

OVERVIEW

8 Randomized Treatment Groups

Germination Test
85%

Planting Date
15-May-23

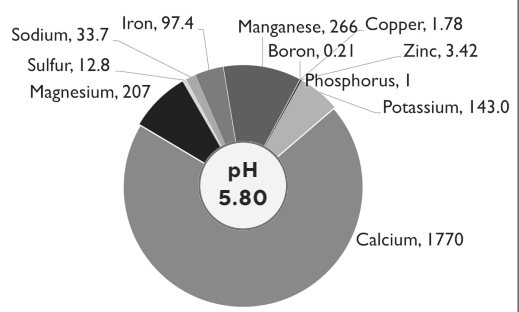
Harvest Date
27-Aug-23



The input omission trial comprises 8 treatment combinations of phosphorus (P) as Di-ammonium phosphate, inoculum (I), and NPK. Each set of 8 treatments were randomized and replicated 4 times. The "SC Salama" variety was planted in 3x5 meter plots with a seed spacing of ~4cm. Each plot contained 4 rows with a spacing of 75 cm. Seeds were treated with inoculum Biofix before planting. Di-ammonium phosphate (DAP) was applied as a side-dress (5 cm deep and 5 cm to the side of the seed furrow) at planting. NPK, Thabiti Fertilizer, was broadcast after planting. The trial was irrigated throughout the growing season with an overhead, rain gun sprinkler system.

BACKGROUND

SOIL ANALYSIS*

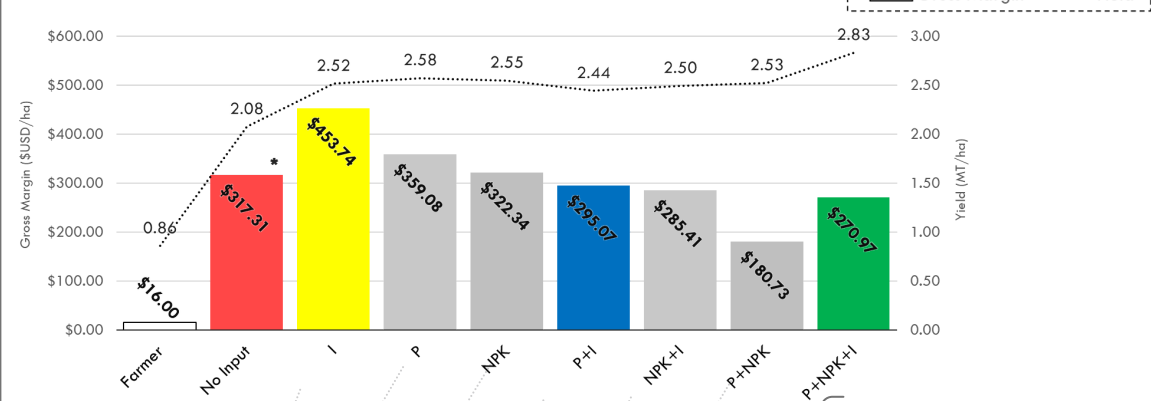


4.32% Organic Matter
15.1 meq/100g Cation Exchange Capacity

TRIAL INPUTS

ID	Name	Source	Concentration	Application Rate (per ha)
P	DAP	Yara	18%N 46%P2O5 (20% P)	165 kg
I	Biofix	MEA Fertilizers	-	100g/15kg
NPK	Thabiti Fertilizer	Elgon Kenya Ltd.	17:30:6 NPK 3.5S+2Ca+0.4Zn	250 kg
-	SC Salama	SeedCo	-	320,000 seeds

