

Reducing yield gap in vegetables in Tanzania

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Key messages

- ✓ Using healthy seedlings increases vegetable yields by 18-41%.
- ✓ Yields increase, further by 76-134% if they use healthy seedlings combined with good agronomic practices (GAP).
- ✓ Right spacing of (75x 50cm) for Tomato and African eggplant and 35x35 cm for Amaranths should be considered.
- ✓ Farmers will have higher gross profits of more than \$18000/ha for Tomato and \$9000/ha for African eggplant and benefit cost ratio of up to 8.5 if they adopt integrated management practices-IMPs (healthy seedling and GAP).
- ✓ IPM minimizes pests and disease incidence and reduces overreliance on pesticides by 97%.

Objectives and approach

- ✓ The study looked at various aspects of vegetable production in a bid to identify a novel approach to reduce the yield gap.
- ✓ Sixteen trials with three vegetable cultivars; tomato, African eggplant and amaranth were planted in Matufa, Seloto, Bermi and Galapo during the first season in 2014 and 2015.
- ✓ Four mother and twelve baby trials were planted using a randomized complete block design (RCBD) across the four villages.
- ✓ The treatments were (i) use of healthy seedlings or (ii) integrated management practices (IMPs – healthy seedlings (HS) combined with application of manure and fertilizer complemented by proper spacing, mulching, timely weeding, pruning and integrated pest management-IPM).

Key results

- ✓ Highest yields are obtained for tomato and African eggplant 64.74 t ha⁻¹ and 53.97 t ha⁻¹ respectively, using healthy seedlings and GAP (IMPs) (Table 1).
- ✓ Right spacing of (75x 50cm) for Tomato (Tengeru 2010) and African eggplant (Tengeru white) and 35x35cm for amaranths (Madiira I) is recommended.
- ✓ Higher profit margins of about USD 18,300/ha and USD 9,600/ha and benefit-cost ratios of 8.5 and 4.5 for tomato and African eggplant respectively, under IMPs.
- ✓ Integrated pest management practices boost plant vigor by minimizing the incidence of pests and diseases, reducing overreliance on pesticides by 97%.
- ✓ The incidence of early blight, bacterial wilt, powdery mildew, leaf miner and leaf spot in tomato were all lower in plots under IMPs (Figure 2).

Significance and scaling potential

- ✓ Use of healthy seedlings is recommended because it significantly increases vegetable yields and farm incomes.
- ✓ Combining healthy seedlings and good agricultural practices (GAP) results into even higher yields, thereby contributing to increased incomes, food and nutrition security.
- ✓ Quality seeds and healthy seedlings are available while GAP can be easily called out to small-scale farmers.
- ✓ Promoting combination of healthy seedlings and GAP can be easily adopted by many farmers due to incentive of increased yields and incomes.

Partners:



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Figure 1: Tomato staking and mulching in African Egg plant

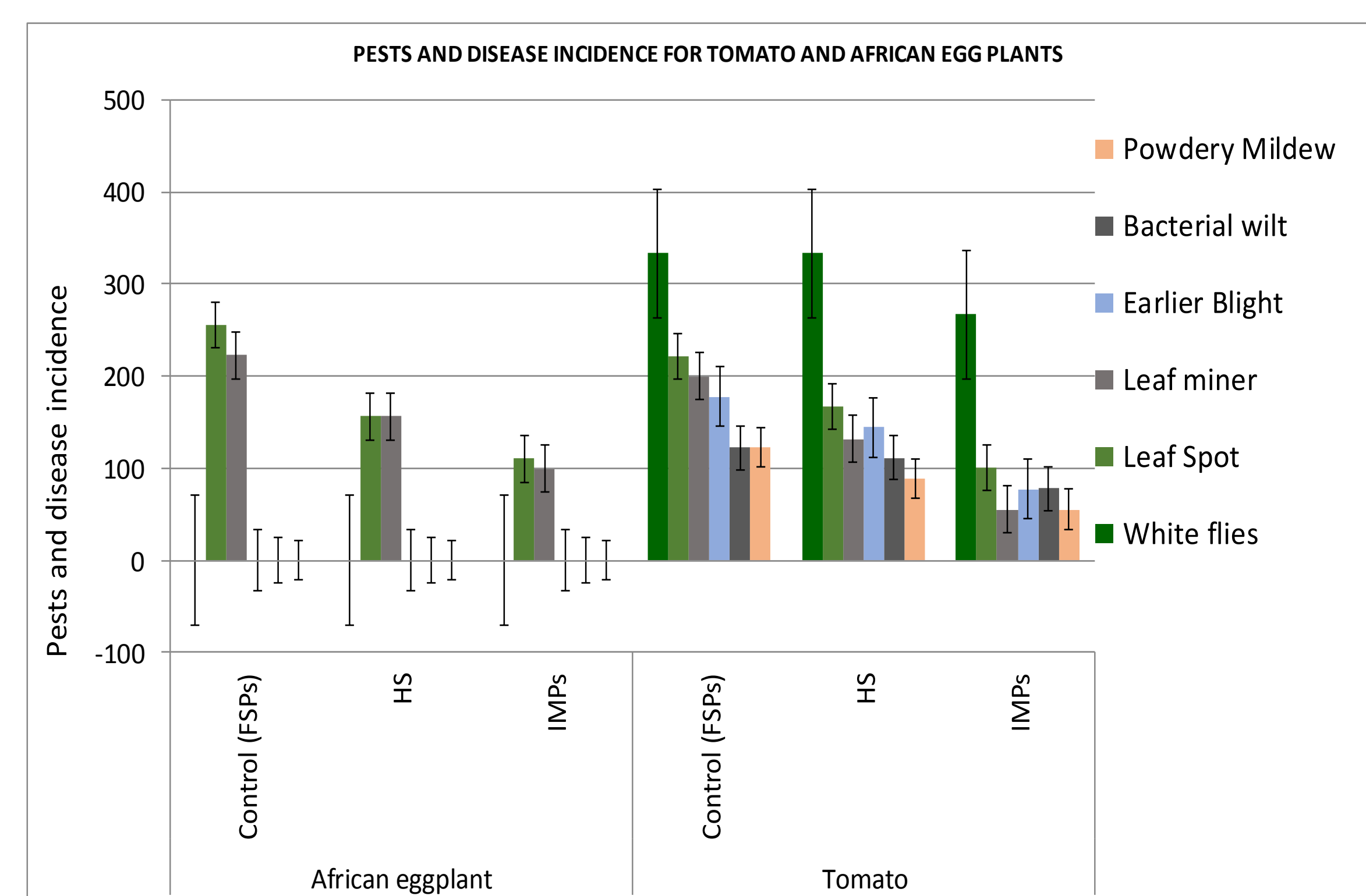


Figure 2: Pests and disease incidence

Treatments	Tomato (Tengeru 2010)	African eggplant (Tengeru white)	Amaranth(leaves) (Madiira I)
Integrated management practices(IMPs)	64.74	53.97	14.91
Healthy Seedlings (HS)	36.05	32.42	10
Control (Base)	28.28	23.04	8.46
ANOVA F-Test (between treatments)	17.364***	24.316***	2.031 ^{ns}
Total	43.91	37.02	11.12

Table 1: Yield gap analysis

