

TEA MADE FROM CLONES

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Up to the present, in choosing material for vegetative propagation, attention has been concentrated on high yield, good rooting, and other properties connected with the success of the bush, such as resistance to disease and to drought. Many clones with some of these properties are known. It is now time to concentrate on the properties of the tea that can be made from the clones which have been chosen in this way. If a certain clone which has a very high yield, but which does not make a good tea, is widely planted, the estate that uses it may be saddled for half a century with a lot of tea that will be most sensitive to low prices.

These remarks imply that the properties of the made tea depend on the bush. Naturally they depend on weather and manufacture as well—but you can't make a silk purse out of a sow's ear. When the tea is grown and made in the most suitable conditions, if you don't get a good tea then, you never will. The power of providing good tea is inherent in the clone, and some clones will not make into good tea whatever you do to them.

In the past two decades, many hundreds of samples have been made, mostly at St. Coombs by the mincing-machine technique (Keegel, 1953). They have shown clearly that quality is a character inherent in a clone and it is therefore possible to classify the clones according to the type of tea that can be produced from them, as is done in the tables given below.

Logically, there are several conceivable weaknesses in the classification, which depend on the suitability of this technique for the particular clone and for the place where it might be grown. For testing leaf from individual bushes, the mincing-machine technique is the only very small-scale method of manufacture; unfortunately it does not produce quite the same result in made tea from a particular clone as conventional methods do. There is a weakness here, then, in that the small-scale technique may favour or disfavour a particular clone, because that clone has some peculiar properties. We have evidence that this is in fact the case and it seems likely that evidence could be obtained only by a lucky shot, until the biochemistry of the leaf is much better understood. Again, it is *theoretically* possible that a given clone, grown and manufactured in the low-country instead of at St. Coombs, would give better results in made tea. We have no evidence of clones of this type, that would be adapted to low-country conditions in respect of manufacturing properties; the ranking order of clones found for growth and manufacture at St. Coombs seems at present to be the same as for the same clones grown on a low-country estate. It would be rash to ignore the manufacturing tests so far made and to rely on these theoretical possibilities, which are mentioned for the sake of completeness. They will be borne in mind in future researches.

The mincing-machine technique has been carefully standardized at the Institute and it has given reasonably consistent results on quality from particular clones over long periods. Colour and strength have also to be considered; but the technique gives extra colour and strength, which have therefore to be discounted when assessing a clone. The results on quality do, however, inspire confidence.

An alternative method of test, which can be used only when much more leaf from each single clone is available, is the miniature roller (Keegel, 1954). When it can be used, the made teas will correspond much more closely with those made on full-scale rollers.

It has been asked "would the low-country benefit from clonal selection, since all that appears to matter is the appearance of the tea?" The answer is definitely "yes," as the following examples show:—

Sirikandura (altitude 546' AMSL). Clones S106 and S123, manufactured on the estate on a semi-commercial basis. Tasters' report:—"Appearance and liquors of these teas are far better than any standard yet seen from the low-country. They possess a very rare combination of extremely tippy teas plus bright infusions and liquors."

Ederapolla (altitude 634' AMSL). Clones from fields 7B, 28 (T.46) and 2A (all three in mixed V.P. material); manufactured on an experimental scale at St. Coombs.

All the samples had a very good black appearance and were very similar—useful Persian Gulf types, exceptionally well made and twisted. The liquors in all cases came out extremely well for low-country tea, being bright with useful colour and strength. The infusion of 7B was exceptionally bright for low-country while 2A had a coppery infusion, more like an up-country tea. One taster described 2A as follows:—"Excellent strength and body combined with brightness, and is as good as if not better than many medium-grown teas."

Here we have cases where proper selection in the low country can not only supply teas that are exceptionally good, but can also satisfy two different markets equally well.

The ability of a clone to reproduce its inherent manufacturing properties when grown in a different environment has also come into question. The two following examples of T.R.I. clones grown in the mid-country and low country will perhaps clear away any doubts that may exist on the advisability of planting a high-grown clone at a lower elevation, as far as its manufacturing properties are concerned.

Gonakelle (Uva). Clones TRI 1294, 1526, 777, 2024 and 1114 were manufactured at St. Coombs on the miniature plant. At the time of manufacture they were only 5 years old and in regular plucking for 3½ years.

Remarkable teas were made except in the case of TRI 1114 which, true to its previous characteristics, gave a coarse tea, much below a typical Uva. The others were very favourably reported on, particularly TRI 1294 which was considered the best of the lot. This and the three others gave strong pungent liquors with nice flavour and quality.

