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## FIELD CATEGORIZATION IN TEA LANDS

*(This Advisory Circular replaces Circular No. E 1, Serial No. 12/94)*

### 1. Introduction

An estate comprises of numerous fields, often separated from each other by natural boundaries such as ravines and footpaths or man-made boundaries such as wind belts and fences. A given field is generally planted in one year and in an extent that can be handled by one gang of pluckers. Some fields would be high yielding while others may not be so, and hence the contribution of each field to total estate crop will vary. Records of crop harvested, workers utilized, fertilizer applied, cultural operations etc., are maintained individually for each field. This information could be advantageously exploited for planning a development program, for the estate as a whole by relating inputs to field productivity.

### 2. Basis of Categorization

Categorization is based on the performance of each field, which would generally be dependent on topography, microclimate, soil fertility, any pest and disease incidence, and any other constraints that may prevail. As crop harvested is the most reliable indicator of all such factors, the productivity (yield per unit area) potential of each field can be utilized to categorize them.

In order to even out variations that may exist (weather, inputs, worker efficiency etc) over successive years, field categorization should be based on the average yield achieved over the past 2 - 3 pruning cycles. The cycle lengths in all fields on an estate/division should, as far as possible, be constant.

Generally tea fields on each plantation can be categorized into three equal categories of "A", "B" and "C", based on their average annual yields over the past 2-3 pruning cycles.

### 3. Computation of Yield

In order to arrive at a system of categorization the following steps are necessary:

**3.1.** Obtain yield records for the last 2 or 3 completed pruning cycles from the yield book. The first year of the cycle refers to the first 12 months since pruning, the second year from the 13<sup>th</sup> to the 24<sup>th</sup> month and so on.

**3.2.** Calculate the mean yield per unit area per year (YPH) of each pruning cycle as follows:

$$\text{Mean cycle yield (kg /ha/year)} = \frac{\text{Total production over the full cycle}}{\text{Total Numbr of Months in the cycle}} \times 12$$

3.3. Construct a table with 5 columns as follows:

Name of Estate.....  
Date:.....

**CATEGORIZATION OF FIELDS**

(1) YPH of field (decreasing order )	(2) Field No.	(3) Extent (ha)	(4) Cumulative Extent (ha)	(5) Remarks (Age of field etc)

3.4. To divide the estate into three categories, see which entry in column 4 comes closest to 1/3<sup>rd</sup> the estate extent and draw a horizontal line entry across the table. All fields above this line will fall into "A" Category. Similarly, separate out "B" and "C" categories by drawing a horizontal line across the table below the entry where the entry in column 4 is closest to 2/3<sup>rd</sup> of the total extent.

3.5 After categorizing the fields as above, it is necessary to undertake a thorough study of each field and shift any field, either up or down, based on whether they have undergone any significant changes which merit such a shift (including extreme weather periods, amalgamation of fields, crop etc).

3.6 Field categorization may also be undertaken for each division of the estate separately if there are distinct differences in cycle lengths due to differences in elevation.

3.7 Where there is a significant proportion of VP tea, then VP tea and old seedling tea could be advantageously categorized separately, as their cycle lengths would be invariably different from each other.

**4. Features of the different categories**

4.1 "A" Category Fields: These would be the best one-third of the fields on the given plantation, and would have best stand of tea. Most of the VP tea will be included in this category based on the assumption that their potential yield is high. For some years to come, the plantation has to depend on this category of tea as the bulk of the crop is obtained from these fields. All the inputs should be given without restrictions. The vacancies must be infilled after each prune, to maintain such tea in good condition. Such lands will not be replanted for a long time to come.

4.2. "B" Category Fields: The yield would be relatively poorer than "A" category. Replanting/infilling could commence in the lowest yielding fields in this category, provided there are no soil limitations.

**4.3 "C" Category Fields:** These fields would consist of the poorest one-third of the tea on the plantation. These fields could be earmarked for diversification if they are poor. Where there are no major limitations, this category could be replanted/infilled. Other fields where lands are steep and soils are eroded, can be diversified away from tea.

## **5. Advantages of Categorization**

The main benefit is the prioritization of funds into productive fields, particularly when funds are limited, to obtain maximum returns from limited resources. When fertilizer is in short supply, or curtailment of expenditure is necessitated due to budgetary constraints, we could optimize inputs in better fields to attain maximum benefits, and restrict them to relatively poor fields rather than impose a standard cut all round. In a manner similar to the restriction of inputs, priorities could also be more clearly laid down for efficient and cost-effective worker utilization for various cultural operations.

Categorization is most useful in maintaining the estate production uniformly from one year to other. In order to achieve this objective, it is essential to prune equal extents in each of the categories, say, on a 4 year cycle, one would prune a fourth of each category.

