

DO NOT KILL YOUR MOTHER BUSHES

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Leaves of plants contain an active pigment called chlorophyll that is able to absorb the rays of the sun and fix solar energy for manufacturing essential food material. This intake of energy may be compared in some ways to coal or electricity which give power to a factory.

Though the roots supply the plant with mineral salts, it is the leaves that provide the plant with carbon, an important constituent of plant tissues. Carbon dioxide which is present in the atmosphere is absorbed by the leaves in the presence of sunlight. It enters the cells of the leaves where chemical changes take place leading to the formation of carbohydrates (starch and sugar). This process of food manufacture is known as photosynthesis or carbon-assimilation.

The food made by the leaves is used for the development of new growth, *i.e.* new leaves and shoots, and any excess is stored for later use. For example, these reserves are used by a bush, after it has been pruned, for new growth. If the reserves are too little at the time of pruning, no recovery will take place and the bush will die.

Starch reserves can be assessed by examining roots of half-inch or more in diameter. The roots should be cut with a pair of secateurs or a sharp knife so as to expose a clean cross-section. This is treated with tincture of iodine. If adequate starch reserves are present, a deep blue colour will be produced; if no starch is present, only a yellow colour will appear.

In the low country and the mid-country, where physiological processes are much faster, excess carbohydrates produced are mainly directed to the production of new shoots. Consequently they do not have much chance of storing food reserves in the roots. Under such conditions a clean prune will not always be practicable, since a high percentage of bushes will fail to recover after the pruning operation. In these circumstances, it is essential that a sufficient number of leaves are retained on the pruned bush to provide the required supply of carbohydrates. This can be accomplished by suitable types of pruning such as rim-lung pre-prune or high cut-across pruning.

At higher elevations both growth and carbohydrate production are slower and a proportion of the excess carbohydrate produced is stored in the roots. It is, however, evident that the frequent removal of shoots from mother bushes, an operation that can be compared to a light prune, makes demands on what reserves remain available. It results in the reduction of carbohydrates available as reserve, owing to the frequent stimulus to the production of new shoots which are removed before they can have taken sufficient part in manufacture to compensate for the carbohydrates used. Accordingly, such bushes should not be given a clean prune but every effort should be made to leave sufficient foliage at the time of pruning, in order to manufacture all the carbohydrate required for recovery from pruning.

Beneficial results can be achieved by occasionally resting mother bushes, for about 9 to 6 months, until sufficient reserves are accumulated, before any type of pruning operation is carried out. It is however, essential to ensure that the mother bushes are adequately manured, if growth during the resting period is not to be limited on nutritional grounds.

The following is a suitable inorganic mixture for use with young plants.

	lb.	Nitrogen	Phosphate	Potash	Magnesium
Ammonium sulphate ...	100	20.6	—	—	—
Sapthosphosphate ...	50	—	14.75	—	—
Muriate of Potash (60%) ...	25	—	—	15	—
Magnesium sulphate (24%) ...	25	—	—	—	6
	200	20.6	14.75	15	6
	%	10.3	7.4	7.5	3

Alternatively a balanced organic mixture, containing 6½% nitrogen, 9% phosphoric acid, 9½% potash with magnesium sulphate added at the rate of 14 lb. to 100 lb. of the mixture may be used for the 1st year. The dosage of the organic mixture should however be about 50% higher than the inorganic mixture.

Four to six applications are made per year and the dosage adjusted to the age and growth of plants according to some such scheme as below:—

<i>Years from planting</i>	<i>Approximate rate of inorganic mixture</i>
Up to 1 year	½ to ¾ oz per plant per application
1 to 2 years	¾ to 1 " " " " "
2 to 3 years	1¼ to 1½ " " " " "
3 to 4 years	1¾ to 2 " " " " "
4 to 5 years	2 to 2½ " " " " "

Where there is very vigorous growth, such as may be expected from clones like T.R.I. 2023, 2024, etc., then it may be advisable to increase either the dosage or the frequency of application.

It should be noted that the manurial requirements of clones at different stages of growth or under different conditions are not the same. Accordingly, until more information becomes available it will not be possible to lay down dosages with any degree of precision.

A mother bush from which cuttings are taken has to be pruned periodically. Like any pruned bush, the natural growth cycle starts with a vegetative phase and gradually passes over into a reproductive phase in which less leaf is produced, with shorter internodes, and a pre-ponderance of flower and fruit. Studies on fruit trees show that this change is accompanied by a change in the relative proportions of carbohydrate and nitrogen in the tissues of the plant; as the cycle progresses, the ratio carbohydrate/nitrogen increases. By supplying nitrogen to the mother bush, the time at which it ceases to put out foliage and produces flower buds instead can be delayed to some extent.

Whatever method of delaying the reproductive phase is attempted, inevitably the time comes when the vegetative phase decreases in activity. The mother bush is then pruned in order to deprive it of the potential flower buds which are laid down, long before they become evident. Cuttings taken off shoots in which the beginnings

of flower buds have already been formed do not root readily nor do they make vigorous growth. By pruning, the plant is once more forced into the vegetative phase.

The frequency of the pruning operation will depend on the elevation and the clone. At low elevations, and with a clone that has a tendency to flower early, pruning should be more frequently done than at higher elevations or with late-flowering clones. Generally, a mother bush from which cuttings are taken regularly should be given a pruning once in about every 15 or 20 months.

The time at which the mother bush should be pruned is important. Observations indicate that rapid growth is accompanied by a diminution of starch reserves since the production of new shoots can occur at a greater rate than the bush can manufacture material for their production. Where feasible, therefore, it is advisable, especially at low elevations, to prune before the period in which rapid growth is expected and pruning immediately after much active growth should be avoided.

If you keep on taking cuttings from a mother bush and then clean prune it, you may expect it to die. Give the bush a chance by resting it and by leaving foliage when you prune.