

## TEA IN NORTH-EAST INDIA

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North-East India provides the world tea market with over 300 million kg of tea each year. This is more than three-fourths of India's total production, and is, therefore, the mainstay of the Indian Tea Industry. Tea exports from India have not increased remarkably in recent years. The large internal market, however, has been steadily increasing and is expected to increase further in the future. Two-thirds of India's production is expected to be consumed internally by 1980. The production target at the end of 1973-74, worked out by the Tea Board of India, is fixed at 460 million kg of which 239 million kg have been earmarked for export. Orthodox and broken grades are produced for the Calcutta market, while CTC teas are largely directed to the London market.

India has exported some tea in packets particularly to Nepal, Yugoslavia, the Soviet Union, the countries bordering the Persian Gulf and others of the Middle East and also, to a lesser extent, to France, Italy, Belgium, Poland, Austria, Japan and the United States. The Government of India has decided to set up a National Tea Corporation in the Public Sector, mainly for the export of tea in consumer packets. Regular tea auctions are held in Calcutta, where the bulk of NE Indian teas is sold. Auctions are also held in Amritsar and Gauhati, mainly for the internal market.

Since 1968, Morocco has purchased green tea from India. Earlier, the Moroccan requirements of green tea were supplied by The Peoples' Republic of China, Japan and Taiwan Province. Green tea is produced by some tea growers in the Terai and other plains districts. Estates produce only a little green tea but small owners are said to produce appreciable quantities for the auctions in Amritsar in the Punjab supposedly for consumption in that State. It is also said that some of it is sent across the Afghanistan border illegally to several consuming countries. The green tea industry was generally described as being poorly organized.

### *Areas*

The main areas of tea production in NE India are shown in Fig. 1. This article will not deal with the areas in Cachar, Bihar and Tripura which the Authors were not able to visit. The Assam Valley, consisting of the vast alluvial plain encompassing the north and south banks of the Brahmaputra River is the major tea area in NE India, producing 70 million kg while Terai and Darjeeling produce around 10 million kg each. With the exception of Darjeeling District, the other tea areas in NE India are referred to as the Plains Districts.

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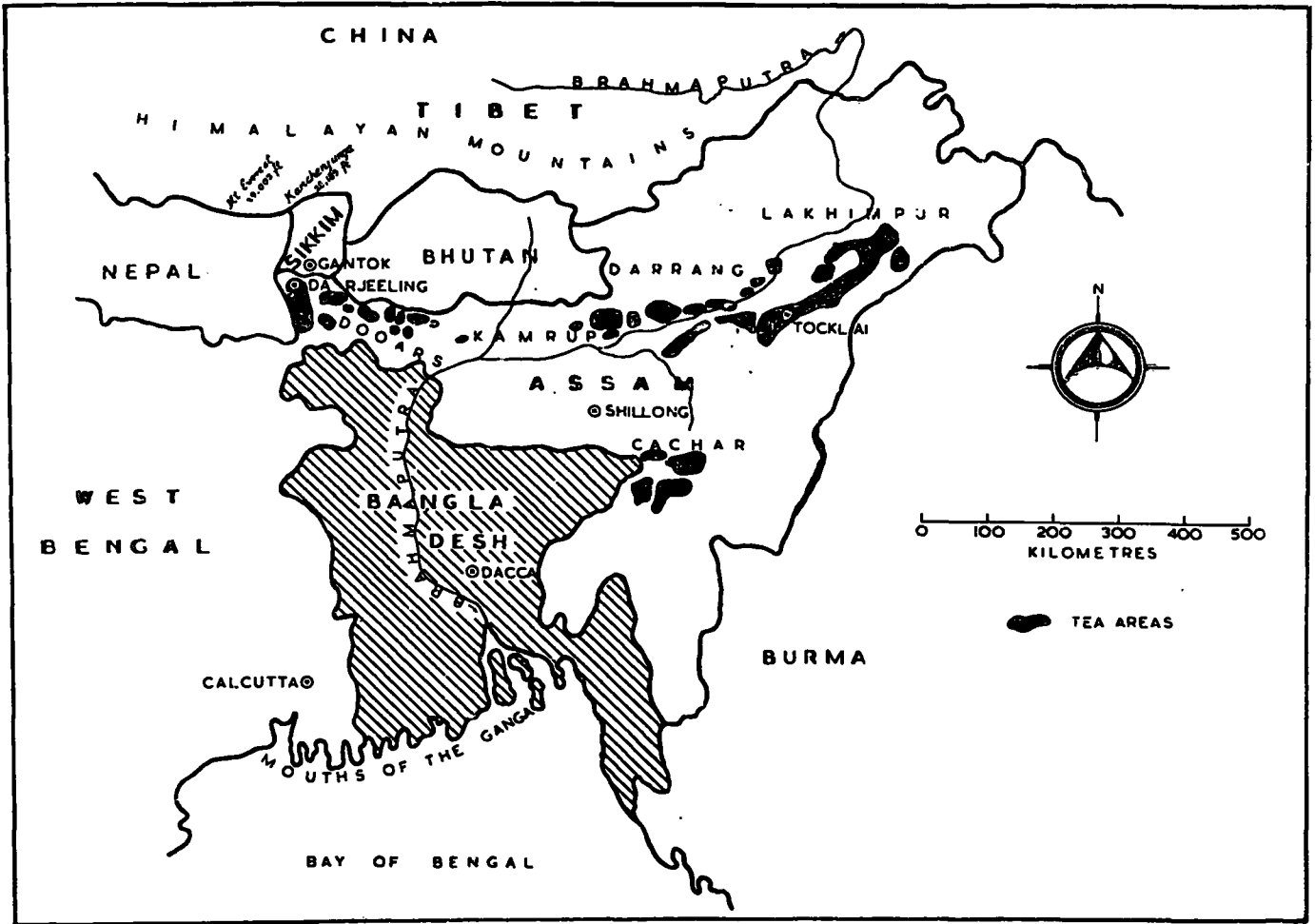


FIG. 1—Map showing tea areas in North-East India

## DARJEELING

The well-known tea district of Darjeeling in the State of West Bengal is situated in the foot hills of the Himalayas, bordering Nepal on the west, Bhutan and Sikkim on the north and Tibet on the north-east. Tea grows at all elevations up to 2440 m (8000 ft) but as we pass above 1830 m (6000 ft) the tea seems to suffer adversely from extremes of climate. Darjeeling District is surrounded by some of the highest peaks of the high Himalayas (Kanchenjunga 8590 m (28,185 ft) amsl) and the climate is, therefore, variable and the weather unpredictable (Fig.2). There is a pronounced winter period during which no harvesting is done. The yields of tea from Darjeeling District average less than 560 kg made tea per hectare. The better estates (Fig. 3 a & b), however, obtain average yields of more than 670 kg per hectare. Besides the adverse climatic factors which tend to depress crop, other reasons for the low yields are poor stands of tea and poor jats of tea, largely China, with very little replanted tea.

