



Darwin Initiative Main Project Half Year Report (due 31 October 2015)

Project Ref No	21-005
Project Title	Pesticide plants for organic cotton, livelihoods and biodiversity in Mali
Country(ies)	Mali
Lead Organisation	RBG, Kew
Collaborator(s)	Institut d'Economie Rurale (Mali); MOBIOM (Mali); Natural Resources Institute (UK)
Project Leader	Dr. Moctar Sacande (to 20 Oct. 2015, Dr Paul Wilkin (interim PI thereafter)
Report date and number (e.g., HYR3)	20/1/16 HYR2
Project website/Twitter/Blog/Instagram etc	http://www.kew.org/science-conservation/research-data/science-directory/projects/pesticide-plants-cotton-mali
Funder (DFID/Defra)	

1. Outline progress over the last 6 months (April – Sept) against the agreed baseline timetable for the project (if your project has started less than 6 months ago, please report on the period since start up to end September).

1. Pesticidal plants identified and authenticated

Further surveys in April-September 2015 updated the list of participating cotton producers and known pesticidal species. They identified local preparation methods of pesticidal extracts, the dosage used by farmers and the frequency of use of bio-pesticides. A database was created using survey results covering all 22 species that have been identified and authenticated. Maceration is the default extraction method except in *Khaya senegalensis* where bark is scalded. Thirteen species were collected in partnership with partner farmers during May/June 2015 for extracting by-products, of which six were sent to Kew. Multiplication testing by seed and/or by cuttings were conducted on *Lophira lanceolata*, *Bobgunnia madagascariensis*, *Chamaecrista nigricans*, *Opilia celtidifolia*, and *Euphorbia paganorum* in the laboratory and at the nursery.

2. Active compounds/key ingredients of plant pesticides used by the producers of organic cotton identified

The six species sent to Kew were evaluated as feeding repellents against cotton bollworm, *Helicoverpa armigera*. They were *Carapa procera*, *Chamaecrista nigricans*, *Khaya senegalensis*, *Securidaca longipedunculata*, *Bobgunnia madagascariensis* and *Balanites aegyptiaca*. Feeding was repelled by *C. nigricans* and stimulated by extracts from the other species. Further research is needed to evaluate the toxic effects of the compounds on the insects in the time period after feeding. This will be undertaken when *Helicoverpa* supply issues are resolved and further samples transferred. Tests on extracts from 23 species occurred in Mali. Five showed high levels of effectiveness against cotton pests.

3. Installation of small units for production of organic pesticides and the training of producers to provide biological pesticides at optimal standards to all of their network;

A training session was organised in July 2015 on the oil extraction techniques of *Carapa procera*. Ten women from cooperatives in Bougouni and Yanfolila have benefited from this training. Three nurserymen were trained in harvesting techniques of seeds and plant production techniques in the province of Bla. Further farmers were trained in planting techniques and plot-based pesticide plants and food plants were installed in the farms

4. Community demonstration plots to strengthen the capacity of target communities to cultivate pesticide plants installed

In total 11 hectares were planted in both 2014 and 2015 across 19 farms. The species used were *Adansonia digitata*, *Khaya senegalensis*, *Carapa procera*, *Tamarindus indica*, *Faidherbia albida*, *Parkia biglobosa* and *Ziziphus mauritiana*. They have been supplied by three nurseries have produced 19500 plants of *Adansonia digitata*, *Khaya senegalensis*, *Carapa procera*, *Tamarindus indica*, *Parkia biglobosa*, *Ziziphus mauritiana*, *Faidherbia albida* for the demonstration plots and members of organic cotton producers' cooperatives in the Bla area.

5. Information and awareness of the use of natural pesticides for the production of organic cotton with policy makers in Mali increased

The 2014 campaign results of the pesticide project were presented to the partner farmer cooperatives. MOBIOM provided a technical report of activities.

The following activities are scheduled for October 2015-March 2016.

- Multiplication tests on pesticide plants in the laboratory and on farm.
- Village nurseries will be equipped for the further production of plants.
- Monitoring, maintenance and biophysical assessment of demonstration plots will take place alongside training and guidance of producers in seed collection techniques and oil extraction from pesticide plants.
- Initiation of two production units for pesticide products developed through research.
- Continued efficiency testing of extracted organs of pesticide plants on cotton pests in the entomology laboratory.
- Training of producers on the efficient use of biological pesticides developed for research.
- Phytochemical analysis of two pesticidal plants and the seed oil of two species by the Department of Traditional Medicine at MOBIOM.
- Reproduction of test results on cotton pests in laboratory and field tests with different cooperatives and management structures of cotton cultivation.

2a. Give details of any notable problems or unexpected developments/lessons learnt that the project has encountered over the last 6 months. Explain what impact these could have on the project and whether the changes will affect the budget and timetable of project activities.

The former project PI left employment of RBG, Kew in October 2015 with just the standard notice period as warning. LTSI were notified by email by their line manager, Dr. Tiziana Ulian. We are working to minimise the impact of this on the project. Fortunately the in-country project partners have been able to continue activities via planned fund transfers. In the interim, the head of the Natural Capital & Plant Health Department (Dr. Paul Wilkin) is standing in as PI pending recruitment to the Research Leader role vacated. Once the recruitment is completed, a decision will be made regarding the longer term project PI.

Mali continues to be a challenging place for European scientists to visit, in particular following terrorist activity in Bamako in November. Subsequent events in Burkina Faso have also ruled out meeting partners there as took place earlier in the project.

2b. Have any of these issues been discussed with LTS International and if so, have changes been made to the original agreement?

Discussed with LTS: LTSI notified of PI change via email

Formal change request submitted: No

Received confirmation of change acceptance No

3a. Do you currently expect to have any significant (e.g., more than £5,000) underspend in your budget for this year?

Yes No Estimated underspend: £

3b. If yes, then you need to consider your project budget needs carefully as it is unlikely that any requests to carry forward funds will be approved this year. Please remember that any funds agreed for this financial year are only available to the project in this financial year.

If you anticipate a significant underspend because of justifiable changes within the project and would like to talk to someone about the options available this year, please indicate below when you think you might be in a position to do this and what the reasons might be:

4. Are there any other issues you wish to raise relating to the project or to Darwin's management, monitoring, or financial procedures?

No

If you were asked to provide a response to this year's annual report review with your next half year report, please attach your response to this document.

Please note: Any planned modifications to your project schedule/workplan can be discussed in this report but **should also be raised with LTS International through a Change Request.**

Please send your **completed report by email** to Eilidh Young at Darwin-Projects@ltsi.co.uk . The report should be between 2-3 pages maximum. **Please state your project reference number in the header of your email message e.g., Subject: 20-035 Darwin Half Year Report**