TEA RESEARCH INSTITUTE OF SRI LANKA

Issued in: December 2018 **Guideline No: 02/2018**

GUIDELINES ON THE USE OF CO-3 GRASS (HYBRID NAPIER) FOR SOIL REHABILITATION BEFORE REPLANTING OF TEA IN THE LOW COUNTRY

Introduction

Soil rehabilitation for a period of 18-24 months before replanting of old tea, is a must to improve soil conditions, minimize weed, pest and disease infestations and reduce soil toxicity. Most of the farmers are reluctant to grow rehabilitation grasses for such a long period before tea cultivation since there is no income generated during this period. Furthermore, there is a scarcity of planting materials of recommended rehabilitation grass species such as Mana and Guatemala, particularly in the low country tea growing region. Therefore, it has become necessary to identify alternative grass species to reduce the length of soil rehabilitation period. The Hybrid Napier grass *(Pennisetum purpureum x Pennisetum americanum*), Variety CO-3 with following beneficial characteristics has been proven to be a suitable alternative to Mana and Guatemala.

Characteristics of CO-3 Grass

- This is one of the inter-specific Hybrid Napier varieties used for fodder production. The hybridization occurs naturally between two species such as Common Napier *(Pennisetum purpureum)* and Pearl millet *(Pennisetum americanum)***.** These two species readily cross and that the resultant inter specific hybrids are more vigorous than the parent species and highly sterile. Therefore, it can be used as fodder without danger of becoming a weed.

- It has a well ecological adaptability to the low country climatic conditions and a high growth rate.

- It improves soil chemical, physical and biological properties.

- It has more leafy growth and shows high coppicing ability. Hence, appreciable number of loppings could be obtained within a short period of time.

- Hybrid Napier variety has a higher tillering ability than Mana *(Cymbopogon confertiflorus)* or Guatemala *(Tripsacum laxum)* grass species.

- It gives higher shoot and root biomass production than Mana and Guatemala (Table 1 and 2). As a result, it adds higher quantity of organic matter into the sub soil at the end of rehabilitation period.

- The weed management cost during rehabilitation period could also be reduced due to rapid growth habit of the grass, covering the land within a very short period of time

Table 1: Above ground dry matter production (Metric tons per ha)

Type of grass	After 12 months	After 18 months
CO-3	30.3 - 43.4	38.1 - 63.6
Guatemala	20.1 - 21.7	31.7 - 32.5
Mana	14.3 - 20.3	19.5 - 26.2

Table 2: Root dry matter production (Metric tons per ha)

Type of grass	**After 12 months**
CO-3	7.9 - 11.7
Guatemala	3.9 - 5.8
Mana	1.6 - 5.0

Climatic and soil requirements for CO-3 grass

The CO-3 grass grows well in high rainfall areas (in excess of 1500 mm per year) and under full sunlight. The optimum temperature range for its growth is 25 – 40^{o}C. The CO-3 grass is very susceptible to frost. Hence, it is not suitable for tea growing regions at high elevations especially above 1500 m *amsl*. Water logging and very acidic soil conditions are also not conducive for growth of CO-3 grass.

Planting of CO-3 Grass

- After uprooting old tea, prepare and level the land for planting of grasses. Dolomite should be applied at the recommended rate to improve soil pH to the desirable range (Please refer TRI Advisory Circular No. SP 6 on Fertilizer Recommendations For Rehabilitation Grasses, Issued in July 2000).

- Fresh cuttings with 3-4 nodes soon after removal from the mother plants are recommended for planting as sufficient amounts of food and water reserves should be present for successful sprouting of buds and initial growth.

- The grass cuttings should be planted at the beginning of rainy season at a spacing of 0.3 m x 0.6 m; Approximately 55,500 stem-cuttings are required for one hectare.

- Cuttings should be planted in holes made with a pointed stick or 'Alavangu' at an angle of 45 degrees from the ground leaving at least 2 nodes above the ground and the soil around the cutting should be compacted well without leaving any air pockets.

Fertilizer application

The grass should be regularly fertilized using the fertilizer mixture U 625 (Please refer TRI Advisory Circular No. SP 6 on Fertilizer Recommendations For Rehabilitation Grasses, Issued in July 2000) similar to other rehabilitation grasses. The quantities and times of fertilizer applications are 160, 210, and 310 kg per ha at the time of sprouting new shoots, after the 1st lopping, and after the 2nd and 3rd lopping respectively.

Management practices

It takes about 4-8 weeks to form a good ground cover. The grass should be lopped at regular intervals and the loppings should be spread on the ground between the contour rows. The first lopping can be done at a height of 45 – 60 cm from ground about 3 months after planting and the subsequent loppings could be done around 75 - 90 cm above the ground. The lopping should be done before the grass flowers and 4 loppings per year are possible. It needs to be protected from the animals as it is a fodder grass. At the end of the one-year rehabilitation period, grass should be cut at the ground level and the stem parts should be removed from the field to prevent re-growth.

Tea Research Institute of Sri Lanka
Talawakelle