

SOME ASPECTS OF TEA CULTURE IN KENYA AND UGANDA

D. Kirtisinghe

Introduction

Records indicate that tea was first planted in East Africa at Entebbe, Uganda, in the year 1900, from tea seed brought from India, and three years later at Limuru, Kenya. By 1925 however, there were still only 325 acres under tea cultivation in the whole of Kenya. It is, therefore, apparent that these early plantings were not considered very seriously at least at the initial stages. Since 1950, expansion of both acreage and production has been at an accelerated pace and indications are that this trend might be maintained for sometime yet. At present, it would seem that the large foreign commercial companies have shifted their emphasis from new plantings to maximizing yields on the existing acreages, but that the acreage under smallholder cultivation continues to expand rapidly under well-organized development programmes.

The small-holder tea scheme

Tea cultivation was first attempted by the smallholders in the early 1950's under the direction and guidance of Mr. G. Gamble of the Agricultural Department and financed by the Kenya Government. The Special Crops Development Authority (SCDA) established in 1960 to work out a fully integrated plan for developing smallholder teas, was succeeded in 1964 by the Kenya Tea Development Authority (KTDA), the latter being constituted under legal notice to enable it to confine its field of interest solely to the culture of tea. A detailed discussion of the activities of the KTDA is justified by the resounding success of the smallholder tea scheme in East Africa, which is that much more creditable when it is considered that the average small holding organized by the KTDA is only just over half an acre per grower.

The development programme for smallholder tea is based on three plans spread over 12 tea-growing areas. The first plan begun in 1960, envisaged the planting of 11,000 acres. The second plan which is scheduled to be completed by 1968, will cover 25,000 acres and by the end of the period covered by the third plan, which will be in 1973, there would be a minimum of 55,000 acres in smallholder tea. In addition to these controlled acreages, a certain amount of illicit planting also takes place. Soil surveys have indicated that 1,500,000 acres are suitable for tea cultivation. The KTDA estimates that, given stable conditions, one tenth of this acreage will eventually be planted in tea by small holders.

The rate of expansion has been hitherto controlled largely by the issue of planting stumps from the huge centralized KTDA nurseries each of which range from 250 to 300 acres in extent. No exact figures were available, but it would appear that each stump would cost the equivalent of 20 Ceylon cents. From 1967 onwards, callused cuttings would be made available to growers and it is envisaged that acreage control would then become more difficult as the techniques of vegetative propagation become more widely known. The KTDA will then exercise its control on acreage expansion by limiting the intake of green leaf at the buying point.

The factory development programme is also geared to the acreage being opened up. By the end of the period of the second plan, there will be 17 factories handling leaf from small holdings and the third plan will add one factory for every 1500 acres of newly planted tea, making a total of 37 factories dealing exclusively with leaf from small holdings, and each capable of an annual output of two million pounds of made tea (KTDA Report 1964). Manufacture at the newer KTDA factories is somewhat standardized and consists of trough withering coupled with rotovane-CTC rolling, trough fermenting and followed thereafter by the procedures of firing and sorting as carried out in Ceylon factories. These operations are discussed in greater detail in a separate article (Kirtisinghe 1967).

Funds for developing the field sector were raised through loans mainly from the International Development Aid. The Commonwealth Development Corporation (CDC), Kreditanstalt Für Wiederaufbau and through self-generating KTDA revenues. Factories are built through loans raised in a similar manner and financed by the CDC, by commercial companies and to a lesser extent by the Kenya Government.

The KTDA exercises very firm control on the growers. Legal action is sometimes resorted to by this authority on errant cultivators for offences such as failure to prune at the specified time. If this tea is unsatisfactorily maintained the smallholder is eventually ejected and the tea is uprooted. This action, drastic as it may seem, is considered essential for the smooth running of the smallholder scheme and only a very few prosecutions are found necessary to produce the desired effect.