For replanting, a long term program could be prepared to replace the tea in fields at the bottom of "B" category as well as those at the top of "C" category, where there are no major limitations. A critical examination must be undertaken on each selected field to determine the cause for low yields. Replanting should be considered only if soil conditions are suitable, without much erosion.

It is only natural that there are deaths in tea fields from time to time and if not replaced according to a regular program of infilling, then productivity of such fields will decline steadily. Infilling should commence with the "A" category fields, consisting of all VP tea and the best seedling tea, and thereafter the better "B" category fields. The poorer "B" category fields, if they are to be retained for some years to come, may be infilled if funds and material availability permit. Infilling generally would not be desirable in lower "C" category fields as soil conditions may be too poor for good growth of infills.

## **6. Conclusion**

Categorization is a dynamic system as it depends on the development of fields relative to one another in a given estate. When a replanted field comes into bearing, it gets into the "A" category, thereby pushing the lowest "A" category field into "B" category and the lowest "B" category field into "C" category. So, some of the marginal tea lands low down in the "C" category could be considered for diversification away from tea. These two instances would alter the category of some fields, indicating that categorization is not a once-and-for-all exercise and has to be reviewed/revised periodically.

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## THE BREEDING, SELECTION AND TESTING OF TEA CLONES

Efficiency is a common feature of any modern agricultural industry. Just as much as improvements in cultural practices have increased tea yields, so has the introduction of improved planting material. In many plantation crops including tea, improvements in yield and quality have been obtained by vegetative propagation of specially selected or bred varieties. The vegetatively-propagated progeny of a single seedling plant is referred to as a clone. By definition, all plants of a single clone have the same genetic constitution and the advantages of a clone accrue from this uniformity among the progeny. Any other variability within a clone will, therefore, be due to the effect of the environment.

An elite clone should possess a combination of some or all of the desirable characteristics, such as high yield, good quality, ease of vegetative propagation, tolerance to pests and diseases, favourable reactions to cultural treatments and regional adaptability. Clones possessing these characteristics may be obtained by the manipulation of one or more of the following procedures :

- (a) Introduction of new clones from outside,
- (b) Selection from existing local populations,
- (c) Hybridization,
- (d) Production of genetic variants by physical means or by the use of chemicals.

The experience we had with tea clones introduced from outside and testing their suitability to local conditions has been limited. There is a need for evolving clones suited to local conditions, selected from indigenous populations.

Tea is naturally cross pollinated and every seedling bush is different from one another. There are probably over two billion mature seedling bushes in Ceylon and the scope for selection of clones from the existing seedling tea is excellent. The screening of such large populations, however, is laborious and expensive. Selection of mother bushes and the development and testing of clones can only be done from random populations. It is doubtful whether all the desirable characters and recombinations to evolve a desired type suited to different environments exist in such randomly selected populations. The discovery of a superior clone from a population of 40,000 seedling bushes is considered as an optimistic estimate. The chances of finding clones which combine all the desirable agronomic characteristics by selection alone are, therefore, limited. By selection and propagation, we are not attempting to improve the type, but to select and multiply the best existing bushes.

The paucity of objective criteria for recognizing and differentiating between those bushes which would make superior clones from a population has been a great handicap. It appears that the yield of a clone does not always necessarily run parallel with the yield of its mother bush. The location, and/or other factors applicable to the mother bush may sometimes not be applicable to the progeny. The selection and subsequent development of an outstanding clone and assessments of its various characteristics, therefore, necessarily involves a series of field trials, for example, the separation of the true from the spurious high yielders can only be done in the vegetatively-propagated progeny.

The production of variants by hybridization or by other methods will always be a fruitful line of work. Lately, hybridization programmes have been initiated using a number of outstanding clones as progenitors. Such specially-bred populations are necessary to obtain individuals with improved chances for the next phases of selection and testing of superior clones.

It is interesting to note that the popular 2020 series of TRI clones and the newly selected 62 series of TRI clones, that are undergoing extensive field testing originated as seedlings from a single mother bush. If suitable combiner clones could be found, there is hope that an array of useful types would emerge even from such a limited hybridization programme. Clonal resistance to pests, diseases and drought in tea have been established; but clones showing a high degree of resistance do not necessarily give high yields for which the hybridization projects are generally undertaken. All these lines of investigation are intended to solve both the academic as well as the economic problems of tea production.

On the assumption that both selection of clones and their subsequent testing has been carried out effectively, the next step is to supply estates with the material of the finally-selected clones for experimental planting. Should performance on estates prove satisfactory, then these clones may be considered for large scale planting.

For the present, the list of clones approved by the Tea Control Department should serve as a guide to the selection of clones in replanting programmes. For the future, we hope to add to the list of new clones for experimental planting.