

FIELD TRIAL MANAGEMENT

by

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Purpose: to characterize the morpho-agronomic and physiological response of Andean genotypes to drought stress by;

- Evaluating the effect of water levels on Common bean yield
- Investigate the morphological, agronomic and physiological traits associated with drought resistance in selected Andean genotypes of common bean

Experimental Design

- Split plot design
 - Two factors affecting the seed yield of the genotypes
 - Main Plot – Water Treatment
 - Separated by a Buffer Crop
 - Subplot – genotypes
- 20 genotypes and 7 Checks
- Randomization was done using Excel to ensure random allocation of treatments to the units within replications
- Border rows/Blocks used at the edges of the experimental field

Field layout Sketch map



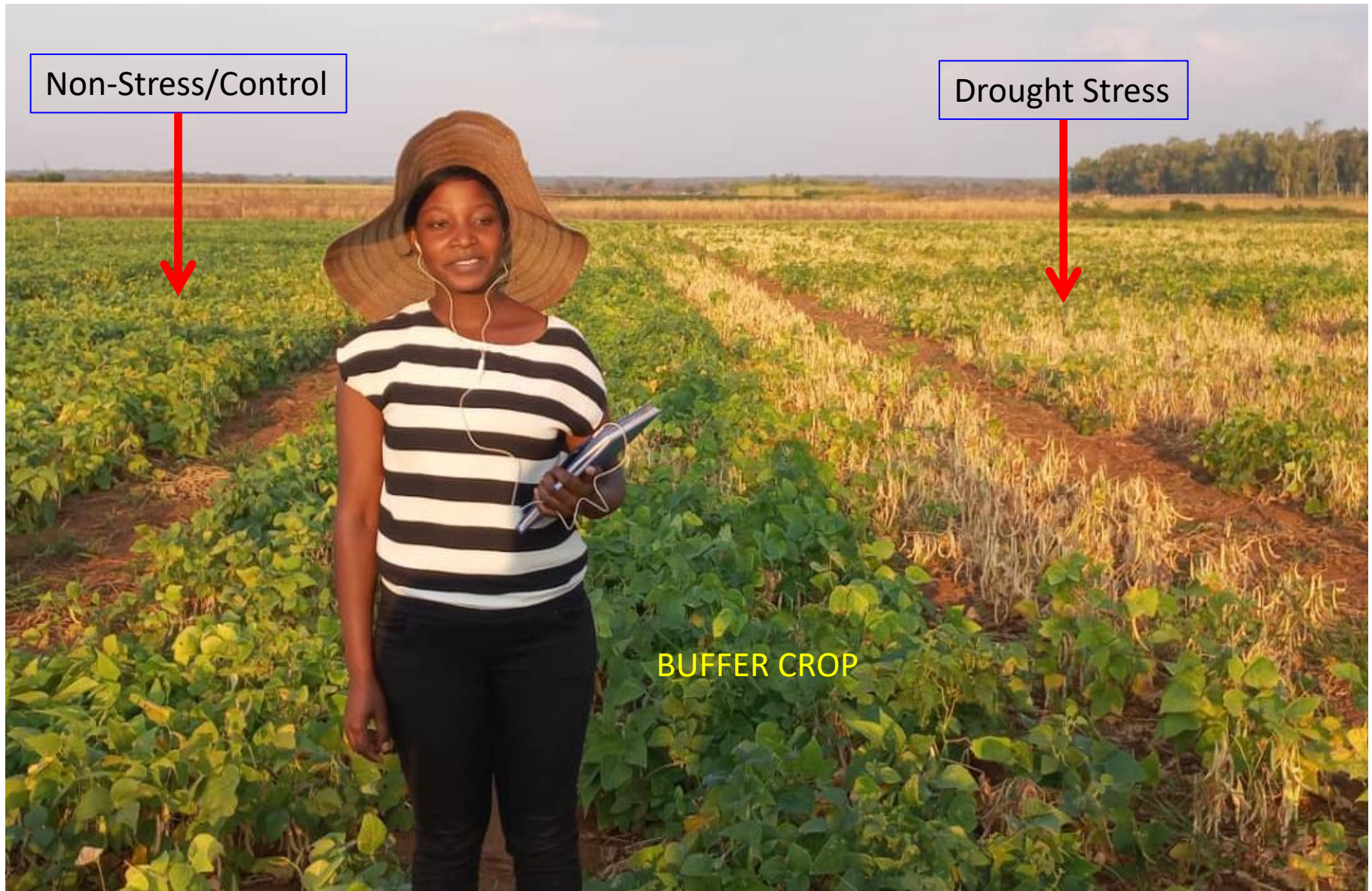
NON STRESSED FIELD

		Rep 1 4m	1m	Rep 2	Rep 3	10m
Plot 1	Border	Border		Border	Border	
Plot 2	Border	RWR 10		Mshindi	SCR_16	
Plot 3	Border	Pink Panther		PI638816	RWR 10	
Plot 4	Border	OAC Inferno		OAC Inferno	LSK	
Plot 5	Border	Mrondo		Kardinal	SCR_44	
Plot 6	Border	SEQ11		Krimson	Mshindi	
Plot 7	Border	PR0737-1		SCR_44	SCR_10	
Plot 8	Border	PI638816		G17913	Kibala	
Plot 9	Border	Kijivu		Gololi	Tepary	
Plot 10	Border	SCR_10		PR0737-1	KAB	
Plot 11	Border	ADP 57		VA-19	PI638816	
Plot 12	Border	SCR_16		Kibala	Kardinal	
Plot 13	Border	SCR_44		Mrondo	SEQ11	
Plot 14	Border	Gololi		Tepary	PR0737-1	
Plot 15	Border	VA-19		ADP 57	SER_16	
Plot 16	Border	Krimson		G6415	TARS HT 1	
Plot 17	Border	H9659-27-10		Pink Panther	H9659-27-7	
Plot 18	Border	SER_16		SEQ11	Mrondo	
Plot 19	Border	TARS HT 1		LSK	ADP 57	
Plot 20	Border	G6415		KAB	OAC Inferno	
Plot 21	Border	Kardinal		RWR 10	Gololi	
Plot 22	Border	Kibala		Kijivu	Pink Panther	
Plot 23	Border	KAB		SCR_16	G17913	
Plot 24	Border	Tepary		H9659-27-10	VA-19	
Plot 25	Border	LSK		H9659-27-7	Krimson	
Plot 26	Border	G17913		TARS HT 1	Kijivu	
Plot 27	Border	H9659-27-7		SER_16	H9659-27-10	
	Border	Mshindi		SCR_10	G6415	
	Border	Border		Border	Border	

