

Fertilizer and water regime influence preference of *Solanum scabrum* by tomato red spider mite



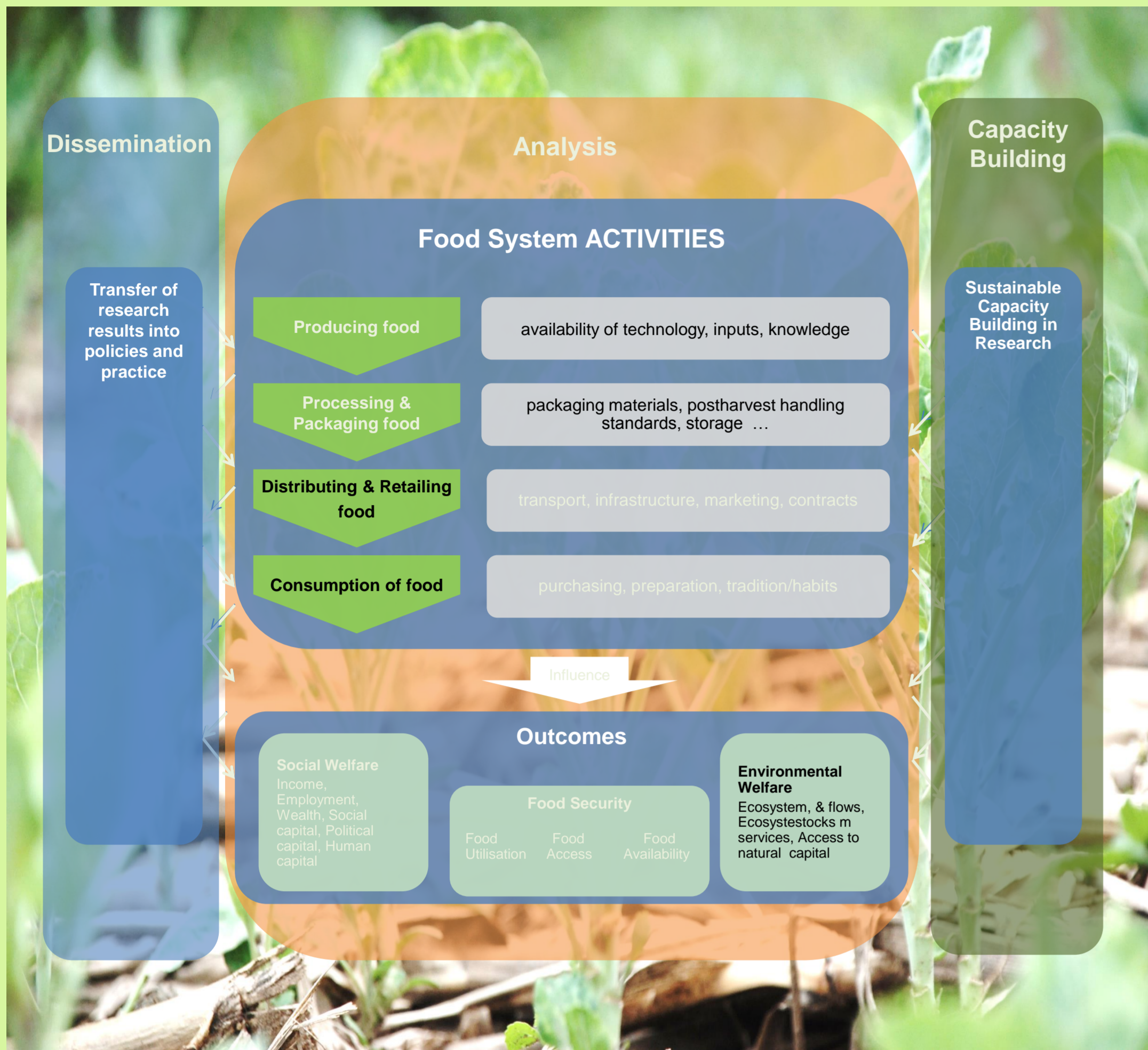
Jackline K. Mworia^{1,2*}, Lucy K. Murungi², Turoop Losenge², Rainer Meyhöfer¹

HORTINLEA
DIVERSIFYING FOOD SYSTEMS

¹ Institute of Horticultural Production Systems, Leibniz Universität Hannover, Hannover-Germany.
² Department of Horticulture, Jomo Kenyatta University of Agriculture and Technology, Nairobi-Kenya.



