



# *The Story of 2017*

*SoilCares Foundation Annual Report 2017*

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## Why should I test my soil?

The fertilizer you use on your crops is a nutrient. It can help your crops grow better. But if you use too much fertilizer, it can harm the soil and the environment. It can also harm the people who work on the farm. So it's important to know how much fertilizer to use. Testing your soil can help you know how much fertilizer to use. It can also help you know what kind of fertilizer to use. Testing your soil can also help you know what kind of soil you have. This can help you know what kind of crops to grow. Testing your soil can also help you know what kind of soil you have. This can help you know what kind of crops to grow.

Also, testing is part of a farming system.

For testing, you:

1. Why? Because you can see if your soil is healthy or if it needs more fertilizer.
2. How? By using a soil test kit.
3. What? By testing the soil in different places on the farm.

SoilCares Foundation

SoilCares Foundation is a 501(c)(3) nonprofit organization. For more information, visit [www.soilcares.org](http://www.soilcares.org).



SoilCares

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# Summary

SoilCares Foundation's aim is to increase food production by introducing solutions that will incite farmers around the world to adopt more efficient use of soil nutrients. In optimal conditions, for every 1 kg of nutrients, about 50 kg of harvestable biomass can be produced. Sadly, under the current production practices, experiencing losses of 50% of the nutrients we apply on a field is considered acceptable. Imagine that nowadays, a farmer has to apply twice as much nutrients than what his crop actually needs just because of such losses and a former unbalanced fertilisation.

SoilCares Foundation is convinced that increasing food production by reducing nutrient losses is now possible as fast, affordable and customized methods for soil analysis have been made available. 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. The simple reason is that soil can not be read.

In 2017 SoilCares Foundation supported the introduction of SoilCares Scanners into the Kenya markets, especially targeting markets that are not yet commercially viable, i.e. NGO's, cooperatives and local organisations working with smallholder farmers.

*“Low soil fertility costs Africa’s farmers US\$4 billion a year in reduced yields”.*

*Kaizzi et al. (2017)*

Within one growing season SoilCares Foundation reached more than 1500 farmers with a context specific soil management recommendation. This intervention has resulted in the following conclusions:

- Huge impacts can be made, both in agronomic as in economic performance by using the soil Scanner;
- Farming is complex and has many known and unknown interactions. Improvement of one production factor may cause a shift towards another limitation. Partnerships with complementary services, like seeds, credits, processing, insurance are required to be bring a ‘total solution’ to the farmer.
- The introduction of the SoilCares Scanner caused a disruptive process and is changing the way soil testing is handled and brought towards smallholder farmers.

Activity	Number	Remarks
Trainings provided	Rabobank	23
	F4APK	10
Training materials shared	270	Training material was translated into 4 local languages in Namibia, training material shared with partner in Nepal.  Training booklets shared to Rabobank partners
Success stories published	10	Succes stories from smallholders farmers who adopted the recommendations.
Events organized	2	Launch event during AgriTech Nairobi User experience and sharing workshop in Nairobi

Activity	Number	Remarks
Scanner distribution events	23	Half day events to train new partners on the use of Scanners
Blogs published	3	<ul style="list-style-type: none"> <li>- Adoption of fertiliser recommendations</li> <li>- Soils and Climate change</li> <li>- Youth in agriculture</li> </ul>
Newsletters published	3	
Conferences visited	4	GINN investors forum, February 2017, Amsterdam Syngenta Foundation, February 2017, Basel Agritech/GRODAN Nairobi, June 2017, Nairobi GLOSOLAN launch FAO, November 2017, Rome ACI: European mineral fertilizer summit, December 2017, Amsterdam ASEAN meeting: September 2017, Brussels
Adoption studies	1	Full adoption is low, but partial adoption is high which indicates a change trajectory
Impact studies (M&E)	1	The recommendations can have considerable impacts. Yield increments of 300% are reported. However, farmers are challenged for credits for inputs and risk aversion strategies.
Field experiments	2	Recommendations between wet chemistry (CropNuts) and dry chemistry are very much comparable for maize and potato
Presentations given	5	Wageningen Soil Conference, CGIAR steering group meeting, FAO, Fertiliser stakeholder conference, Added value expo East Africa
Nominations and prizes	2	<ul style="list-style-type: none"> <li>- MoMo: Innovations to combat climate change</li> <li>- GLINKA: world soil prize. SoilCaresFoundation was nominated by ISRIC</li> </ul>
Ongoing projects	2	<ul style="list-style-type: none"> <li>- Rabobank Foundation</li> <li>- F4APK</li> </ul>
Submitted project proposals	7	<ul style="list-style-type: none"> <li>- Mutshibishi fund (rejected)</li> <li>- Common Fund for Commodities (under review)</li> <li>- GreenDeal (scoping phase)</li> <li>- Capacity Building University of Sidney (under review)</li> <li>- Leap-Agri: accepted for full proposal</li> <li>- Incubator (rejected)</li> <li>- NWO (rejected)</li> </ul>
New projects	2	<ul style="list-style-type: none"> <li>- AgriServices</li> <li>- KMT</li> </ul>
Memberships	1	UNCCD
Foundation partners		Rabobank Foundation, HEIFER, Solidaridad, Woord&Daad, ZOA, GreenRhino and many others
Foundation main leads (non commercial)		OAF, FAO, Commonland, Koornzaayer Foundation,

