



LIVE SUPPORT SYSTEMS (T) LTD

SOIL FERTILITY SERVICES



WHO WE ARE

Brief History of The Company

Live Support Systems (T) Limited (referred to as the company) was incorporated on the 24th March 2003 with the aim of running a leading agricultural products and processors company in Tanzania. The company has a vision of seeing better and beautiful structures established and it is with that regard that they teamed to form what we have today as Live Support System (T) Limited.

Company Vision & Mission

Our vision and mission is to and support all farmers across Tanzania to know the fertility status of the soil which includes but not limited to the soil pH, soil nutrients composition present before planting crops with correction plan so as to know the correct nutrients required before and after planting for the various specific crops. This is to enable the farmers maximize production in their farms. The company is focused on improving both agricultural practices and veterinary services in the entire country.

The Company's Philosophy

The objective of the Company is to achieve the desired results for its clients and partners in most efficient and most economical way, to ensure basis for the client's investment and business ideals without unnecessary complexities, to protect our clientele from any future challenges. We constantly strive to understand the needs and circumstances of our clients' demands, as this is the only way accurate solutions are identified.



OUR SOLUTIONS: Scanner and Lab-in-a-Box

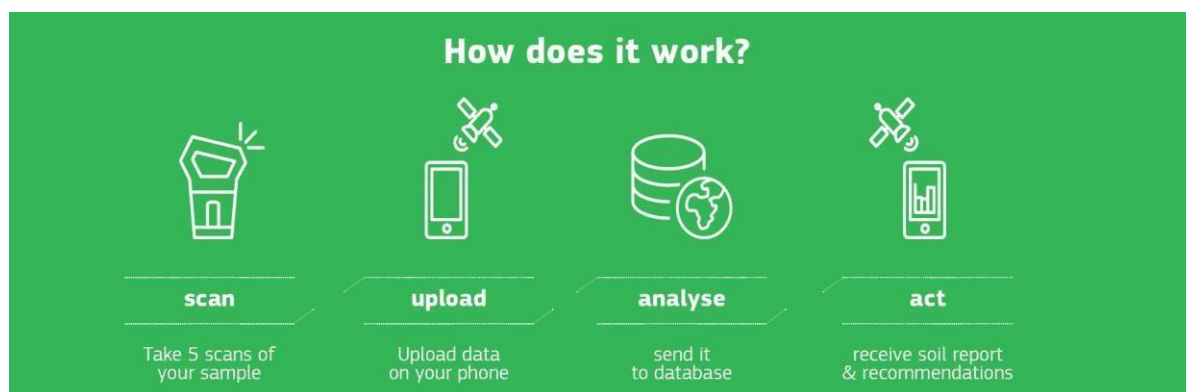
Portable Scanner with NIR

The Scanner is a handheld device designed for the field and using a single NIR sensor. Combined with a mobile application it provides quick on-site access to key nutrients in soil. It also offers the option to provide advice on soil fertility management and yield projection.



The soil report is directly generated on a smartphone within 10 minutes. The report indicates the level of total nitrogen (N), total phosphorus (P), and exchangeable potassium (K) in the soil, as well as pH level, organic carbon and cation exchange capacity. These parameters are placed into one of three ranges: low, adequate and high. The report also specifies the crop types suitable for the scanned soil and provides crop-specific fertilizer recommendations.

(See *Annex 1: Scanner soil analysis report*)