HORTINLEA Framework



Introduction

Fertilizer and water supply are important agronomic practices in crop production that have profound impact on plant quality and may influence host selection by herbivorous arthropods. One of the most serious pests, the tomato red spider mite, *Tetranychus evansi* (Acari: Tetranychidae) is an invasive pest in Africa that causes severe damage to solanaceous plants including African nightshades, i.e. economically and nutritionally important indigenous leafy vegetables.

Objectives

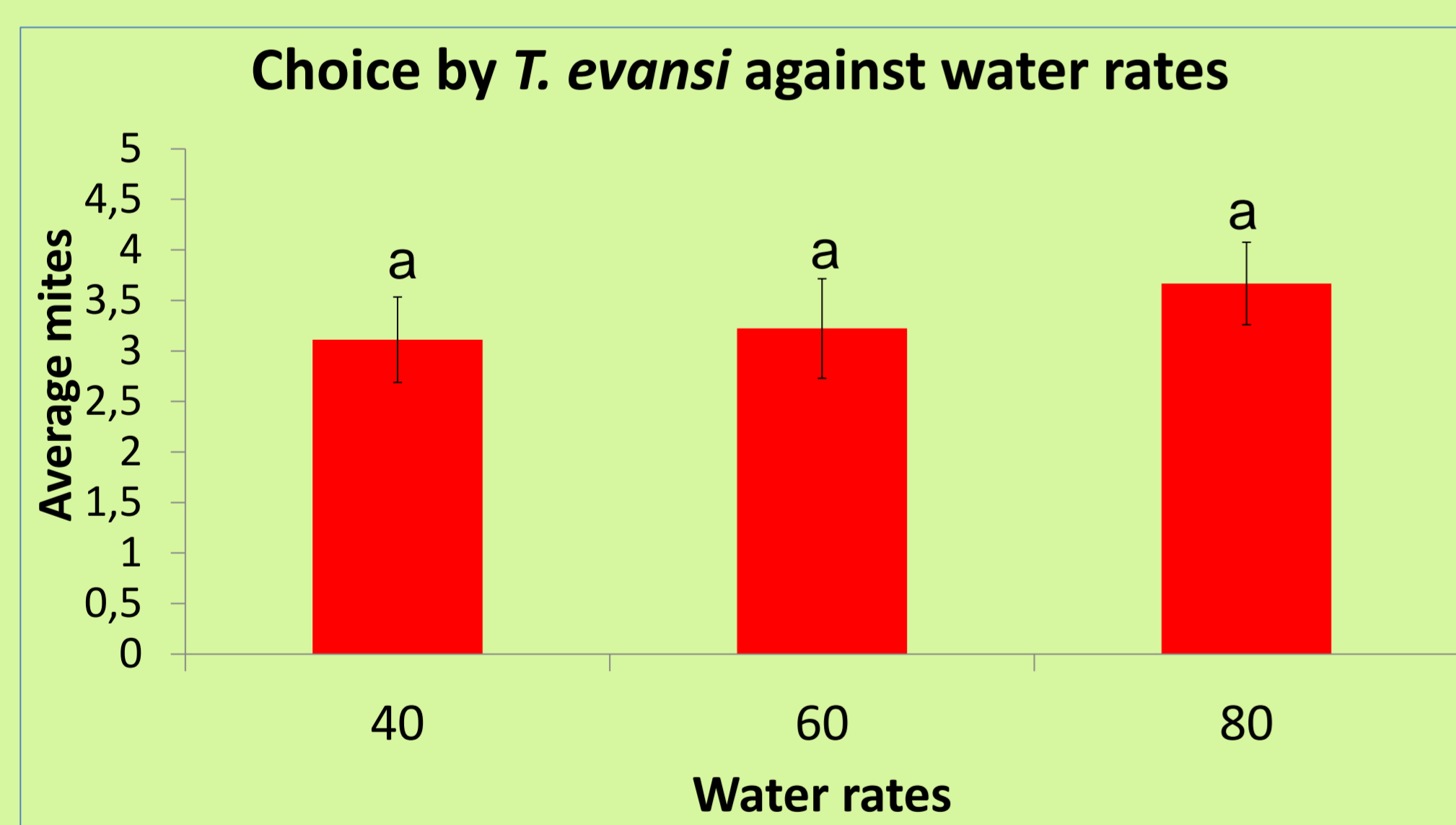
Objective:

To determine the effects of fertilizer and water supply to African nightshades, *Solanum scabrum* var. Olevolosi, on host plant preference by the tomato red spider mite, *T. evansi*.