Climatic and soil conditions

The elevation of the tea growing areas range from approximately 5400 to 7200 feet above mean sea level in Kenya and from 3300 to 5500 feet above mean sea level in Uganda. In general it is found that the quality of tea from Kenya is somewhat superior to that from Uganda as is to be expected from the differences in the elevation of the tea land. East African tea growers consider that 50 inches of rain per annum represents the lower limit of rainfall required for tea cultivation. Only a very few of the tea growing areas in Kenya and Uganda record an annual rainfall in excess of 70 inches. The rainfall distribution varies from district to district but except east of the Rift Valley, there is no pronounced dry season as is experienced, for instance, in the Uva Province of Ceylon. Consequently, the crop is fairly evenly distributed throughout the year. For the same reason, there is no pronounced quality or flavour season and it is not surprising, therefore, that it is relatively easy to produce a tea of uniform character throughout the year. The manufacturing policy on matters such as the period of fermentation *etc* are often determined by decisions made in London.

Severe hailstorms do a considerable amount of damage to East African tea each year. In order to combat hail, a group of estates have arranged a programme whereby they fire a number of rockets (at £5 of apiece) into the hail-bearing clouds; they seem convinced that the enormous expenditure is justified by the savings in crop. No evaluations of the economics of this operation seem to have been worked out.

Tea is generally found growing on very gentle slopes on well-drained deep soils which are often of volcanic origin. These soils, while being quite acid ($\text{pH} < 5.5$) are much richer in plant nutrients than Ceylon soils because they contain more clay and humus.

