

On-farm comparison of maize postharvest storage technologies in central Tanzania



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HELKETAS Swiss Intercooperation

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Background & justification

- Maize is an important staple and commercial crop in central Tanzania
 - Post harvest losses are high (16-23% across regions (APHLIS); farmers report 25-40%).
 - Storage pests can be effectively controlled by insecticides but it alters taste, health issues
- increased interest in hermetic storage options without use of insecticides
- some hermetic storage structures (i.e. metal silo) have not been tested under condition of smallholder farms and managed by farmers

Objectives

To test the **effectiveness** and **acceptance** of different storage technologies for maize under conditions of smallholder farms in central Tanzania with a particular emphasis on **hermetic storage**.



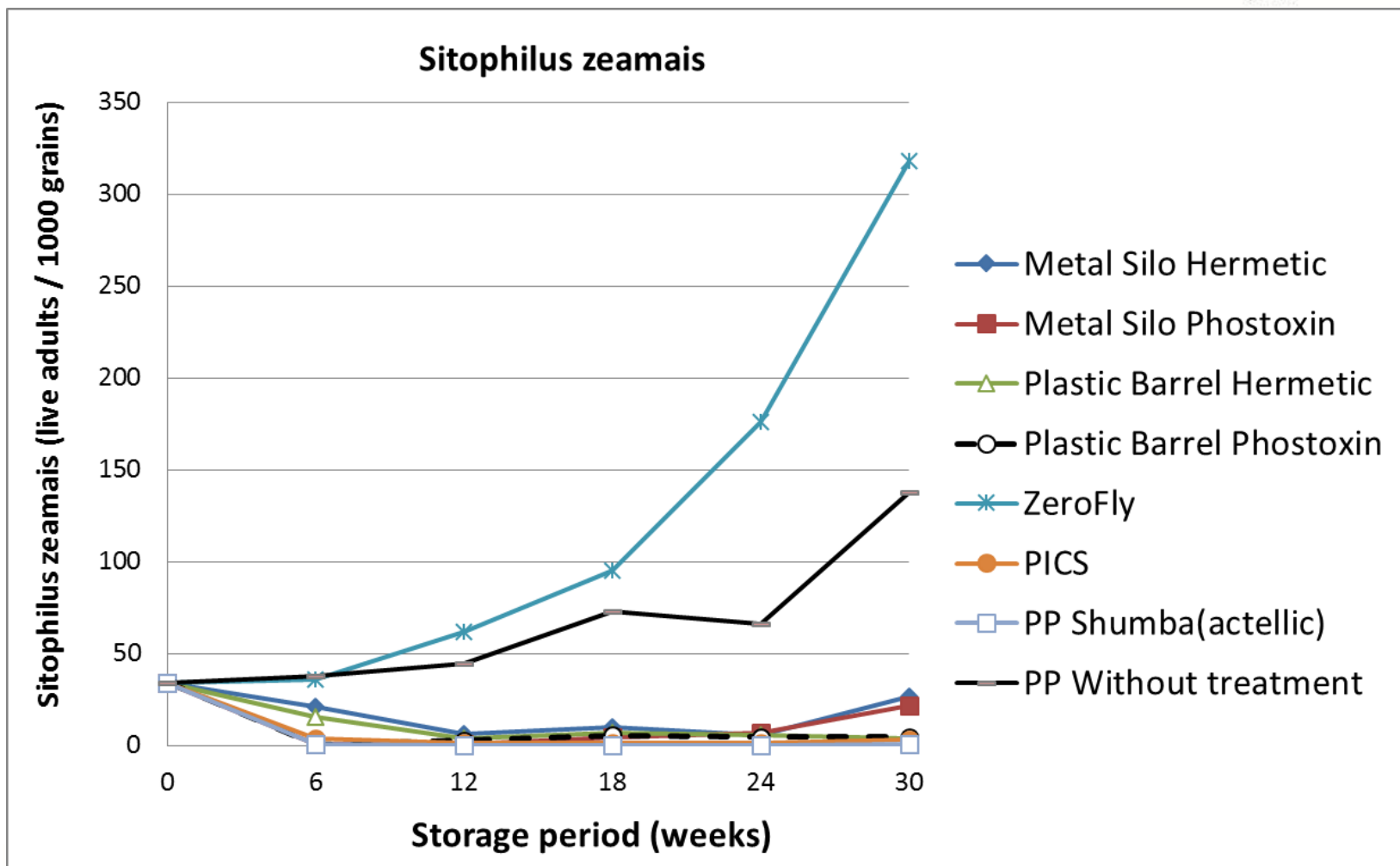
Storage technologies tested

1. **Metal silo (500 kg)**, hermetic storage (no further treatment).
2. **Metal silo (500 kg)**, with **phostoxin** treatment (aluminium phosphide tablet form, 57% w/w).
3. **Plastic barrel (150 kg)**, hermetic storage (no further treatment)
4. **Plastic barrel (150 kg)** with **phostoxin** treatment
5. **ZeroFly[®]** storage bags (4x50 kg) (insecticide treated yarn, a.i. = Deltamethrin, non-hermetic)
6. **PICS[®]** Triple layer bags (2x100 kg), hermetic storage (no further treatment)
7. **Polypropylene (PP) bags (2x100kg)** with Actellic Super dust (“Shumba”) treatment (non-hermetic)
8. **PP bags (2x100 kg)**, without treatment (control = farmer practice)

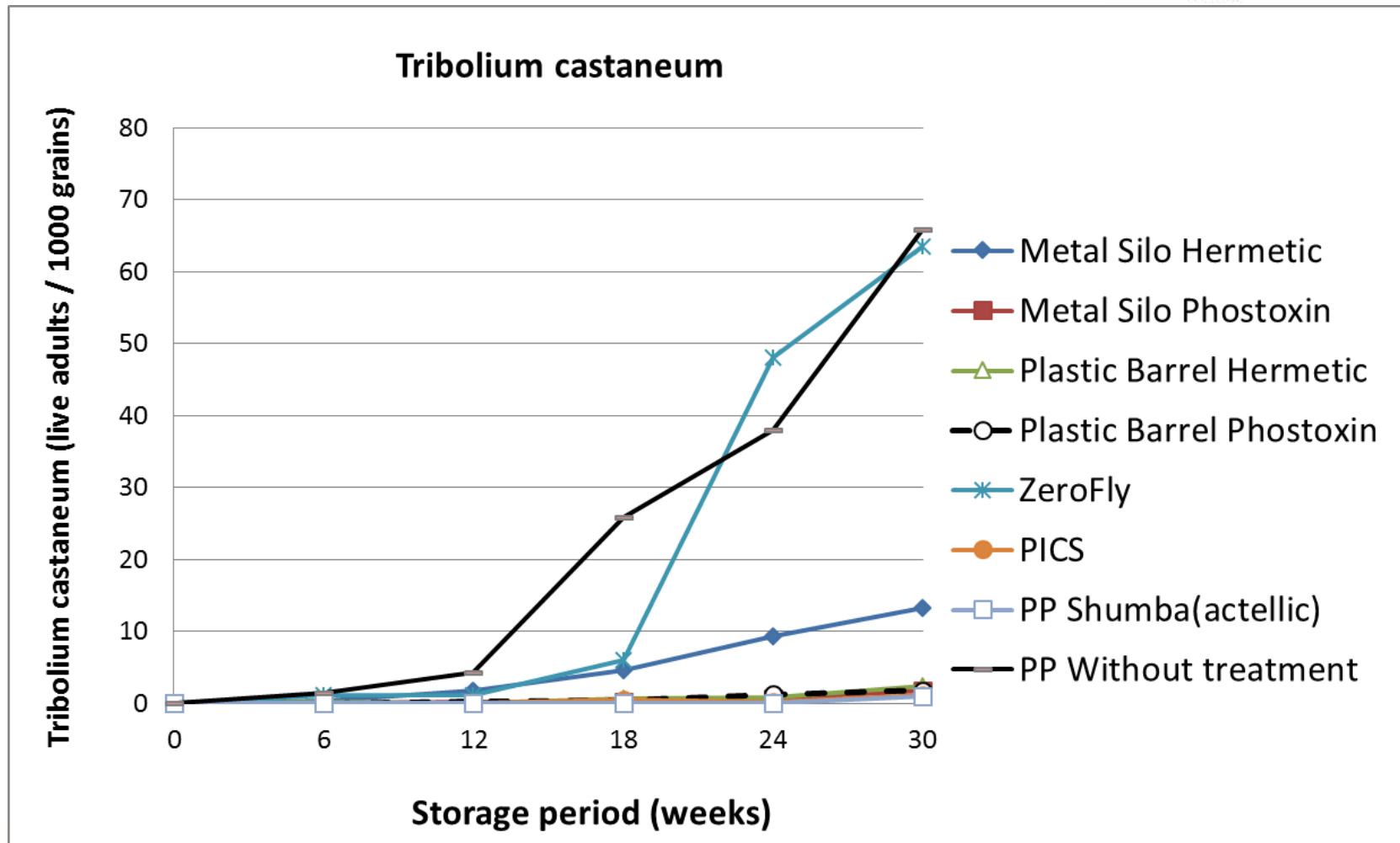
Storage technologies tested (2)