Palmgarden (Ratnapura). Another example of success achieved from T.R.I. clones was the result obtained from the manufacture at St. Coombs of TRI 2023, 2026 and 25 from Palmgarden.

TRI 2026, though not a good quality clone by high-grown standards, yet satisfied the requirements of a low-country tea in all respects. TRI 2023, however, gave a more valuable tea, being more coloury and having almost got quality. TRI 25, because of its quality, could have almost passed as a high-grown tea, but was not black enough in appearance for Middle East markets. All three clones gave brighter infusions and liquors than leaf from a seedling area manufactured at the same time, and in strength and quality were definitely better.

It is not necessary to go into past history of the manufacture tests carried out in the first instance to weed out V.P. material with undesirable characteristics from the point of view of liquoring properties. Rejection was carried out by rigorous standards after numerous tests and the few clones now propagated at St. Coombs are the result. Within the last two years, others have been added with promising physiological characteristics and the present position (30.10.59) is summarised in Tables 3 and 4 at the end of this article.

Considering the limitations of the mincing-machine technique, and errors in sampling and tasting, we cannot with any scientific accuracy classify clones in a linear order. However, the classification is a guide for selection purposes.

Recently an attempt was made to have clonal samples, made by the mincing machine technique, reported on in a more elaborate way than hitherto and even valued, each characteristic being assessed on a basis of marks as in Table 1.

TABLE 1.—*Relations between verbal descriptions and marks allotted*

MARKS	INFUSED LEAF	COLOUR	STRENGTH	QUALITY OR CHARACTER	FLAVOUR
0—2	very dull	very light	very thin	plain	nil
3—4	dull	light	thin	little	little
5—6	fair colour	fair	fair	fair	fair
7—8	bright	coloury	useful	good	useful
9—10	very bright	very coloury	very strong	very good	very marked

As a result some useful data have been collected. Differences in valuation between TRI 2024 and some blister-resistant clones examined on these lines are given in Table 2. These differences might not apply to liquors made by normal methods. Nevertheless they do show up the considerable variation in values of different clones. At the same time the figures reveal the outstanding potential value of TRI 2024.

TABLE 2.—*Difference in valuation between various clones (TRI 2024 is taken as the standard in each case)*

GROUP	CLONE	DIFFERENCE IN VALUATION IN CENTS
A1	W 14	Minus 8
	W 3	20
	S 106	50
A2	D	50
	RL/E	55
	OK 4	60
B	KEW 14/1	50
	KEN 15/8	65
	KEN 15/13	72
	TRI 2114	75
	KEN 22/1	76
	TRI 2091	80
	TRI 2042	88
	KEN 13/3	90
TRI 2086	95	
C	OK 1	85
	TRI 2115	90
	TRI 2065	100
	KEN 16/3	108
	KEN 15/2	150

These figures show what can be achieved by clonal selection.

There are doubtless carefully selected clones on various estates that are not considered in this article. Some of these may turn out to be more useful than those selected at the Institute, but we cannot comment on them until trial manufactures have been done.

In conclusion we gratefully acknowledge the invaluable help of tasters in Colombo and London, and in particular we wish to mention Messrs T. Kane and A. J. Pelly-Fry, and the late Mr R. H. Horne, all of whom have given unstinted assistance in the tasting of a large number of clonal samples.

Abbreviations used in the following tables

TRI	...	Tea Research Institute	KM	...	Kirimetiya
B	...	Bogawana	KPW	...	Kanapediwatte
C	...	Chapelton	M	...	Mooloya
CH	...	Craighead	MH	...	Moray
D (DN)	...	Diyagama	N	...	Nayabedde
DA	...	Dambatenne	OK	...	Ouvabkellie
DK	...	Diyanilakele	RL	...	Rutland
DT	...	Drayton	S	...	Sirikandura
GL	...	Glasgow	TK	...	Talankande
K	...	Kirkoswald	UR	...	Uda Radella
KEN	...	Kenilworth	VK	...	*Vellikelle
KEW	...	Kew	W	...	Wootton

* One of the divisions of Ouvabkellie

The following lists are subject to revision as more information becomes available on manufacturing characteristics. The clones are *not* arranged according to merit within each list.