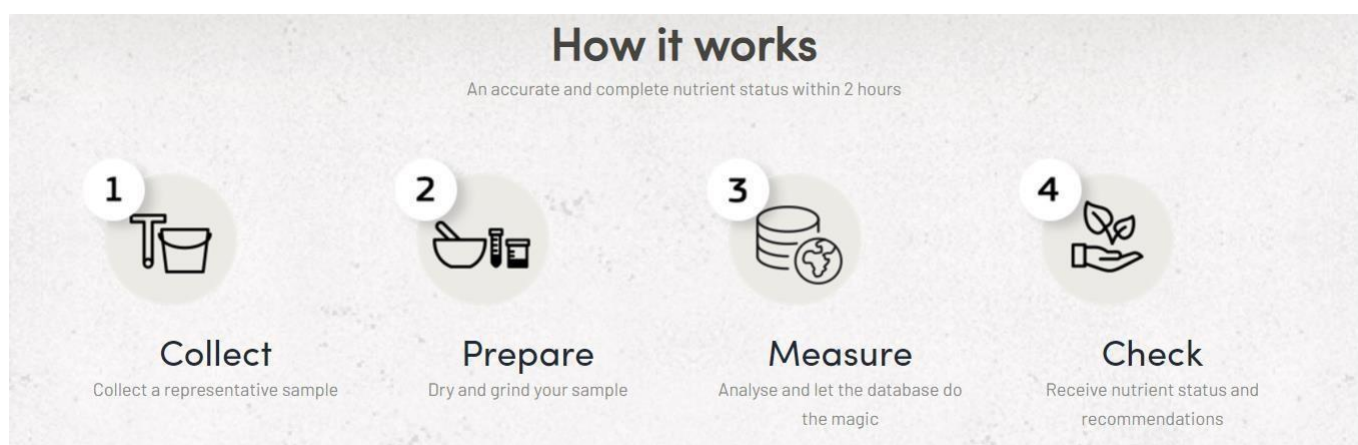
Scanner Benefits

- Scanning and results within 10 minutes on-the-spot;
- Wireless and web-connected;
- Light-weighted and robust design; quite adaptable for field activities
- Cost effective big data solution
- Improved production systems: higher yields of better quality
- Better farmer livelihoods and income
- Nutrient correction plan and yield projection

Laboratory in a Box (LiaB)

The LiaB uses MIR and XRF technology, that is reliable, fast and affordable alternative to a conventional wet chemistry laboratory. It can do 70 samples a day, including full diagnostics (50 parameters) and reporting. It gives results on soil fertility status and fertilizer recommendations for about 70 crops.

An example of a LiaB report is provided in *Annex 2: Liab Soil Analysis Report*. LSSL (T) LTD owns and operates two Soil Fertility Services Laboratory, Stationary Lab, that is stationed in Arusha and a a mobile lab for near field, on spot soil analysis.



Lab-in-a-box benefits

- Affordable alternative for conventional soil laboratory
- Real time on-site soil analysis results
- Customized crop specific fertilizer recommendations and yield projection
- Geo-Mapping
- Fresh soil samples fully processed in 2 hours only
- No chemical consumables needed

Areas of collaboration

- Area 1: Supporting farmers with data-based precision farming tools in order to extensively increase crop yields, through on and off-site soil testing services using scanner and LiaB services.
- Area 2: Develop trainings and capacity building programs to make best use of soil analysis data

The overall objective is to *empower farmers to make informed based decisions and provide thrust in the agricultural value chain* by building an ecosystem of services in the agricultural space using modern technologies.

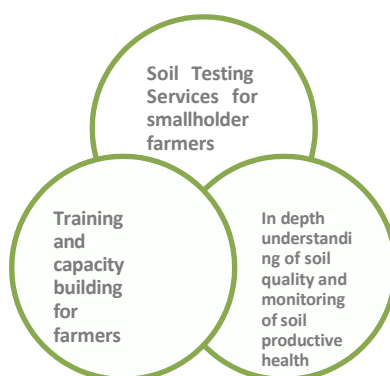


Figure 1: Ways for to empower farmers to make informed based decisions and provide thrust in the agricultural value chain.



Collaboration Area 1: Soil testing for farmers

Even though, soil fertility is at the start of the value chain of any agricultural commodity and by improving the soil status the entire value chain will improve, of all the agricultural production factors it is the one that receives the least attention.

