

CIAT experience in using DNA fingerprinting in variety adoption studies

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Our experience in DNA fingerprinting

- CIAT started to use DNA fingerprinting in adoption/impact studies in 2013 (Rice, Bolivia) and has continue participating in other efforts with Beans (Zambia, Rwanda) and cassava (Colombia, Vietnam)
- In general, this method has proved to be very useful and valuable (Mixed results: under estimation & over estimation of adoption)
- One first lesson: the importance to have a reference library of varieties that could be used in future studies:
- CIAT had invested in developing this library for other purposes well in advance. To identify any rice & cassava variety related to CIAT. But for beans we have had to be building the library for each study

CIAT experience in DNA fingerprinting

- Having the largest collection of cassava accessions (over 6K) has allowed to look for cost effective methods and use SNPs effectively
- Also have the largest collection of beans, but would need to do a similar investment to bring cost-effective methods to identify varieties in Africa
- Having in-house capacity (geneticists and breeders) have added value to the interpretation of the results.
- Definitely we are reducing significantly the cost to implement DNA and a large study could be done at 25-30 dollars total cost (>1K samples)

Challenges & lessons

- Have tried to collect leave samples from fields, but found it logistically challenging. Collecting seed/planting material more efficient for us and reduced burden on enumerators. (enumerator agronomy background)
- Seed/planting material give more flexibility to replant them (greenhouse, pots) & to extract DNA as long as needed
- Shipping leaves, seed or DNA depends on: country regulation, country capacity for DNA extraction, DNA analysis, or greenhouse/field capacity: we need to create capacity on site for future
- In general investment in labelling and keeping track of samples key

Challenges & lessons

- Sampling for DNA analysis still will need more research: intra-plot diversity, hybridization, cost-effectiveness (household/community)
- Putting together lessons learned will help to scale-up the method and identify needs of different countries to implement it
- Implications of DNA fingerprinting identification on economic analysis (determinants of adoption & impact assessment) requires more attention: evidence that analysis & implications may change
- But also need to keep exploring other important methods for yield measurements, crop and seed mixtures, area measurements