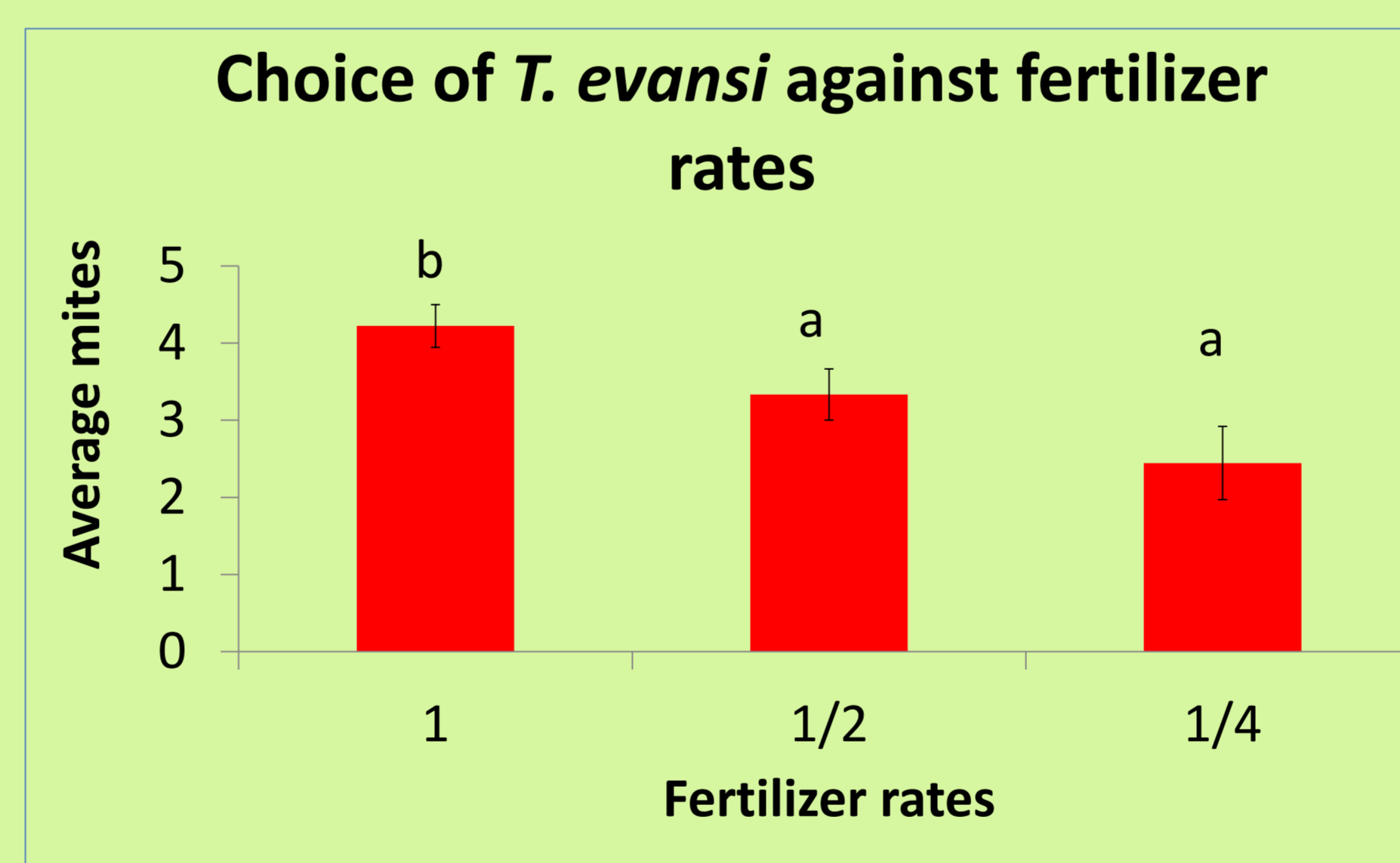
Hypothesis:

Female mites will prefer nightshade plants treated with high levels of fertilizer and water to ensure best performance of their offspring.