Presently, farmers lack on-site information and base their fertilizer selection on intuition or on tacit knowledge and advice from local agro dealers without knowing actual nutrient status of their soils. It results in a mismatch between applied nutrients and required nutrients for productive soils, and a yield stagnation. More so, applying non-limiting nutrients result in economic losses and environmental degradation.

This problem can be overcome when farmers base their fertilizer selection on real-time information of the nutrient status of their soils.

In this context, there is a clear need for soil fertility service which is simple, reliable and rapid for farmers. Live Support Systems (T) LTD bring such services to farmers using spectral technology developed in Netherlands by Wageningen University and Soilcares NL. The two technologies are LiaB and Scanner as explained in page 2 and 3.

Functionalities of LiaB and Scanner

	pH scale	Organic Matter	Macronutrient	Micronutrient	Toxicity test	Fertilizer Recommendation
LiaB	ü	ü	ü	ü	ü	ü
Scanner	ü	ü	ü			ü

Collaboration Area 2: Training and capacity building programs

Empowering farmers to make informed decisions about soil fertility management will increase yields and reduce farming costs. Live Support Systems (T) LTD has trainings available for early career professionals (training of trainers) and farmers which can be customized to the needs of clients, partners or a particular project. The trainings do cover the following topics;

- Soil sampling and Soil Analysis
- Soil Fertility
- Soil Analysis Results and Fertilizer Use



ACTIVITIES UNDERTAKEN WITH VARIOUS STAKEHOLDERS IN THE UNITED REPUBLIC OF TANZANIA

Supply of Agro Cares Soil Scanners

1. Supplied 143 Agro cares Scanners to the Ministry of Agriculture-Mainland and the Agro Cares scanners were commissioned by Her Excellency The President of Republic of Tanzania Mama Samia Suluhu Hassan.
2. Supplied Agro Cares Scanners to the following organizations:
 - a) One Acre Fund (ONAF).
 - b) Pyrethrum Company Tanzania Ltd (PCT)
 - c) Agricultural Seed Agency (ASA)
 - d) Solidaridad Network
 - e) Agricultural Marketing Development Trust (AMDT)
 - f) COTACOF Ltd
 - g) Kilombero Sugar Company
 - h) Café Africa

Soil Analysis using Liab

LSSL have worked with the following organizations in The United Republic Tanzania by conducting soil analysis using the Lab in a Box (Liab). The organizations work directly with the farmers in improving their productivity.

- Tanzanice Agri-Foods
- Olivado Tanzania Limited
- GBRI Business Solutions (Eat Fresh)
- Jane GoodAll Foundation (Kigoma)
- Food for the Future.
- The Nature Conservancy (TNC)
- Ministry of Agriculture, United republic of Tanzania
- Ministry of Agriculture, Natural Resource, Livestock and Fisheries, Revolutionary Government of Zanzibar



- FADHILI AFRICA (NAIROBI, KENYA)
- Zanzibar Agricultural Research Institution (ZARI)
- Ministry of Livestock and Fisheries
- Tanzania Livestock Research Institute (TALIRI)
- Earth Frontiers
- UWAMARU AMCOS
- SACGOT
- World Vegetable Centre
- International Fertilizer Development Centre (IFDC, RWANDA)
- Kenya Agricultural Research and Livestock Organization (KARLO)
- ZAMSED
- Hanns R. Neuman Stiftung (HNRS)



Annex 1: Scanner Soil Analysis Report

Fertilization and Management Advice

NEI Moshi

Tanzania
 0714291421
 -3.316325, 37.327202

User:mukami Gitau (0723973128)



General information

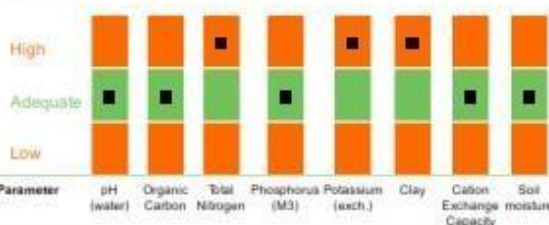
Sample Number : 557292
 Field Name : Block L1