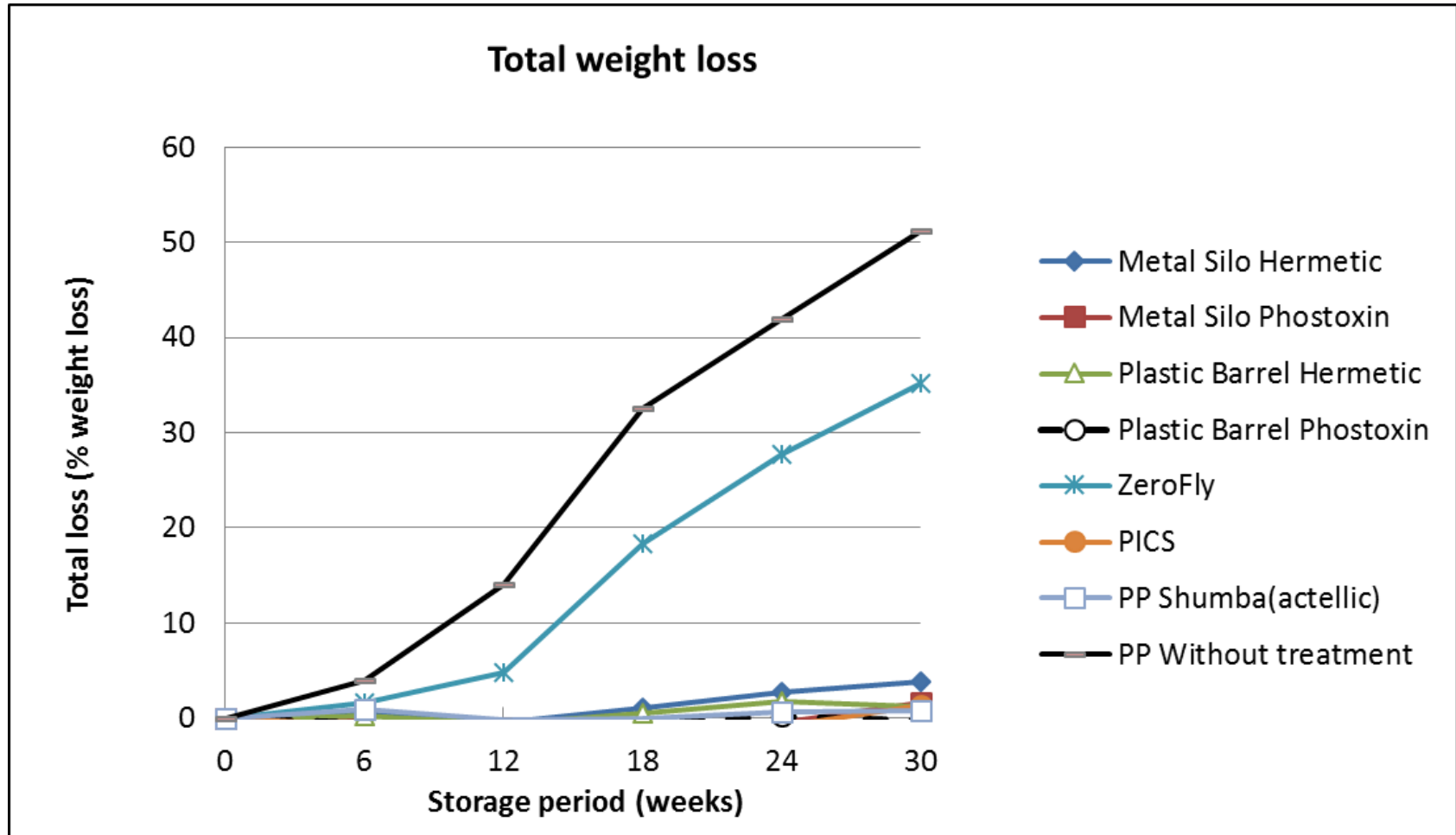
Key results: occurrence of maize weevil (live adults)



