



Organic amendments with fertigation for cultivation of water melon (*Citrullus lanatus* Thunb.) in *Theri* land (Red sand dune) of Tamil Nadu.

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The *Theri* lands (red sand dunes) are one of the major wastelands in Tirunelveli and Thoothukudi districts of Tamil Nadu. These *Theris* are located (77° 49' 44" to 78° 28' 22" E and from 8° 15' 13" to 9° 11' 0" N) to an extent of 20,171 ha (Jawahar *et al.*, 1999). The soils have low nutrient status, low water holding capacity, low organic carbon content and are susceptible to high wind erosion (Manikandan and Subramanian, 2010). The mean annual rainfall of the study area is between 610 and 700 mm. The sand dune ecosystem formed in isomegathemic and ustic regime from geogenic sand deposit under a semi-arid climate. Soil at the experimental site was red sandy, with organic carbon 0.12%, electrical conductivity 0.13 dS/m, neutral pH (6.66), low available N (93.7 kg ha⁻¹), low available P (8.2 kg ha⁻¹) and low available K (88.5 kg ha⁻¹).



Watermelon (*Citrullus lanatus* Thunb.) is one of the important vegetable crops grown extensively in India. It is a major tropical crop in south Indian states of Karnataka, Andhra Pradesh and Tamil Nadu. India is the second largest producer of watermelon fruit among the Asian countries accounting 2.48 million tonnes from 1.01 lakh hectare with the productivity of 24.58 t ha⁻¹ (HSD, 2017).



In Tamil Nadu, the production is 1.63 lakh tonnes from an area of 6930 ha with the average productivity of 23.52 t ha (DES, 2017).

A soil amendment is any material added to a soil to improve its physical properties, such as water retention, permeability, water infiltration, drainage, aeration and structure. In *Theri* soils (red sand dune) organic amendments like tank silt, FYM, composted coir pith (CCP) etc. improve the physico-chemical properties of soil. Many organic amendments contain plant nutrients and act as organic fertilizers. Monitoring soil and plant nutrient status is an essential to ensure maximum crop productivity. It is well known that organic amendments and inorganic fertilizers are essential to increase the productivity of crops and fertility of soils.



The fertigation technology is the possible way to improve the crop production and soil productivity for profitable farming in constrained *Theri* soil. Fertigation within the rhizosphere matches with the physiological needs of the crop viz. root development, vegetative growth, flower and fruit development. Scientific information on fertigation in *theri* land (red sand dune), especially in watermelon, is very scanty. Hence, the present field experiment was conducted to determine influence of organic amendments combined with inorganic fertilizers through fertigation on growth, fruit yield of watermelon and soil fertility of *Theri* land.

The investigation was carried out at Thirumaraiyur village, Sattankulam taluk, Thoothukudi district to study the effect of organic amendments with recommended dose of fertilizers on growth and yield of watermelon in *Theri* soil (red sand dunes) during the year 2017 and 2018. The experiment was laid out in Randomized Block Design with Factorial concept (FRBD). In all there were three factors as organic amendments with 6 treatment combinations for each factor, which were assigned at random in each plots with





three replications. The recommended dose of fertilizers in treatments were two levels as 75 and 100 per cent. Seeds of watermelon F1 hybrid Suprit taken as test crop, sown with 60 cm plant-to-plant spacing, during the first week of November in both years.

Among the treatment combinations, the tank silt application @ 100 t ha⁻¹ with 100 per cent recommended fertilizer as 200:100:100 kg of NPK ha⁻¹ through fertigation at 7 days interval (A1N5) produced maximum number of branches (10.67), longest vine (362.0 cm), number of fruits plant⁻¹ (2.57), weight of fruit (5.27 kg), fruit yield (68.77 t ha⁻¹), gross return (₹4,09,320/ha), Benefit-cost ratio (2.45), uptake of NPK 39.79, 4.04 and 30.49 kg ha⁻¹, respectively) compared to other treatments. Significant built up of organic carbon (0.52%), available N (253.47 kg ha⁻¹), P (16.40 kg ha⁻¹) and K (218.40 kg ha⁻¹) were registered with the application of tank silt application @ 100 t ha⁻¹ with 100 per cent recommended fertilizer as 200:100:100 kg of NPK ha⁻¹ through fertigation at 7 days interval.