Workshop proceedings:

Gainesville FL, 21-25 September 2015
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Abstract

This meeting was the first since the two RTB seed-related cross-cutting projects were to some extent joined. Programmatically, the two types of activities are still separated into two work packages and the activities are also still more or less done independently. There are however, a number of areas of overlap and even integration that were made evident in this workshop.

Overall, this workshop was excellent for gaining consensus on a number of issues. For the degeneration team, we succeeded in making the modeling process understandable to everyone - it is no longer a black box to many. In the modeling session on Wednesday afternoon every crop group was able to simulate yield loss due to degeneration; the outcome was generally logical based on the parameters they had input for, which indicated a general understanding of how the model works. We also succeeded in identifying a number of characteristics of the field work that are important for the modeling team to know. During the last day, the team identified a number of issues that should be addressed including, travel of the modeling team, publications and funding and responsibilities and time lines assigned.

For the framework team, this workshop was an excellent opportunity to revisit the case studies and the framework. We identified a new consultant and set up an editorial committee that will analyze and publish the cases studies and a framework’s user guide, with input from the members of the community of practice that attend the workshop and were part of the case studies.

Background, Objectives, Participants and Organization

BACKGROUND

The workshop entitled “One year on into a joint RTB seed project”, was held at the University of Florida (UF) in Gainesville, Fl, from 21-24 September, 2015. This workshop was organized by the CGIAR Centers Bioversity, CIAT, CIP and IITA with the collaboration of UF. This workshop was funded from the CGIAR Research Program on Roots, Tubers, and Bananas (RTB) grant to four CGIAR centers (Bioversity, CIAT, CIP and IITA) and UF to enhance the efficiency of RTB seed systems through a better understanding of seed degeneration and through the development and application of a conceptual framework to support improved documentation, diagnosis, and analysis of seed systems and seed system interventions.

Seed sector development in RTB encompass banana and plantain (Musa), cassava, potato, sweet potato and yam. RTB systems share common opportunities and challenges: local seed system provide nearly all the planting material used by farmers; due to their clonal propagation seeds of RTB crops are highly susceptible to infection from virus and other pathogens leading to degeneration; farm management of seed and use of resistant varieties can significantly improve the returns of farmer-saved and self-sourced planting material; and the high volumes of planting material used for sowing and high perishability make transport expensive and off farm acquisition of planting material risky.

There has been a growing interest in improving the efficiency of RTB seed systems through a better understanding of seed degeneration. At the same time it is being recognized that RTB seed practitioners may not have sufficient access to documentation of RTB seed systems and previous RTB seed interventions, and may not have an understanding of key lessons from earlier work on critical success

Workshop on RTB Seed Systems
factors in RTB seed systems. Similarly, seed practitioners may not have or use a diagnostic framework which enables for ex-ante, ex-post, and comparative analysis across RTB seed systems.

OBJECTIVES

The workshop had as principal objectives:

1. Plan for upcoming year(s): field trials, modeling, integration, publications, data pipeline and funding.
2. Develop plans for manuscripts from seed degeneration and seed systems field studies
3. Develop common understanding of the conceptual seed framework, structure and use of models for seed degeneration and impact network analysis and greater clarity about how field trials can be designed to provide data needed for modeling.

PARTICIPANTS

Twenty five participants from the following organizations attended the workshop (Annex 1): Bioversity, CIAT, CIP, IITA, UF, Natural Resources Institute, and CIRAD. Participants represented 12 countries (where they are currently resident): Belgium, Colombia, Ecuador, Burundi, India, Kenya, Netherlands, Peru, Uganda, UK, China and USA.

ORGANIZATION OF WORKSHOP REPORT

In preparation for the workshop, all communications were handled via a workshop webpage: https://sites.google.com/site/rtbworkshop2015/home. Powerpoint presentations are also available at this site.

In contrast to last year, we stayed in one group this year, with exception of one small satellite meeting held by some people very familiar with the Framework project. The first three days were dedicated primarily presentations and discussions in the morning looking at progress over the last year, and more in-depth discussions in the afternoon focused on specific topics - for example Monday afternoon we looked at the degeneration model in more detail; Tuesday afternoon we discussed Impact Network analysis in more detail. Wednesday afternoon was dedicated to hands-on modeling using the degeneration model.