Darjeeling produces characteristically-favoured teas which regularly fetch premium prices at the Calcutta Auctions. Most estates do not seem to mind the low crop as the price factor compensates for it. After the winter period, flushing begins at the end of March and reaches a peak from about the end of April to the middle of May. This crop is called the first flush, as it follows the winter. Plucking rounds



FIG. 2—Terrain of Darjeeling District with its variable climate. The snow peaks of the high Himalayas are seen in the distance.



FIG. 3a—*A good tea estate in Darjeeling District*



FIG. 3b—*A good tea estate in Darjeeling District*

are five to nine days. The best flavoured teas, fetching as much as Rs 85 or more per kg (Rs 40 per lb) come from first flush teas. Although the prices realized by Darjeeling flavoured teas are lower than the highest-priced Ceylon teas by an appreciable margin, the quantities of Darjeeling teas offered, are greater than the quantities invoiced for the highest-priced Ceylon teas. After the first flush, there is a short period when the tea becomes dormant. This period may last only a couple of weeks. Flushing takes place again, and the teas are called second flush teas. Plucking rounds for the second flush period may be eight to eleven days. There may be flavour even in second flush teas, but it is considerably less than in first flush teas, unless the bushes have been pruned. Following the second flush comes the monsoon, when the flavour characteristic of Darjeeling disappears completely. The rain crop, as the tea is called, is poor. Flushing stops completely by the end of November or early December with the onset of the winter.

The prices realized for flavoured teas vary considerably with the grade of tea produced. Table 1 gives a breakdown of the quantities of various grades of tea produced by one Darjeeling factory.

TABLE 1 — *Grades, quantities and prices of teas produced by a Darjeeling Factory*

Grade	Approximate % produced	Price per kg
Golden Flowery Orange Pekoe I	48	Rs 45 to Rs 60
Golden Flowery Orange Pekoe II	8	Rs 35
Golden Broken Orange Pekoe	25	Rs 30
Broken Orange Pekoe I	3	Rs 15
Orange Fannings	10	Rs 20
Dust	4	Rs 8 to Rs 9
Poor remnants	2	—

Manufacture is strictly orthodox; withers average 55%, but first flush withers are hard and second flush withers are medium. A 90-minute rolling programme, broken up into three rolls of 40, 20 and 30 minutes was used in one factory. Factory costs may average at Rs 3 per kg with field costs averaging Rs 8 to Rs 9 per kg in a typical case. Each first or second flush invoice is vitally important to the profitability of the property.

### *Cultural Practices*

Tea estates in Darjeeling District are located on steep slopes of the foot hills of the Himalayas (Fig.4). The problem of soil erosion is, therefore, extremely important and dominates many of the cultural practices adopted in the District. Much of the tea remains China although Assams are being introduced rather sluggishly. Estate managers hold the view that replanting on a large scale is not possible because uprooting the old tea will lead to severe soil erosion. This view is perhaps ingrained in the managers because they are constantly reminded of the extremely high cost of road maintenance and the frequent landslides that cause much damage and concern. One school of thought, rather than resorting to replacing old tea, advocates a hard 'rejuvenation' prune in order to attempt to revitalize the bushes (Fig. 5). Should they die as a result of the prune, the vacancies are infilled, although the practice of infilling vacancies has been slow in implementation. Planting distances in old tea are 0.9 x 1.2 m (3 ft x 4 ft). This leaves much room for weed growth. The retention



FIG. 4—The steep slopes of the Himalayan foot hills showing extensive land slides



FIG. 5—Rejuvenation pruning of old tea on an estate in Darjeeling District



FIG. 6—Weeding with a three-pronged fork around the collars of tea plants in Darjeeling District



FIG. 7—Non-uniform stands of shade trees (*Albizia chinensis*) in Darjeeling District

of weeds is regarded as a soil conservation measure and clean weeding is, therefore, not practised. *Paspalum scorbiculatum*, *Borraria hispida*, *Drymaria cordata*, *Lilium* sp. and Illuk are common weeds in the District. Paraquat is used in some properties but is by no means universally popular and the Tea Research Association had advised caution in the use of herbicides in the District until the results of their experiments on soil erosion are available. Weeding is sometimes done by the use of a three-pronged scraped around the collars of bushes (Fig.6). It is done towards the end of the growing season. This process, called 'thullying,' is done once a year in some properties. It is followed by slashing the remaining weeds with a sickle. This requires around 20 labourers per acre. On some estates this practice of 'sickling' is the only method of weed control employed.

Pruning is very variable from estate to estate and the choice of techniques seems to be guided largely by personal preference. The length of the pruning cycle can range from three to six years depending on the elevation of the property.

#### *Three-year cycle*

- (a) The first step is a *light prune*, which is usually 1.3 to 2.5 cm ( $\frac{1}{2}$  to 1 inch) above the last pruning level.
- (b) Then comes a *levelling-off skiff*, which is more like a light tipping designed to flatten the plucking tables. This process usually follows the prune.
- (c) A *light skiff*, 5 cm below the levelling-off skiff, is given into red wood; crows feet are retained.
- (d) The original light prune (a) follows.

#### *Four-year cycle*

- (a) Light prune.
- (b) Levelling-off skiff.
- (c) Then follows a *medium skiff*, where crows feet are removed at about 5 cm below the present plucking level. As an alternative, a *deep skiff (cut-across)* is given in between the last pruning level and the present plucking level.
- (d) If (c) is a medium skiff, then a light skiff is given, but if (c) is a cut-across then a levelling-off skiff takes place.
- (e) The original light prune (a) follows.

#### *Five-year cycle*

- (a) Light prune.
- (b) Levelling-off skiff.
- (c) Light skiff.
- (d) Medium skiff or *deep skiff* which is a cut-across described under (c) for four-year cycles.
- (e) If (d) is a medium skiff then a light skiff follows, but if (d) is a deep skiff then a levelling-off skiff follows.
- (f) The original light prune (a) follows.

### *Six-year cycle*

- (a) Light prune.
- (b) Levelling-off skiff.
- (c) Light skiff.
- (d) Deep skiff.
- (e) Levelling-off skiff.
- (f) Light skiff.
- (g) The original light prune (a) follows.

These schemes have often to be modified as a result of fluctuations in labour availability. The cycles are geared to producing the maximum first and second flush crops. Estates are advised to introduce deep and medium skiffs into their cycles rather than shorten cycles. Estates are advised to remove banjis manually when they appear between flushing periods, but when this proves impractical, they are advised to resort to light skiffing. The erratic labour position in Darjeeling leads to problems like plucking tables rising unduly. The pruning techniques are relied upon to provide solutions to such difficulties. Frames of the bushes, some of them 90 years old, appeared to be quite satisfactory, with very little wood rot.

