



TEA RESEARCH INSTITUTE OF SRI LANKA

Issued in: June 2011

Guideline No: 01/11

GUIDELINES ON BURYING OF PRUNINGS TO IMPROVE SOIL FERTILITY AND PRODUCTIVITY OF TEA LANDS

Soils in tea lands have been degraded due to continuous cultivation practices and human involvements, and as a result productivity has decreased significantly. Productivity in tea lands is greatly influenced by the presence of a sufficient quantity of organic matter in soils, which acts as a source of plant nutrients, binding agent for soil particles (material responsible for developing soil structure) and as a source of food for soil earthworms and microorganisms. Poor retention of nutrients and water, compaction, soil erosion and acidification are major consequences of lack of soil organic matter. Therefore, it becomes extremely important to revive tea soils by adding soil organic matter to arrest declining of soil health and to sustain productivity. Prunings are one of the major *in situ* sources of organic matter available in tea lands.

Burying of prunings

- Tea bushes in plucking are pruned every 3 - 5 years depending on jat or cultivar, vegetative vigour and elevation.
- Tea fields nearing pruning have a fully grown canopy with large amount of biomass accumulated over the pruning cycle. On average, pruned tea bushes could provide 8 - 16 tons of dry matter per ha.
- In tea plantations, most of the prunings (generally the "brush wood" containing 2/3 of the total dry matter) is removed from fields as firewood for domestic use thus depriving organic matter to tea soil that can be added to the land *in situ*.
- Prunings could be advantageously used for the improvement of soil conditions by burying in shallow trenches.
- Burying of prunings is vital for tea soils, where poor fertilizer response is observed due to low retention capacity and heavy loss of applied nutrients.

Advantages of burying of prunings

1. Add plant nutrients

All pruned leaves, twigs and stems (brush wood) on average contain about 1.7% Nitrogen (N), 0.13% Phosphorus (P), 0.6% Potassium (K) and 35% organic Carbon (C).

Eight to sixteen tons of tea prunings (dry matter) contain about 136 - 270 kg of N, 10 - 21 kg of P (23 - 48 kg of P_2O_5) and 48 - 96 kg of K (58 - 116 kg of K_2O).

If it is assumed that 50% of the nutrients in prunings will be made available after mineralization, approximately 35 - 70 kg of N, 3 - 6 kg of P (7 - 14 kg of P_2O_5) and 12-24 kg of K (15 - 30 kg of K_2O) are available for crop growth.

The fertilizer use efficiency could be enhanced by adopting burying of prunings in fields.

2. Add organic matter, aerate tea soils and improve water holding capacity

Eight to sixteen tons of tea prunings (dry matter) will supply around 2.8 - 5.6 tons of organic carbon per ha.

With the increase of organic matter content in soil, aeration and soil moisture retention are improved. This in turn promotes root growth and increase the number of feeder roots thereby enhancing plant growth. In addition, cutting trenches could also lead to root pruning, thereby old roots are replaced with newly emerged vigorous roots.

Burying of prunings could be considered as an operation that brings about added benefits to those fields, where envelope forking is not practiced in mature tea. This practice also helps to prevent re-infestation of horse hair blight disease

3. Improve tea yield and financial benefits

An increase of yield about 200 – 350 kg/ha/cycle could be anticipated due to burying of prunings. Worker requirement for this operation is about 80 workers/ha. The return for investment depends on cost of workers and net sale average of made tea.

As the organic materials/prunings are available *in situ*, no transport cost is involved. The overall benefits thus outweigh the cost. Cost benefit analysis has shown that burying of pruning together with application of recommended quantity of fertilizer is more beneficial.

Method of burying of prunings:

- Burying prunings in the Low country region could be undertaken after the second prune onwards whereas in the up country, mid country and Uva regions, after the third prune onwards.
- Steep lands (slope more than 55 %) that are highly vulnerable to soil erosion in all regions should not be selected for burying of prunings.
- Before the commencement of pruning operation, identify the alternate lanes those in which the staggered trenches to be cut so that the lungs could be left only facing the side where trenches will not be cut. This will avoid possible disturbances to burying operations due to lungs (Figure 1).
- Cut shallow trenches (30 cm wide and 22 - 30 cm deep) in the centre of alternate inter-rows after pruning.
- Chop prunings into pieces as required, put them into the trenches, and cover with soil to form a bund along the tea inter row.
- Weeds, green materials and any other suitable organic materials could also be buried along with tea prunings.
- Burying of pruning at the next prune should be done on the alternate inter-rows (the rows which were left without buring prunings).
- Envelop forking need not be done in tea lands, where prunings are buried.
- Burying of prunings should not be undertaken during heavy rains.

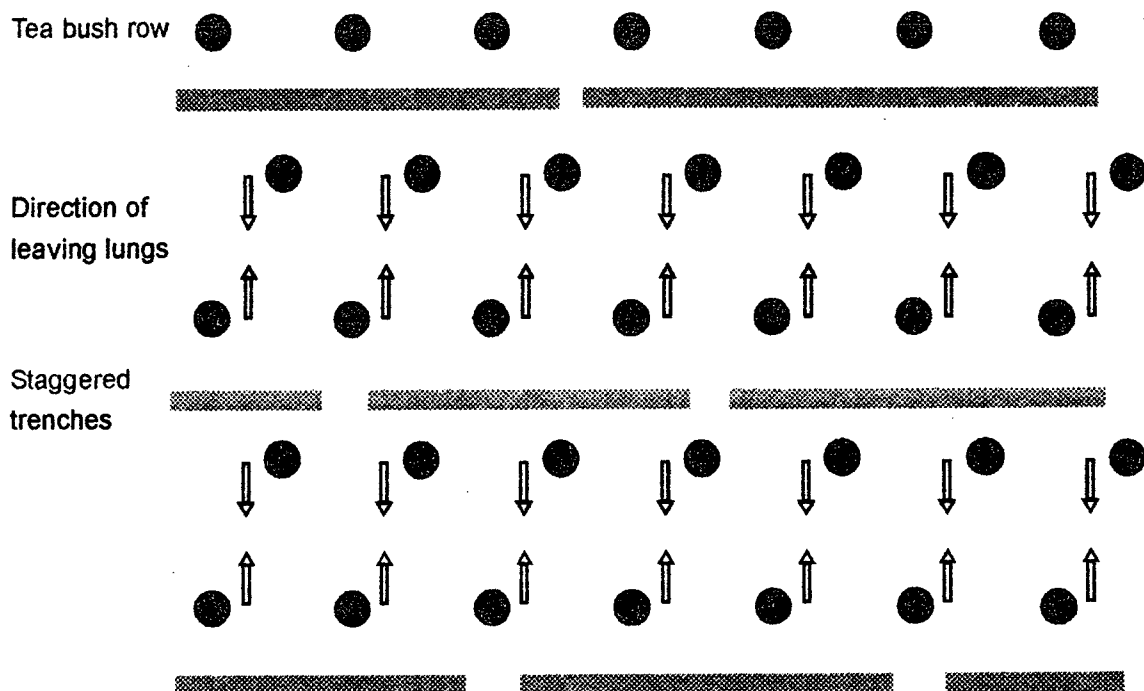


Figure 1. Sketch describing cutting trenches along alternate tea rows and direction of leaving lungs

© Tea Research Institute of Sri Lanka

COPYRIGHT

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or information storage and retrieval, without permission in writing from the Director, Tea Research Institute of Sri Lanka.