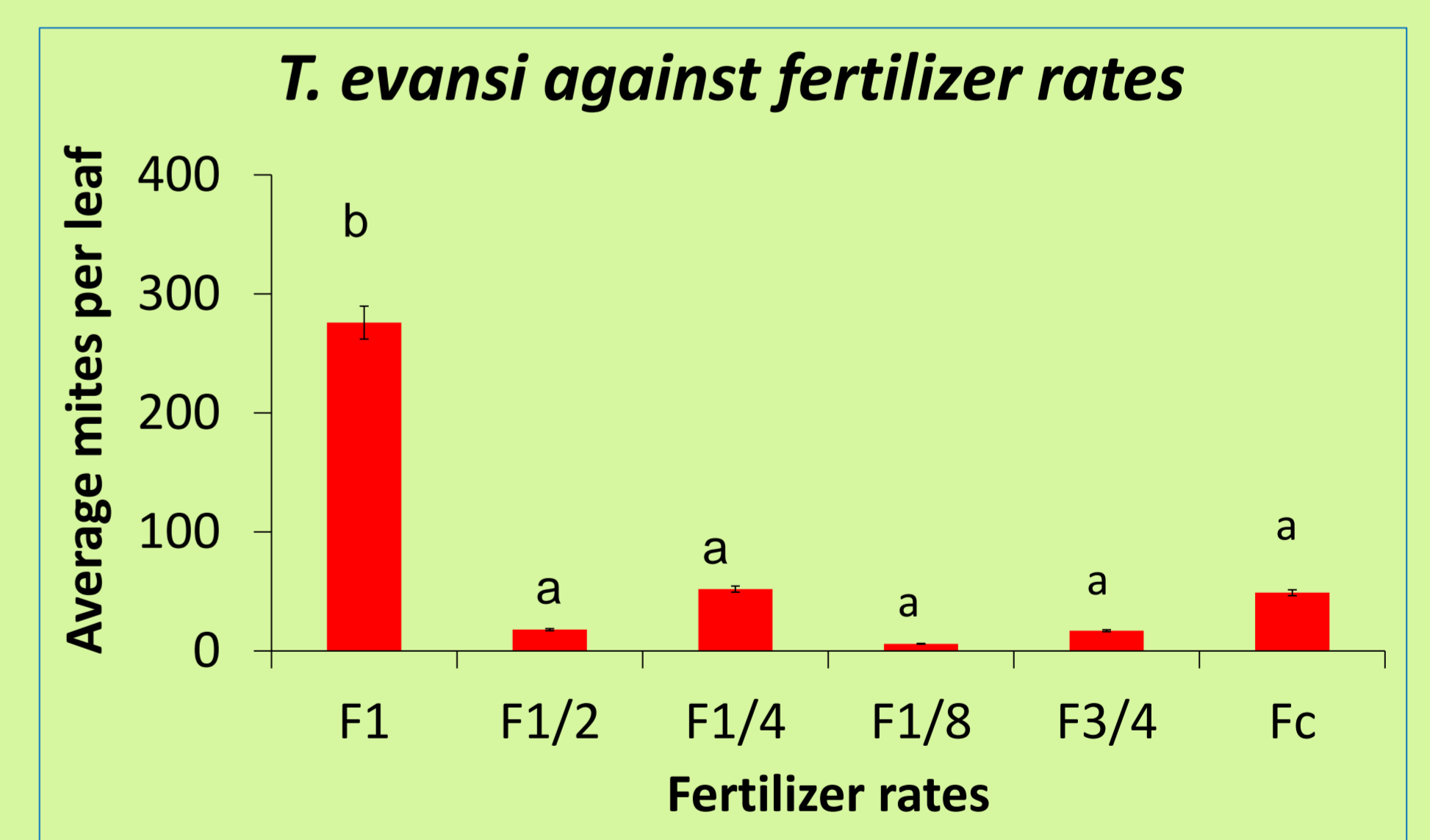
Methods and Results



Frequency of mite choice against water treatments on leaf discs



Frequency of mite choice against fertilizer treatments on leaf discs



Frequency of mite choice against fertilizer treatments on whole plants

Discussion

T. evansi preferred plants that were supplied with the highest fertilizer level (mean 4.22). Fertilizer treatments had significant influence ($P, 0.034$) on *T. evansi* preference but no significant interactions with water treatments. The indication that *T. evansi* prefers plants that are highly nourished suggests implications for management of water and fertilizer against this pest in smallholder vegetable farming systems in Africa. Since farmers use optimal levels of fertilizer to maximize yields, manipulation of fertilizer for pest management requires more considerations. Plant compounds involved in plant-pest interactions can be monitored for variations at various fertilizer rates.

Acknowledgment

References:

- Gripenberg, S., Mayhew, P. J., Parnell, M., & Roslin, T. (2010). A meta-analysis of preference-performance relationships in phytophagous insects. *Ecology Letters*, 13, 383–393.
- Navajas, M., de Moraes, G. J., Auger, P., & Migeon, A. (2013). Review of the invasion of *Tetranychus evansi*: Biology, colonization pathways, potential expansion and prospects for biological control. *Experimental and Applied Acarology*, 59, 43–65. [10.1007/s10493-012-9590-5](https://doi.org/10.1007/s10493-012-9590-5)