*Albizia chinensis* is a popular shade tree in Darjeeling although stands of shade are far from uniform (Fig.7). They vary not only in spacing but also in age in particular tea fields. The Tea Research Association (TRA) is of the opinion that shade is not required on seedling tea at elevations above 600 m on north and east facing slopes, but that shade is required for estates which have planted light-leaved jats.

### *Pest and Diseases*

Thrips and scale insects cause some concern and chemical control measures are adopted. Attacks of Scarlet, Purple and Red Spider Mites on the first flush are controlled with prophylactic sprays of chemicals, as the estates do not wish to risk damage to the first flush. Some estates do not adopt any control measures. Under the clouded Darjeeling conditions, Blister Blight is said to cause considerable damage to crops if not controlled. Many estates do not however adopt any control measures.

Hail damage could be very serious, sometimes resulting in the appearance of enormous cankers on branches.

### *Fertilizer*

Fertilizer practices are extremely variable and the only reliable guides are perhaps in the field experiments conducted by the TRA. In one experiment on china-jat seedling tea, there was a response to 65 kg/ha nitrogen, over no nitrogen. There was no response to phosphate or potash at levels of 22 and 45 kg/ha each. These results were confirmed in another experiment, but in yet another, plots receiving 45 kg/ha phosphate gave more crop than those receiving no phosphate, at constant levels of potash.

### *Research and Development*

The TRA maintains a Clonal Proving Station at Ging Estate near Darjeeling at an elevation of 1220 m (4000 ft) and extending over an area of one hectare of land leased from the Darjeeling Tea Company. The Station is under the charge of a resident graduate. One Advisory Officer is stationed in Darjeeling and covers the interests of the estates which are members of the TRA in Darjeeling and the plains district of Terai. Member estates constitute about 80% of the tea properties in Darjeeling and Terai. This officer also advises the few estates in the bordering country of Sikkim, to which access is difficult because of poor road communications.

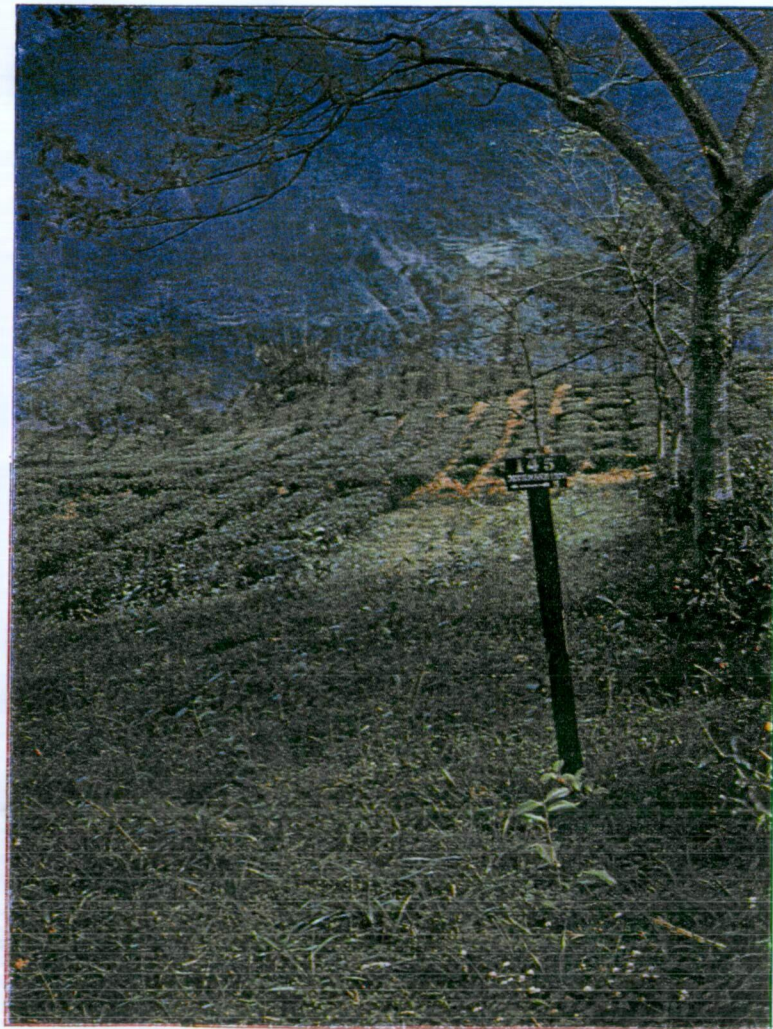


FIG. 8—Clonal testing station of the TRA at Ging Estate Darjeeling.  
Note the weed growth in the plot in the foreground.



FIG. 9—Clonal plots at the Ging Clonal testing station  
Chemical weed control measures are employed in the plots



FIG. 10—Area in the Dooars, sample pruned under the supervision of the manager. This is used as a guide for pruning the rest of the field.

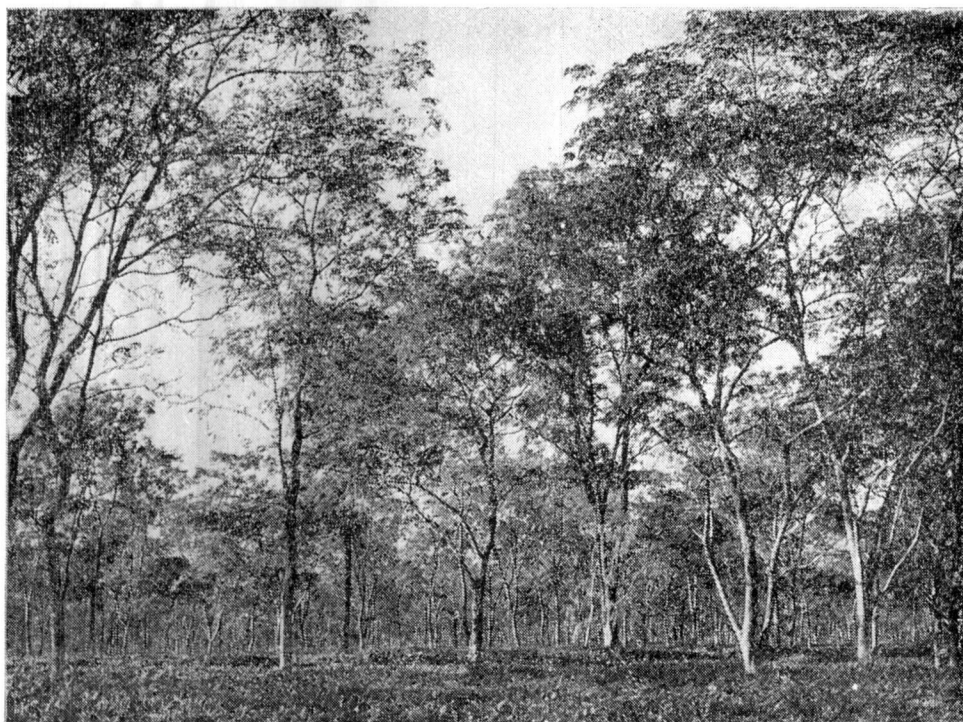


FIG. 11—Stand of shade trees in the Terai

Forty clones were under test in five experiments at the Ging Clonal Proving Station (Figs. 8 & 9). The leaf from every plucking round is manufactured on a miniature scale. This gives an indication of the importance attached to made tea characteristics in the District. The highest yield obtained in the test plots was 2240 kg/ha but most clones gave much less crop. On the basis of the clonal testing programme, four clones have already been recommended to estates. Some selection work has been done by private estates who have planted out their own clones.

