

THE PROGRAMMES OF THE REGIONAL STATION OF THE CENTRAL PLANTATION CROPS RESEARCH INSTITUTE FOR IMPROVEMENT OF SPICES

M. K. NAIR

(Central Plantation Crops Research Institute, Regional Station, Calicut, Kerala)

India earned more than Rs. 700 million in foreign exchange during 1975-76 by exporting spices. In spite of their importance in the country's economy, the improvements of spices were not contemplated till recently. It is assumed that the research input for improvement of spices till 1975 had been less than Rupees one lakh annually. The establishment of a new Research Station of Central Plantation Crops Research Institute at Calicut exclusively to carry out research on improvement of spices crops with major emphasis on pepper fulfils the long felt need. The station started functioning from 10th November, 1975 with its temporary laboratory and office located at Calicut City and the experimental farm located at Peruvannamuzhi, about 50 Kms. north-east of Calicut. The total area of the farm is 101.2 hectares with an elevation of 60 m above MSL. The soil is laterite having a high organic matter content. Out of 101.2 hectares of the experimental farm, 20 hectares have been cleared, developed and planted with various experiments. A total of Rs. 30.56 lakhs has been allotted for the establishment of the Regional Station during the Vth Five Year Plan period, besides a sum of Rs. 20.25 lakhs provided for construction of laboratory, and residential buildings.

The Research Station has 12 scientific positions sanctioned during the Vth Five Year Plan with separate Administrative and Accounting wings. The Technical programmes as envisaged in the project are the following:

- (1) Collection and evaluation of germplasm in pepper, clove, nutmeg, cinnamon, ginger, turmeric and vanilla.
- (2) Evaluation and screening of germplasm for yield, quality and resistance to disease and pests.

- (3) Exploitation of desirable characters available in the germplasm by incorporating them in the cultivated types, through appropriate breeding techniques.
- (4) Characterise the quality standards for market acceptance.
- (5) Breeding varieties to meet the quality expected by the Industry.
- (6) Work out suitable cultural and manurial practices for spices.
- (7) Evolve suitable control measures for diseases and pests.

Taking into consideration the available scientific personnel, a limited number of research projects have been undertaken initially.

Some of the highest of the research projects being implemented are as follows:—

(a) *Trial on live and dead standards of pepper:* *Erythrina indica* is the common live standard used in India to trail pepper vines. In view of the manurial and cultural recommendation now given for pepper cultivation, the practice of using a live standards needs reconsideration. *Erythrina indica* has also been found to be an alternate host for nematode associated with slow wilt of pepper. To compare the advantages of growing pepper on dead standards, three popular varieties of pepper (Panniyur-I, Karimunda and Kalluvally) are being trailed on three dead standards (Granite, RCC and Teak posts) and two live standards (*Erythrina indica* and *Garuge pinnata*). These standards are placed under two different spacings 3 m × 3 m and 3 m × 2 m.

(b) *Germplasm collection and evaluation in spices*: A detailed survey of pepper germplasm has been initiated by the Central Plantation Crops Research Institute and about 850 types have been assembled at Central Plantation Crops Research Institute, Regional Station, Vittal, from the forests of Karnataka State. The collection has shown wide variation for berry size, spike length (5 to 30 cm), percentage of dry to green pepper (30 to 43), percentage of female and bisexual flowers, non-volatile ether extract (6.4 to 12.5%), volatile oil (0.4 to 3.9%), crude piperin (4.8 to 10.2%), crude fibre (11.6 to 19.8%), starch (35.9 to 45.8%) and crude protein (8.1 to 14.1%).

The representative types from these collections have been planted at the farm along with popular cultivated varieties. The Kerala portion of the germplasm survey of pepper is being taken up now.

A detailed survey was undertaken to collect the available variability in three spices (clove, nutmeg and cinnamon) and vanilla. So far 89 accessions of clove, 157 accessions of nutmeg, 139 accessions of cinnamon and 47 accessions of vanilla have been collected from within the country. The germplasm of spices so far introduced from other countries include clove from Zanzibar, cinnamon from Sri Lanka and vanilla from Seychelles.

An All India Survey was undertaken in collaboration with the National Bureau of Plant Introduction and Himachal Pradesh Agricultural University to collect germplasm in ginger and turmeric during 1977. About 230 accessions of ginger and 120 accessions of turmeric were collected during the survey and they have been planted in the experimental farm at Peruvannamuzhi.

(c) *Vegetative methods of propagation in tree spices*: Non-availability of superior planting material is one of the main difficulties in increasing the area under tree spices. Standardisation of vegetative methods of propagation in each of the tree spices would help in rapidly multiplying the superior types available at present and reduce the long juvenile phase. In nutmeg a good vegetative propagation method will also solve the problem of dioecy. It is therefore

proposed to standardise the different vegetative propagation methods in tree spices.

(d) *Slow and quick wilt diseases of pepper*: 'Quick wilt' caused by *Phytophthora palmivora* and 'slow wilt' or slow decline associated with the fungal, nematodal and nutritional complex, are the two major diseases limiting the pepper production in all the pepper growing tracts. Screening of all the available cultivars and wild types of pepper for pest and disease resistance has been given top priority in the Station's programme and the works on these lines are in progress.

(e) *Hybridisation and selection in pepper*: To evolve improved varieties of pepper with respect to yield, quality and resistance, a hybridisation and selection programme has been initiated during 1976. The wide genetic variability for yield and associated characters observed in the germplasm collection available, offers considerable scope for hybridisation and selection. There is also urgent need to evolve pepper varieties with high yield potential and field tolerance to 'Quick wilt' and 'Slow wilt' diseases. During the current year, about twenty thousand seedlings have been raised and five per cent of the selected seedlings among them have been planted in the main field. The programme envisages simultaneous clonal multiplication, evaluation for yield and quality and screening for tolerance to *Phytophthora* and nematodes. The final selection will be based on comparative yield trial, quality characteristics and tolerance to diseases.

Thus to start with, the Regional Station has research projects on breeding, agronomy, and plant protection aspects of spices. Under the Kerala Agricultural Development Project, a total of Rs. 22.95 lakhs have been provided for the Station to strengthen the research programmes in pepper. Under the project, the areas of investigation will be confined to the epidemiology of 'quick wilt' and 'slow wilt', the role of nematodes in the incidence of 'slow wilt', effective control measures against the diseases and pests and the physiological and biochemical pathways in the biosynthesis of chemical principles in pepper.

It is also proposed to start sections on bio-chemistry, physiology, horticulture, soil science and technology during the VIth plan period at the station.