Date : 2022-11-29
 Crop Name : banana

Field Size : 2.1 acre
 Target Yield : 10200 kg

Soil Texture : Clay

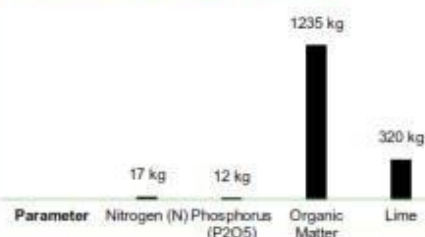
Soil Fertility Status



Soil Fertility Status

Parameter	Unit	Analysis Result	Range Low	Range High	Low	Adequate	High
pH (water)	pH Value		6.0	7.2		■	
Organic Carbon	g/kg	25.8	17	50		■	
Total Nitrogen	g/kg		1	2			■
Phosphorus (M3)	mg/kg		20	40		■	
Potassium (exch.)	mmol+/kg		1.5	3			■
Clay	%	66	20	40			■
Cation Exchange Capacity	mmol+/kg	153	75	200		■	
Soil moisture	%	21.9	10	30		■	

Actual Nutrient Need



Soil Correction Plan

Activities	Instructions	Best Option	First Alternative	Second Alternative
1 Before planting	 If Available	350 kg Agricultural Lime		
2 Before Planting	 If available	1235 kg Compost or Animal Manure		
3 Start of 1st rains	 Remove all trash (leaves, mulch) around the stool of the banana plant. Apply the fertiliser at the beginning of the first rains. Spread the fertiliser in a 10 cm wide band around the plant about 30-50 cm away from the stool. Cover the fertiliser with soil. Do not dig it into soil because you may damage the superficial roots.	10 kg Calcium Ammonium Nitrate (CAN) and 25 kg Mono Ammonium Phosphate (MAP)	20 kg Calcium Ammonium Nitrate (CAN) and 30 kg Triple Super Phosphate (TSP)	10 kg Calcium Ammonium Nitrate (CAN) and 15 kg Triple Super Phosphate (TSP) and 15 kg Di-Ammonium Phosphate (DAP)
4 Topdress	 Topdress after 6-8 weeks. Do this again by the same method	10 kg Urea 46%N	20 kg Calcium Ammonium Nitrate (CAN)	20 kg YaraBela Sulfan
5 Start of 2nd rains	 Topdress again at the start of the second rainy season. Do this by the same method.	10 kg Urea 46%N	20 kg Calcium Ammonium Nitrate (CAN)	20 kg YaraBela Sulfan
6 Topdress	 Topdress another 6-8 weeks later. Do this again by the same method	10 kg Urea 46%N	20 kg Calcium Ammonium Nitrate (CAN)	20 kg YaraBela Sulfan

Suitable Crop Types

Potatoes

Beans

Grains

Vegetables



Your soil is suitable for growing potatoes, grains, vegetables and beans.

Disclaimer - Science

The Analysis Report exclusively relates to the sample presented and examined by the Scanner of AgroCare. AgroCare cannot warrant that the Analysis Report relates to the source of the sample if the sample was not correctly collected. Recommendations and values given in the report provide indicative rates, that are only valid for the sample presented and based on parameters provided by the user. AgroCare strongly recommends that results are only used in the context of classification: low, adequate, high, (etc) as we have taken all reasonable care to ensure that our results are accurate, we have not taken into account other factors that could affect the interpretation of the results. AgroCare accepts no liability for any loss of damage arising directly or indirectly from the use of the report and under no circumstances whatsoever shall be liable for any special, incidental or consequential damage which may arise therefrom. This document cannot be reproduced, except in full, without prior written approval from AgroCare. The recipient of this report agrees to and understands that in the preparation of the report, personal data has been sent to AgroCare in the Netherlands. The recipient further consents to his personal data being collected by AgroCare and by the use of AgroCare technology with whom the recipient entered into an agreement for the preparation of this report, and expressly consents to such personal data being used for research and marketing purposes. The recipient may at all times request access to his personal data or demand that his personal data is removed by contacting AgroCare by email: info@agrocare.com.