The techniques of raising young VP plants is in many respects similar to those adopted in Ceylon. Cleft grafting a three-leaved scion onto a rootstock is used as a method of quick multiplication of clonal material and is extremely popular in Darjeeling and elsewhere. Bamboo slats are sometimes used to provide high shade for nurseries. The sides of the entire nursery are also enclosed. Polythene is used to cover the young cuttings to minimize watering operations. It takes 1½ years to produce a plant of 50 cm, the size TRA recommends for planting out.

## THE DOOARS

Darjeeling teas, as stated earlier, are quite distinct from the teas coming from the plains. It must be explained that the States of West Bengal and Assam largely cover the flat plains through which great rivers like the Brahmaputra, Teesta and several others flow down from the Himalayas to join the Ganga (Ganges) which enters the Bay of Bengal. The Himalayas rise from this vast plain and Darjeeling is the only tea district on the mountain slopes. The other tea areas of NE India, referred to as the plains districts, may be separated by hundreds of miles from each other but they still have much in common. The Dooars, is the largest tea district in the State of West Bengal and accounts for about four-fifths of its production. With the possible exception of Cachar, it is also the driest of the plains districts of NE India. Orthodox and Rotorvane-CTC teas are produced in the Dooars, with many factories being equipped for both. The choice of technique appears to depend on the market for CTC tea at any particular time. When the CTC market is slack most factories switch to orthodox manufacture. The Legge Cut method is also used in a few factories.

In common with other districts situated in the plains, a dominant problem in the Dooars is draining tea land, for eliminating excess water. It was seen that in Darjeeling, soil erosion and the maintenance of the quality of the teas dominated the activities of all estates. In the plains district much money is expended on what is called proper land planning and drainage. In improperly-drained areas, the water tables are high and this affects the tea adversely. Great publicity is given by the TRA to land planning and proper draining, particularly in planning new clearings.

### *Cultural Practices*

Plucking practices are closely linked with pruning practices. In the Dooars, and also in the Terai, the cycle is generally three years. A light prune is usually given and is followed by a deep skiff. After this, the practice adopted appears to be more variable. Some estates prefer a light or medium skiff while others employ a levelling-off skiff. Four-year cycles are employed in some estates. Here again, labour availability plays an important role in the practices adopted. In most tea areas in NE India, before tea fields are pruned, a few bushes are sample pruned under the personal supervision of the Manager (Fig.10). The labour then proceed to prune the rest of the field accordingly. This appears to be a very desirable practice and could well find wider application on Ceylon estates. Stands of shade trees vary in different estates (Figs. 11, 12 & 13).

*Indigofera tysmanii* (Fig.14) is widely used as a temporary shade tree and many estates are satisfied with it. *Albizia chinensis* is discouraged as a permanent shade tree as it is attacked by various pests and diseases of which the worst appears to be a canker disease. Nevertheless, *A. chinensis* is a species which estates would wish to have on their properties. Other species used are *A. lebek*, *A. lenticularis*, *A. lucida* and *A. procera*. *A. moluccana* has been dispensed with. Heavy shade is said to increase the incidence of Black Rot Disease. Mulching with loppings of Gautemala Grass and Pusa Giant Hybrid Napier Grass, though not universally popular because of its high cost, is generally accepted as being beneficial. Herbicides are being used on many estates in the Dooars and Terai districts, and are very much more popular than in Darjeeling District.

Replanting and new planting, aided by the subsidy given by the Tea Board of India appears to be rather slow. Both VP and seed plantings are done and new clearings are extremely good. A two-year period of rehabilitation is being recommended. The thornless *Mimosa invisa* (Fig. 15) is popular. The TRA releases cuttings of recommended clones only to member estates. Pairs of generative clones from which bi-clonal seed stocks can be raised, and also groups of clones from which polyclonal seed can be raised are also being released to estates by the TRA. The success of these programmes will no doubt be carefully observed by estates. Seeds are produced on seedbearers in NE India once a year before the onset of winter.

In large nurseries, two practices are noteworthy. Plants are sometimes placed in brick-lined sunken beds with the soil surface in the polythene bags either at, or below the surrounding ground level (Fig.16). It has been mentioned that the Dooars is a dry district, and this practice is said to have the advantage of conserving moisture and reducing expenditure on watering. The use of Bamboo for high shade nurseries has already been referred to for Darjeeling District. One large nursery in the Dooars had a distinct improvement in that the 'roof' of the high-shade nursery was gabled (Fig.17). This had the advantage of minimizing the drip of water from the 'roof'.

Some estates adopt the practice of 'double hedge planting', where they expect pluckers to pass between every two rows of bushes, instead of between every single row. Two adjacent rows are, therefore, planted close together. This practice is by no means universally employed, and its advantages are somewhat in dispute.

Most estates apply 110-130 kg nitrogen per hectare per year as ammonium sulphate. A few estates use up to 170 kg N. Urea is not easily available and is therefore not commonly used.

Teas from the Dooars are mainly Rotorvane-CTCs, the 38 cm (15 inch) diameter Rotorvanes being most common. One factory had a most elaborate tunnel-withering system where the leaf was loaded onto trolleys on trolleys (Figs. 18 & 19) and the entire trolley was wheeled into a withering tunnel. The enormous capital expenditure on this system is evidently a deterrent to any further installations of this system. Troughs are most popular and large driers (2 m = 7 ft) are not unique. Elaborate fermentation systems were installed in some factories, but they were not very common. If this can be construed as an index of their success, they do not appear to be of intrinsic importance.

#### *Research and Development*

The Headquarters of the Advisory Service of the TRA for West Bengal State are situated at Nagrakarta in the Dooars. One Advisory Officer is generally responsible for West Bengal and apart from the Advisory Officer who covers Darjeeling and Terai, there is one other Advisory Officer for the Dooars. The Station at Nagrakarta is equipped for clonal testing (Fig.20) and extension experimentation, and has a well-equipped Meteorological Recording Station (Fig.21). There is also an experimental substation at Mal in West Bengal, but this will soon be closed.

