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From Forest Nursery Notes Winter 2013

**238. © Preliminary studies on morphological diversity of coconut (*Cocos nucifera* L.) seedlings by organic and inorganic fertilizer amendments at Karachi, Pakistan.**  
Solangi, A. H. and Iqbal, M. Z. Pakistan Journal of Botany 44(1):161-164. 2012.

## PRELIMINARY STUDIES ON MORPHOLOGICAL DIVERSITY OF COCONUT (*COCOS NUCIFERA* L.) SEEDLINGS BY ORGANIC AND INORGANIC FERTILIZER AMENDMENTS AT KARACHI, PAKISTAN

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### Abstract

The study was undertaken to determine the effect of organic and inorganic fertilizers amendments on the growth parameters of coconut seedlings in field at the Coastal Agricultural Research Station, Karachi. The seedling height and number of leaves were significantly high in treatment T7 (Neem seed powder) ( $27.62 \pm 8.74$ ) and treatment T5 (NPK) ( $27.18 \pm 8.60$ ). The maximum number of the roots was observed in T1 (NPK + Neem seed powder + *Gliricidia sepium*) ( $2.26 \pm 0.71$ ) and T3 (NPK + *Gliricidia sepium*) ( $1.69 \pm 0.53$ ), where as minimum roots was recorded in T8 (Control) ( $0.94 \pm 0.29$ ). The maximum number of leaves was observed in T4 (Neem seed powder + *Gliricidia sepium*) ( $1.49 \pm 0.47$ ) and T1 ( $1.31 \pm 0.41$ ). The results showed the beneficial effects of organic and inorganic fertilizers on seedlings. The work indicated morphological diversity of seedlings at the nursery stage to help the growers in choosing planting materials for their gardens in coastal area of Sindh and Balochistan.

### Introduction

Coconut (*Cocos nucifera* L.) is currently grown in nearly 90 countries spread along the tropical belt. Of the 11.9 million hectares of coconut grown in the world, eight million hectares, or about 70% is in South East & East Asia (Carpio, *et al.*, 2005). The coconut is not indigenous to Pakistan, which had no or very little information on variety or specific characters. The seedlings produced in nurseries came from nuts imported from other countries (Laghari & Solangi, 2005).

Coconut is a cross-pollinated perennial crop, which can be propagated only through seeds and the selection of the planting material is of a vital importance. The coconut seed takes a long time before it attains a stable level of production. Proper selection and planting of good quality seed nuts must be done to ensure a productive plantation (Magat, 1999). Palm seeds will need a resistant structure in order to be able to spend a long time in winter and for this reason their shells are quite hard. They need more nourishment than normal or their long journeys and the exact quantity of food necessary is placed inside the coconut seed-package. Coconut seedlings grow and develop faster when fertilized with a combination of ammonium sulfate + potassium chloride + 1 gram of Borex (Santos, 1987). Soil is a mixture of organic and inorganic materials. The organic part consists of living things and their remains while the inorganic part is made up of rocks and minerals. Tenkoon & Bandara (2003) observed that organic materials (Cattle manure, goat manure, Broiler & Layer poultry manure, Pig manure, farm yard manure, biogas residue, sewage sludge, compost, *Gliricidia*, *Pueraria*, *Calopogonium* and *Acacia*) have considerable amounts of macro and micro-nutrients and these materials could be used as a source of plant nutrients for coconut to supply the N requirement in full and P, K and Mg requirements in part. *Gliricidia* planted in coconut plantation through seeds and cuttings had better biomass production of cuttings as compared to seeds (Solangi *et al.*, 2010). Sumbak (1970) studied that more frequent or heavier N applications might be necessary for maximum growth whereas intervals

between S applications could be prolonged. The relative poor growth over the first 12 months of seedlings transplanted with 4-7 leaves showed a need for better establishment techniques.

Menon & Pandalai (1960) concluded from their studies that soaking of seed nuts in water for period up to 15 days resulted in quicker and better germination. Injection of major nutrients like N, P and K into the husk was also found to have adverse effects on the germination of seed coconuts. According to the international criteria (Anon., 1980) only 30 percent of the total field contained adequate organic matter. Beside many beneficial effects on soil properties and plant growth, soil organic matter is also indicative of N supply status of soils.

Indian Council of Agricultural Research (Anon., 2004) recommended the soils which are poor in organic matter, the application of green manure or compost at 50kg per/palm. As such it spent entire life span of 70-80 years or more rooted in one place. Consequently it removes most of the available nutrients in the soil within a few years. Annually, the palm removes large quantities of nutrients from the soil (Nathanael, 1961; Von Uexhull, 1971). Balakrishna (1975) studied that all the inorganic and organic fertilizers mixture treatments have consistent and significant effects on the yield. Mravilla *et al.*, (1978) noted that the non responsiveness to fertilization of seedlings in the early nursery stages could be due to the already sufficient levels of nutrients available while they were still in the endosperm stage. This is likely so with seedlings collected from adequately nourished or properly fertilized palms.

Therefore the main objectives of this study were to examine the effects of organic and inorganic fertilizers amendments on the germination of coconut seeds and the growth & measurable characters of seedlings viz. the height, total number of leaves, petiole length, rachis length and number of roots.

### Material and Methods

The experiment was conducted to study the effect of organic and inorganic fertilizers on the coconut seedlings at Coastal Agricultural Research Station, Saleh Muhammad Goth, Karachi. The station is situated at about 11km from