INTER-AND MIXED CROPPING IN ARECANUT GARDENS

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THE long pre-bearing age of 5 to 8 years, the low income in the early period of bearing and the fluctuation in the market price of arecanut from year to year have forced the arecanut growers to take up intercropping in arecanut gardens. This practice also helps the arecanut growers to get some additional income and cover the risk of poor yields from arecanut due to the unfavourable weather conditions and incidence of pests and diseases.

The choice of the crop depends upon its ability to grow under shade of arecanut palms and to withstand the heavy dripping during the monsoon. If the subsidiary crops and arecanut differ in their nutrient requirements and feeding zones, these will be additional advantages. The crops which can be successfully grown in arecanut gardens without detriment to arecanut yield are elephant-foot-yam, banana, pepper, betelvine, guinea grass and cacao. In the case of banana, it also provides shade to the young arecanut palms in the early years.

Inter-and Mixed Crops

Banana. Selected suckers are planted in pits of 50 to 60 cm cube dug at a spacing of 2.7m × 5.4 m (when the spacing for arecanut is 2.7m × 2.7m) in the same row of arecanut palms. A basal dose of 12 kg of cattle manure or compost and 0.5 kg of superphosphate may be applied followed by 0.4 kg of calcium ammonium nitrate or ammonium sulphate and 0.25 kg of muriate of potash, each applied in two equal doses, first application being 2 or 3 weeks and the second 4 to 5 months after planting. Desuckering, propping, etc., have to be attended to.

Elephant-foot-yam. Seed material is prepared by cutting mature tuber into pieces, each weighing 0.75 to 1.0 kg and having a small portion of the central ring or bud. These are planted in pits of 50 cm cube. Two pits at a distance of 90 cm may be dug in the same row of arecanut palms planted at a spacing of 2.7 m×2.7 m. A basal dose consisting of 10 tonnes of cattle manure, 225 kg of superphosphate and 135 kg of muriate of potash per hectare may be applied to the pits and mixed with soil. Ammonium sulphate at the rate of 400 kg per hectare may be applied half as basal and the remaining one month after planting. The planting is done usually in February-March and the crop can be harvested after nine months.

Pineapple. In the early years pineapple can be grown as a profitable intercrop in arecanut gardens. Trenches of 60 cm width and depth and about 125 cm length are dug in between two arecanut palms. In each trench three pineapple suckers are planted. The plants are to be manured with 500 kg of ammonium sulphate, 275 kg of superphosphate and 335 kg of muriate of potash per hectare in two or three split doses during pre-and post-monsoon periods over a basal dose of 15 to 20 tonnes of cattle manure per hectare.

Guinea grass. The slips of this fodder grass can be planted in two rows about 50 cm apart in the interspaces between rows of arecanut palms or on the edges of drainage channels. Application of cattle manure at the rate of 10 tonnes per hectare as basal dose followed by top dressing with ammonium sulphate or calcium ammonium nitrate at 200 kg per hectare per year in two equal doses, at an interval of six months may be done. The crop can be cut five to six times in a year.

Pepper. Pepper can be grown as a mixed crop using arecanut palms as standards. Rooted cuttings of pepper at the rate of two per palm are planted at the base of each palm, about 30 to 35 cm away from the base. While planting southernside of the palm

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1. *A.* 218 *from Abohar.* This has recorded an average kapas yield of 1922 kg per hectares as compared with 1566 kg per hectare of control variety 320-F. In spinning value, variety A. 218 gave an average of 46 counts as compared with 31's of 320-F. This constituted a significant advance in the quality improvement in the Northern Zone. An improved nucleus bulk of A-218 is to be built after screening for field tolerance to bacterial blight during 1970-71 before it could be released for cultivation.