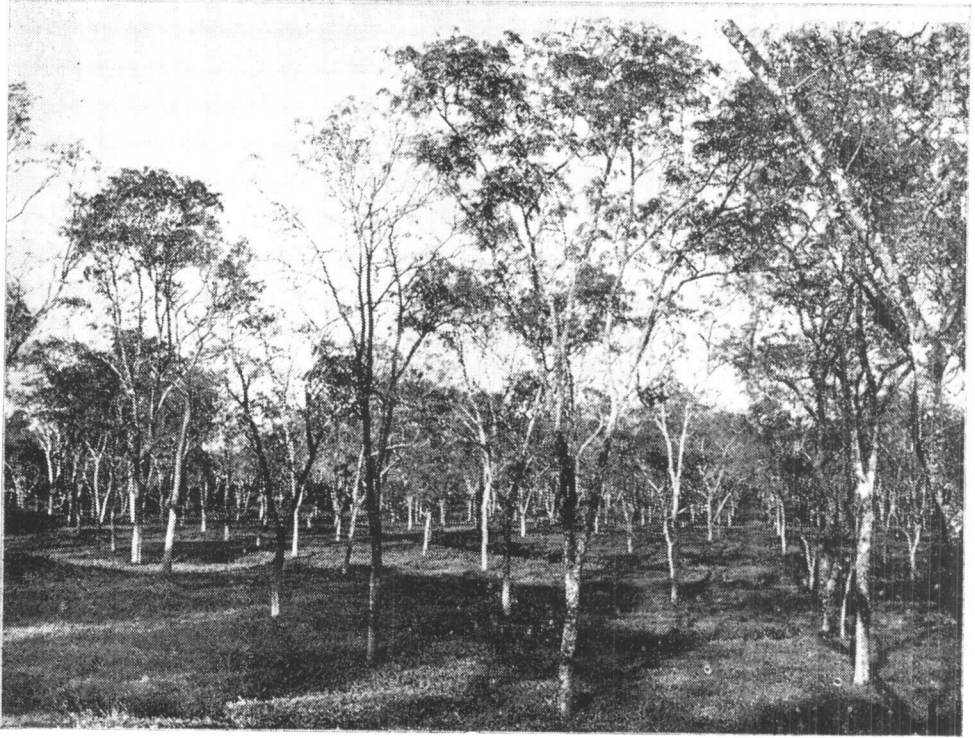


FIG. 12—*Stand of shade trees in the Dooars*



FIG. 13—*Shaded and unshaded tea in the Dooars*

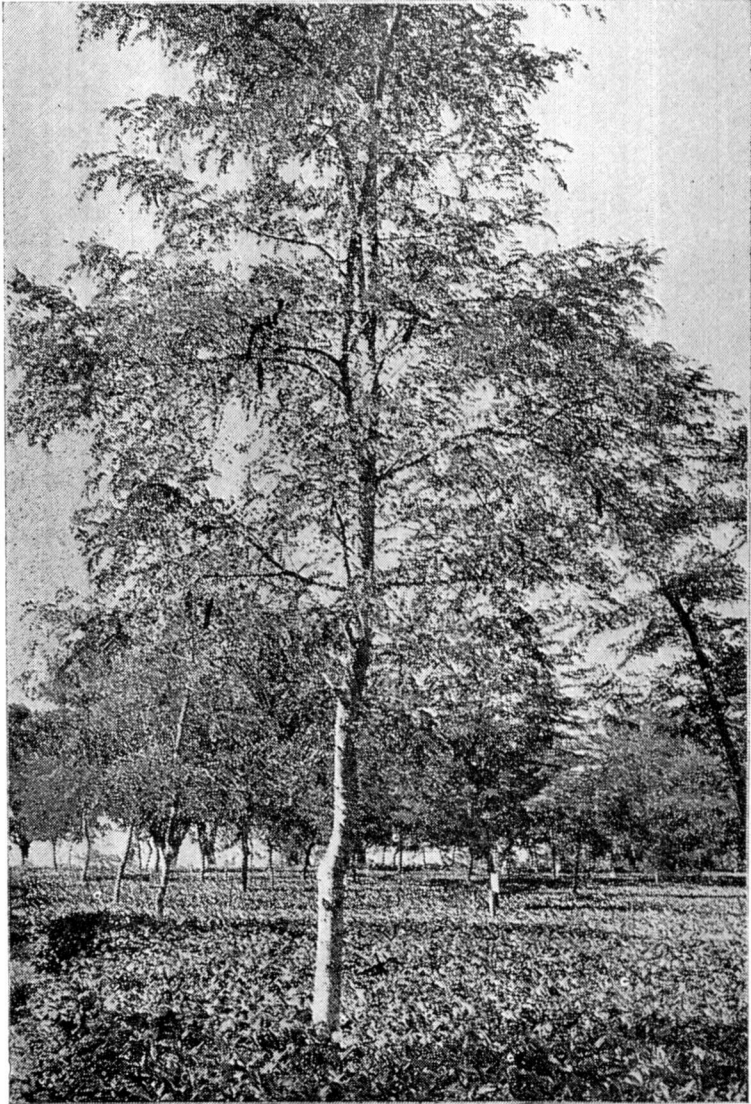


FIG. 14—*The temporary shade tree Indigofera tysmanii in the Dooars*

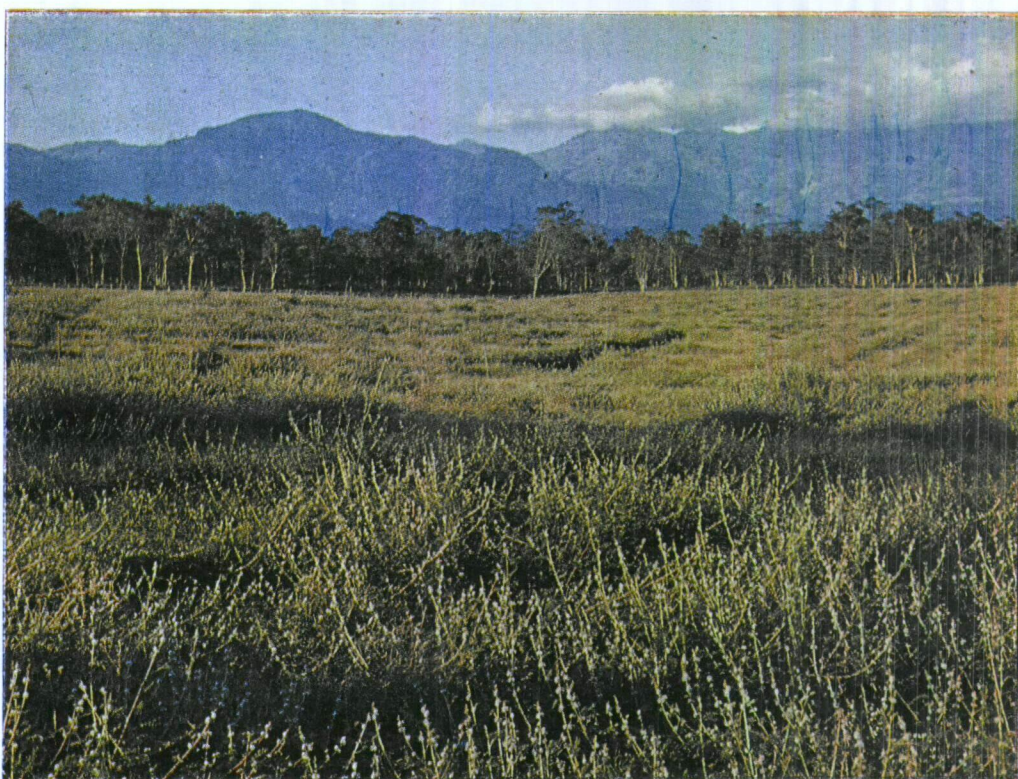


FIG. 15—*Mimosa invisa* being used in the Dooars for rehabilitation of tea land



FIG. 16—A large nursery for young tea plants in the Dooars. Note the sunken beds which are said to maximize water conservation.

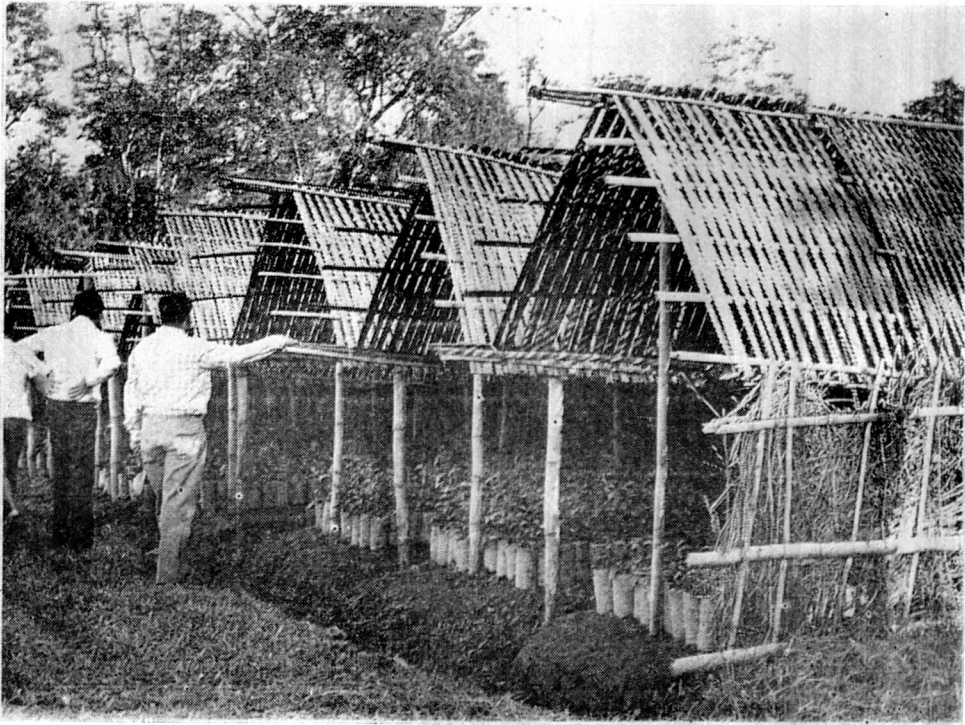


FIG. 17—Gabled bamboo slat roof of nursery for minimizing water drip from high shade

## ASSAM

The districts of Cachar, Darrang, Goalpara, Kamrup, Lakhimpur, Nowgong, Sivasagar and Dibrugarh constitute the tea districts of the State of Assam and produce well over 200 million kg (440 million lb) of tea each year. The largest producer is the North Bank district of Lakhimpur, while Goalpara, Kamrup and Nowgong produce very small quantities. Assam is largely a flat plain and drainage is evidently a major problem. Much funds, effort and research are, therefore, devoted to land planning and drainage. Leader drains are almost like little canals and their construction, and cleaning are, therefore, expensive operations. Some estates had difficulties because leader drains often ran through property not belonging to them. The drains were sometimes bunded for fishing, thereby reducing their efficiency.

As the land is almost flat, it is advantageous to use the slightest slopes for judicious placement of subdrains along a gently sloping contour. This is being carefully done by estates planning new clearings. In the early days of tea planting, roads were built criss-crossing the property, but in new plantings or in replanted areas, roads are being constructed as far as possible on crests of land in order to minimize maintenance costs. *Eragrostis curvula* is grown on the banks of drains in order to minimize soil erosion on some properties. Roads are often overgrown with grass (Fig. 22). They are not cleaned up intentionally because during heavy rainstorms, they may be severely eroded by rushing water.