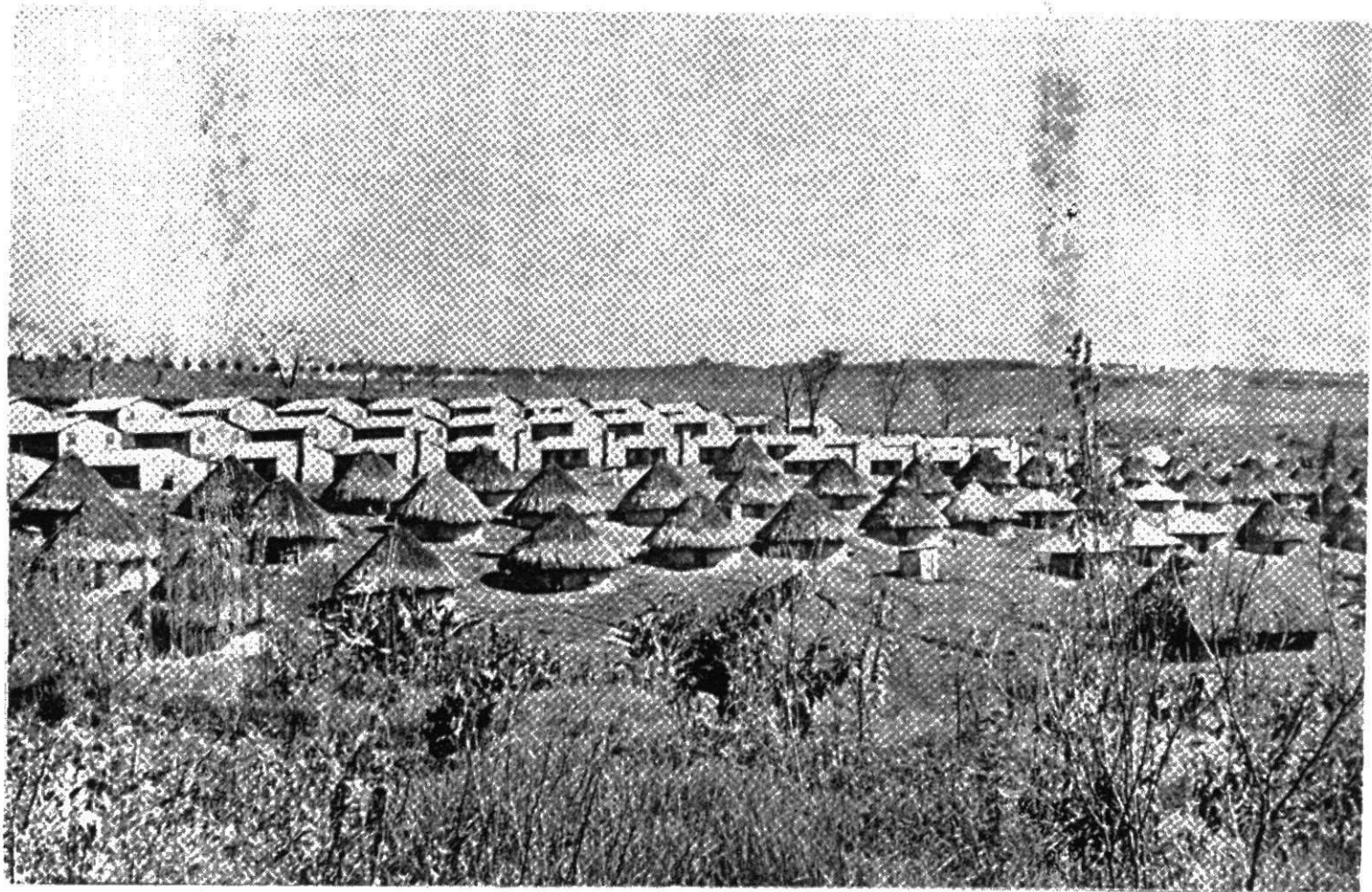


FIGURE 1 — *Accommodation for labour on an estate in Kenya*

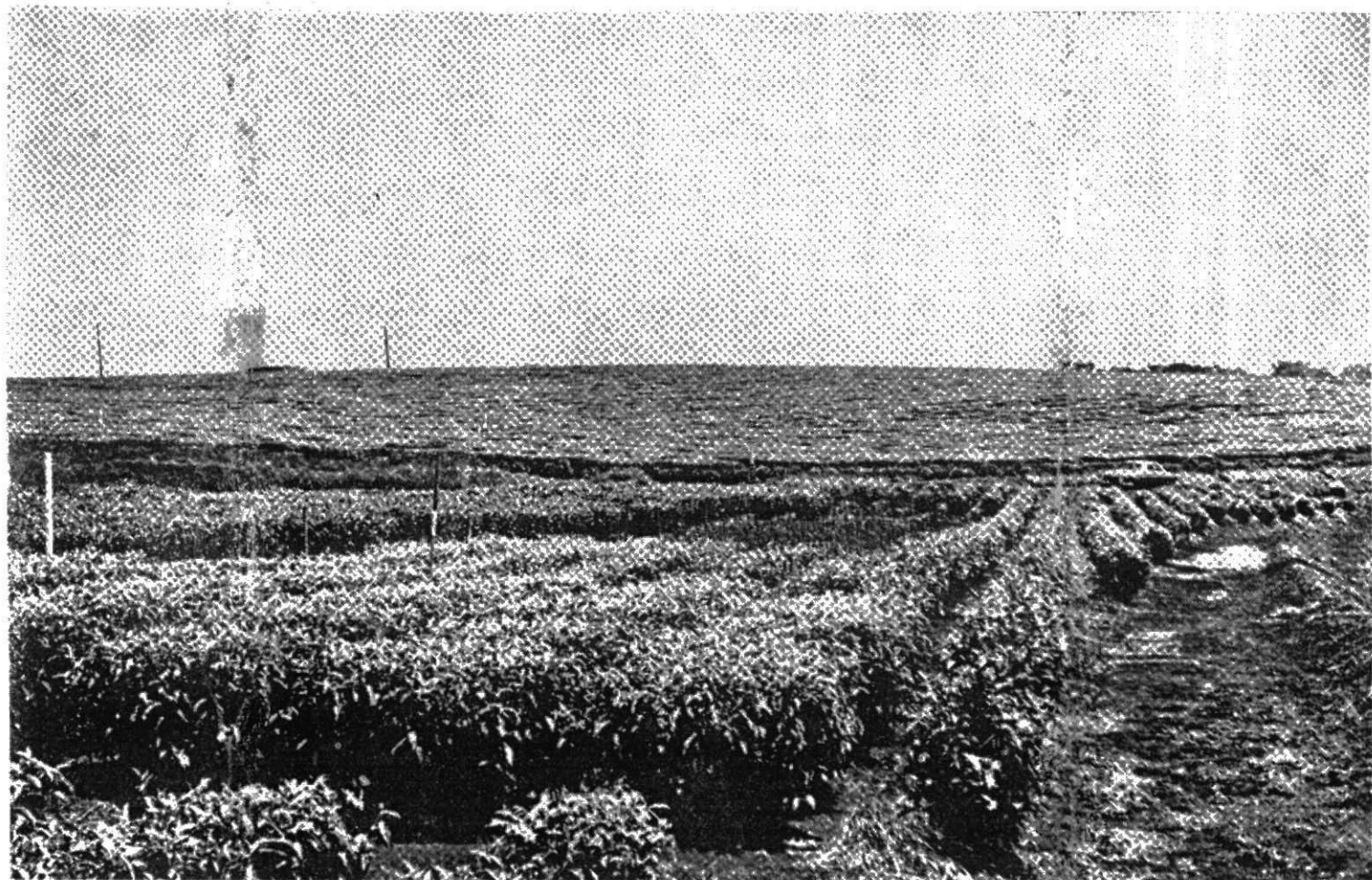


FIGURE 2 — *Experimental areas at The Tea Research Institute of East Africa, Kericho, Kenya*

Type of tea and yield

The Tea Research Institute of East Africa have a wide collection of jat types, ranging from China to Betjan. These plants are grown on their properties for selection purposes and originate from seed imported from several seed gardens in India. Most of the tea planted out on commercial estates is of a high jat variety, originating from seed. Vegetative propagation is now gaining popularity. Tea estates seem to have an excellent cover of tea notwithstanding which, yields are fairly low. Well managed estates register yields of just over 1200 lb per acre, and it is expected that the VP tea will produce about twice as much.

Cultural practices

Planting

Plants are most often grown on the contour at a stand which ranges from 5 ft x 2½ ft to 4 ft x 3 ft. At the time of writing there were 90 established East African tea clones which have been tested to varying degrees. Clonal selection is being done by the TRIEA and also to a very large extent by individual estates who are equipped for this purpose with clonal manufacturing units. They have also the services, when required, of an experienced tea taster to help them with their selection. Very recently, the KTDA purchased 6000 cuttings of Brooke Bond's clone 35 for £150. Among the outstanding TRIEA clones are 6/8 and 11/4. Approximately 25% of established plants from each clone are rejected in the nurseries on the basis of the vigour of growth after a period of time.

Plucking

None of the estates visited showed any interest in shear or mechanical means of harvesting leaf.

