

# Valourising Neglected and Underutilized Crops: Role of Bio-Inoculants in Improving Productivity

Authors / Institutions

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## INTRODUCTION

Food/nutrition insecurity in Africa is driven by:

- Low crop diversity
- Dependence on a few staples
- Soil degradation and nutrient depletion
- Pests, diseases, and climate change

Neglected/underutilized crops (NUCs), such as African egg plants:

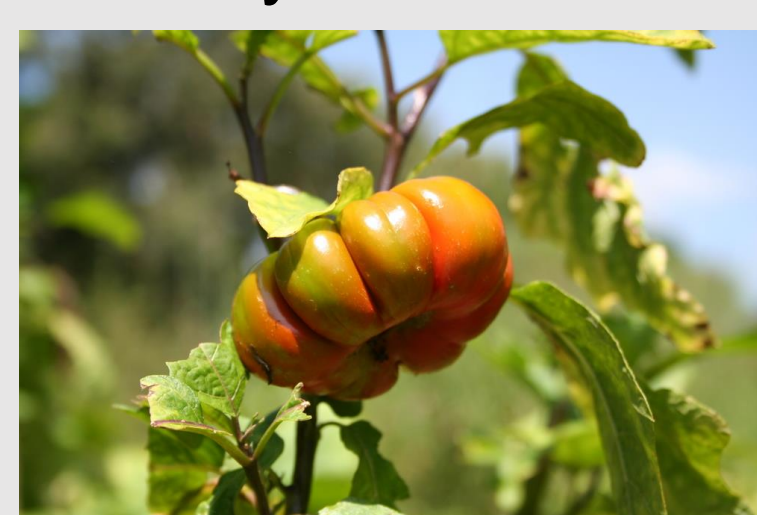
- Are nutrient-rich and climate-resilient
- Offer sustainable alternatives for food/nutrition security

Their productivity remains low due to:

- Limited agronomic research
- Poor seed systems
- Lack of soil and crop management strategies

Unlocking the potential of NUCs requires:

- Improved bio-based inputs
- Integrated soil fertility and crop health management



## RESEARCH OBJECTIVES

- Assess potential of bio-organic inputs to reduce whitefly infestation, enhance eggplant fruit yield, biofortification and shelf-life.
- Assess potential of four edible coatings (*Piper guineense*, neem oil – *Azadirachta indica*, honey, and apple cider vinegar) to extend the shelf-life of eggplant fruits.

## MATERIALS AND METHODS

- A study was conducted on African eggplant (*Solanum aethiopicum* L.) in Buea Cameroon to improve pre- and post-harvest performances.

**Pre-harvest treatment include:**

Control = No input, Chemical = NPK and pesticide, Organic = Poultry manure and *Piper guineense*, Biological = Beneficial microbes, Integrated = Combination of Chemical, Organic and Biological

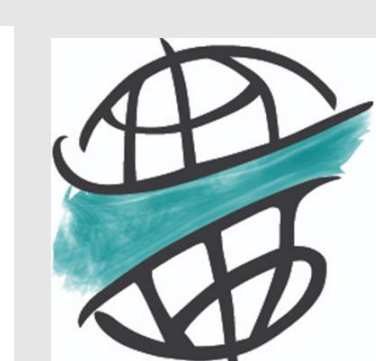
**Post-harvest treatment include:**

Control = No input, *Piper guineense* extract, neem oil, honey, and apple cider vinegar. Each treatment had four fruits, arranged in complete randomized design (CRD) with no variation in storage environment, and replicated four times.