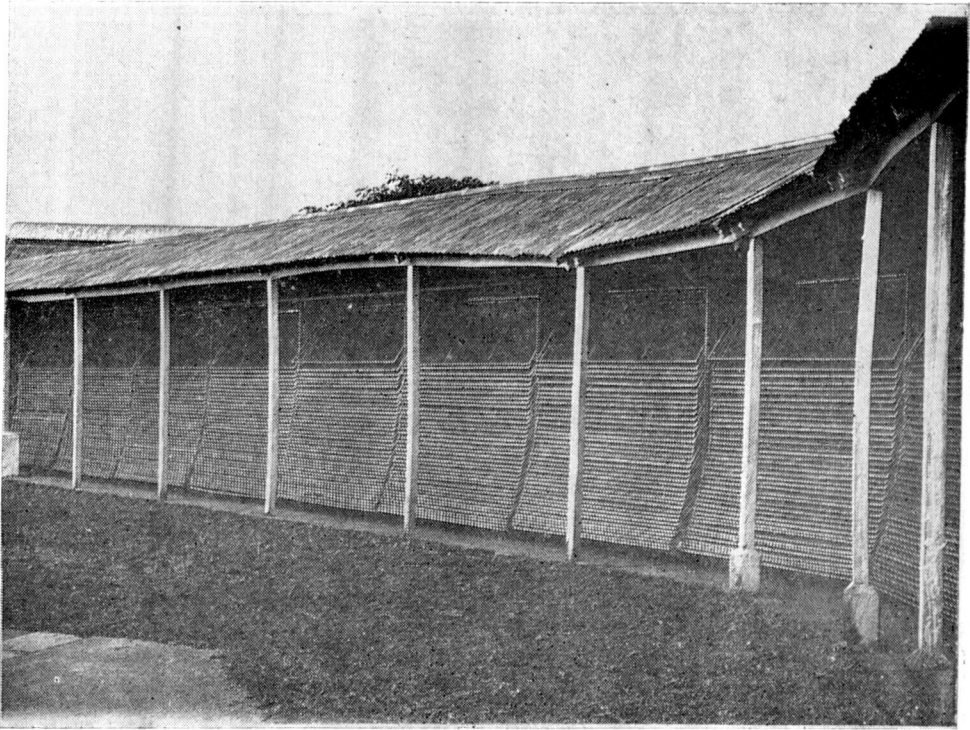


FIG. 18—*Tats on trolleys, used in the tunnel-withering system*

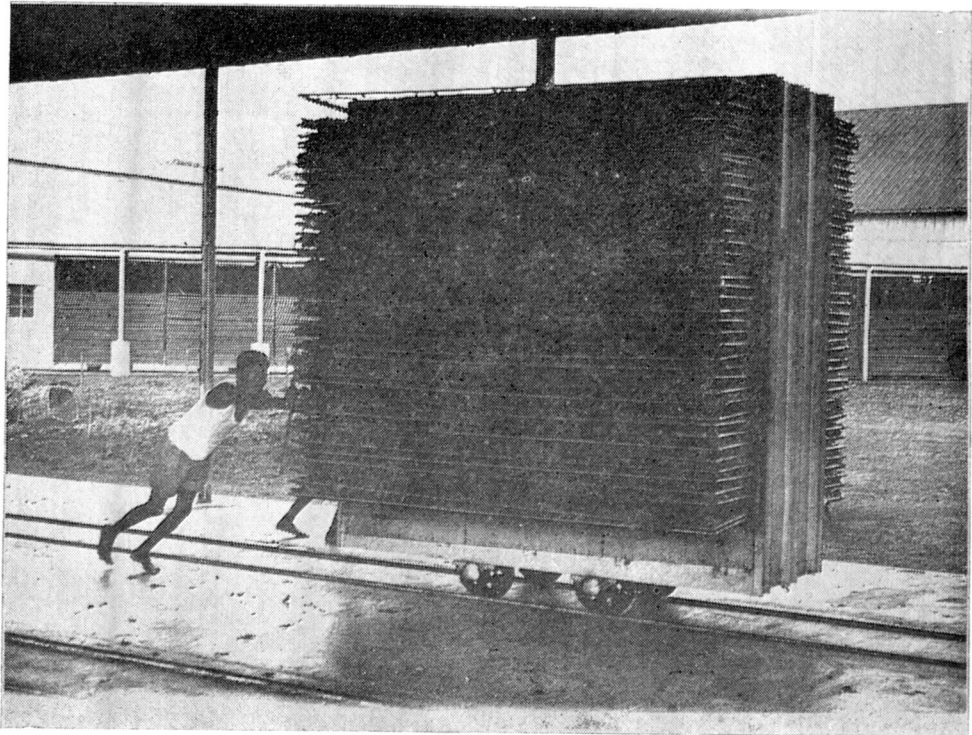


FIG. 19—*Loaded tats on trolleys, being wheeled into the tunnel withering system*



