CURRENT STATUS OF CROP IMPROVEMENT, PRODUCTION AND PROTECTION RESEARCH IN OIL PALM AND FUTURE PRIORITIES

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Efforts so far made in oil palm research under the aegis of ICAR to provide necessary basic information for its cultivation are summarised in this write up and future research strategy is indicated.

Crop Improvement

The aim of oil palm breeding is to evolve genotypes with higher yield potential. Being an exotic crop, the first attempt was to increase the available variability for which seeds from Nigeria, Cot' d' Ivoire, Republic of Zaire, Indonesia, Malaysia, Papua New Guinea, Singapore, Cameroon and Costa Rica were introduced. The American oil palm Elaeis oleifera has also been recently introduced. Inter se mating and selfing of palms from earlier introductions yielded various dura, pisifera and tenera combinations which were added to the germplasm.

From a comparative yield trial laid out in 1976, three high yielding combinations viz. 65d x 30.103p, 120d x 30.103p and 92d x 30.103 p have been identified giving an average yield of 15 MT fresh fruit bunches per hectare (equivalent to 3 MT of palm oil) under rainfed conditions. Another sixty dura x pisiferas are currently under field testing for selection of more number of hybrid combinations. Three sterile pisifera palms were identified from a tenera x tenera population. Work has been initiated to upgrade the existing dura lines. In the long term breeding programme a modified reciprocal recurrent selection method is followed. Identification of high yielding dura mother palms and sterile pisifera pollen parents has enabled us to produce three lakh tenera seeds annually since 1982.

Plantlets have been produced from tender leaf explants of seedlings. Thirty six seedlings from these have been field planted

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since 1987. Flowering was noticed from the 12th month itself. A non-destructive method for tissue culture sampling was standardised. Among the different age groups, 8 and 12 year old palms responded better than 23 year old ones.

Crop production

Based on a five year ~~old~~ field trial, the NPK requirement of oil palm has been worked out as 1200g N, 600 g P_2O_5, and 1200g K_2 O per palm/year. Application of $MgSO_4$ @2Kg/palm is recommended if deficiency symptoms are noticed. Agrotechniques for raising nursery and field management have been standardised. Twenty eight percent yield increase was obtained when the palms were irrigated during summer with 90 litres of water per palm/day. A pollinating weevil Elaedobius kamerunicus was successfully introduced for effective pollination and fruit set.

A small scale palm oil extraction unit at a cost of Rs. 2 million has been designed by CSIR and established at Palode. This has an extraction efficiency of 20% and can cater to the processing requirements of a 200 hectare plantation.

Research work on utilisation and disposal of factory wastes has also been initiated. Oyster mushrooms (Pleurotus florida, P. flabellatus and P. sajor-caju) gave conversion of 49 to 58% on mesocarp waste and paddy straw mushroom (Volvariella volvacea) gave an yield of 5 kg/bed (5% conversion) on bunch refuse of oil palm.

Crop Protection:

It could be established that bud rot can be cured by removing the affected portion and drenching with Carbandazim 0.1%. Palms showing spear rot and yellowing of the innermost whorl of leaves are to be rogued systematically to check the spread of the disease. Bunch failure, a situation in which there is failure of fruit development can be avoided if there is effective pollination by the weevil.

Avian pests create by far the most serious pest problem in oil palm plantations. This can be minimised by covering ripe bunches with wire net and scaring away the birds. Rhinoceros beetle

(Oryctes rhinoceros) causes damage to emerging fronds and spindle. Field sanitation and control of grubs in breeding sites are essential control measures. Biological suppression using Baculovirus oryctes is also effective. The grubs of red palm weevil (Rhynchophorus ferrugineus) tunnel into the crown and feed on the growing tissues resulting in wilting. If detected early, the palms can be saved by treatment with 0.2% endosulfan or 1% carbaryl.

Future strategy:

The main research priorities are listed below:

1. Widening genetic variability
2. Identification of more number of high yielding d x p combinations.
3. Upgrading dura populations.
4. Evolving parental lines from different countries of origin
5. Implementation of long term breeding strategy
6. Identification of d,p and t at the seedling stage
7. Standardisation of tissue culture technique for mass multiplication from adult palm ortets.
8. Defining agrotechniques under irrigated conditions
9. Studies on population density and oil palm based cropping system
10. Reducing cost of production and increasing net income.
11. Evolving control measures for spear rot disease.
12. Control of avian pests
13. Biological suppression of major pests.
14. Increase pollination efficiency using different species of pollinating weevils.
15. Design and improvement of small scale processing unit
16. Studies on quality aspects of palm oil
17. Establishment of seed gardens to meet seed requirement