Strength in diversity. Designing on-farm trials to guide gender-intentional maize breeding

Michael Euler[1*], Jill Cairns[2], Paswel Marenya[3], Mainassara Zaman-Allah[2]
[1]*International Maize and Wheat Improvement Center (CIMMYT)-Ethiopia,* [2]*CIMMYT-Zimbabwe,* [3] *CIMMYT-Kenya*
[*]m.euler@cgiar.org, ILRI Sholla Campus, CMC Road, P.O. Box 5689, Addis Ababa, ETHIOPIA

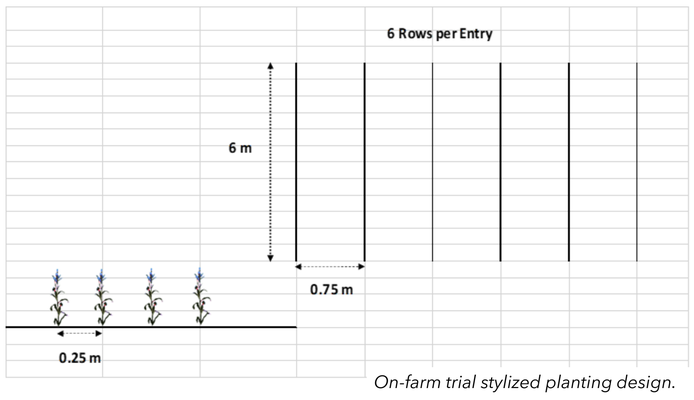
1. Background

- Strengthening gender-intentionality in maize breeding can contribute to closing adoption and productivity gaps between female and male managed plots
- Conventional approaches in breeding often do not focus on the linkages between the dynamics of gender roles in maize production systems, gender-based differences in trait preferences, and seed demand
- Inclusion of management practices used by women and poorer farmers into variety evaluations can help ensure new maize hybrids meet their needs
- Molecular breeding technologies, such as genomic selection, provide new opportunities to conduct early generation testing on-farm in parallel to on-station breeding

2. Selection of host farms

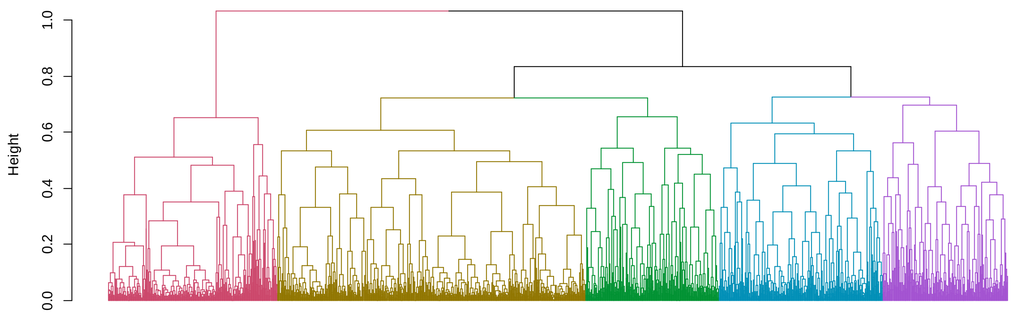
- The 'On-Farm-Maize Select' project pilots a new method of genomics-assisted on-farm testing with early-stage breeding material on ~ 800 farms in Kenya and Zimbabwe

On-farm trial in Kenya.



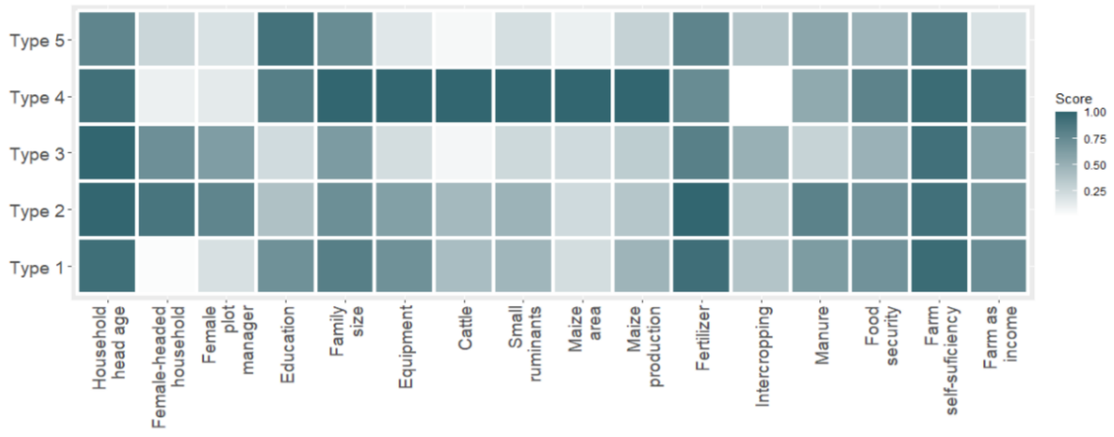
On-farm trial stylized planting design.

