importance. Here I should like to pay a personal compliment to Dr. Sekhar for his mastery of the subject and his impeccable delivery. Dr. Sekhar, a pioneer research worker in the field of new process rubbers, said that, while modernisation of the agricultural sector has been going on for some time and has been rewarding, the second aspect of modernisation, which is processing and technology, has only just started. In the context of increasing supplies of natural rubber becoming available in the coming years, the need for concerted effort into processing and presentation problems needs no emphasis. Malaysia has launched both a technical grading scheme and new presentation processes some five years ago.

Progress has been quite satisfactory, but the complete answer to modernisation lies in paying emphasis at the same time to controlling the basic technological characteristics of interest to consumers. The factors governing these characteristics have to be appreciated and proper control measures instituted. Dr. Sekhar discussed the possibilities in this direction and the future action required by producers. In this connection, it must be remembered that while the first targets in modernisation must remain national operations and national standards, in the ultimate analysis, competitive pressure is basically on the *polymer itself*. Removal of this pressure can only be effected by *international action by all producers of natural rubber*, co-operating to enhance the image and market acceptability of natural rubber itself. The timing for Dr. Sekhar's address is opportune as the International Rubber Study Group meets next month (October) in Singapore, and Ceylon's representatives at this meeting will be able to be properly briefed on the international action necessary to obtain realistic prices for rubber.

Mon. J. Leveque, representing the French Rubber Institute, Paris, read a complementary paper on the views of the French-speaking Institutes in the field of new process rubbers and technical grading of natural rubber. This is an important aspect to consider as, although new process rubbers are made basically on the same principles, the methods of crumbling and drying may vary, and it is fortunate that the rubber producers in Ceylon had today the benefit of the experience of Malaysia and the French-speaking Institutes in one session, as this will help our country assess the relative value of the two types of manufacture. The French Institutes recommend granulation by rotary cutters alone or in conjunction with hammermills, and drying in continuous dryers. The RRIM appears to favour a mechano-chemical process for crumbling, as this gets rid of more dirt. The general concensus of opinion is that in addition to the present set standards, a further specification on cure characteristics should be added. Thus although there may be certain preferences at a national level regarding the methods of production, there has never been any disagreement between nations about the need to move into new process rubbers and to present the product for sale on the basis of technical specifications. We have lagged behind in this direction, and if this conference helps to point out the importance of a quick shift, then it would certainly have achieved its purpose, and paid its way in full.

I am sure that every planter here would like me to indulge in a bit of sooth saying, as far as the future of natural rubber goes. As you have been told by Dr. Sekhar, NR remains the best general purpose elastomer in the world today. However, it is one polymer amongst many others, and we must expend a lot of energy to make it attractive to the consumer and get a piece of the market. You have listened to a number of papers on the biology of the crop, and know that we are well advanced in this section, and the future is in capable hands. It is in the second aspect of processing and technology that we require rapid advance. Here again