For more information on meeting process and outputs, contact Jorge Andrade (j.andrade@cgiar.org) and/or Greg Forbes (g.forbes@cgiar.org).

Day One

PRESENTATIONS AND DISCUSSION

Day one began with two general overviews, one by Jorge on the history of the two projects and Karen gave a brief overview of the degeneration modeling – both were done to be sure everyone knew basic background information. The following talks focused on degeneration field trials for the different
center/crop teams. The day ended with an in-depth presentation and discussion on degeneration modeling (Table 1).

Table 1. List of presentations, presenters and links to PPT files for day 1 (PPT files available on workshop Website: https://sites.google.com/site/rtbworkshop2015/presentations).

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Presenter</th>
<th>Link</th>
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<tbody>
<tr>
<td>Seed framework and seed degeneration overview: concepts and brief history</td>
<td>Jorge Andrade</td>
<td>PPT</td>
</tr>
<tr>
<td>Brief overview on modeling</td>
<td>Karen Garrett</td>
<td>PPT</td>
</tr>
<tr>
<td>Cassava degeneration field studies in Colombia</td>
<td>Monica Carvajal</td>
<td>PPT</td>
</tr>
<tr>
<td>Sweet potato degeneration trials in Peru and Africa</td>
<td>Jan Kreuze</td>
<td>PPT</td>
</tr>
<tr>
<td>Potato seed degeneration in Ecuador, Peru and Kenya</td>
<td>Peter Kromann</td>
<td>PPT</td>
</tr>
<tr>
<td>Yam degeneration trials</td>
<td>Lava Kumar</td>
<td>PPT</td>
</tr>
<tr>
<td>Banana degeneration activities of IITA and Bioversity</td>
<td>Lava Kumar, Aman B.</td>
<td>PPT</td>
</tr>
<tr>
<td>Degeneration model in more detail</td>
<td>Sara Thomas Sharma</td>
<td>PPT</td>
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</table>

**Day Two**

**PRESENTATIONS AND DISCUSSION**

The first presentation by Jorge Andrade gave an overview of the Framework project, which set the stage for the presentations that followed. Jeff Bentley, who was unknown to most of the group, followed with a short presentation of his professional experiences. This was followed by a series of presentations on cases studies, one by Mohinder Kadian who gave information on some CIP led potato seed work in India, the objective of which is to decentralize seed production and one by Karen on Impact Network Analysis (INA).

Table 2. List of presentations, presenters and links to PPT files for day 2 (PPT files available on workshop Website: https://sites.google.com/site/rtbworkshop2015/presentations).

<table>
<thead>
<tr>
<th>Presentation</th>
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<tr>
<td>General presentation on framework project</td>
<td>Jorge Andrade</td>
<td>PPT</td>
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<tr>
<td>Five minutes of seed - some experiences of Jeff Bentley</td>
<td>Jeff Bentley</td>
<td>PPT</td>
</tr>
<tr>
<td>Seed distribution project in India</td>
<td>Mohinder Kadian</td>
<td>PPT</td>
</tr>
<tr>
<td>Seed system framework bananas and plantains</td>
<td>Kim Jacobson</td>
<td>PPT</td>
</tr>
<tr>
<td>Cassava UPoCa in Africa</td>
<td>Richardson Okechukwu</td>
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<tr>
<td>Potato framework activities in Ecuador</td>
<td>Peter Kromann</td>
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<tr>
<td>Potato 3G project in Africa</td>
<td>Elly Atieno</td>
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<tr>
<td>Sweet potato sales model</td>
<td>Richard Gibson</td>
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<tr>
<td>Impact Network Analysis</td>
<td>Karen Garrett</td>
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<tr>
<td>Conpapa seed system</td>
<td>John Nopsa</td>
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**Panel Discussion with UF Plant Pathology**

The day ended with a panel presentation of 6 CG researchers to the UF Plant Pathology Department, followed by a discussion of phytopathological and social issues related to degeneration of RTB (Figure 1).