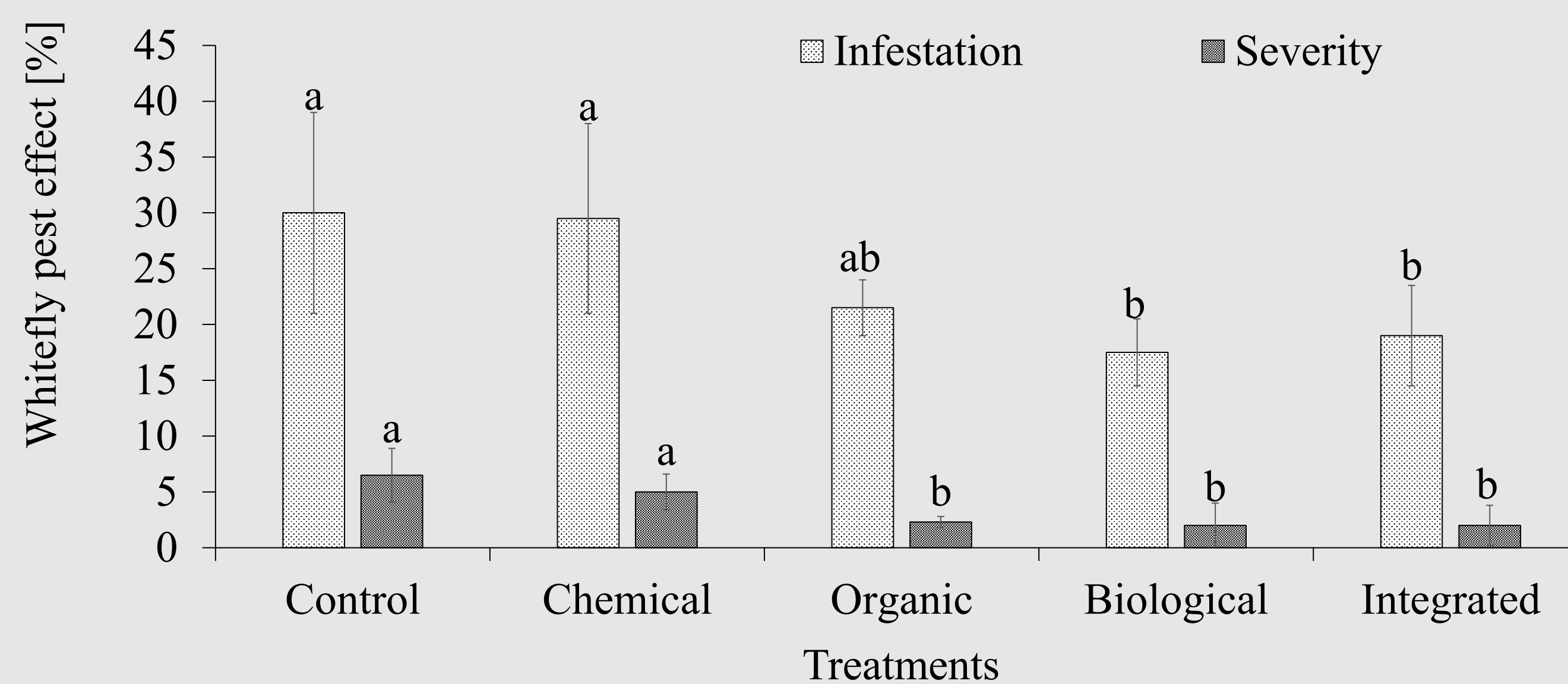
## DISCUSSIONS/CONCLUSIONS

- ✓ Pre-harvest bio-organic amendments mitigated whitefly infestation and improved eggplant fruit yield.
- ✓ Organic and integrated treatments increased the protein content in eggplant fruits, highlighting their nutritional importance.
- ✓ Post-harvest coatings extended the shelf-life of eggplant fruits produced without pre-harvest treatment or with chemical and organic treatments.
- ✓ *Piper* coating extended eggplant fruit shelf-life, regardless of pre-harvest practice.
- Bio-organic amendments provide a sustainable way to valorize NUCs, contribute to resilient and productive agroecosystems, and promote crop diversification.

