Role of Potassium in Coconut Palm

P.G. Kamalakshi Amma, V.S. Lekha and Dr. C.C. Biddappa.
Central Plantation Crops Research Institute,
Regional Station, Kayamkulam-690 533.

Potash is one of the three major fertilizer elements commonly recommended for successful crop production. It is required for many of the crop plants in large amounts. In nature, it is found in many compounds and minerals, viz., muriate of potash, sulphate of potash, muscovite, biotite, micas and illite. Potassium occurs in three forms viz. water soluble, water insoluble and in a form of intermediate solubility.

The term potash is commonly referred to caustic potash or potassium salts like muriate of potash and sulphate of potash. While dealing with fertilizer and analysis of soils potash signifies the hypothetical potassium oxide (K_2O).

Potassium is known to be important in plant metabolism in regulation of stomatal function (water economy of the plant) and in the formation of chlorophyll. It also participates in photosynthesis, helps in root development, enabling uptake of more nutrients and water from the soil and subsequently in increasing yield and improving quality of nuts. It increases the oil content in oil seeds. Coconut is a heavy feeder of potassium. It stimulates early shooting and early fruit maturity. Supplementing potassium in the soil increases yield substantially. Potassium increases the resistance of coconut from the attack of diseases and pests.

The deficiency of potassium affects all the production factors, particularly the nut set. Tip scorching of leaves is a prominent symptom of potassium deficiency and is corrected by potassium manuring. Potassium deficiency also leads to chlorosis and development of poor crown with short fronds. Leaves of the deficient palms give yellowish appearance which is more pronounced near the periphery of the leaf than the middle portion. The growth in general is reduced, the trunk becomes slender, leaflets gets shortened and consequently the number of inflorescences and nut set get reduced. Potassium deficiency would result in poor quality of nut and kernel.

Potassium has been found to have an effect on the earliness of bearing in coconut palms. Experimental results revealed that palms receiving regular dose of fertilizers bear fruit at the fifth year of planting while unfertilized palms needed eight years to bear. While nitrogen contributed only an eight per cent increase in copra yield, potassium contributed about 25-39% increase. Thus potassium plays an important role in coconut culture.

The coconut growing soils of Kerala are generally deficient in available potassium. Exchangeable K content varied from 13.69 ppm in coastal sandy soils to 93.49 ppm in laterite in the surface soils.

A number of factors such as the availability and the fixation of potassium in the soil affects potassium status of individual coconut soil. The absorption of potassium is interfered by an excess of nitrogen, calcium and magnesium in the soil, thus affecting potassium nutrition of coconut. The response of coconut to the available potassium is also influenced by other ionic inter-relationship in the soil and absorption of potassium by plants.

In poor soils, a complete NPK mixture has found to increase kernel weight by 10 percent. The beneficial effect of potassium to regulate water loss from the coconut palm offering tolerance to drought also points to its importance in coconut nutrition. It is well known that the chlorotic appearance of the leaves and increased susceptability to the attack by grey blight (*Pestalozzia palmaram*) are the result of deficiency of potassium in the leaves.

Application of potassium fertilizers to low and medium status soil is advocated. Muriate of potash is superior to sulphate form for coconut manuring as it is cheaper and supplies chlorine along with potassium. Moreover sulphate of potash increases acidity of the soils. For better and profitable farming, balanced fertilization with nitrogen, phosphorus, potassium and also with magnesium is essential. The general recommendation of CPCRI for fertilizing adult bearing palm is to apply 500g N, 320g P_2O_5 and 1200g K_2O along with 500g MgO/palm/year in two split doses, namely 1/3 of the above dosage during April-May (pre-monsoon) and two-third during Aug-Sep (on cessation of heavy rain). To supply this quantity of nutrient it is required to apply 1.1 kg. urea 1.5 kg. mussoriephos and 2 kg muriate of potash. This enables the farmer to reap higher crop yields.