

A STRATEGY TO ADOPT THE APPROPRIATE GENETIC DIVERSITY FOR PLANTING CLONAL TEA

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INTRODUCTION

Approximately 40,000 ha of genetically diverse old seedling tea lands have already been replanted to clonal tea of uniform genetic character and consequently, the once available very wide genetic base has now been reduced to a very narrow one. The total area of 40,000 ha would have had a possible genetic diversity of $40,000 \times 8,000 = 320,000,000$ combinations (assuming a stand of 8,000 tea plants per ha). By replanting such areas to a very limited number of clones (around 2 or 3 clones in most cases), we have dangerously narrowed the genetic base.

The ambitious replanting programme was embarked upon with the hope of trebling yields to as much as $3,000 \text{ kg ha}^{-1}$. However, what has been achieved so far in most instances is far below this anticipated target, with a national average clonal yield of only, around $1,800 \text{ kg ha}^{-1}$. Nearly 60% of the replanted area is yielding well below $2,000 \text{ kg ha}^{-1}$ whilst only around 2% is yielding over $3,000 \text{ kg ha}^{-1}$. This relatively poor achievement had been at the enormous expense of: (a) heavy soil losses during uprooting and land preparation; (b) a narrowed genetic base, most often dangerously narrowed to just one or two clones.

It is no doubt impossible to have a very wide multiplicity of clones to replace the genetic diversity of the old seedling fields. However, it is equally unwise to narrow the genetic base to just one or two of the so-called "popular clones". Making the best use of the available choice of clones we could yet retain a reasonably sound genetic base that could withstand the rigours of environmental pressure. A clonal mix of about five or six different good clones should make up a reasonably good genetic base for every hectare of land that is to be replanted. The planting should be so designed to accommodate the following features:

- (a) select a group of clones having a good yield potential;
- (b) the clones should all have desirable characters to make a tea that is sought after in the particular region;
- (c) they should not be very susceptible to pests and diseases prevalent in the given region.

When the above criteria are to be satisfied, the selection invariably gets narrowed to about five or six different clones. However, this is by far better than replanting the entire extent to just one or two clones that have become popular by being less troublesome to manage.

A more positive outlook :

The overall combined character of such clones should accentuate the typical desired character of a particular region. The up-country teas are priced on the basis of their liquor characteristics and flavour, rather than on appearance. The selected clonal mix should, therefore, accentuate these desirable characters. Further, within the high-grown areas there are distinctive location-specific desirable sought after features such as : the bright and strong liquors of the Bogos or the light liquoring teas with the characteristic bouquet of the Nuwara Eliyas and so on.

In the case of the low-grown teas that sell on appearance, a clonal mix should be so chosen in order to produce a high grade per cent of the stylish leafy grades that command premium prices, such as OP1/FOP, FBOPF Sp., FBOPF1, BOP1 etc. The grade mix should be geared to maximize the outturn of such sought after stylish grades. The clonal character that helps to generate such desirable grade mixes should be selected for planting in the low-country. The clone TRI 2043 should be an ideal one if, not for its low yield potential and extreme susceptibility for drought, pests and diseases. Clones similar in architecture to that of TRI 2043 should be chosen for planting in the low-country.

The clone TRI 2025 by itself makes up for more than 60% of the total area replanted in the up-country tea districts. Besides dangerously narrowing the genetic base to just this one clone, this particular clone is a very poor tea maker that would not bring out the distinctive character that is sought after in a given location, such as Dimbula, Bogowantalawa or Nuwara Eliya. Therefore, with such vast extents planted to this single clone, one cannot expect the preservation of the old distinctive character that is so specific to a given location. It is time that we rethink on new lines and propose a clonal mix that is most appropriate for a given region. The bright and dark liquoring clones like K145 and N2 are best suited for the Bogo region ; the bright light liquoring teas such as PK2 and TRI 2024 are suited for Nuwara Eliyas, whilst the clones such as DT1, TRI 62/9, TRI 62/5 and TRI 2142 will produce a well rounded tea that is characteristic of Dimbula.

The potential for higher revenue :

Yield is no doubt a very important criterion that influences the choice of clones for replanting specific areas. Whilst, higher yields mean the lowering of the cost of production (in general), what should matter most, is to realise the highest sale average (value potential), and consequently the highest earning capacity per unit of land.

As an example, a yield range between 2,000 kg ha⁻¹ and 3,000 kg ha⁻¹ could generate the same income per unit of land, if the NSA ranges between Rs. 49.20 to Rs. 32.80 :

$$3,000 \text{ kg.} \times \text{Rs. } 32.80 = \text{Rs. } 98,400$$

$$2,696 \text{ kg.} \times \text{Rs. } 36.50 = \text{Rs. } 98,404$$

$$2,460 \text{ kg.} \times \text{Rs. } 40.00 = \text{Rs. } 98,400$$

$$2,000 \text{ kg.} \times \text{Rs. } 49.20 = \text{Rs. } 98,400$$

The best combination is of course to have the best possible yield and the best value potential :

$$3,000 \times \text{Rs. } 49.20 = \text{Rs. } 147,600.$$

Value addition :