![Panel Discussion with UF Plant Pathology](image)

Figure 1. Picture taken outside the UF Plant Pathology Department building after a panel of 6 CG researchers presented general overviews of degeneration in five crops.

**Day Three**

**Group Presentations and Discussion**

This day started with a short presentation by Xing Yangru on Performance Management Mapping. Yangru used examples from wheat head blight and wheat rust. The maps show how where of fungicide is likely to be most effective. This stimulated a lively discussion of how the process could be applied to RTB degeneration. After Yangru's presentation, some framework case studies remaining from the previous day were presented.

Danny Coyne presented on a project done in West Africa focusing on yam seed quality. His project demonstrated some simple on-farm techniques (Adapted Yam Minisett Technique) that can easily double yields. Mohinder noted that there are other seed treatments including cow dung ash, boric acid and wood ash. This led to discussion of possible residues in ware yams.

Kwame Ogero then presented on the Sasha Marando Bora Project. This was a large project that focused on dissemination of clean vines of new materials, and teaching in clean vine production.

Richard Gibson noted that he was involved in the project and learned much about how vine sale works and then this led to his new successful project. There was then a long discussion on how the framework helped in the analysis of this project - this is the one case study that has already used the framework for analysis.

Jorge Andrade gave the case study for Cajamarca, Peru, which was the last of the case studies. This is a highly subsidized system in which a mining company is financing an NGO. It was more or less chosen as an example of what not to do.
Table 3. List of presentations, presenters and links to PPT files for day 3 (PPT files available on workshop Website: https://sites.google.com/site/rtbworkshop2015/presentations).

<table>
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<tr>
<th>Presentation</th>
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<tr>
<td>Performance management mapping</td>
<td>Xing Yangru</td>
<td>PPT</td>
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<tr>
<td>Management of yam planting material</td>
<td>Danny Coyne</td>
<td>PPT</td>
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<tr>
<td>Marando Bora SASHA study</td>
<td>Kwame Ogero</td>
<td>PPT</td>
</tr>
<tr>
<td>Cajamarca potato case study</td>
<td>Jorge Andrade</td>
<td>PP</td>
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</tbody>
</table>

Sara Thomas-Sharma presented on a comparative biology of seed degeneration in vegetatively propagated crops. The group discussed how to move forward on the development of this meta-analysis paper.

**HANDS-ON MODELING EXPERIENCE**

The day ended with a modeling session in which crop-based teams used the Shiny interface in an attempt to estimate the model parameters for their crops (Figure 2). This experience was very successful (certainly more than had been feared by the organizers). All groups succeeded in running the model, and had results that were in some way logical. All groups understood how the different parameters enter into the model and can eventually change the results.

![Shiny apps interface](https://yanru-xing.shinyapps.io/SDAppvX1.png)

Figure 2. Modeling results of Banana degeneration trials made by the banana team, using parameters estimated from experience.
FRAMEWORK

Jorge Andrade, Kim Jacobsen and Jeff Bentley discussed next steps regarding the framework:

- Hire Jeff Bentley as consultant, to replace Steve Walsh.
- Create an editorial committee: Jorge Andrade, Kim Jacobsen, Jeff Bentley, Conny Almekinders, and Steve Walsh to review the case studies and a framework’s user guide.
- Compile the 11 eleven cases in a book: Jeff will write 12-pg synthesis of each of the case studies, and an introductory and conclusion chapter. The book will be published in early 2016.
- Jeff and Jorge will meet in Cochabamba in November 2015 to review the case studies and discuss the introduction and conclusion chapters.
- The editorial committee will meet in Wageningen in January 2016 to finalize the case studies and work on the framework’s user guide.
- Depending on funding, on 2016 the user guide will be tested with stakeholders in ongoing projects (e.g., Nigeria project with cassava funded by Gates).

