

Dry matter accumulation and leaf chlorophyll content of bitter gourd (*Momordica charantia* L.) as influenced by fertigation

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ABSTRACT

Field experiments were carried out to elucidate the effect of macro and micronutrient fertigation on dry matter accumulation and chlorophyll content in the leaf of bitter gourd during 2001 and 2002. Application of different levels of fertigation significantly influenced the total dry matter accumulation and chlorophyll a, b and total chlorophyll in leaf at different stages of crop growth during both the seasons. Application of 100 per cent macro and micronutrients in water soluble form, significantly influenced the total dry matter production. Chlorophyll a, b and total chlorophyll content increased with increase in the fertigation levels and the highest being in 100 per cent macronutrient applied in combination with micronutrients. The content in the leaf increases up to 60 days and thereafter in, slowly declined during both the season.

Key words : Dry matter, Chlorophyll, Bitter gourd, Fertigation, Macronutrient, Micronutrient.

Bitter gourd is a commercially and medicinally important vegetable belonging to the cucurbitaceae family. It is mainly grown for its fruit in the tropical parts of the world. Besides the highest calorific value, the fruits are rich in Vitamin-C, phosphorus and iron (Wills *et al.*, 1984). Bitter gourd is also known for its various medicinal properties (Morton, 1967) with a more recent attention focused on its use as a hypoglycemic agent (Perl, 1988).

Accumulation of nutrients in a plant depends on many factors such as physico-chemical characteristics of soil, variety and agroclimatic condition prevailing in a place. The study on dry matter accumulation and leaf chlorophyll content at different stages of crop growth is essential for understanding the nutrient requirement and also to estimate the nutrient removal by the crop. Nutrient content and uptake as a function of dry matter production during the different stages of crop growth will bring out the nutrient requirements of the plant, besides indicating the physiological status of the plant.

The fertigation proved to increase the dry matter production (DMP) through vegetative growth and nutrient absorption through expanded root system. Fertigation offers increased flexibility in managing orchard nutrition programs because of the potential for more closely synchronizing nutrient application with plant demand (Haynes, 1985). There is a need, however, to assess the effectiveness of any new fertilization strategy relative to traditional methods. Hence, the present investigation was carried out to study the effect of fertigation on dry matter accumulation and leaf chlorophyll content of bitter gourd.

MATERIALS AND METHODS

The study was conducted at University Orchard, Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore during 2001 (season I) and 2002 (season II) in bitter gourd hybrid CoBgoH-1. The soil of the experimental field was alkaline (pH 8.1) in reaction and sandy loam in texture. The experimental field containing available N (175.00 kg ha⁻¹), available P (17.20 kg ha⁻¹) and available K (626.00 kg ha⁻¹) in the soil. The treatments included were three levels of macronutrients in water-soluble form (100%, 75% and 50%) and three levels of macronutrients in water soluble form applied in combination with micronutrients (polyfeed) (100%, 75% and 50%) with a control (conventional method of fertilizer application).

The seeds of the bitter gourd hybrid were sown at a spacing of 1.5 x 2 m. The experiment was laid out in a randomised block design and the fertigation was given once in a week starting from the 4th week after sowing. The total dry matter production was recorded at 40, 60, 80 and 100 DAS. Five plants were selected in each replication and the plants were uprooted and fresh weights were noted. Freshly chopped materials were dried at 80°C in an oven to get per cent dry matter and the dry matter yield was calculated. The chlorophyll a, b and total chlorophyll content were estimated as per the method suggested by Yoshida *et al.* (1976) and expressed in mg g⁻¹ on fresh weight basis.

RESULTS AND DISCUSSION

The total dry matter production increased significantly with advancement in the crop age and with every increase