Buffer crop separating the two treatments

STRESSED FIELD

TRIAL AT MATURITY



2021 Terminal Drought Trial - October 2021

Design Choice Rationale

- The design is ideal for single treatment factor with a number of levels
- Small population with few number of entries where there is soil homogeneity
- A replication of materials to occupy a block
- Border rows used to reduce edge effect and protect the trial against external effects

Record Keeping

- Very Important at all stages of Field Trial.
 1. Genetic purity maintenance
 - Seed preparation and Harvest – envelopes or plastics containing seed to have;
 1. Genotype ID
 2. Replication ID and
 3. Plot ID
 - Plot tagging
 - Verification done at planting and harvesting in the field
 2. Making sure data collected is assigned to the correct genotype
 - Field book used to collect pre-harvest data
 - Lab Record book used to record post-harvest data

Seed Stock Handling

- Seed parked in well labelled bottles for long term Seed storage to prevent weevil infestation
- Bulk seed kept in sacks for short term storage
 - Also for the next seed preparation
- Label reinforcement to prevent loss of genotype identity
 - Bottles labelled on the side, bottom and the lead
 - Seed parked in the bottle, plastic or envelope to have a printed genotype identity tag inside
 - Seed stocks for long term storage to have information on when the seed was packed.

Seed stored in bottles on Shelves



Data Analysis

- R version 4.0.4
- t-test to determine significance of differences between the water treatments
- ANOVA to determine differences among the genotypes on several parameters of data
- Correlation analysis between seed yield and other traits

Challenges

- Difficulty to keep tabs with materials when the skilled labour is spread thin
- Long distance to trial sites make it difficult to collect phenological data as it is spun for a longer period
- Soil heterogeneity when dealing with large populations
- Variation in seed quality and quantity that could lead to variation in plant stand and replications