

WORKSHOP SYNTHESIS, CONCLUSIONS AND RECOMMENDATIONS

Topic 1. General Cocoa Breeding Aspects

Cocoa Production Systems

- Cocoa production systems vary greatly within and between countries. Most cocoa production is still based on low-input management. There are however tendencies to increase inputs (fertilizer, labour), to reduce overhead shade, to adopt pruning to limit tree height and canopy density, and to associate cocoa with other profitable trees (fruit trees, timber).
- Cocoa planting materials are still largely made up of unselected seedling populations. Selected hybrid varieties represent less than 30% of the world cocoa area. Often farmers rely on their own source of planting material. The use of cocoa clones is increasing in Asia and in America.
- Strong competition between cocoa trees is often observed in older cocoa plantations, which may be a factor in yield decline. Common cocoa varieties may be too vigorous, especially so under favourable growing conditions and at commonly used planting densities.
- Little information is available on the possible interaction of cocoa genotypes and production systems (shaded versus unshaded, high input versus low input cultivation, pruned versus unpruned, *etc.*).
- There is a tendency to involve farmers directly in the identification of promising genotypes and to carry out validation of new varieties in farmers' fields (*e.g.* presentation of Uilson Lopes, CEPLAC, Brazil). Such would help to ensure that new varieties are adapted to the farmers' growing conditions.

Cocoa Breeding Programmes

- Objectives of major cocoa breeding programmes include: yield potential, resistance to major diseases and pests, production uniformity and stability, easier and less costly management and improvement of quality characteristics.
- To be successful, a breeding programme should be comprehensive, balanced, with sufficient magnitude of scale. Continuity and sustainability are of utmost importance. These conditions are only rarely being fulfilled in any of the cocoa producing countries.
- There is an increased tendency to select clonal cocoa varieties rather than hybrid varieties. Clonal varieties allow for more rapid genetic progress that can be fixed in asexually propagated varieties. Selection of clones is to be considered even in Africa, where traditionally only seed varieties are grown.
- Growing of clonal cocoa varieties requires important changes in cocoa cultivation practices. Although adoption of clonal cocoa may be difficult under some conditions, availability of outstanding clonal cocoa varieties may be a stimulus for the farmers to improve production and management practices.
- Clonal cocoa varieties are mostly multiplied through budding or grafting. This poses the question of the possible effects of the rootstocks on the scion, which is still poorly understood with cocoa (see Topic 5).

Recommendations

- *Similarities between cocoa producing countries in the same region (America, Africa and Asia) justify regional approaches to cocoa breeding.*

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