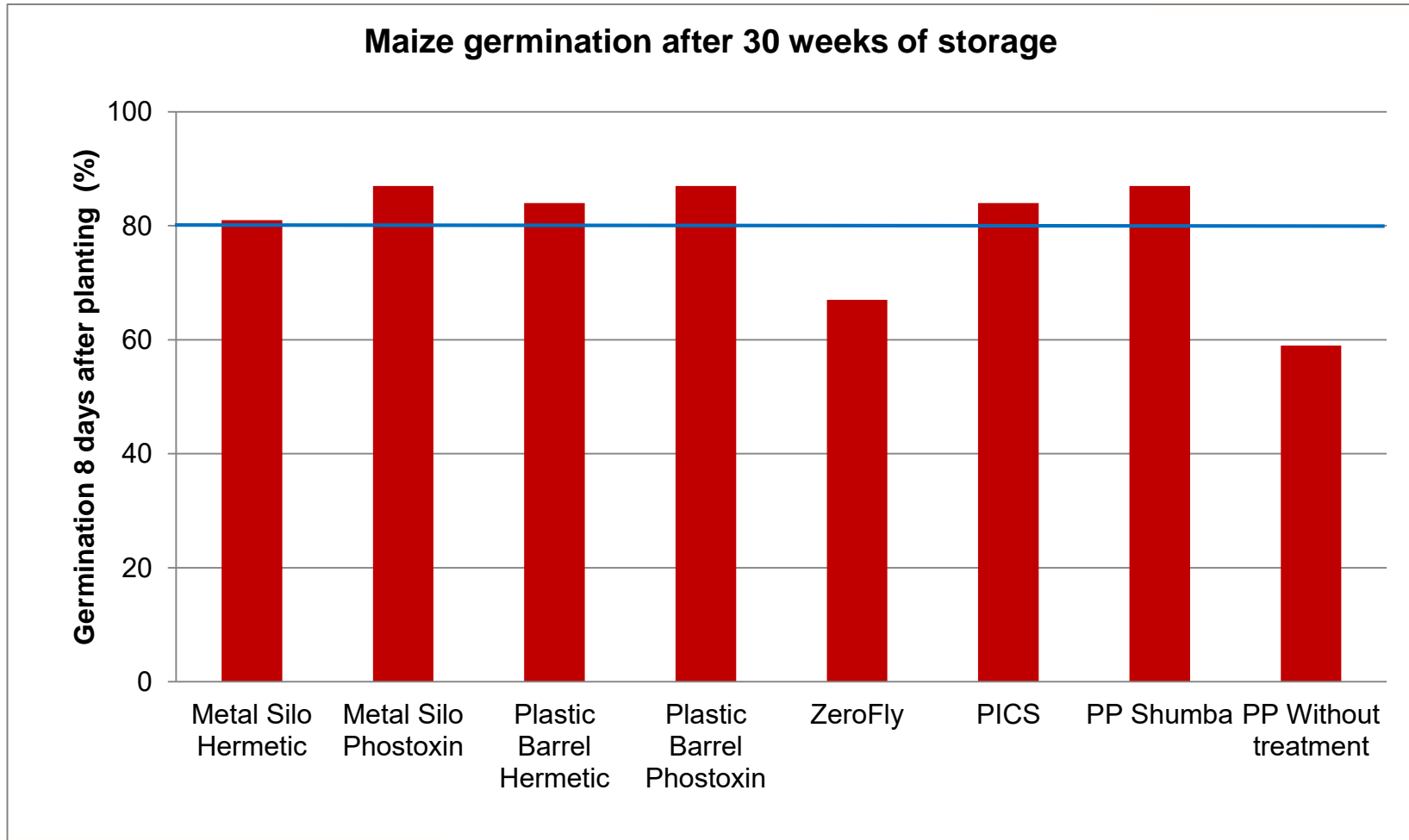
Occurrence of red flour beetle (live adults)



