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EUPHATORIUM INNULIFOLIUM - A SOURCE OF GREEN MANURE IN TEA PLANTATION

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Euphatorium innulifolium (Family: Asteraceae; Genus: Euphatorium), is commonly known as "Kuringhnan" by some estate communities, is a shrub found in the up-country and Uva region. Being a freely grown shrub and considered as a weed, it serves only as a ground cover, although its vegetative parts, could be used as a source of green manure or compost. It is also used as a SALT hedge-row species in few estates of the Up country (De Costa, 2000).

According to Kehl and Rajiah (1954) the same weed, which was earlier as *E. riparium*, a native of Mexico, was introduced into Sri Lanka in 1918. It has been found in the Dimbula area since 1932 and rapidly spread into this region, during 1940-1944. Since then, it has adapted itself to a wide range of climatic conditions. This is now found in most estates and their surroundings particularly, Dimbula, Talawakelle, Hatton/Dikoya, Ginigathhena, Hangurankethe, Hewaheta; at high elevations in Balangoda and on most of the estates in Uva province (Prematilake, 2002). Although, feared that this shrub would invade tea fields and nurseries, this has been mostly limited to the uncultivated areas such as exposed river-banks, road sides and ravines. The weed thrives also under *Eucalyptus* plantation forming a useful ground cover.

The plant is shrubby with a loosely spreading habit and grows to a height of 70-120 cm (Kehl and Rajiah, 1954), but grows to a height of 2.0-2.5 m under the shade. The stem is minutely covered with short hairs; woody at the base but tender at the apex. The leaves which are opposite, are long lance shaped, tapering into petiole and 3-ribbed. Flowering commence at the beginning of the dry weather and continues for several weeks. The closely compacted white flower heads resembles those of "Pum- pillu" (*Ageratum conyzoides*) and are borne on clusters with long stalks and thus plant produces a large quantity of viable seeds. The seed can be carried by even a light breeze and wind is the chief agent by which seeds are dispersed. Some seeds are carried by water and may be taken long distance and down-stream. The seedling establish readily, wherever conditions favour their growth.

Recent laboratory analyses have recorded 3.15%, 2.0% and 35.3% of total N, K and organic carbon respectively, in leaves (Prematilake and Prematunge,

2000). Accordingly, it has a low C/N ratio i.e. 11.2. in leaf material, indicating it as suitable for compost making or to use as a green manure. In Java *Euphatorium* is used as a source of green matter for compost making (Kehl and Rajiah, 1954).

The average population density of *Euphatorium* is about 20,000-30,000 plants ha^{-1}. Being a plant with a high coppicing ability, it could produce about 0.75 kg of biomass per shrub, which include greenish tender shoots together with leaves, from a single lopping. Accordingly, about 15-22 mt/ha of biomass can be obtained from a single lopping of *Euphatorium* before flowering (Prematilake and Prematunge, 2000).

The loppings can be used as a thatch, if lopping is done before flowering. 3.0-4.0 kg of biomass is required to cover one m area of the bare ground [i.e. approx. 30-40 mt/ ha. Field investigations had shown that leaves were totally decomposed within 10-12 weeks after thatching (De Costa, Prematilake and Gamage, un published data 2000) This is comparatively a shorter duration when compared with that of Mana and Flemingia, which take about 24 and 28 weeks, respectively. (Prematilake *et al*, 1998). A higher percentage of soil Organic C was maintained until 28 weeks from thatching resulting from the decomposition of materials adding considerable amount of humus to the soil. However, a profuse growth of weeds was observed at 13 weeks from thatching responding to such high organic matter in soil (Prematilake and Prematunge, 2000).

As our tea soils contain less organic carbon, the productivity is lower when compared with other tea growing countries. Therefore, it is prudent to exploit our plant resources such as *Euphatorium* to improve soil productivity and thereby to achieve maximum benefit from our tea lands.

Euphatorium iinnulifolium - General picture

Euphatorium innulifolium – A close up picture

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