FIG. 20—Nagrakarta experimental station—Clonal observation plots

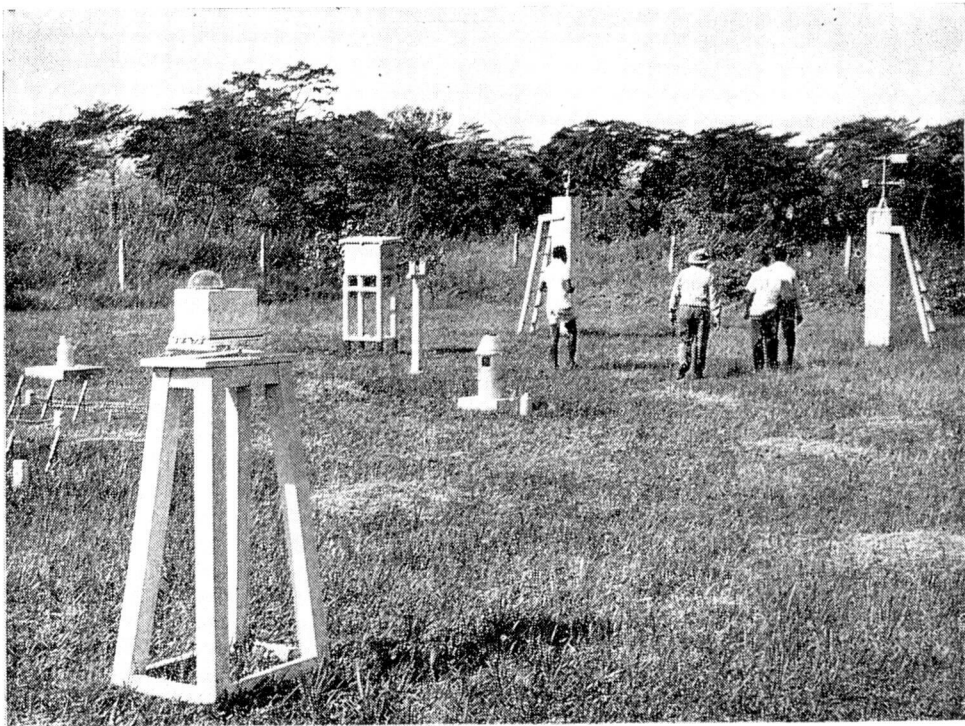


FIG. 21—Meteorological recording station at Nagrakarta in the Doars

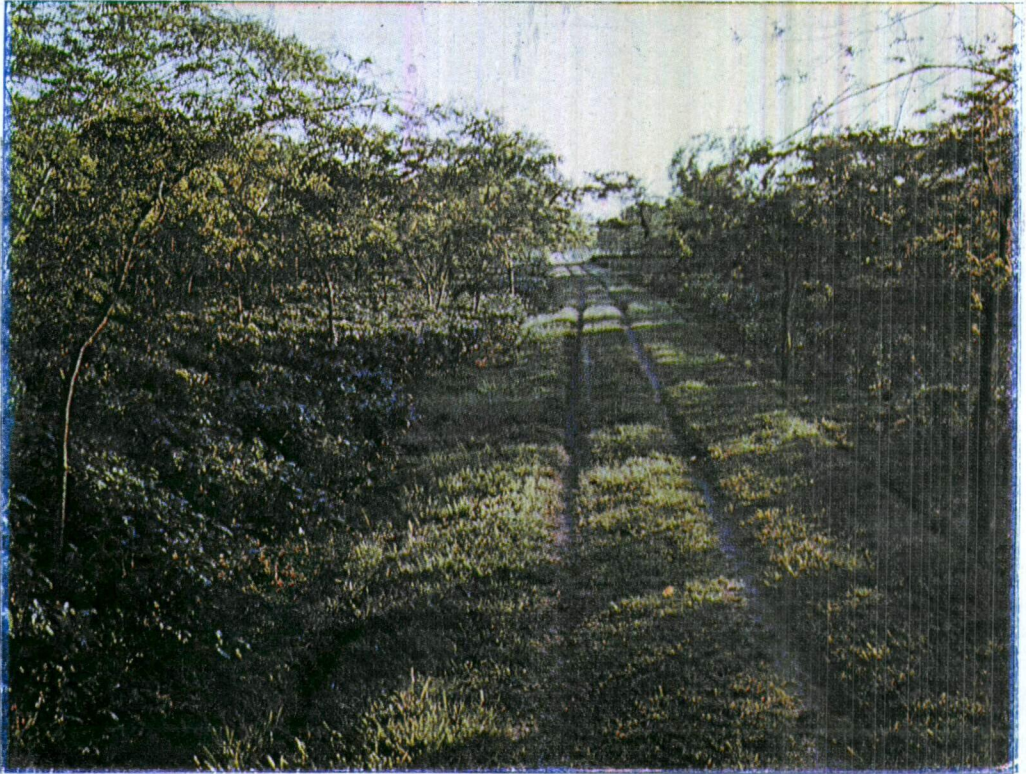


FIG. 22—Weeds are allowed to grow on cartroads as a soil conservation measure



FIG. 23—The Tocklai Experiment Station near Jorhat, Assam



FIG. 24—*Borbetta* field station near the *Tocklai* Experiment Station. Note the large drain for minimizing water logging of soil. Tea seed bearers are shown on the right.

### *Cultural Practices*

There is a widespread view that pruning and quality are closely linked. The general practice of pruning is a three year cycle, beginning with pruning, followed by a deep skiff, and finally either a light skiff, medium skiff, or even a levelling-off skiff. Two and four-year cycles are also employed in a few estates.

*Indigofera teysmanii* is used as a temporary shade tree, spaced initially 1.5 to 2.5 m (about 5 to 8 ft) apart and later it is thinned out to 6 to 7 m (20 to 24 ft). The common permanent shade trees are *A. lebbek*, *A. odoratissima*, *A. lenticularis*, *Derris robusta* and *Dalbergia servicea*. As in the Dooars, canker incidence affects the popularity of *A. chinensis*, *A. procera* and *A. lucida*.

A wide range of herbicides is used for weed control, but where Gramoxone alone was used, *Polygonum chinense* and other resistant weeds became a problem.

For many years, potash and phosphate were not applied to tea in the Assam Valley except in young tea and medium pruned tea. Widespread potash deficiency was recorded on Assam tea and led to the debilitation of some tea areas. TRA recently recommended the application of 40 kg/ha/year  $K_2O$  (36 lb/acre/year) and 20 kg/ha (18 lb/acre/year)  $P_2O_5$  every third year. Following the Ceylon practice of applying zinc, more interest is being shown on the requirements of this element for Assam tea.

### *Pests and diseases*

Ethion, Kelthane, Morocide, Tedion and Trithion are used to control Red Spider, Scarlet, Pink and Purple Mites. Looper Caterpillars, Bunch Caterpillars, flushworms, aphids, green fly, thrips and *Helopeltis* cause concern from time to time. Red Rust and Black Rot Diseases are treated with potash manuring and copper fungicides respectively.

### *Research & Development*

The Tocklai Experimental Station (Fig.23) at Jorhat in Assam has been in existence since 1911. It has a tea property called Borbetta (Fig.24) situated 5 km away, for field experimentation. Until 1964 it was run by the Indian Tea Association, but since then it has been the responsibility of the Tea Research Association (TRA) whose membership is open to all tea growers in NE India. Half the funds come from members and the other half from the Government of India and the Tea Board of India. Membership of the Association is voluntary at present. Besides the substations at Nagrakarta and Mal in the Dooars and Ging in Darjeeling, there are substations at Nangaon and Silcoorie serving the North Bank of the Brahmaputra and Cachar respectively. The Advisory Officers stationed in the South Bank cover those areas.

The Agriculture Department is staffed by two senior Agronomists and the Botany Department includes Plant Physiology and Plant Breeding. Besides the Entomology and Mycology Departments, there is a separate Pesticide Testing Department to look after problems connected with pesticide residue analysis.

In NE India the Pest Ecology of tea significantly differs from that in Ceylon in two main aspects. Firstly, NE India does not have the extensive monoculture of tea that we have in Ceylon as the tea gardens are interspersed with villages, forests and waste lands. This fact, their policy in weeding, and the extensive and heavy stand of shade trees in tea estates contribute much towards a favourable insect environment, which encourages the development of beneficial parasitic populations in tea and also helps to mitigate the adverse effects of the use of insecticides for pest control in tea. The second advantage NE India has over Ceylon is the occurrence of the annual winter, which will bring about a periodical natural regulation of pest populations. The seasonal short cropping periods, particularly of flush that goes to form high quality teas, therefore results in short and significant pest susceptible periods, where the judicious and conscious use of insecticides for pest control are more likely to bring in economic yield returns, or even perhaps, valuable protection for these crucial short periods.

Despite these environmental advantages as regards pest problems, it is important to note that the Tocklai Experimental Station has banned the use of chlorinated hydrocarbons in tea. Prophylactic sprays for mite control are recommended, but some estates either resort only to spot-spraying when the pest appears, or do not do any spraying against mite pests.

Entomology research is ecologically orientated, although they have a pesticide section within the Department of Entomology, where research is mainly directed towards mite control. The insect pest problems in NE India are far less severe than those in Ceylon tea.

The Biochemistry Department has had difficulties with staffing problems recently, and so has the Manufacturing Advisory and Tea Tasting Department. The soils and Meteorology Department is staffed by a Soil Chemist and a Soil Physicist. The Engineering Development Department is concerned with the development of new machinery. A Statistics Department assists all divisions in experimental design problems. The Advisory Service has to cover tea areas separated by thousands of miles. A senior Advisory Officer for Assam is stationed at Tocklai and separate officers cover the South Bank, North Bank and Cachar. A Chief Advisory Officer for West Bengal is stationed in Nagrakarta. One Advisory Officer covers Darjeeling and Terai, and another the Dooars. Specialist Officers tour all districts whenever possible, particularly in connection with specific problems.

### ACKNOWLEDGEMENTS

The authors thank the Tea Research Association of India for their invitation to visit NE India and for their kind hospitality. They thank the Director and Staff of the Tocklai Tea Experiment Station for the opportunity to visit the laboratories and have valuable discussions with them. They also thank Mr & Mrs D. N. Barbora (Tocklai), Mr & Mrs R. P. Basu (Dooars), Mr & Mrs W. Grice (Dooars) and Mr & Mrs S. K. Sarkar (Darjeeling) for their kind hospitality. They are also indebted to the many managers of Tea Plantations in Assam, Darjeeling and the Dooars for the opportunity to visit their estates, for their hospitality and kindness in other ways. Particular mention is made to Mr & Mrs P. K. Roy (Runga Muttee TE), Mr R. Royals (Takdah TE), Mr & Mrs M. Prasad (Goomti TE), and Mr & Mrs H. Hussien (Baradighi TE).