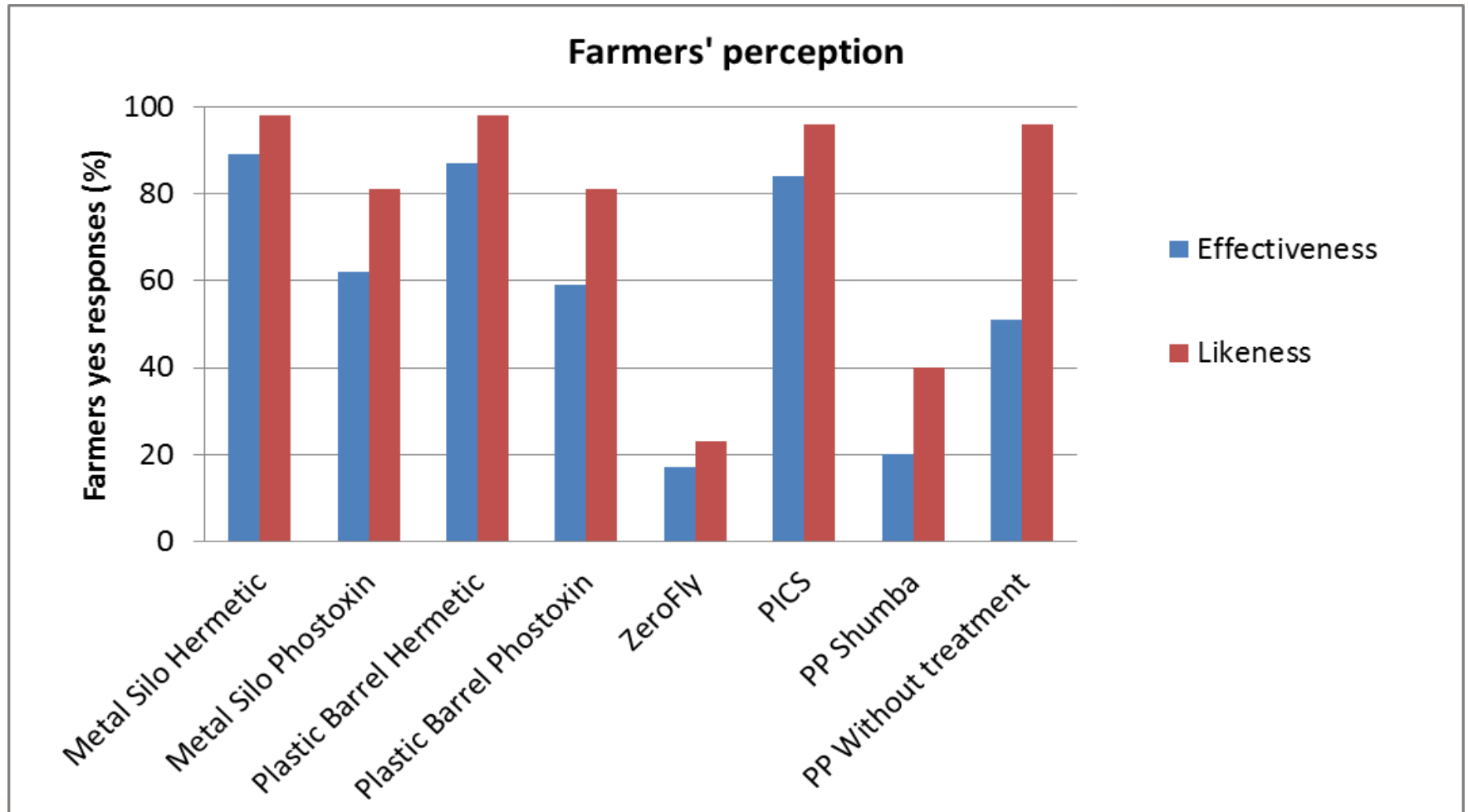
Total weight loss



Germination after 30 weeks of storage



Key results: Farmers' perceptions



Conclusions

- All hermetic storage techniques tested were effective in preventing maize damage by insects for a storage period of 30 weeks (7 months), irrespective of phostoxin treatment.
- ZeroFly bag (non-hermetic) was not effective in control storage insect pests.
- Farmers rated hermetic storage technologies as effective to control storage pests, and they showed a high acceptance for them.
- Application of Actellic (Shumba) is effective to control storage pests but is not liked by farmers because it alters the taste of the grain.

Recommendations

- ✓ **Hermetic storage without insecticide treatment can be recommended to farmers provided:**
 - ✓ high quality of technologies is ensured i.e. metal silo and plastic barrel are hermetic and
 - ✓ sound handling and management of the technologies by farmers i.e. proper placement (shade, dry) and hermetic sealing of lids.
- ✓ Re-infestation of insects during intermittent opening of hermetic containers by farmers to take out food during storage must be avoided irrespective whether maize is initially treated with insecticide/fumigated or not.

Asanta sana – Thank you!



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