# Introduction

For SoilCares Foundation 2017 was the year of the introduction of the Scanner to the Kenya market. SoilCares Foundation supported SoilCares by collecting proof of concept data and success stories, but it also critically looked at the wider impacts of the introduction of the Scanner by Monitoring & Evaluation Studies, field experiments and adoption studies. Alongside these activities SoilCares Foundation continued its work on capacity building in Kenya and beyond. In this report SoilCares Foundation shares its activities deployed in 2017.



**FIGURE 1. FIRST DISTRIBUTION EVENT TO TANYIKINA DAIRY COOPERATIVE, FEBRUARY 2017.**

## Success stories

SoilCares Foundation has collected 10 success stories. The success stories are published on the website and are currently being processed into a booklet.

At a glance, the success stories show that substantial impacts can be made with relatively little means. Often, the success was a matter of more balanced fertilization practices. Personal efforts could make a large impact. For instance, a farmer split its field into two to test the recommendations, or another farmer who travelled a day to collect compost. It shows that with due efforts considerable improvements can be made. The success stories fit within the adoption theory of Rogers (1963). Rogers concluded that only 15% of a population is ready to take up an innovation, mainly because of personality characteristics. The recommendations of SoilCares enjoyed a higher adoption rate, but most farmers adapted the recommendation towards their personal views and resources.



Targeted interviews indicated that the Scanner especially contributed to the empowerment of farmers. They feel ownership for the recommendation because they are part of it and they discuss the results with the Scanner provider on the spot. The Scanner contributes to the empowerment and capacity building of smallholder farmers, which is the road to lasting change.

# Adoption study

The fact that farmers receive fertiliser recommendations does not mean that the recommendations are actually implemented. It is the same with all kind of recommendations people get (nutrition, driving habits, etc); recommendations serve to initiate a change trajectory, and will only very seldom lead to instant change. The same is true for fertiliser recommendations.

To have a better understanding of the adoption of the recommendations of SoilCares, SoilCares Foundation performed an adoption study in 2017 amongst 35 farmers, distributed over 4 cooperatives, through standardised questionnaires. The objectives for this study were:

- to quantify the level of adoption of SoilCares fertiliser recommendations
  - to understand the reasons for non-adoption
- SoilCares Foundation retrieved phone numbers from SoilCares distributors and project partners. Phone interviews were made within two weeks after the farmers had received the recommendation.

Farmers generally indicated they were happy with the report. However full adoption did not occur and partial adoption was 65%. In other words, 65% of the farmers changed the way they managed the soils on the basis of the SoilCares report.

Reasons for non-adoption are mentioned in Table 2.

Reason for non-adoption	Times mentioned
Did not understand the report	2
Fertilisers were not available	3
Could not afford fertilisers	3
Other factors limited yields (drought)	2

The adoption study showed that it takes more for farmers to change their fertiliser practices than a tailor made report. SoilCares now teams up with input providers and insurance companies to overcome costs for input supplies and risk aversion strategies.