- Host farms selection aimed at capturing differences in management practices among farms and between female and male managed plots
- Selection was guided by farm typologies to capture heterogeneity of across the target population of environments



Dendrogram of hierarchical clustering for farm typology identification based on farm survey data from Zimbabwe analyzed by Cairns et al. (unpublished work).

- Approach improves accuracy of selection for low-input management conditions often experienced by smallholder farmers

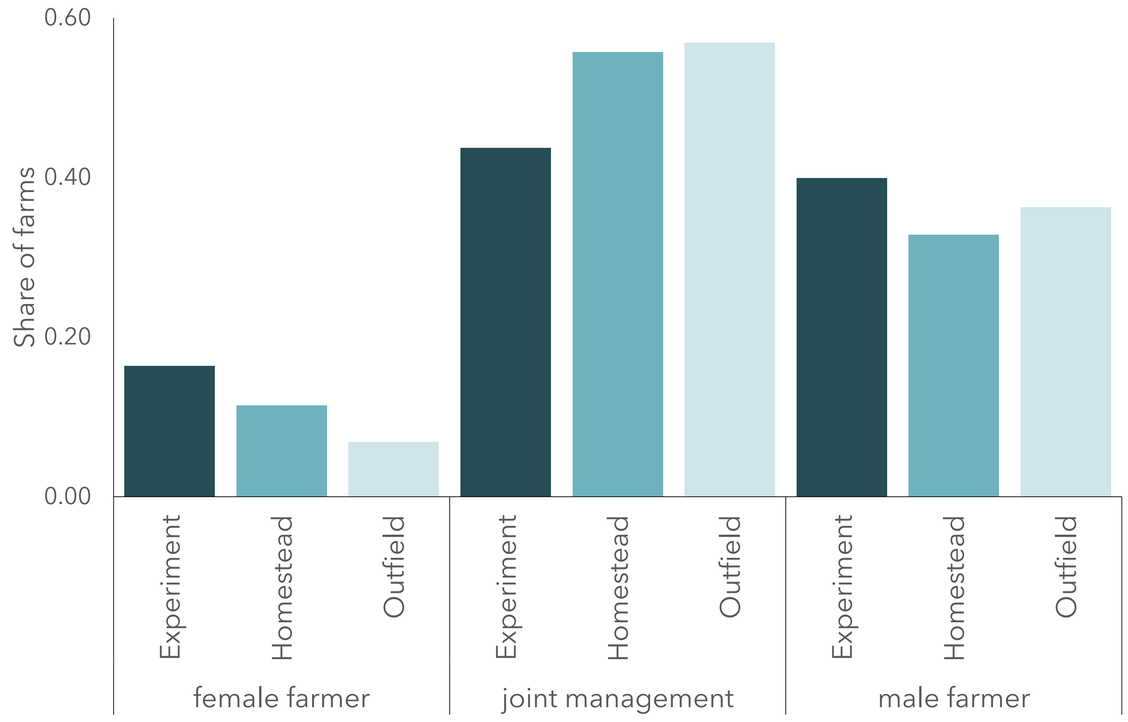


Heatmap of indicators used in farm typology analysis across identified farm types based on farm survey data from Zimbabwe analyzed by Cairns et al. (unpublished work).

3. Data sources

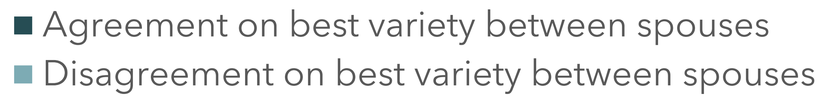
- Data collection through structured, individual questionnaires to male and female farmers
- Surveys cover ~750-800 farms (~1300-1500 individuals) in Zimbabwe (completed 09/23) and Kenya (ongoing)
- Collected information includes gender disaggregated data on:
  - division of labor in maize production
  - preferences on tested maize lines
  - intra-household decision-making arrangements in maize production and seed choices
  - ownership and control over farm and household assets

4. Gender roles in maize production



Gender of main decision-maker in maize production by location of production. Source: Household survey Zimbabwe. n=238 (experiment), n=201 (homestead), n=102 (outfield).

5. Gender trait preferences



Level of agreement between female and male farmer about individual ratings of the best line tested on farm. Source: Household survey Zimbabwe. n=89 pairs of female and male farmers.

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