

**Issued in: July 2016****Serial No: 01/16****Fertilizer Recommendation for Mature Tea in Small Holdings****This circular replaces Interim Circular No. SP 10, Serial No: 01/10, issued in August 2010.**

The soil organic matter content in low and mid country and Uva tea growing regions are generally low and therefore, the potential of retaining plant nutrients in these soils is also relatively low. This leads to poor use efficiency of soil applied fertilizers in these regions. Recent assessments done in small holder lands in these regions revealed that soil magnesium (Mg) and sulphur (S) levels are also significantly low.

Applications of mixed fertilizers containing nitrogen (N), phosphorus (P) and potassium (K) as Urea, Eppawela rock phosphate and Muriate of potash respectively, are recommended for mature tea fields in 2 to 5 splits per annum. The annual requirement of N is based on the potential yield categories. Magnesium requirement of the pruning cycle is expected to fulfill by the application of recommended quantity of dolomite ($MgCO_3 \cdot CaCO_3$) for pH correction at the time of pruning. The recommended quantity of dolomite is to be based on soil pH level in the latter part of the last year of cycle. Dolomite should comply with the specifications given in the TRI Advisory Circular SP3. Even though dolomite is applied, low nutrient retention capacities of soils may not make Mg available for plants throughout the pruning cycle. Furthermore, Mg deficiency could also be induced due to suppression of its uptake by the applications of higher rates of N and K containing fertilizers. These circumstances invariably lead to lack of Mg in soil and affecting healthy plant growth.

In view of above observations, two new fertilizer mixtures *viz.* U834 and UT752 were formulated as strategic interventions to improve soil fertility status in the tea small holdings. The suitability of new mixtures were tested in 26 small holder lands along with the other fertilizer mixtures previously recommended by the TRI, covering different Agro-ecological regions in major tea growing areas.

Based on the outcomes of adaptive trials, two new fertilizer mixtures *viz.* U834 and UT752 are recommended for small holdings in all the tea growing regions in addition to previously recommended fertilizer mixtures for mature VP tea fields in different tea growing regions *viz.* VP/LC 880 and VP/LC 1075 for low country, VP/UM 910 and VP/UM 1020 for mid & up country and VP/Uva 945 and VP/Uva 1055 for the Uva region (Table 1).

Growers may select the mixture/s to be used primarily based on the soil nutrient status, yield or crop responses. It is advisable to use either UT 752 mixture with 100 kg of dolomite per acre per annum or U 834 mixture if soil Mg and/or S levels are below 60 and 40 milligrams per kilogram (ppm) respectively in all the tea growing regions. However, if soil Mg level is above 60 ppm and S level above 40 ppm, it is appropriate to use regional specific mixtures viz. VP/LC 880 and VP/LC 1075 for low country, VP/UM 910 and VP/UM 1020 for mid and up country and VP/Uva 945 and VP/Uva 1055 for Uva region.

Table 1 – Recommended fertilizer mixtures for different agro climatic regions

Region	Fertilizer Mixtures
Low country	U 834, UT 752, VP/LC 880, VP/LC 1075
Mid & up country	U 834, UT 752, VP/UM 910, VP/UM 1020
Uva	U 834, UT 752, VP/Uva 945, VP/Uva 1055

Compositions of new fertilizer mixtures

U834 mixture

Urea	parts	438	(200 N)
ERP	parts	103	(30 P ₂ O ₅)
MOP	parts	168	(100 K ₂ O)
Kieserite	parts	<u>125</u>	(30 MgO & 28 S)
		<u>834</u>	

This mixture contains approximately:

24.0% N, 3.6% P₂O₅, 12.0% K₂O, 3.6% MgO and 3.4% S.

UT752 mixture

Urea	parts	396	(182 N)
SA	parts	85	(18 N & 20 S)
ERP	parts	103	(30 P ₂ O ₅)
MOP	parts	<u>168</u>	(100 K ₂ O)
		<u>752</u>	

This mixture contains approximately:

26.6% N, 4.0% P₂O₅, 13.3% K₂O and 2.7% S.

* Quantities of nutrients are given within the parenthesis

Dosage and frequency of application of new fertilizer mixtures

The potential yield categories, frequency and dosage of application of the new fertilizer mixtures are given in Table 2.