The "value added" plus point in terms of a sought-after "quality" tea should be for the inherent value of the well made tea rather than by packeting or by adding various scents. We could add the value right in the field and during the manufacturing process. As an example, a well made true to type Nuwara Eliya tea could command a price of around Rs. 100/kg, even during a depressed market. We tend to blame international market trends for the overall poor prices paid for our teas. Whilst this may be true to an extent, it should be realised that even during such depressed markets, certain teas do fetch attractive prices. **A WELL MADE GOOD TEA HAVING SPECIFIC DESIRABLE CHARACTERS WILL ALWAYS SELL WELL, IRRESPECTIVE OF PEAK OR DEPRESSED MARKETS. BOOM TIMES REALLY HELP THE SALE OF THE RUN OF THE MILL TYPES.**

The strategy for up-country :

Having ensured the selection of the right type of land, with the minimum of restrictions, the planting should be expanded to a variety of clones, having desirable characters. The more hardier but relatively poor clones like DN, CY 9 and TRI 2025 should be limited only to the areas that are likely to impose some degree of restriction to growth, whilst the rest of the area should be planted to good clones, including TRI 2024, TRI 62/9, TRI 62/5, TRI 2142, DT 1, DT 95, DK 19, WT 26, K 145, PK 2 and N 2.

When one takes a closer look at the performance of clonal tea in the up-country areas, the performance has been on the whole poor, both in terms of yield as well as cup quality. The up-country tea area is divisible into areas of distinctive tea character—such as Dimbula, Bogawantalawa, Nuwara Eliya etc. With large-scale replanting and the narrowing of the genetic base with the "run of the mill type of clones" like TRI 2025, DN, CY 9, there could well be a tendency to destroy the natural character of individual regions and what is worse, destroying even the "good up-country character". More than 60% of the replanted areas in the up-country is confined to the clone TRI 2025. In general, the tendency had been

one of unconsciously playing safe by using the hardier clones like the above as well as DN and CY 9 which are capable of average performance in marginal areas. It is time we move out of this undesirable and dangerous situation. The few estates that have been wise enough to have used good judgement in land selection for replanting and had used a wider choice of the better clones like DT 1, K 145, N 2, TRI 2142, PK 2 and N 2, have done well by producing "quality teas" that often fetch premium prices.

When the area to be replanted is say 5 ha, this extent should be planted to a minimum of 5 to 6 of the better quality clones that are likely to accentuate the distinctive desirable character that is sought after in that particular region.

<i>DIMBULA</i>	<i>NUWARA ELIYA</i>	<i>BOGAWANTALAWA</i>
(a) TRI 2024	(a) TRI 2024	(a) TRI 2024
(b) TRI 2142	(b) TRI 2142	(b) TRI 2142
(c) TRI 62/5	(c) PK 2	(c) K 145
(d) TRI 62/9	(d) WT 26	(d) N 2
(e) DT 1	(e) DT 1	(e) TRI 62/5
(f) DT 95	(f) HS 10A	(f) TRI 62/9
(g) WT 26		

The overall combined character of such a clonal mix would accentuate the specific regional character, such as the well rounded quality of Dimbula, or the bright, strong and dark liquors of Bogo, or the bright light liquor and the fragrant bouquet of the Nuwara Eliyas.

The forgotten clone TRI 2024 :

The clone TRI 2024, which was once considered a "golden clone", got displaced with time, on account of certain reservations, such as its susceptibility to eelworm infestation, blister blight and on account of the difficulties of survival in marginal areas. It is most unfortunate that this exceptionally good clone came to be dropped by the way side. If proper land selection is done, selecting areas with good depth of soil, the clone TRI 2024 will no doubt perform very well and yield much more than a clone like TRI 2025.

The strategy for low-country :

In the low country areas, the genetic base is even more dangerously narrowed to just two clones, TRI 2023 and TRI 2026. Almost 90% of the replanted area in the low-country comprise only these two clones. The clone TRI 2023 in particular, had proved to be extremely susceptible to drought and performs very badly in marginal soils. When subject to stress, this clone becomes very susceptible to stem

canker (*Macrophoma*) and suffers excessive die-back from pruning and the subsequent heavy termite damage and ultimate early death. It is not uncommon to see vast areas planted to this clone displaying a large number of vacancies. The scenario in the low-country holds testimony to this sad tale of such an overdependence on just this one clone !

As the sole overriding selection criterion had been the initial high yield potential, all attention was focussed on the above two clones (TRI 2023 and TRI 2026). Our experience had clearly demonstrated the fact that such high yields are short-lived and the overall pattern had been a decline in yield leading to an overall poor average yield of about 1,800 kg ha⁻¹. It is now evident that it is safer to depend on a steady modest yield that will hold good for a relatively long period, than go for super-high-yielding clones that are extremely sensitive to environmental pressures. It is thus wise to depend on a clonal mix including clones such as : TRI 2026, TRI 2027, TRI 62/2, KP 204, DG 39, KEN 16/3.

The TRI has from time to time made very useful recommendations of clones having specific virtues. A large number of such clones have been recommended up to now. Unfortunately, not all of them have been used to any significant extent and some have hardly been used (especially the TRI 62 series of clones). What seems to have been the case is that the few clones that were hardly enough to withstand the rigours of marginal soils as well as withstand poor to average managerial inputs, came to be widely accepted as the "popular clones" (TRI 2025, DN, CY 9).

There is no easy way out for any agricultural venture. Care and attention to detail and a scientific approach are all essential requirements for success. The adoption of the "path of least resistance" will lead only to average if not poor results. The large scale use of clones such as TRI 2025, DN and CY 9 had indeed been a procession down the path of least resistance !