

**A 13** **Effect of high density planting and nutrient doses on growth and yield of oriental pickling melon (*Cucumis melo* var. *conomon* (L.) Makino)**

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A field experiment was conducted in the summer rice fallows of the Agricultural Research Station, Mannuthy, Thrissur from December 2011 to February, 2012 to maximize the production of oriental pickling melon using the high yielding short duration variety 'Saubhagya'. The treatments consisted of five population and three nutrient levels. The results revealed progressive decline in vegetative growth characters like number of vines per plant, mean length of vine and mean number of leaves per vine with increase in plant population from 10,000/ha to 33,333/ha. But leaf area index increased progressively with increase in plant population. All the above growth parameters increased significantly with increase in nutrient doses upto the N,P,K dose of 87.5: 32: 31 kg/ha. Mean number of fruits per plant, average of fruit yield per plant and mean weight and volume of single fruit decreased significantly with increase in plant population and increased with nutrient levels. Significantly the highest fruit yield per hectare was recorded with the plant population of 26,666/ha. It was 81 per cent higher than that recorded at the recommended population of 10,000/ha. The nutrient dose of 87.5: 31: 31 kg N,P,K/ha recorded the highest fruit yield from among the nutrient levels. The interaction between population and nutrient dose was significant and significantly the highest fruit yield of 76.9 t/ha was obtained at the combination of 26,666 plants and N, P, K at 87.5: 32: 31 kg/ha.

**A 14** **Species diversity of arbuscular mycorrhizal fungi in arecanut - based cropping systems under organic management practices and AM relationship with soil - physico- chemical properties**

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Mycorrhizal fungi are important components of soil micro-flora involved in the transfer of nutrients from soil to plants in natural ecosystems. Arbuscular mycorrhizal (AM) associations have been reported in palms, such as coconut, oil palm and date palm but very little information is available on AM research in arecanut palms (*Areca catechu* L). Present study focused on the arbuscular mycorrhizal status and species diversity of AM fungi in farmers' fields of arecanut based cropping systems at three different locations of Kannur district of Kerala, India. Arecanut based intercropping system in Maneikkara had banana as the intercrop, Cheruvanjeri had banana and pepper as intercrops and Nedumpoyil had banana, pepper and cardamom as component crops. Farmers' fields were under organic management practices with only cowdung and husk as the inputs. The soil samples from the three locations had extramatrical AM spore distribution in different levels. The highest AMF colonization was observed at Maneikkara with a spore load of 90 spores / 10g soil and 80 % frequency of root colonization and least at Cheruvanjeri plot with an average

spore load of 28 spores / 10g soil and 49 % frequency of root colonization. However, it was observed that species diversity increased with the number of intercrops. *Funneliformis mosseae*, *Rhizophagus fasciculatus*, *Funneliformis geosporum*, *Glomus macrocarpum*, *Glomus aggregatum*, *Glomus multicaule*, *Glomus glomerulatum* and *Acaulospora bireticulata* were the AMF species associated with different crops in arecanut cropping systems. The relative distribution of AMF spp. varied between cropping systems as well as among intercrops. Studies indicated that *Funneliformis geosporum* was most abundant (29-50 %) followed by *Glomus macrocarpum* (9.4 - 29%) and *Glomus multicaule* (11.9 - 29.38 %) and least relative abundance (0-2.93%) was observed in *Acaulospora* sp. Mycorrhizal association showed an inverse relationship with available phosphorus content of basin soils. The study reveals the extent of AM colonization and spore distribution and diversity in main crop, arecanut and the component crops in arecanut based cropping systems.

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### **A study on sprouting, sprout elongation rates and seedling characters in selected coconut varieties**

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A study on germination, sprouting character and seedling characters was undertaken in selected varieties and parental lines of coconut in order to identify discriminate characters for characterisation of varieties and evaluate their utility for DUS testing in coconut. A minimum of fifty seed nuts of six varieties viz. West Coast Tall (WCT), Chowghat Orange Dwarf (COD), Kalpa Pratibha, Kalpa Mitra, Kera Chandra, Chandra Kalpa were sown in the nursery beds at a spacing of 30 cm x 30 cm. The time taken for sprouting of seed nuts after sowing in the nursery was recorded. The colours of the emerging sprouts were also recorded. The length and the girth of the seedlings of the seedlings and number of leaves were recorded on sprouting seedlings, at the 6<sup>th</sup>, 9<sup>th</sup> and 12<sup>th</sup> month after sowing. Further, for identification of new discriminating traits for DUS characterisation in coconut, observation on length of emerging sprouts and its rate of elongations at five days intervals were recorded. Significant difference on days to germination, seedling traits and sprout characteristics were observed among the varieties. Kera Chandra and Kalpa Pratibha were the earliest to germinate with robust seedling characters. COD was late germinating unlike dwarfs, but was comparable to the other tall varieties (except Kera Chandra and Kalpa Pratibha) for this trait, indicating the effectiveness of days to germination to discriminate between varieties to a certain extent. Initial sprout length and sprout elongation rates appear to be promising as discriminating traits and need to be explored further for utilisation as descriptors for DUS testing in coconut.