Table 2 – Frequency and dosage of application of new fertilizer mixtures for VP tea fields

Average yield (green leaf kg/ac/month)	Fertilizer mixture (kg/ac/yr)	
	U834	UT752
< 130	2 x 75 kg	2 x 75 kg
130-249	3 x 100 kg	3 x 75 kg
250-374	4 x 100 kg	4 x 100 kg
375-524	4 x 150 kg	4 x 125 kg
> 525	4 x 175 kg	4 x 150 kg

Compositions of regional specific fertilizer mixtures as per TRI Advisory Circular SP3 and Guideline No 02/08.

The compositions of regional specific fertilizer mixtures for moderate and high yielding VP tea fields are given in Table 3.

Table 3 - Compositions of regional specific fertilizer mixtures for moderate and high yielding VP tea fields

<i>Mixtures for fields yielding < 375 kg green leaf/ac/month (moderate)</i>			
Composition	Mid/Up country	Low country	Uva
	VP/UM 910	VP/LC 880	VP/Uva 945
Urea parts	587 (270 N)	587 (270 N)	587 (270 N)
ERP parts	123 (35 P ₂ O ₅)	126 (35 P ₂ O ₅)	125 (35 P ₂ O ₅)
MOP parts	200 (120 K ₂ O)	167 (100 K ₂ O)	233 (140 K ₂ O)
<i>Mixtures for fields yielding >375 kg green leaf/ac/month (high)</i>			
	VP/UM 1020	VP/LC 1075	VP/Uva 1055
Urea parts	695 (320 N)	782 (360 N)	695 (320 N)
ERP parts	125 (35 P ₂ O ₅)	126 (35 P ₂ O ₅)	127 (35 P ₂ O ₅)
MOP parts	200 (120 K ₂ O)	167 (100 K ₂ O)	233 (140 K ₂ O)

* Quantities of nutrients are given within the parenthesis

The N, P and K percentages of the regional specific fertilizer mixtures are given in Table 4.

Table 4 - N, P and K percentages of the regional specific fertilizer mixtures.

Mixture	Nutrient (%)		
	N	P ₂ O ₅	K ₂ O
VP/UM 910	29.7	3.9	13.2
VP/LC 880	30.7	4.1	11.4
VP/Uva 945	28.6	3.8	14.8
VP/UM 1020	31.4	3.4	11.8
VP/LC 1075	33.5	3.3	9.3
VP/Uva 1055	30.3	3.3	13.3

Dosage and frequency of application of regional specific fertilizer mixtures

The potential yield categories, frequency and dosage of application of regional specific fertilizer mixtures for VP tea fields are given in Table 5.

Table 5 – Frequency and dosage of application of regional specific fertilizer mixtures for VP tea fields

Average yield (green leaf kg/ac/month)	Mid/Up country	Low country	Uva
	Fertilizer mixture (kg/ac/yr)		
	VP/UM 910	VP/LC 880	VP/Uva 945
< 130	2 x 75 kg	2 x 75 kg	2 x 75 kg
130 – 249	3 x 75 kg	3 x 75 kg	3 x 75 kg
250 – 374	4 x 75 kg	4 x 75 kg	3 x 100 kg
	VP/UM 1020	VP/LC 1075	VP/Uva 1055
375 – 524	4 x 100 kg	4 x 100 kg	4 x 100 kg
> 525	4 x 125 kg	4 x 125 kg	4 x 125 kg

Considering lower plant density, individual bush manuring is strongly recommended for the fields yielding less than 130 kg green leaf/ac/month.

Since dolomite is recommended at the rate of 100 kg/ac/yr in one or two applications, as a source of Mg when UT752 mixture is applied regularly, dolomite should be broadcast at least four weeks prior to ground fertilizer applications.

In addition to ground fertilizer application, it is essential to apply foliar spray of Zinc sulphate ideally within 10-14 days after each ground fertilizer application in order to induce bud break.

The lack of yield or crop response to fertilizer application could be due to many reasons. Factors such as weather conditions, soil properties and moisture status *etc.*, affect the use efficiency of applied fertilizer. It is essential to apply fertilizers when the soil is moist.

Adding organic matter in the form of compost and green manure *etc.*, to tea fields improves retention of moisture and applied nutrients in soil. In addition, adoption of soil conservation measures and good agricultural practices (GAPs) significantly improves the availability of plant nutrients. Hence, application of chemical fertilizers should not be considered as the only solution for every constraint encountered in tea fields.

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