Annex 2: Liab in a Box (LiaB) Soil Analysis Report

Fertilization and Management Advice

pass fields

Tanzania

0785611523

-0.592709, 36.870219



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Phone: +255715723999
Email: md@lssl.co.tz
Home Page: www.lssl.co.tz

General Information

Sample Number : EAEON00438A22

Date : 2022-11-16

Field Size : 0.04 acre

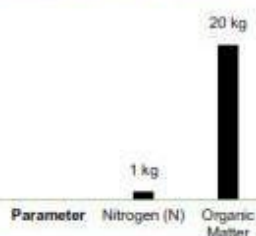
Soil Texture : Sandy Clay

Field Name : Old screen house D9

Crop Name : sweet pepper

Target Yield : 60 kg

Actual Nutrient Need (in kg)



Fertilizer recommendations

Activities	Instructions	Best Option	First Alternative	Second Alternative
1 Before Planting	If Available	20 kg Compost or Animal Manure		
2 At Planting	Place the fertiliser at the bottom of the planting holes, put 10 cm of soil on top, add the seed and cover the seed with soil.	5 kg urea	5 kg Calcium Ammonium Nitrate (CAN)	5 kg YaraLiva Nitabor

Suitable Crop Types



Your soil is suitable for growing potatoes, grains, vegetables and beans.

Soil Status

Parameter	Unit	Analysis Result	Range Low	Range High	Low	Adequate	High
Organic Carbon	g/kg	18.8	17	50		■	
Cation Exchange Capacity	mmol+/kg	169	75	200		■	
Clay	%	35	20	40		■	
ratio C:N	ratio	11	12	18	■		
pH (water)	pH Value	7.5	6.0	7.2			■
Sand	%	58	35	55			■
Potassium (exch.)	mmol+/kg	9.9	1.5	3			■
Total Potassium	g/kg	6.9	9.8	22	■		
Total Nitrogen	g/kg	1.4	1	2		■	
Phosphorus (M3)	mg/kg	46.2	20	40			■
Aluminium (M3)	mg/kg	705.4	220	960		■	
Boron (exch.)	mmol+/kg	0.1	0.01	0.03			■
Boron (M3)	mg/kg	1.1	0.15	0.2			■
Copper (M3)	mg/kg	1.9	1	2		■	
Iron (M3)	mg/kg	71.9	10	20			■
Manganese (M3)	mg/kg	210.4	40	80			■
Molybdenum (exch.)	mmol+/kg		0.03	0.7	■		
Total Sodium	g/kg	4.4	3.1	13		■	
Total Nickel	mg/kg	23.7	16	40		■	
Total Silicon	g/kg	284	250	330		■	
Zinc (M3)	mg/kg	9.3	2.5	4			■
Calcium (exch.)	mmol+/kg	133.6	15	25			■
Calcium (M3)	mg/kg	2787.6	880	3800		■	
Magnesium (exch.)	mmol+/kg	23.3	4.5	10			■
Sulphur (exchangeable)	mmol-/kg	1.2	0	0			
Sulphur (M3)	mg/kg	13.7	0	0			
Total Sulphur	g/kg	0.2	0.3	0.5	■		
Organic Carbon	g/kg	18.8	12	18			■
Total Bromine	mg/kg	21.3	7.4	15			■
Total Cobalt	mg/kg	8.2	9.3	25	■		
Cobalt-mehlich 3	ug/kg	2.9	0	0			
Total Chromium	mg/kg	42.9	29	94		■	
Total Lead	mg/kg	11.9	21	34	■		
Total Rubidium	mg/kg	27.2	45	100	■		
Total Scandium	mg/kg	11.2	8.8	23		■	
Total Vanadium	mg/kg	106	55	130		■	