



## TEA RESEARCH INSTITUTE OF SRI LANKA

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### GUIDELINES FOR USE OF MOTORIZED TEA HARVESTING MACHINES

#### 1. Introduction

Harvesting of tea, known as 'plucking' is considered to be the most labour intensive and expensive field operation in tea cultivation. Usually, more than 70% of the workforce in a plantation is employed daily for plucking. Manual harvesting of shoots at regular intervals is the appropriate strategy for achieving potential productivity levels and quality if adequate work force available. Nevertheless, in order to increase plucking efficiency and minimize leaf damage during harvesting, the growers can use TRI Selective Tea Harvester (TRI shear) as an alternative to manual harvesting. Please refer the TRI Guidelines for Use of Selective Tea Harvester issued in July 2009. However, when severe shortages of workers are encountered and all the tea fields cannot be properly harvested, motorized tea harvesting machines can be used to harvest pluckable shoots and improve worker productivity. Also use of machines will prevent the plucking fields being overgrown or abandoned.

#### 2. Type of motorized tea harvesting machines and their cutting mechanism

There are different types of motorized machines available for tea harvesting. Broadly, they are either portable or mobile harvesters. The portable machines are driven either by a knap-sack mounted or directly coupled engine powered by fuel, electricity (battery or generator) or pneumatic pressure.

Shoots are cut and harvested either by reciprocating or rotating blades. The harvested shoots are thrown into the collector (bag, tray etc) by an air flow or automatically by moving blades. The motorized harvesting machines also differ in their lengths of cutter blades. Generally, the length of blades in harvesting section of portable machines varies from 30 - 100 cm. The blades are either flat or dome shaped. These portable machines are designed to be used by one or two operators. The output of portable harvesting machines (single or two operators) tested in tea plantations of Sri Lanka varied from 50 - 250 kg per day, depending on the length of blade and field conditions.

#### 3. Proper use of motorized machines in the fields

- Motorized machines should only be operated and used by the skilled workers. Workers should be properly trained for operating the machines, servicing them and educating safety measures periodically as per manufacturer's instructions.
- Machines should not be used during heavy rains.
- In the event that all tea fields cannot be properly harvested with available work force, motorized machines can be used to harvest tea fields timely and improve worker productivity. Without greater impacts on growth and yield of tea, machines can be used for a few rounds during the rush crop periods when worker requirements for plucking is exceptionally high.

- The low yielding tea fields that are compelled to be harvested at extended rounds or abandoned due to lack of workers can also be harvested using motorized machines.
- High yielding fields (A and B upper category) should not be continuously harvested by the motorized machines unless it is inevitable.
- Use of motorized machines for harvesting of young fields (before the formative or first prune) should be best avoided.
- Mechanical harvesting should not be practiced during a period of stress viz. a drought or a severe pest and disease attack, and also immediately after a period of stress, as it could lead to bush debilitation.
- Harvesting of shoots across the entire length of the cutter blade should be done only with a single pass. Repeated harvesting on the same area of the bush i.e. several passes to harvest shoots, should be avoided as it damages small buds and maintenance foliage.
- Coarse leaves and other sub-standard materials (twigs etc) in the harvest which are unsuitable for manufacture should be removed before supplying to the factory. Additional workers may also be required for the sorting out operation.
- Harvested fields should be properly fertilized by ground and foliar zinc sulphate ( $ZnSO_4$ ) applications as per the TRI recommendations.
- Use of motorized machines, tend to form more dormant shoots (*banjies*) and hence, manual removal of *banjies* after every few rounds of mechanical harvesting is beneficial.
- It is essential to rest (withhold harvesting) tea fields harvested by the motorized machines for about two months prior to pruning.

#### **4. Disadvantages from the use of motorized machines**

- The motorized machines are non-selective in harvesting and, hence the use can reduce tea yield by about 30 - 50% during the period of use itself.
- The crop harvested by motorized machines also contains higher amounts of coarse leaf than the manually harvested crop.
- Use of motorized machines is difficult on steep terrains and in fields nearing pruning. Therefore, selection of fields and periods of harvesting should be done with utmost care as per the above guidelines.

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