INFLUENCE OF DIFFERENT FERTILIZER LEVELS ON GROWTH AND DEVELOPMENT OF TISSUE CULTURED BANANA cv. ROBUSTA (AAA)

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ABSTRACT

A study was conducted to assess the effect of different fertilizer treatments on tissue cultured banana cv. Robusta. The experiment laid out in RBD had six treatments each replicated four times. The experiment consisted of application of 100 per cent, 150 per cent and 200 per cent of recommended NPK (110:35:330 g plant^{-1}) in three and four splits respectively in each level. There was a positive response in plant growth in terms of height and girth to nutrient application. Application of NPK @ 165:52.5:495 g plant^{-1} in four splits (T_4) recorded better growth of the tissue cultured plants followed by T_3 (165:52.5:495 g NPK plant^{-1}) in three splits. Higher number of functional leaves at shooting stage with shorter phyllochron, greater leaf area and leaf area index were recorded with the application of N @ 165 g, P @ 52.5 g and K @ 495 g plant^{-1} given at four split doses. The same treatment recorded lesser number of days for shooting and harvest and also recorded higher bunch weight.

Key words : Tissue cultured banana, Robusta, Fertilizer, split, Vegetative characters.

Banana is commercially propagated through sucker, which is seriously limited by its low rate of multiplication, easy spread of many pathogens *et*c. In recent times, *in vitro* produced tissue cultured planting materials have become popular in banana as a possible replacement for conventional suckers, due to their superior performance when compared to conventional suckers (Robinson, 1990). The inherent advantages of *in vitro* propagation of banana include high survival rate during field establishment, vigorous growth, retention of healthy leaves, uniform flowering, shorter harvesting period and higher yields (Hwang *et al.,* 1984).

High amount of nutrients are required for proper growth and production of banana because it is a gross feeder. More of nitrogen and potassium are required for its growth and production as compared to phosphorus. Existing fertilizer recommendations are related only to sucker derived planting material and not for tissue cultured banana. With this background, the effect of varying fertilizer doses with different timing in application has been assessed on growth and development of banana cv. Robusta.

MATERIALS AND METHODS

A field experiment was conducted with tissue cultured banana cv. Robusta (AAA) as a test crop in randomized block design with six treatments and four replications. The treatments consisted of application of 100 per cent, 150 per cent and 200 per cent of recommended NPK (110:35:330g plant^{-1}) (Anon, 1999) in three (3, 5, 7th MAP) and four splits (2, 4, 6 and 8th MAP) in each level.

The sources of N, P and K were urea, single super phosphate and muriate of potash. Vegetative characters such as pseudostem height, girth, number of leaves, phyllochron, leaf area and leaf area index (LAI) were recorded at shooting stage. Height of the pseudostem was measured from the base of the trunk to the axil of the youngest leaf and expressed in centimetre. The girth of the pseudostem was measured at 30cm height from the ground level and expressed in centimetre. The total number of leaves produced until shooting and the number of functional leaves at different stages of observation was counted. The date of emergence of each leaf was recorded from which the rate of emergence (phyllochron) was calculated (Summerville, 1944). Total leaf area was estimated non- destructively by multiplying the product of length and breadth of third leaf by the factor 0.8 (k_1) (Murray, 1960), number of leaves and the factor 0.67(k_2) (Kumar *et al.*, 2002) and expressed in m^2. The leaf area index was calculated using the following formula (Watson,1952).

$$LAI = \text{Leaf area per plant} / \text{Area occupied per plant}$$