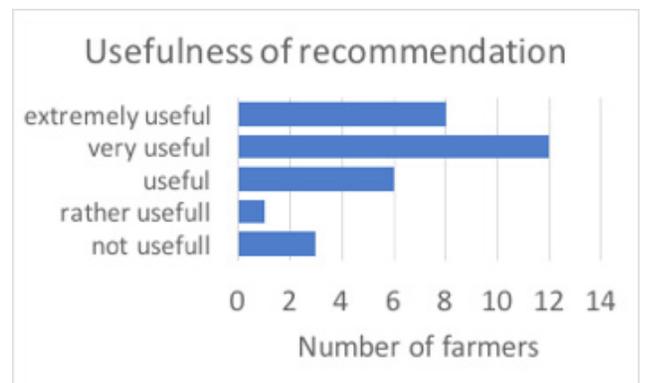
The results of the adoption study are in line with international research. Bold (2015) reported adoption rates for fertilisers is typically between 41-67% depending on the expected return on investment. In that light, the adoption level achieved by SoilCares can be considered high.

**TERMINOLOGY**

**FULL ADOPTION:** RECOMMENDATIONS ARE EXACTLY FOLLOWED

**PARTIAL ADOPTION:** NUTRIENT MANAGEMENT PRACTICES ARE ADJUSTED TOWARDS THE RECOMMENDATION

**NON ADOPTION:** RECOMMENDATIONS ARE NOT USED FOR VARIOUS REASONS.



**FIGURE 2. THE ADOPTION THEORY OF ROGERS (1963) SHOWS THAT THE MAJORITY OF A POPULATION WILL ADOPT AN INNOVATION ONLY AFTER SOME TIME.**

# Impact study

Interventions may have intended and unintended effect. The impact study was designed to collect qualitative and quantitative data on the effect of SoilCares' recommendation. This study was performed for both LiaB and Scanner users, and for partners and end-users. Hence, four surveys were performed:

- Farmers using Scanner results
- Farmers using LiaB results
- Partners using Scanner
- Partners using LiaB

For the farmers the survey focussed on the yield impacts and cost-benefit ratios. For the partners the survey focussed on market potential and economic viability of the service provision.

Standardised questionnaires were performed amongst 65 participants (Table 3) in September 2017.

**TABLE 3. NUMBER OF RESPONDENTS REACHED.**

Number of surveys	
farmers using Scanner	15
farmers using LiaB	34
partners using Scanner	13
partners using LiaB	3

(1) fraction of the farmers providing a yes/no answer. A considerable number of farmers replied 'not applicable', for various reasons.

Table 4 shows the experiences of farmers; nearly all farmers will use SoilCares services again.

**TABLE 4. RESPONSES FROM FARMERS USING SCANNER AND LIAB SERVICES.**

	# of surveys	Farmers reporting yield increase	Farmers reporting profitable intervention	Farmers following the recommendations exactly	Would use service again
farmers using Scanner	15	67%	60%	57%	100%
farmers using LiaB	34	57%	94%	75%	97%

A remarkable observation was that farmers using LiaB used less, but more balanced, fertilisers. The partners using LiaB (farmer center, Usain Gishu and Bungoma) reported a steady increase in soil testing demands.

