PROJECT SUMMARY

TITLE: Intensive study of *Leucaena* genetic resources in Mexico and Central America
R NUMBER: R4524
STRATEGY AREA: Agroforestry and plantations
PROGRAMME MANAGER: OFI
SUB-CONTRACTOR: OFI

START DATE: 01/01/90 **FINISH DATE:** 31/12/92
TOTAL COST:

1. Background:
In recent years, planting of the woody legume *Leucaena leucocephala* has been widely promoted by national and international development agencies because of its fast growth, ease of propagation and management, and beneficial products. With its extended use, a number of important limitations have become starkly apparent. These include lack of cold and drought tolerance, poor growth on acid soils, heavy pod production and susceptibility to defoliation by the psyllid pest *Heteropsylla cubana*, which has now spread throuhjout Asia. These limitations are largely attributable to the extremely narrow genetic base that has been used in leucaena planting to date. One or a few self-pollinated progeneies from a few cultivated trees in Mexico and El Salvador have become dominat across the tropics.

The work of previous ODA research schemes, and especially R4091 (Intensive study of tropical and subtropical multipurpose tree gene resources) has shown that considerable variation exists within the genus *Leucaena* with a number of impressive species that merit wider testing. The genus comprises a number of distinct, uniform species with restricted distributions and others that are widely distributed and polymorphic. For these species, complex patterns of morphological variation are apparent but remain to be investigated in detail and formally included in a complete taxonomic revision. Some Leucaena species have very restricted distributions, and often occur in areas with a long history of human interference and loss of forest cover such that several species are now rare and threatened with severe genetic erosion or extinction.

2. Objectives:
Generally, to diversify genetic material of the multipurpose leguminous trees of the *Leucaena* genus that is available for planting across the tropics. Specifically to:
1) continue exploration, collection and biosystematic study of the native *Leucaena* genetic resources in Mexico and Central America;
2) coordinate the establishment of a new international trial of *Leucaena* species;
3) assemble background information on *Leucaena* species for inclusion in a trial manual;
4) contribute to *ex-situ* and *in-situ* conservation.

3. Results:
The project achieved its objectives. Seed collections of *Leucaena* species and provenances were completed. Extensive botanical investigations resolved much of the taxonomic confusion that surrounds the genus. The project paved the way to effective genetic conservation by providing a clearer understanding of the taxonomy, patterns of diversity and distribution of species in the genus. A trial manual was prepared that reports in detail the exploration and seed collection activities of the project, and gives background information about *Leucaena* species.

4. Dissemination products:
See PROREC output.

5. Follow-up:
The natural populations of *Leucaena* have now been more thoroughly explored than those of most tree genera. It is, therefore, anomolous that no recent or complete taxonomic revision is available for *Leucaena*. This will be the primary objective of research over the next two years under the extension of R4524.