The clones in Group A1 are all so outstanding with respect to quality that yield is not of great significance. In Group A2 it would be advisable to take yield into account as well. Some of the clones in this group might well be ranked as A1, but they are grouped under A2 until more evidence is available. For example TRI 331, TRI 2142, TRI 2145, GL 48, DK 8, DK 16, DT 95, and K 150, appear very promising. There may be others which would, after further testing, prove to be excellent. Clones in Group B are of average quality and may be considered for propagation in the light of yield, special manufacturing properties, and any other features such as resistance to drought, disease, etc. As for those in Group C, none can be recommended. However, in view of the fact that clone TRI 2026 has been found to thrive in the low-country, it is proposed to re-examine the manufacturing properties of this clone in relation to low-country requirements. Another clone which also requires further study is TRI 1114, in view of its very high potential yield. From the evidence available so far it has not produced a sufficiently attractive tea to justify its use in replanting.

TABLE 3.—*Classification of clones into groups according to quality.*
Group A1—Clones of good quality

Clone No.	Special Features
TRI 777	Very attractive tea
TRI 1294	Pungent liquor with a very bright greenish infusion
TRI 1526	Harsh liquor, otherwise outstanding
TRI 2024	Very useful all-rounder
DK 19	Very useful clone
DT 1	Excellent clone with a very bright coppery infusion
S 106	Coppery infusion and creams down well
W 3	Useful strength and colour
W 14	Nice quality. Attractive clone

Group A2—Clones with very fair quality

<i>Clone No.</i>	<i>Special Features</i>
TRI 4	
TRI 14	
TRI 15	
TRI 16	
TRI 21	Fairly good all-rounder
TRI 23	Rather light
TRI 25	Rather light
TRI 37	Very rapid fermenter
TRI 43	A fairly good all-rounder
TRI 45	A fairly good all-rounder
TRI 46	A fast fermenter. Very good coppery infusion
TRI 128	A good all-round tea
TRI 218	All-round tea
TRI 222	
TRI 331	Very bright coppery infusion
TRI 425	Good tea
TRI 483	Useful colour and quality
TRI 769	Coloury and strong
TRI 784	Very good fermenter
TRI 928	Fairly good all-rounder
TRI 1002	Good all-rounder
TRI 1005	If not for greenish character, a good tea
TRI 1018	Good all-rounder
TRI 1076	A little green
TRI 1082	Mellow smooth liquor
TRI 1456	Fairly good all-rounder
TRI 1530	Round and useful liquor
TRI 2020	Liquor slightly greenish, otherwise useful quality
TRI 2021	Useful tea
TRI 2023	Fairly good all-rounder
TRI 2041	Bright coppery infusion
TRI 2116	Coloury liquor
TRI 2142	Bright coppery infusion
TRI 2145	Bright coppery infusion
TRI 2151	Useful clone
C 171	Fairly good all-rounder
D	Greenish dull infusion
DK 8	Bright infusion
DK 16	Useful all-rounder
DT 95	Useful clone
GL 48	A fairly good all-rounder
K 150	Useful all-rounder
KEN 15/7	Useful colour and strength
MH	Coppery infusion
N 3	Good, bright infusion
OK 4	Useful strength
RL/E	Greenish infusion but coloury liquor
S 123	Attractive coloured infusion. Coloury
TK 48	Poor fermenter, somewhat green liquor
UR 12	Bright infusion, useful strength and coloury
VK 9	Rather greenish but useful strength

Group B—Clones with fair quality

<i>Clone No.</i>	<i>Special Features</i>
TRI 1	
TRI 19	
TRI 32	Rapid fermenter. Very coloury
TRI 33	Slow fermenter but bright greenish infusion
TRI 34	Rather greenish
TRI 170	A fairly good all-rounder
TRI 235	Rather light
TRI 293	Greenish liquor
TRI 343	A fair all-rounder
TRI 397	Rather greenish
TRI 603	Fair all-rounder
TRI 679	Fair all-rounder
TRI 839	Rather light and greenish
TRI 862	Fair all-rounder
TRI 934	
TRI 999	Fair all-rounder
TRI 1000	Fair all-rounder
TRI 1001	Fair all-rounder
TRI 1114	Slightly harsh liquor. Poor fermenter
TRI 1128	Fair all-rounder
TRI 2016	Fair all-rounder
TRI 2022	Little greenish
TRI 2025	Coloury
TRI 2042	Fair all-rounder
TRI 2086	Fair all-rounder
TRI 2091	Useful strength
TRI 2114	Fair all-rounder
B 95	Fair all-rounder
CH 13	Bright infusion
DA 434	Average tea
DK 1	Greenish infusion
DN	Greenish infusion
KEN 13/3	Useful strength
KEN 15/8	Fair all-rounder
KEN 15/13	Fair all-rounder
KEN 22/1	Good strength and colour
KEW 4A/2	Fair all-rounder
KEW 4A/4	Fair all-rounder
KEW 14/1	Rather greenish
KM 247	Fair all-rounder
M 21	Coppery infusion
OK 2	Fair all-rounder
OK 3	Fair all-rounder
TK 42	Rather greenish
VK 1	Not a bright infusion. Useful colour

