The use of agroecological techniques by smallholder farmers to improve sorghum productivity in Burkina Faso

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The outlines

- Introduction
- Materials and methods
- Results and Discussion
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Introduction (1/3)

- Burkina Faso is a Sahelian country located in the heart of West Africa with a total population of 16 million.

- economy is highly dominated by agriculture and livestock husbandry, employing 80% of the population.

- farming system is smallholder agriculture based on cereal production (sorghum, millet, maize).
Cereal form the staple diet for the population

Sorghum covers 44% of 2.9 million hectares of land with an average production of 1.5 million tons.

Production is constantly challenged by climate hazards, inefficient farming practices, and declining soil fertility.
One objective of this study was to evaluate, in a participatory manner, the impact of agroecological techniques on soils and crops.

The second one was to help local communities to understand these techniques and to adapt them to their own conditions for a sustainable land management.
The study was conducted from 2013 to 2015 in a participative manner with more than 150 male and female farmers.
Each farmer was asked to test out 2 or 3 agroecological techniques of his choice against their usual farming practices.

Plant material was composed of local landraces and improved varieties of sorghum, sesame and cowpea.
Materials and methods (3/3)

- The techniques combined the use of organic fertilizer and/or mineral fertilizer (micro dosing) with the crop rotation and mixed cropping, in addition to “zaï” technique and the half-moon method.
Results and Discussion (1/3)

- On-farm application of agroecological technologies resulted in significantly increased sorghum production.

- The rates of increase for grain yield were 8% for the half-moon fields and more than 130% for the rotation systems when compared to the farmers’ usual practices.
Results and Discussion (2/3)

- The chemical characteristics of the soil showed a mixed evolution after two years of experimentation. Only the organic matter content was improved after two years.
### Results and Discussion (3/3)

- The sorghum/cowpea rotation is the second technology that has less *Striga hermonthica* after zaï technology.

- Yield reduction was 7.42% in zaï and rotation plots and 12.69% in farmer’s practice plots.

<table>
<thead>
<tr>
<th>Agroecological Technologies</th>
<th>Infestation density (plants/m²)</th>
<th>Mean</th>
<th>CV %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>gross mean</td>
<td>transformed mean</td>
</tr>
<tr>
<td>Rotation sorghum/cowpea</td>
<td>10,26 b</td>
<td>0,74 b</td>
<td></td>
</tr>
<tr>
<td>Intercropping sorghum/ cowpea</td>
<td>15,21 ab</td>
<td>0,86 ab</td>
<td></td>
</tr>
<tr>
<td>Improved Zaï</td>
<td>9,03 b</td>
<td>0,68 b</td>
<td></td>
</tr>
<tr>
<td>Half-moon farmer’s practice</td>
<td>13,49 ab</td>
<td>0,74 ab</td>
<td></td>
</tr>
<tr>
<td>mean</td>
<td>14,89</td>
<td>0,81</td>
<td></td>
</tr>
<tr>
<td>Standard deviation</td>
<td>24,04</td>
<td>0,26</td>
<td></td>
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<tr>
<td>CV %</td>
<td>160,43</td>
<td>31,44</td>
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</tbody>
</table>
Conclusion

- Crop rotation, mixed cropping and “zaï” technique combined with compost and improved drought-resistant varieties constitute agroecological strategies favorable to the intensification and diversification of farming systems in the studied locations.

- Through innovative “scaling out” techniques, including farmer field schools and “farmer to farmer” training, the study enabled 6,832 farmers (over 40% women) to test and adapt various combinations of Agroecological intensification (AEI) techniques.
Acknowledgements

- This study was supported by the Collaborative Crop Research Program (CCRP) of the McKnight Foundation.
THANK YOU

Merci pour votre attention