

## From laboratory to farm: Small-scale cashew farmers benefit from DNA marker technology

The planting of improved seedlings contributes immensely to higher yields and a better quality of raw cashew nuts (RCN). Through the ACi Matching Fund, the Cocoa Research Institute of Ghana (CRIG) and the Ministry of Food and Agriculture (MOFA) in Ghana target 100,000 cashew farmers to increase their productivity by replacing genetically unproductive trees with superior, highly productive clones. The main objectives of the project are:

- (1) By the end of 2015, the 8 most productive and resistant cashew clones are selected out of 40 clones planted by Ghanaian farmers in 2009.
- (2) By the end of 2015, 30 new scion banks are established from the 8 superior clones and scions are made available to farmers.



Source: CRIG, A productive, three-year old cashew tree established as a graft of one of recommended clones in Ghana

### Research on DNA of cashew clones improve productivity

When starting the project in 2013, CRIG selected 27 farms in 8 communities to identify the 40 clones. In a next step, CRIG technical officer's identified the best and worst performing clones by interviewing farmers about their tree performances in terms of nut yield, pest/disease resistances as well as tree size. This approach

facilitated a better understanding of why some clones performed well in some areas, while failing in others. Also the use of different production practices and cropping systems mattered for cashew tree performance. In a final step, CRIG fingerprinted the best and worst performing cashew trees using DNA markers. The markers helped to identify each tree's mother-tree in the scion bank.



Source: CRIG, Mr. Clemet Aryee, Technical Officer at CRIG explaining Ms Ann-Kathrin Beck, intern with ACi about fingerprinting of cashew clones

CRIG made a great leap forward when identifying the best performing clones across the cashew belt in Ghana. The application of DNA marker technology paired with farmers' record keeping of cashew tree performance refined the development of superior planting materials. Nursery operators can now select the best performing clones to establish new scion banks and provide farmers with improved planting material that match their preferred cropping systems. Eventually, farmers also have the opportunity to replace unproductive trees with more productive ones.

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