Group C—Clones with little quality

<i>Clone No.</i>	<i>Special Features</i>
TRI 9	Non-fermenter
TRI 13	Not up to standard
TRI 18	Rather dull and plain
TRI 20	Dullish and plain
TRI 22	Rather plain and greenish

<i>Clone No.</i>	<i>Special Features</i>
TRI 26	Very poor tea but excellent colour
TRI 105	Not up to average standard
TRI 142	Poor tea
TRI 223	Good strength but not sufficient quality
TRI 384	Plain
TRI 396	Greenish
TRI 407	Plain with a fruity odour
TRI 510	Inclined to be soft
TRI 708	Very thin
TRI 740	Greenish
TRI 742	Very thin
TRI 789	Unattractive harsh liquor
TRI 896	Greenish
TRI 946	Green and thin
TRI 960	Coloury but poor quality
TRI 997	Not up to average standard
TRI 1054	Not up to average standard
TRI 1118	Not up to average standard
TRI 1387	Some colour but not sufficient quality
TRI 1446	Greenish
TRI 1544	Strong but little quality
TRI 2026	Dull and coloury
TRI 2043	Very coloury but lacks strength
TRI 2046	Coloury
TRI 2065	Dull infusion
TRI 2104	Dull infusion
TRI 2115	Not up to average standard
TRI 2118	Not up to average standard
TRI 2135	Not up to average standard
DK 11	Unattractive
DT 150	Dull greenish infusion
K 145	Rather green and plain. Good colour
KEN 15/2	Not up to average standard
KEN 16/3	Useful colour but below average quality
KPW Seedling	Very green, rather dull liquor
M 3	Dull greenish infusion
OK 1	Not up to average standard

TABLE 4.—*List of clones, grown on different estates and tested at the Institute, which appear promising as regards quality*

<i>Estate</i>	<i>Clone</i>	<i>Special Features</i>
Balangoda	13	Coloury
Balmoral	CD2	Useful colour and strength
Calsay	2	Quite useful quality, but rather greenish
	11	Smooth liquor
Carolina	1	Very coloury with a smooth liquor
	2/18	Stand-out all-round tea with bright coppery infusion
Chapelton	7	Bright even red infusion. Nice quality
	68	Good all-rounder
Concordia	34	Fair all-rounder
Court Lodge	31	Fair all-rounder
	32	Bright coppery infusion. Nice quality combined with good strength and some pungency
	25	Fairly useful

<i>Estate</i>	<i>Clone</i>	<i>Special Features</i>
Dickoya (Dunbar)	5/3	Coloury, but not particularly strong
	4/4	Coloury, but not particularly strong
Diyagama	G	Coloury
	13	Good all-rounder
	21	Good all-rounder
	F	Good colour and quality
Drayton	1	Good all-rounder
	95	Good all-rounder
Eltoft	L17	Particularly good quality
Glentilt	7/1	A most suitable clone. Very good strength and useful quality
Hellbodde	16/19	Coloury
	16/14	Strong pungent liquor
	16/13	Strong pungent liquor
	13/4	Strong pungent liquor
	6A/1	Outstanding, thick, coloury rich liquor; very bright coppery infusion
	6A/2	Very useful tea
	6A/3	Very useful tea
Kirkoswald	136	Fair all-rounder
Loolecondera	LC1	Attractive quality but light liquor
	LC50	Good all-rounder
Melfort	S/4/10	Exceptional all-rounder
	S/4/37	Good all-rounder
	S/4/40	Stand-out quality
Nayabedde	9	Good all-rounder
Nayapane	RF4	Good all-rounder
	6/20	Attractive liquor
	7/4	Good all-rounder
	6/19	Very attractive liquor with a very bright infusion
Neluwa	48 2/4	Fair all-rounder
	48 2/11	Fair all-rounder
Ouvahkellie	OK4	An example of a good class of Dimbula tea. Attractive liquor with fullness and roundness
Park	2202	Useful but greenish in character
	1703	Useful and has some flavour
Pitakande	SW10	Useful strength and colour
	SW11	Useful strength and colour
Portmore & Aldourie	7/3	Useful clone
	7/4	Useful clone
Queenstown	3/3	Good all-rounder
	3/4	Good all-rounder
Rayigam	RGM/12	Very good all-round tea
Sheen	LPS/3	Nice smooth tea with a good red infusion but fair colour
Srikandura	S106	Good creaming qualities
	S123	Infused leaf up to good high-grown standard and above general average
Stellenburg	16	A little light otherwise fairly good quality
Stonycliff	11	Rather light but good quality
Talankande	42	Useful all-rounder
	36	Quite attractive
Thotulagalla	5/35	Rather light but attractive

