

Evaluating Tomato Seed Quality in Uganda

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Introduction

Tomatoes are a source of income and contribute to food security for small-landholder farmers in Uganda, including the Kamuli District. Seed is a critical input to grow tomatoes successfully and contribute to food security. Low yields in tomato production have been attributed to challenges including pests and low quality seed.

Objective: To evaluate the quality of seed on the local market in Kamuli District through conducting seed quality (germination and seedling dry weight) experiments.

Materials and Methods

- **Design:** RCBD with factorial arrangement
- **Treatments:** (15)
Seed sources (3) = S
Enterprises within seed source (5) = E
- **Replications** over time (4)



Fig.1. Seed company seed



Fig.2. Distributor seed



Fig.3. Farmer seed



Fig.4. Experimental treatments



Fig.5. Seed sampling

Table 1. One-way Analysis of Variance of main effects for normal, abnormal and dead tomato seedlings grown in Uganda, 2017.

Treatment	Normal (% last count)	Abnormal (% last count)	Dead (% last count)	Dry weight (g)
Seed Source	0.0273	0.7130	0.0311	0.0114
Enterprise (within a source)	0.0001	0.0001	0.0001	0.0001

Table 2. Comparison of tomato seed sources for normal, abnormal and dead tomato seedlings grown in Uganda, 2017.

Seed Source	Normal (% last count)	Abnormal (% last count)	Dead (% last count)	Dry weight (g)
Seed Company	61ab	11a	28ab	0.079ab
Distributor	81a	8a	11b	0.106a
Farmer	35b	11a	54a	0.037b

Table 3. Normal, abnormal and dead tomato seedlings from five tomato Seed Companies, in Uganda, 2017.

Seed Companies	Normal (% last count)	Abnormal (% last count)	Dead (% last count)	Dry weight (g)
Company 1	77a	6b	17c	0.105a
Company 2	87a	7b	7c	0.117a
Company 3	80a	7b	13c	0.104a
Company 4	48b	15ab	37b	0.059b
Company 5	15c	19a	67a	0.011c

Table 4. Normal, abnormal and dead tomato seedlings from five tomato seed distributors and in Uganda, 2017.

Seed Distributors	Normal (% last count)	Abnormal (% last count)	Dead (% last count)	Dry weight (g)
Distributor 1	86ab	8b	7bc	0.091a
Distributor 2	80b	7b	13b	0.113a
Distributor 3	59c	16a	25a	0.091a
Distributor 4	90a	6b	4c	0.125a
Distributor 5	91a	5b	4c	0.111a

Table 5. Normal, abnormal and dead tomato seedlings from five farmers in Uganda, 2017.

Farmers	Normal (% last count)	Abnormal (% last count)	Dead (% last count)	Dry weight (g)
Farmer 1	60a	14a	26c	0.056a
Farmer 2	40bc	10a	50b	0.057a
Farmer 3	50ab	16a	35c	0.047ab
Farmer 4	26c	16a	58b	0.024b
Farmer 5	0d	0b	100a	0c

Results/Conclusions

- Germination and seedling dry weights were highest in distributor seed and did not differ from seed company seed, but were lowest in farmer seed.
- Three companies and four distributors of five enterprises had high quality seed.
- All farmer seed had low germination percentages and seedling dry weights, as well as high percentages of dead seedlings.



Fig.5. Normal seedlings



Fig.6. Abnormal seedlings



Fig.7. Dead seedlings

Recommendations

- The Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) in Uganda should improve the regulation of seed companies to improve the quality of seed provided by registered companies.
- After seed companies are held to standards, MAAIF should assist in creating opportunities for companies to package seeds in smaller amounts for small-landholder farmers.
- Extension efforts should train farmers on advantages of professionally produced seed; if income is limited, programs on proper seed-saving techniques are needed.



Fig. 8. Planting of tomato seeds in paper towels



Fig. 9. Oven and desiccator used for seedling dry weights