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Effect of fertigation through drip and micro sprinkler on plant biometric characters in cocoa (*Theobroma cacao* L.)

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ABSTRACT : A field experiment to study the influence of fertigation of N, P and K fertilizers on biometric characters of cocoa (*Theobroma cacao* L.) was conducted at the Department of Spices and Plantation Crops, Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore during January 2010 to December 2011. The experiment was laid out with thirteen treatments replicated three times in a randomized block design. A phenomenal increase in growth parameters such as trunk girth, canopy spread, weight of the pruned branches removed, leaf fresh weight and leaf dry weight was observed with increasing levels of NPK as well as methods of fertilizer application in this study. Among the various treatments, fertigation with 125 per cent recommended dose of fertilizers (125:50:175 g NPK plant^{-1} year^{-1}) as water soluble fertilizers (WSF) through drip irrigation increased all vegetative growth parameters.

KEY WORDS : Fertigation, Drip, Micro sprinkler, Growth parameters, Water soluble fertilizers, Straight fertilizers

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Cocoa (*Theobroma cacao* L.) the 'Food of Gods' is one of the most important plantation crops consumed worldwide and around 40 - 50 million people depend on cocoa for their livelihood (World Cocoa Foundation, 2011). Cocoa is cultivated mainly in Africa, Asia, Central America and South America and major cocoa producing countries are Ivory Coast, Ghana, Indonesia, Nigeria, Cameroon, Brazil, Ecuador and Malaysia. The annual production is around 3 million tonnes with an estimated value of $ 5.1 billion (World Cocoa Foundation, 2010). Ivory Coast leads in production occupying 38 per cent of total world cocoa production followed by Ghana (21 %), Indonesia (13 %), Nigeria (5 %), Cameroon (5 %), Brazil (4 %), Ecuador (3 %), Malaysia (1 %) and others (10 %). West Africa alone contributes nearly 70 per cent of the world cocoa production.

India offers considerable scope for cocoa cultivation, production and further development. Though cocoa has been known as the beverage crop even before tea and coffee, it is relatively a new crop to India. Cocoa is intercropped in coconut and arecanut and is a good companion to these crops. Four states *viz*., Kerala, Andhra Pradesh, Tamil Nadu and Karnataka share the major cocoa production in India. The current area is estimated to be 46,318 ha with production of 12,954 MT. The national productivity is 550 kg dry beans per ha. Kerala leads in production with an area of 11,044 hectares contributing 6344 MT of cocoa beans with a productivity of 592 kg per hectare. Tamil Nadu occupies third in cocoa cultivation and the area reported under this crop is 15,000 ha with an annual production of 350 MT (DCCD, 2011).

More than 80 per cent of active roots in cocoa are located within the radius of 30-60 cm, surface application of the required fertilizers are to be applied between 30-60 cm distance from the main trunk under conventional system of irrigation. Such spot application of fertilizers often leads to mismatch in meeting