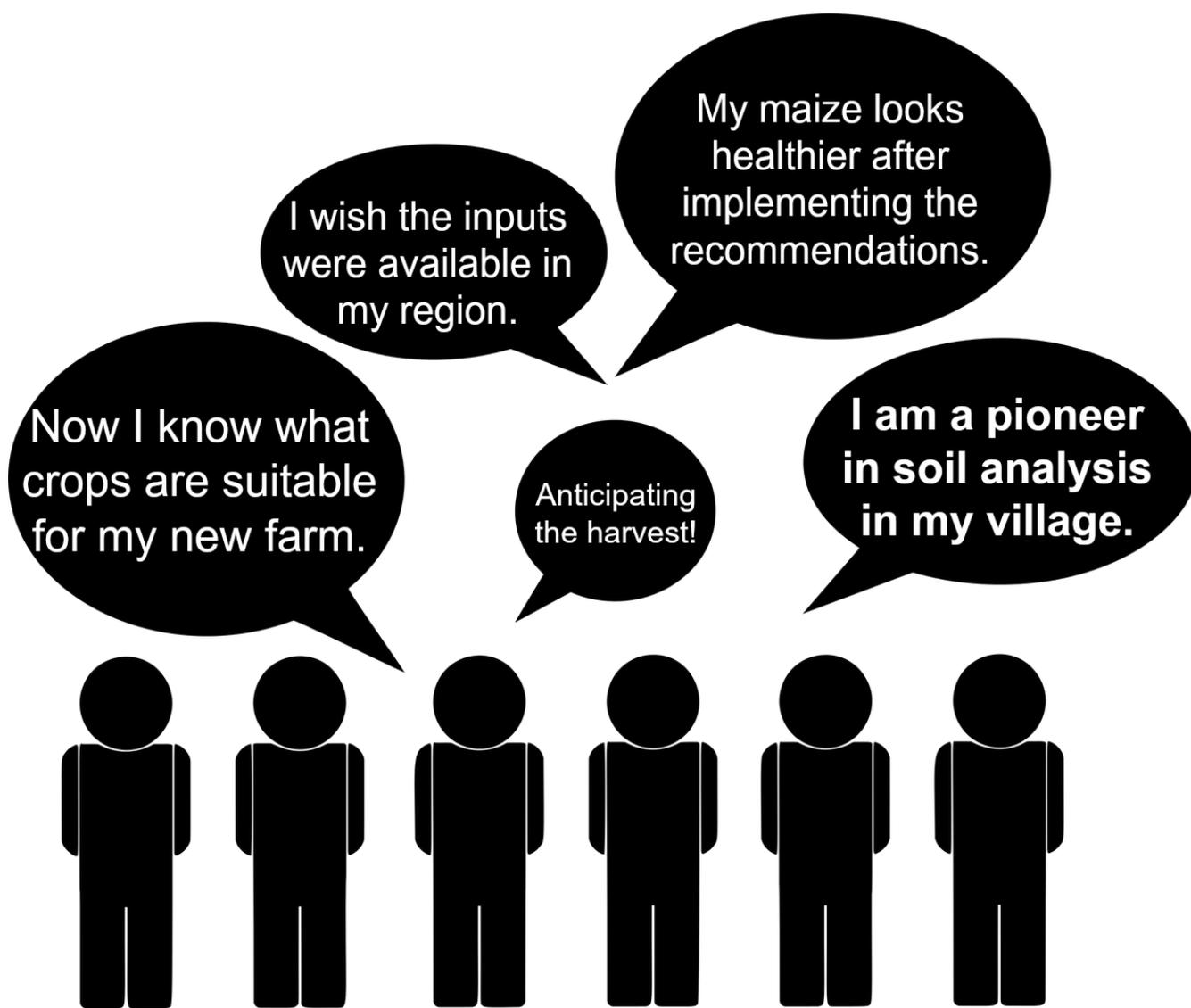
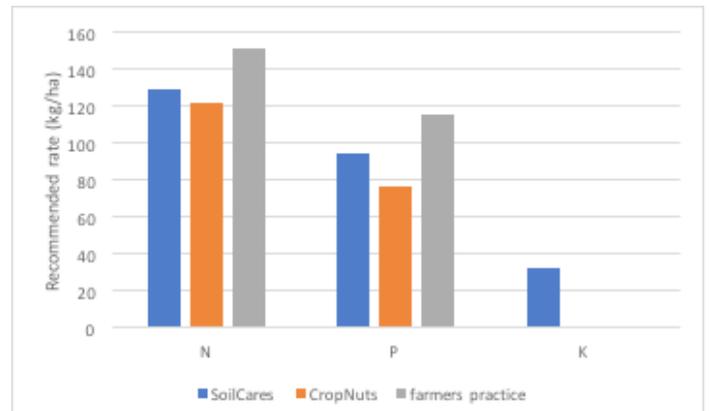


FIGURE 3. QUOTES FROM FARMERS WHO USED SOILCARES' SERVICES.