2. Variety 66-BH-5/91 which is likely to replace Badnawar-1 in the rain fed Malwa tract in Madhya Pradesh.

3. Variety 1301-DD to replace Laxmi in Northern tract of Andhra Pradesh.

A new *hirsutum* variety Bharati has been recently released by the State Variety Release Committee of Tamil Nadu to replace an *arboreum* variety K-7 in the rain-fed areas of Tamil Nadu. This variety was recommended for release by the third cotton workshop held in 1969.

The workshop further recommended, on the suggestion of Dr J.S. Kanwar, that the yield potential of the new varieties of cotton released under the Coordinated Cotton Improvement Project like MCU-5, Sujata, Bharati, etc. should now be demonstrated by the scientists in the farmers' fields under the national demonstrations scheme.

The workshop also recommended a package of agronomic practices for growing *hirsutum* cotton in Tamil Nadu.

The workshop noted the incidence of a new disease, *Verticillium* wilt which was posing a serious problem in Tamil Nadu. It recommended the spot applications of wet ceresan at a strength of 0.1 per cent before planting. The workshop has further drawn up a detailed research programme for the study and control of the new disease.

Reviewing the results carried out during the past few seasons, the workshop noted that a six spray schedule proved as effective as eight spray schedule in controling the insect pests-complex of cotton. The workshop also noted the significant results obtained with the applications of granular insecticides like disulfotun and carbofuran to the soil which reduces the number of foliar applications required for controlling early season sucking pests. The workshop further recommended the adoption of an integrated pest control approach in evolving a control schedule in the cotton pest-complex.

The workshop also suggested that the ICAR should finance an *ad-hoc* scheme for the introduction of an exotic natural enemies of cotton bollworms and initiate work and biological control at four centres (Coimbatore, Ludhiana, Parbhani and Surat) in addition to work at IARI, New Delhi.

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may be avoided. As the pepper vine grows, it has to be trained to the palm. Cattle manure or compost at the rate of 8 kg per vine is to be applied before the south-west monsoon. Ammonium sulphate, superphosphate and muriate of potash at the rate of 500 gm, 1.0 kg and 100 gm respectively per vine may be applied in the month of August or September. The manures are applied around the vine to a depth of about 1.5 cm, about 30 cm away from the base and mixed with soil by light forking. Pepper vine commences yielding from the third year.

Cacao. The requirements of cacao seem to favour the conditions prevailing in the arecanut gardens of west coast of India. The mixed plantations of arecanut and cacao can be raised adopting the quincuax method with a spacing of 4 m×4m, the cacao seedlings occupying the centre of the square. In older plantations cacao can be planted at the under-planting stage at a spacing of 2.7 m×5.4 m in gardens where arecanuts are 2.7 m×2.7 m apart. Six to nine months old cacao seedlings are planted in pits of 90 cm cube which are previously filled with compost. Both areca and cacao require shade during the first one or two hot weather periods. Hence artifical shade may be provided or a shade crop of banana may be grown during the initial two years. Subsequently, the shade cast by areca will be sufficient for the cacao plants. Each cacao plant is to be manured every year with 12 kg of cattle manure and 12 kg of green leaf as basal dose and 500 gm of Suphala (15:15:15) in two equal doses once in September-October and the other in February-March from the second year of planting. During the first year, the full dose of organic manures and half the dose of fertilizer may be applied. Irrigation and cultural practices as given to arecanut will meet the requirements of cacao. With a view to getting good shape and height of main stem for cacao tree all the fan branches arising from the main stem are to be cut up to a height one metre from the ground. Cacao trees flower during the second year after planting. The pods take about five to six months to ripen.

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STORAGE OF FOODGRAINS

are first closed with earth and examined the next day. Those found opened are regarded as live burrows and need to be treated. The use of aluminium phosphide results in saving of foodgrains required in conventional poison baiting programme.

Safety first. Care in using fumigants and zinc phosphide is very necessary, since both the chemicals are deadly poisonous. They should be, therefore, handled as per recommendations of the manufacturers and with care and kept away from children and farm animals. For preparing baits, earthen vessels should be used, and must be buried in the soil after the bait has been prepared.