With the exception of a group of estates which has very special marketing facilities, the standard of leaf gathered in Kenya and Uganda was high. Examination of flush on these estates indicated an average pluck of 70% two leaves and a bud. Despite this high standard set for the leaf by the large overseas commercial companies, none of them could match the quality of flush from the smallholdings, at the KTDA factories. Leaf counts done over several districts with leaf from smallholdings revealed a count of 80 to 95% two leaves and a bud, and it is therefore not a mere coincidence that the KTDA factories of Kangaita, Karirana, Mataara and Ragati are consistently on top in the East African market.

Pruning

Bushes are brought into bearing by a method of pruning or by pegging which is a technique which has been introduced into East Africa recently. The methods of bringing into bearing and the subsequent prunings employed by the KTDA are given in Table 1 for both stumps and sleeve plants.

TABLE 1—Techniques of bringing into bearing and pruning of tea

Years from planting	Height of pruning and tipping	
	Bringing into bearing by pruning	Bringing into bearing by pegging
	Stumps & sleeve plants	Stumps Sleeve plants
1	6" prune	Peg 6" prune
2	11" prune	Tip at 30" Peg
3	Tip at 30"	— Tip at 30"
4	16" prune ; Tip at 30"	16" prune —
		Tip at 30" —
5	—	— 16" prune
6	20" prune ; Tip at 30"	20" prune Tip at 30"
		Tip at 30" —
7	—	— 20" prune
8	—	— Tip at 30"
9	22" prune ; Tip at 30"	22" prune —
		Tip at 30" —
10	—	— 22" prune
		Tip at 30"

The bushes are plucked after tipping at 30 inches

The bushes are slope pruned and the height of pruning is raised two inches at each subsequent prune on a three-year cycle. Twenty years after planting, the frame is cut back to 20 inches and the procedure starts from there. The actual time of pruning varies from district to district depending on weather conditions.

