Farmers’ Knowledge and Opinions towards Bollgard II® Implementation in Cotton Production in Western Burkina Faso

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PhD FRAMEWORK “ERAFRICA GROUP”


Consortium Composition

• University of Groningen: Innovation perspectives
• National Biosafety Authority, Kenya: Communication issues
• North West University, South Africa: Regulation issues
• University of Ouagadougou, Burkina Faso: Societal issues
• Universite Libre de Bruxelles, Belgium: Kick off Meeting
• Gent University, Belgium: Socio-economic issues
WP2: Integrated Analysis of Relationship between Farming Systems and Socio-economic Impact and Conditions of Agricultural Biotechnology Applications: Burkina Faso and Kenya
Goals

• Make a comparative assessment of the potential socio-economic impacts of biotechnology based agricultural applications on farming systems and local stakeholders (farmers).

• Identify acceptable forms of biotechnology with respect to social conditions and the kind of applications.
Targeted objectives

• Identify critical mass (issues/requirements/stakeholders) towards biotechnology based agriculture (Private and/or Public initiatives).

• Identify farmers’ preferences and the influencing factors determining the technology uptake.

• Assess the socio-economic impact of biotechnology based agriculture towards Food and Non-food crops.
Expected Methods

• Develop structured surveys among farmers to capture their knowledge and understanding towards biotech event and its use.

• Develop choices experiments among farmers to analyze their preferences and the influencing factors.

• Develop an adoption model incorporating the information gathered in step 1 and 2 to predict the technology uptake.
Case study of Burkina Faso

• *First paper:* “Farmers’ Knowledge and Opinions towards Bollgard II® Implementation in Cotton Production in Western Burkina Faso”.

• *Second paper:* “Which kind of biotechnology do farmers prefer? A Discrete Choice Experiment considering cotton cultivation in Burkina Faso”.

• *Third paper:* “Heterogeneous Demand for Insect-Resistant (Bollgard II®) Cotton: Evidence from Western Burkina Faso”.
First paper: **Background: Bt cotton in Burkina Faso**

- **Lead motifs:**
  - Pest damage (Lepidopteran insect groups)
  - Weakness of IPM strategy

- **Introduction and spread:**
  - 2002: collaboration with Monsanto led to 2 regional varieties
  - 2008-2009: first commercial release (3rd in Africa)
  - 2011: fast adoption (74% of cultivated surface)
Advantages:

- Yield improvement (15%) due to control of Lepidopteran insects
- Lower pesticides use led to health and environmental benefits

Disagreement Points: Economic benefit and cotton lint quality

Current status: decision to suspend Bt cotton (2016-17)
First paper: Objectives of the study

- to gauge their understanding and knowledge on the concept of biotechnology and more specifically Bt-technology

- to assess the attitudes of farmers towards Bollgard II®

- to look at their experience with the Bollgard II® crop and their view on the decision to impose suspension of Bollgard II®
First paper: Approach and Methodology
<table>
<thead>
<tr>
<th>Clusters</th>
<th>Description</th>
<th>Method/tools</th>
<th>Target group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers' knowledge and understanding</td>
<td>Knowledge about Biotechnology and Bt technology</td>
<td>Yes/No (6 statements)</td>
<td>All farmers</td>
</tr>
<tr>
<td></td>
<td>Understanding on the use of Bt technology</td>
<td>Yes/No/Not sure (4 statements)</td>
<td>Type of farmers, Education level and Position in the GPC</td>
</tr>
<tr>
<td>Farmers' perception towards Bt technology effectiveness</td>
<td>Agricultural practices, pest control, labor times, etc.</td>
<td>True/False/Don't know (15 statements)</td>
<td>all farmers</td>
</tr>
<tr>
<td>Farmers' opinions about Bt technology advantages</td>
<td>yield performance, income gain, farmers wellbeing, etc.</td>
<td>7 points likert-type scale (from 1=Strongly disagree,… to 7= Strongly agree): 4= Neutral, …to 7= Strongly agree): 7 statements</td>
<td>Type of farmers (Small, medium and large)</td>
</tr>
<tr>
<td>Farmers' opinions regarding health and environmental effects of growing Bt cotton</td>
<td>Health benefit, environmental risk, etc.</td>
<td>True/False/Don't know (6 statements)</td>
<td>all farmers</td>
</tr>
<tr>
<td>Farmers' opinions about Bt seed cost?</td>
<td>Did farmers know how the Bt seed price was fixed?</td>
<td>Yes/No (3 statements)</td>
<td>all farmers</td>
</tr>
<tr>
<td></td>
<td>Is this price affordable for them?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farmers' attitudes to pest management</td>
<td>How many times have farmers sprayed their cotton fields this year?</td>
<td>Based on the declaration of farmers</td>
<td>Bt and Non Bt growers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1 statement)</td>
<td></td>
</tr>
<tr>
<td>Farmers's opinions and preferences regarding the decision to abandon Bt cotton</td>
<td>Do farmers know why this decision was undertaken? Do they agree with that?</td>
<td>3 point likert-type scale (Agree/Neutral/Disagree)</td>
<td>Bt and non Bt growers</td>
</tr>
</tbody>
</table>
First paper: Data Collection and Analysis

- Stratified sampling (Bt vs Non Bt, farm size)

- 3 districts from western Burkina Faso: agro-ecological characteristics

- 32 villages and 108 GPC (Groupement de Producteurs de coton): Individual interview among 324 farmers

- SPSS: One-way ANOVA, Chi-square, Descriptive Analysis
First paper: Main findings 1/2

- Knowledge of farmers concerning biotechnology and Bt-technology is limited and depends on their education level and their role within the GPC.

- The regulatory oversight in the implementation of Bt-technology is insufficient. The risk of the non-implementation of refuge strategy was ignored by both farmers and extension officers.
First paper: Main findings 2/2

- Farmers knowledge of suitable pest management strategies is low. Two late insecticides applications was not implemented.

- The income gain generated by Bollgard II® cotton adoption was getting different appreciation levels according to farmers groups due to the Bt seed cost.

- Finally the decision to forsake Bollgard II® cotton in Burkina Faso was badly perceived by the majority of the farmers.
First paper: Main Recommendation

To guarantee the success of Bt cotton in the farming system of Burkina Faso after having fixed the fiber length issue, adoption of a new approach based on the multidisciplinary assessment will be highly required taking into account parameters such as farmers’ behavior.
Thanks for your attention