Day Four (morning)

Day Four was dedicated to discussions on several topics - principally looking toward the future; next steps, including travel plans, research plans for 2016, writing responsibilities and a funding strategy, were discussed (list Annex 2). The workshop formally ended at noon but some people had private discussions in smaller groups after lunch.
## Annexes

### Annex 1: Workshop Participant

<table>
<thead>
<tr>
<th>No.</th>
<th>Participant</th>
<th>Institution</th>
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<tr>
<td>1</td>
<td>Aman, Bonaventure</td>
<td>Bioversity</td>
<td>Burundi</td>
<td><a href="mailto:b.a.omondi@cgiar.org">b.a.omondi@cgiar.org</a></td>
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<td>2</td>
<td>Andrade-Piedra Jorge</td>
<td>CIP</td>
<td>Ecuador</td>
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<td>CIP</td>
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<tr>
<td>4</td>
<td>Jeff Bentley</td>
<td>Consultant</td>
<td>Bolivia</td>
<td><a href="mailto:jefferywbentley@hotmail.com">jefferywbentley@hotmail.com</a></td>
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<td>Carvajal, Monica</td>
<td>CIAT</td>
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<td>USA</td>
<td><a href="mailto:sarathomas@ksu.edu">sarathomas@ksu.edu</a></td>
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ANNEX 2:  PLANNING NEXT STEPS AND TIMING

1. Discussion of some important points:

   1.1. Seed system interventions should begin with idea of understanding and improving existing seed system
   
   1.2. Members present in Lima RTB annual meeting will hold satellite meeting

2. Meeting in 2016 probably in Africa to be planning meeting for next phase.

3. Funding - proposals

   3.1. Discussion with W. Bowen - FTF project in Haiti - Greg and Jorge to follow up
   
   3.2. EU call (Information week in Brussels end Nov). 10 M Euros for 3-4 years.
   
   3.3. USAID - Nepal, Bhutan. Greg and Mohinder to follow up
   
   3.4. Gates CN to Lawrence Good - Jorge will lead and Elmar, Danny, Aman, Karen, Richard. Dec. 2015
   
   3.5. NSF - ecology and evolution infectious disease... due for Nov 2016. Karen will lead..
   
   3.6. Mcknight for S. America - Jorge and Peter will follow up
   
   3.7. BMZ - all centers will coordinate to have a 4 centre project coordinated on seed - need to finalize in Lima meeting.
   
   3.8. Generic CN Jorge lead - Kim will help - share with all; Lava, Elmar, Wilmer, Aman,

4. Trips: Karen and John

   4.1. Peru, Ecuador, Colombia. Monica, Jan, Peter. (Nov)
   
   4.2. Africa - attach trip to workshop? Kwame
   
   4.3. West Africa - Lava (early Nov)
   
   4.4. East Africa - James, Kwama, Elly, Danny - (Nov- Dec); Mwanza -SP seed system

5. Agreement on manuscripts and responsibilities

   5.1. Yam: Mid-Oct.
   
   5.2. Banana: end of year
   
   5.3. Cassava: Feb 2016
   
   5.4. crop-specific SP - Jan, data in Feb
   
   5.5. crop-specific Cassava - Peter for existing data one paper; James & Wilmer for new data
   
   5.6. crop-specific potato - Peter is coordinator
   
   5.7. crop-specific banana - Aman
   
   5.8. crop-specific: Lava

6. Data pipeline (discussed after lunch) need to add soil structure, put real parameter values - 0-1 and not high low. Add location to gps coordinates. Greg and Karen follow up

7. Discussion on how to use models.
7.1. At different elevations what might be times that a person needs to change seed for specific crops.

7.2. Justification for certain interventions in proposals; advocacy with large donor agencies

7.3. Tolerance levels and economic thresholds.

7.4. Determine economic viability of interventions.

7.5. Eventually link to climate change and risk analysis.

7.6. Should not forget agronomic details?? - to extent possible.

8. Example of how to set up INA (Elmar and Karen privately)

9. Jeff B. talked to case study representatives (after lunch privately)

10. Discussed integration of two work packages

   10.1. In dec make satellite meeting to discuss cluster

   10.2. Need better integration of information and knowledge management; must fix Web page
          - Greg and Jorge follow up

   10.3. Focus on prototypes on how INA can integrate the two parts of the project.

   10.4. Strong agreement among participants to fuse the two work packages in new cluster