References

- KEEGEL, E. L. (1953). Vegetative propagation of tea — the manufacturing aspect. *Tea Quart.*, 24: 82-89.
- KEEGEL, E. L. (1954). A note on the operation of the miniature roller. *Tea Quart.*, 25: 66-67.

REVISED PROVISIONAL LIST OF APPROVED CLONES

Approved on the basis of records available at the Tea Research Institute and the Tea Control Department. Revised December, 1959, and cancelling the list published in *Tea Quarterly*, Vol. 30, Part 1, March, 1959, page 52.

Tea Research Institute:	Clone Nos:	
(St. Coombs Estate, Talawakele)		TRI 23, 25, 740, 777, 1076, 1114, 1294, 1526, 2016, 2020, 2021, 2022, 2023, 2024, 2025, 2026.
Agra Ouvah:	" "	A/O.
Balangoda Group:	" "	MT12, MT13, MT16, MT17, MT18, MT20, DG3, DG7, DG39, DG43, DG51, DG52, DG54, DG56, DG58, DG66, DG67.
Cannaverella Group:	" "	CV4/B1, CV5/B1, MG3/B1, NK4/B29.
Carolina Group:	" "	2/18, 3/1, 6/3, 7/3, 7/10.
Chapelton Estate:	" "	C171.
Craighead Estate:	" "	CH13.
Diyagama West Estate:	" "	A, B, C, D, DI, DN, E, G, K, N, P, 1, 2, 3, 4, 6, 7, 12, 13, 15, 19, 21, 22, 27.
Drayton Estate	" "	DT1, DT95.
Fernlands Estate:	" "	F4, F8.
Hellbodde Estate:	" "	16/13, 16/14, 16/19, 13/4, 2A/1.
Hunnasgeria Estate:	" "	No. 1, No. 5.
Kenilworth Estate:	" "	13/3, 15/2, 15/7, 15/8, 15/13, 16/3, 22/1.
Kirkoswald Estate:	" "	K145, K150.
Kolapatane Estate:	" "	1/8, 82/7B.
Moray Estate:	" "	MG, MH.
Nayabedde Estate:	" "	Nay-3.
Neluwa Estate:	" "	NL 3/1, NL 4/2, NL 8/3.
Niriella Estate:	" "	1B7, 3B22, 3B30, 12B30.
Pindeniyoa Estate:	" "	PO5.
Pitakande Estate:	" "	S.W.11.
Queenstown Estate:	" "	QT 1/3, QT 1/5, QT 2/3, QT 2/5, QT 3/4, QT 4/4, QT 7/1.
Rutland Estate:	" "	RLA. R.L.E.
Sirikandura Estate:	" "	S106, S123.
Talankande Estate:	" "	TK42, TK45, TK48.
Tangakelle Estate:	" "	CY 9.
Tillicoultry Estate:	" "	No. 9.
Uda Radella Estate:	" "	UR12.
Uva Highlands Estate:	" "	UH 3/4, UH 9/3.

It will be noted that the following changes have been made in the list published in the *Tea Quarterly*, Vol. 30, page 52:—

Instead of Diyagama Group, Diyagama West Estate is specified for the Diyagama clones.

The following clones have been deleted, mainly because they are not available: Bogawana, B8, B95; Kew, 4A2, 4A4, 14/1; Kirkoswald, K136; Niriella, 3B39; Ottery, OT5/8, OT5/18, OT5/30, 6A/35, 1B/3; Ouvahkellie, OK1, OK2, OK3, OK4, VK1, VK9; Wootton, W3, W14.

Further revisions will be made from time to time.