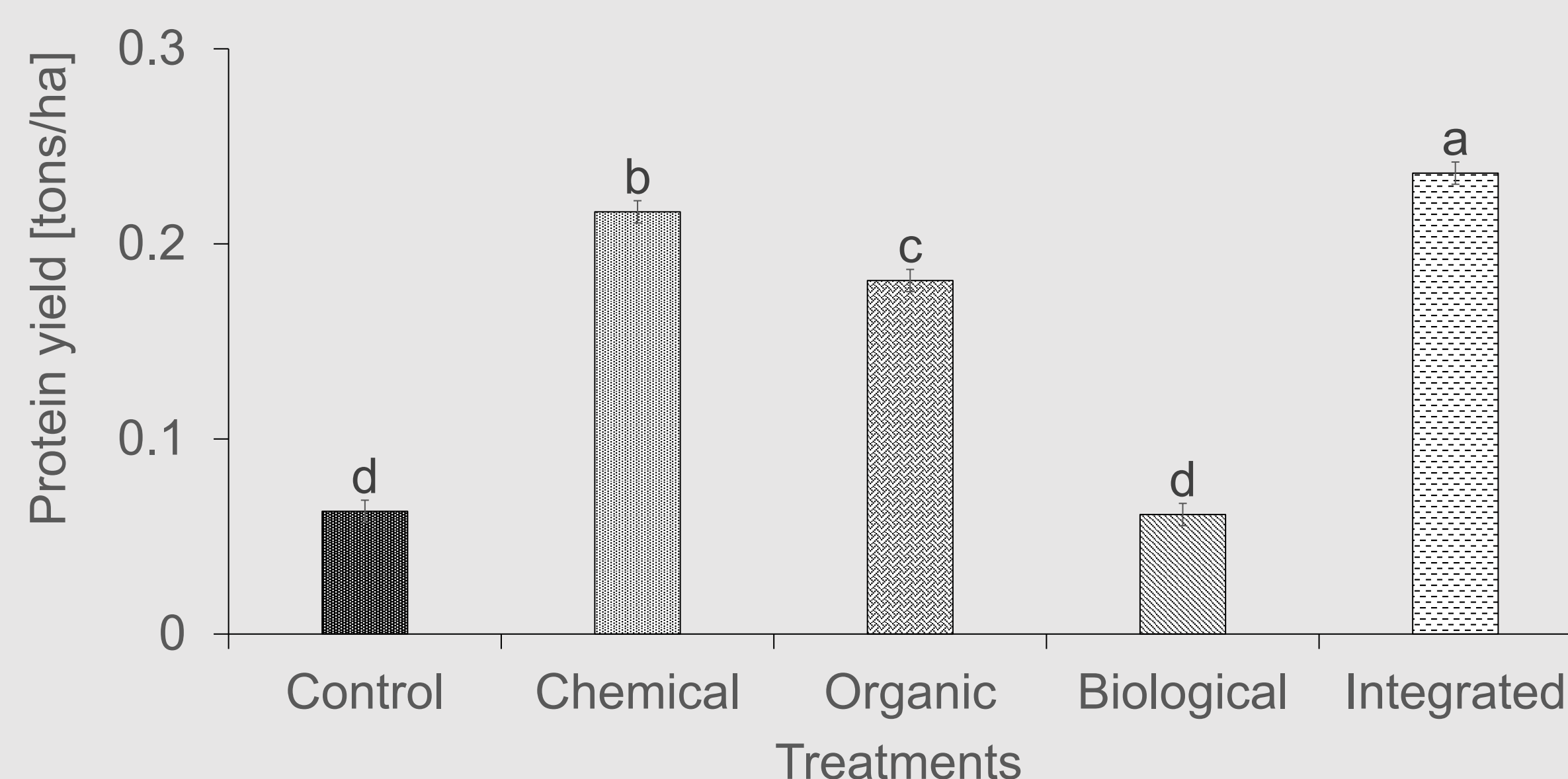
## ACKNOWLEDGEMENTS



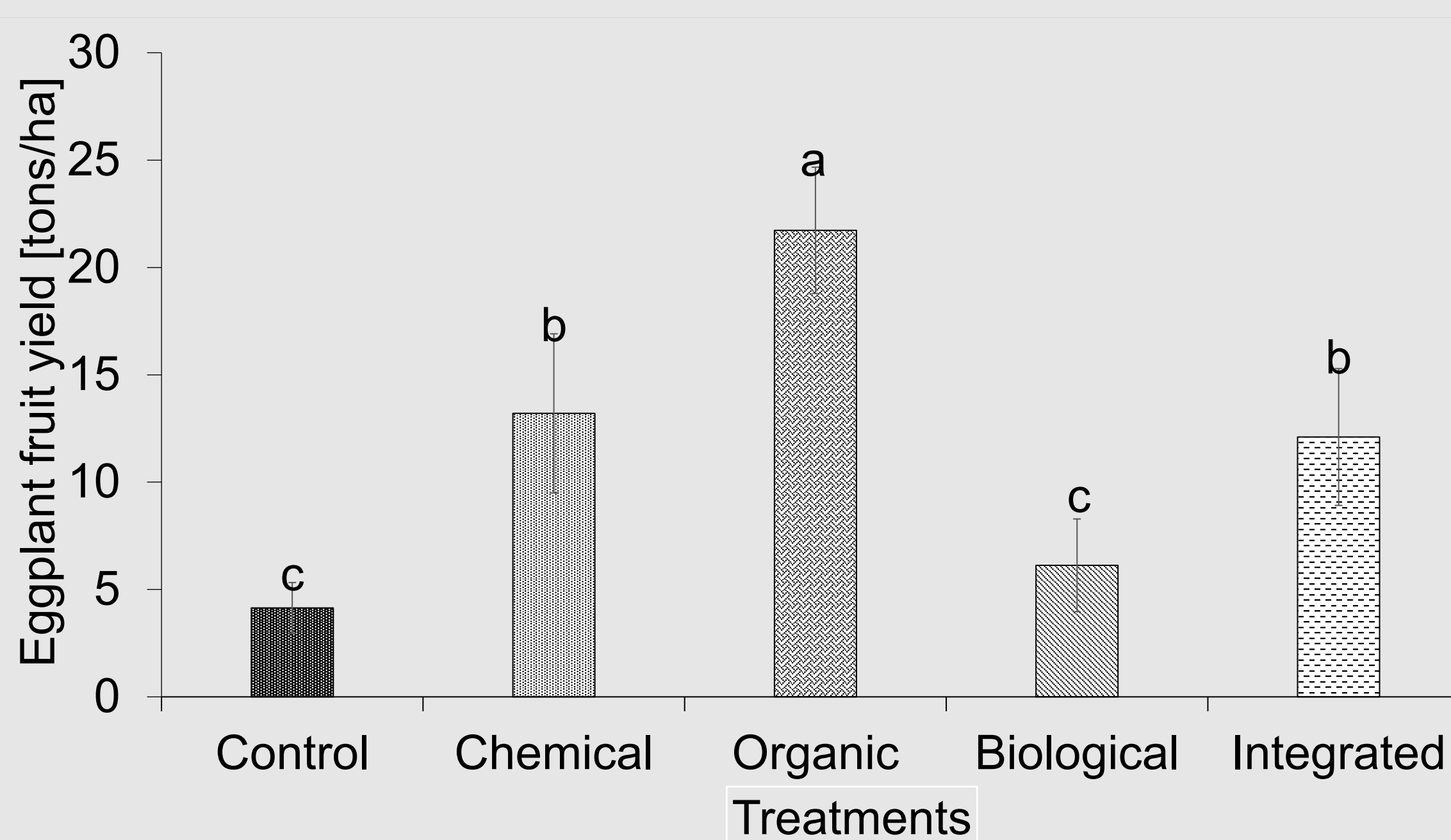
## RESULTS



**Figure 3:** Bio-organic treatments reduced whitefly infestation and severity on eggplant. Bars with different letters for infestation or severity are significantly different (Tukey's HSD,  $P < 0.05$ ).



**Figure 2:** Bio-organic treatments increased protein yield of eggplant fruits. Bars with different letters are significantly different (Tukey's HSD,  $P < 0.05$ ).



**Figure 1:** Bio-organic treatments increased eggplant fruit yield. Bars with different letters are significantly different (Tukey's HSD,  $P < 0.05$ ).

**Table 1:** MANOVA results on level of significance for the interactions between pre- and post-harvest treatments on colour, texture and sensory properties of eggplant fruits.

Values are significant at \* =  $P < 0.05$ , \*\* =  $P < 0.01$ , and \*\*\* =  $P < 0.001$ ; ns = not significant.

Source	Parameters	Days of eggplant storage							
		1	3	5	7	9	11	13	15
Pre-Post-harvest Treatments	Colour		**	ns	ns	*	***	***	**
	Texture	/	ns	ns	*	ns	***	***	***
	Sensory properties	/	*	ns	**	***	***	***	***
Pre-harvest Treatments	Colour	/	***	**	***	***	***	***	***
	Texture	/	ns	*	**	***	***	***	***
	Sensory properties	/	**	**	**	***	***	***	***
Post-harvest Treatments	Colour	/	***	*	*	***	***	***	***
	Texture	/	ns	ns	**	***	***	***	***
	Sensory properties	/	**	ns	***	***	***	***	***

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