Infills in new clearings are brought into bearing by different techniques which depend on whether the plants were stumps or sleeve plants, and also on whether the surrounding tea was brought into bearing by the pruning or pegging technique.

The TRIEA technique varies a little from the system already described. The Institute recommends pruning at six inches and eight inches with the bushes being tipped at 24 inches in a pruning cycle of three to four years. Pegging is also recommended, and it is said that this technique could result in the tea being ready for plucking 18 months after planting, compared with 30 months for bushes brought into bearing by the pruning method.

Fertilizers

Fertilizer formulations generally contain only nitrogen and phosphorus; potassium is added into mixtures for use only in very restricted areas where the tea shows deficiency symptoms. Fertilizer application is in a single annual dose. The level of nitrogen applied is generally in the range of 80 to 120 lb per acre per annum and the highest commercial applications are around 160 lb. On experimental plots, 240 lb of nitrogen have been applied in a single annual dose.

The form of nitrogen applied depends on pH of the soil. Calcium ammonium nitrate (CAN) is generally applied to soils of pH 5.0 or less and ammonium sulphate nitrate (ASN) is preferred in soils of pH 5.0 to 5.5. At pH's higher than 5.5, ammonium sulphate (SA) is most commonly used. The present thinking at the TRIEA is that some caution as to be exercised in the repeated use of CAN even in soils where the pH is less than 5.0.

Shade

The KTDA does not permit the smallholders to grow shade trees except as wind breaks and the only shade to be found at the TRIEA was in their shade experiment plots. Most company estates are cautiously thinning out their shade by reducing the *Grevillea* from a stand of approximately 40' x 40' to a spacing of 40' x 80'. This too will be eventually reduced to approximately 80' x 80' on most estates. The TRIEA have a large shade x nitrogen experiment replicated in several tea growing districts but the results seem somewhat difficult to interpret.

Night temperatures under the pandal shade are somewhat higher than those in the other treatments and this introduces another factor which might have contributed towards the higher crops observed from the two treatments involving the pandal shade. The unshaded plots turn out to be better than those with *Grevillea* shade but the difference is not statistically significant. Wind and radiation effects are among the other factors being considered in this experiment.

Weed control

Weeds are kept under control by the use of Diuron or Simazine with Amitrole and Paraquat being used for spot spraying.

East African tea has been kept under chemical weed control for a few years, and as a result of the repeated treatment, are now relatively free from weeds. No large scale weed control measures are, therefore, found necessary on a large number of estates.

Pests and diseases

East Africa is fortunate in that there are only a few diseases and pests of tea. Blister Blight is unknown and the only pathological problem of economic importance is a root disease caused by the fungus *Armillaria mellea*. Pests too, are not considered serious, the only one worth mentioning being *Helopeltis bergrothi*, which causes the 'gnarled stem canker' of tea. Tea-growing areas in East Africa are separated by very large distances; this is no doubt a factor which helps reduce the spread of both pests and diseases.

Research

Organized research into tea was first initiated in East Africa as a subsidiary division of Brooke Bond (Africa) Ltd. in 1949. The scope of this department was expanded by the formal inauguration in 1951 of the Tea Research Institute of East Africa as a company supported with funds derived from a compulsory cess levied by the joint Tea Boards in the three territories of Kenya, Tanzania and Uganda. The governing body is constituted of the members of these boards, and also some *ex-officio* members such as the three Directors of Agriculture and the Director of the Agriculture and Forestry Research Organization. The main tea research station in East Africa is situated in the heart of the tea-growing area in Kericho, Kenya, with sub-stations in both Uganda and Tanzania. The Institute which consists of a Director and six senior staff officers, concerns itself with the field operations in tea and does not have a department dealing with the problems associated with tea manufacture.

References

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- KIRTISINGHE, D. (1967). "The manufacturing and marketing of tea in Kenya and Uganda." *Tea Quart.* 38 : 10-21.

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