RESULTS**



	V2 Stand (count)	R6 Plant Height (cm)	R6 Stand (count)	Seed Moisture (%)	100 Seed Weight (g)	AVG	LSD	CV %	P-Value
	181	64.3	181	12.6	11.3	202.66	33.25	8.81	0.058
	210	75.0	188	12.6	15.0	75.69	3.55	6.26	3.3464 8E-07
	188	78.4	194	12.6	15.0	202.34	32.99	8.70	0.060
	194	77.8	194	12.5	15.0	12.57	0.18	0.43	0.643
	197	78.4	210	12.6	15.0	14.00	0.00	9.124	1.9620 4E-05
	216	76.6	197	12.6	15.0				
	195	78.4	216	12.7	15.0				
	237	76.5	236	12.5	15.0				

*Significantly different at ≤ 0.05 . Based on the trial ANOVA, the treatment control showed a significantly (p-value <0.001) low yield compared to the other treatments.

CONCLUSION

The **Yellow Bundle** is recommended for the Kisumu location. This includes the usage of certified soybean seeds, the adoption of good management practices (early planting, planting in rows, increased seed population, and timely weeding), and the addition of one (I) input. The Inoculum treatment generated an average gross margin of **USD\$453.74**, a marginal ratio increase of **1.43** compared to the Red Bundle (certified seeds and good agronomic practices) and **yielded 2.52 MT per hectare**. This produces a **7.63x** return on fertilizer costs and provides an implicit wage of **\$1.60 USD** for every \$1.00 USD of labor spent (a **60% increase in wages** compared to the average Kenyan farmer).



AVERAGE MONTHLY WEATHER

Month	Min Temp (°C)	Max Temp (°C)	Rainfall (mm)
May	14.9	28.2	3.5
June	14.4	28.2	4.5
July	13.5	28.4	2.1
August	13.0	29.1	1.8

COSTS

Item	\$USD/ha
Input Costs	
Phosphorus	132.70
NPK Fertilizer (Thabiti Fertilizer)	160.80
Inoculum (BioFix)	17.87
Seed (SC Salama)	125.75
Labor Costs	
Land preparation, planting, harvesting, bagging, etc.	284.00
Soybean Selling Price	
Grain Price (\$USD/MT of seed)	350.00

VALUES FOR ECONOMIC ANALYSIS
APPENDIX
ECONOMIC ASSUMPTIONS

1. For the estimated average of a Kenyan farmer it is assumed that soybean seeds are saved from one year to the next, and that no additional inputs are purchased.
2. A season of labor is estimated to be 60-70 workdays (472-560 hours) from land preparation to harvest. It is assumed that for a given household any necessary field labor will be conducted by members of that household.
3. Fixed costs such as leasing costs for land, property tax, insurance, managerial overhead, or transportation costs are not included in the variable cost estimates. It is assumed that these costs are consistent across treatments.
4. It is assumed that the labor involved in applying different input treatments is equal.
5. It is assumed that local African soybean prices are linked to and stabilized by world-wide soybean prices.

DEFINITIONS

 = (Left to right) *Minimum Average Temperature* and *Maximum Average Temperature*.

* = Soil Analysis pie chart: units are in ppm.

** = Gross margin (bars) and yield (line) averages are displayed in the chart shown. The *Farmer* acts as a baseline indicator and comparison. It assumes saved seed is used with no additional inputs and labor costs are absorbed by the household.

Gross Margin: For the SMART Farm reports SIL defines the Gross Margin as the Variable Costs of soybean production, including labor, minus the Revenue generated from grain sales: [Revenue] – [Variable Costs].

Marginal Ratio: is the quotient between two gross margin values: [Gross Margin] / [Gross Margin of [Control]].

Return on Input Costs: The return on input costs compares how much was spent on inputs to how much additional monetary value that input provides.

BUNDLE EXPLANATIONS

Red Bundle

Best Management Practices +
Certified Seed


Yellow Bundle

Best Management Practices +
Certified Seed +
One (1) input


Green Bundle

Best Management Practices +
Certified Seed +
Two (2) inputs


Blue Bundle

Best Management Practices +
Certified Seed +
Three (3) inputs

Interested to learn more?

Let us know!

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