

# Participatory Maize-Legume Experiments as a Tool to Explore Social-Ecological Niches for Innovation Adoption in Small Scale Farming Systems

Victoria Alomia<sup>1</sup>, Erika Speelman<sup>1</sup>, Arun Thapa<sup>1</sup>, Hsiang-En Wei<sup>1</sup>, Andrew McDonald<sup>2</sup>, Pablo Tittonell<sup>1</sup>, Jeroen Groot<sup>1</sup>

<sup>1</sup> Farming Systems Ecology, Plant Sciences Group, Wageningen University and Research

<sup>2</sup> International Maize and Wheat Improvement Centre – CIMMYT



## Background

Small-scale farmers in Nepal rarely use agricultural innovations, especially in the western and far-western mid-hill districts like Palpa and Dadeldhura. The agricultural practices have remained traditional and inefficient in terms of labour use and productivity during the last decades.

## Objective

The main objective of the study was to assess the changes in farmer perceptions about newly proposed and traditional technologies and practices during a farmer-oriented participatory research project, and to gain more insight in the reasons of limited adoption of innovations.

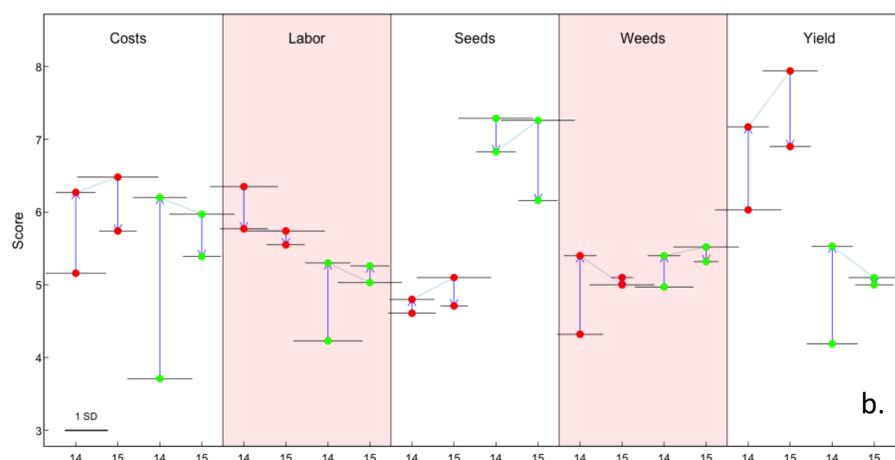
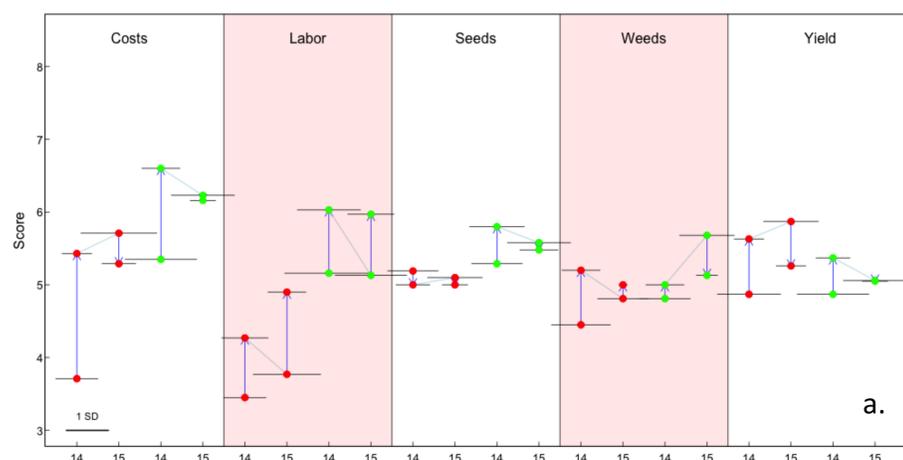
## Results

### Change of perceptions

At the start of the project farmers expected that lower costs and labour inputs and more seeds were needed for seeding by broadcasting than by row seeding, while anticipated yields were lower. The perceived differences between row seeding and broadcasting were smaller after the project (Figure 2a).

Farmers changed their opinion about the initially expected lower costs and labour inputs required for mechanised tillage with a mini-tiller, as compared to animal traction with bullocks (Figure 2b).

Within the two years, the standard deviation of perception scores was lower after the experiment than at the start of the season, which could indicate a convergence of opinion (Figures 2a and 2b).



**Figure 2.** Scoring of the relative input requirements (costs, labour, seeds) and crop performance (weed pressure, yield) of **a)** seeding in rows (red) vs. by broadcasting (green), and **b)** tillage using a mini-tiller (red) vs. animal traction with bullocks (green), in Dadeldhura on a scale of 0-10 in 2014 and 2015. The blue arrows represent the change in perceptions before and after experiments within a year, the grey lines connect the last scoring of 2014 with the first of 2015. Error bars indicate the standard deviations.

## Methodology

- The study took place in two mid-hill regions: *Palpa* and *Dadeldhura* districts located in the Western and Far-western regions of Nepal.
- We used a participatory approach that included on-farm trials to compare productivity of farmer fields with *best bet* management of maize mono-cropping and maize intercropped with soybean and cowpea.
- Farmer perceptions about newly proposed and traditional technologies and practices were studied with an interactive scoring assessment tool.
- The reasons for non-adoption, and adoption after the first year of on-farm trials were explored in farmers field discussions and with survey tools (Figure 1).



**Figure 1.** Overview of participatory methodology.

### Towards adoption

After the first year of participatory process, 20% of the farmers used improved seeds and 20% row seeding. Chemical fertilizers had only a 3% of adoption and none of the farmers started using the mini-tiller. The adoption was limited to better resource endowed farmers.

## Conclusions

- The combination of on-farm participatory approach and the perception assessment contributed to a mutual learning and improved communication between farmers and researchers.
- The participatory process contributed to changes of perception about relative differences between traditional and modern practices.
- Labour and cost perceptions as well as topographic and cultural considerations were causes for limited adoption of technologies.
- Adoption of input technologies was incipient and limited to the higher resource endowed farmers.
- We recommend to assess all the components of the farming system to find better options for sustainable intensification of maize-legumes systems avoiding the high inputs used to increase the yields.

## Acknowledgements

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Wageningen University & Research  
P.O. Box 430, 6700 AK Wageningen  
[maria.alomiahinojosa@wur.nl](mailto:maria.alomiahinojosa@wur.nl)  
M +31 (0)6 2916 03 40  
[www.wageningenUR.nl](http://www.wageningenUR.nl)



International Maize and Wheat Improvement  
P.O. Box 6-641 06600 Mexico D.F. Mexico  
T + 52 (55) 5804 2004,  
[www.cimmyt.org](http://www.cimmyt.org)