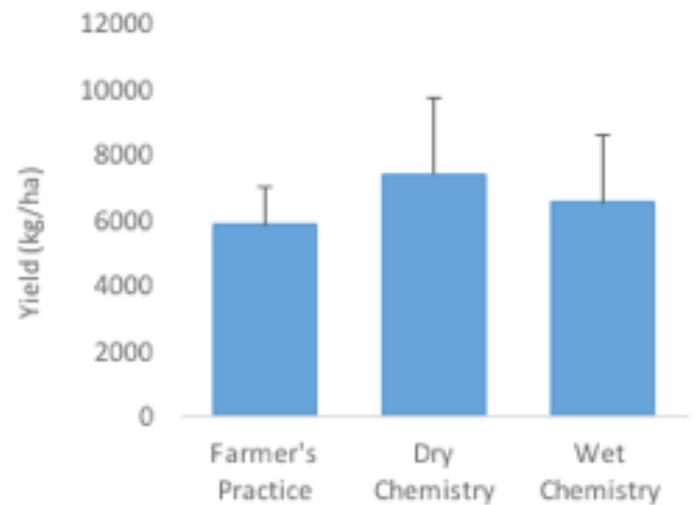
# Field experiment

SoilCares in collaboration with Israel Chemicals Ltd (ICL) conducted field experiments to compare the agronomic and economic effectiveness of recommendations obtained by wet chemistry (CropNuts), sensor technology (SoilCares) and farmers practice. Therefore 2 crops were selected (maize and potato) and CropNuts and SoilCares were requested to provide fertiliser recommendations for a specific target yield of 6500 kg/ha for maize. The experiment showed that the recommendations were very much comparable, except that SoilCares recommended K, which was not the case for CropNuts, nor part of the farmers' practice.

The study revealed **an average yield increase of 126%** compared to conventional practices and no differences compared to wet chemistry results.



**FIGURE 4. RECOMMENDATIONS FROM DIFFERENT SOURCES FOR A SIMILAR SOIL, CROP AND TARGET YIELD.**



**FIGURE 5. RECOMMENDATIONS FROM DIFFERENT SOURCES FOR A SIMILAR SOIL, CROP AND TARGET YIELD.**

# Exposure and publicity

SoilCares Foundation sees it as its responsibility to inform external audience about the vision and results of its activities. Therefore, SoilCares Foundation is a frequent visitor to (inter) national conferences and contributes to on-line discussions by publishing blogs and success stories. A summary of the activities on exposure and publicity is provided in Table 7.

In June 2017 a cocktail party was organised during the AgriTech to celebrate the introduction of the Kenyan market. Scanner Distributor Richard Soy and farmer Peter Chebon shared their experiences. Both were very enthusiastic: Richard saw his business flourish and Peter reported tripling of crop yields.

**TABLE 7. OVERVIEW OF ACTIVITIES ON EXPOSURE AND PUBLICITY CONDUCTED BY SOILCARES**

Activity	Number	Description
Events organized	2	Launch event during AgriTech Nairobi User experience and sharing workshop in Nairobi
Blogs published	2	- Adoption of fertiliser recommendations - Soils and Climate change
Newsletters published	2	
Conferences visited	5	GINN investors forum, February 2017, Amsterdam Syngenta Foundation, February 2017, Basel GLOSOLAN launch, November 2017, Rome ASEAN meeting: September 2017, Brussels ACI European Fertilizer Summit, December 2017, Amsterdam

In September a learning and sharing event was organized to exchange experiences and to train all Scanner partners and Scanner users. The meeting was highly appreciated and contributed to the capacity of SoilCares' partners. It also allowed us to learn from experiences.

In October 2017 the new website of SoilCares Foundation was launched which is clearly linked to the website of SoilCares.



# Funded projects

SoilCares Foundation aims to join projects to

- 1) link to influential stakeholders and
- 2) finance its activities.

At present, SoilCares Foundation is leading one project (Scanning 4 Success) and participates in another project (F4APK).

## Ongoing projects

The Rabobank Foundation funded project “Scanning 4 Success” started in 2016 with the objective to distribute 165 Scanners at a financially attractive package. The project is open to organisations who work with smallholder farmers and can absorb a minimum number of 5 Scanners at a training fee of 500 Euro per Scanner. To date, 50 Scanners were distributed to different organisations. Most of the organisations are inside Kenya, but increasingly also outside Kenya (with approval of Rabobank Foundation).

The RVO funded project Food 4 All (F4APK) is led by Solidaritat and aims to train lead farmers, who in turn will train their fellow-farmers (training of trainers concept). SoilCares Foundation has performed 23 trainings. These trainings increase the demand for soil sampling.

## New projects

Two new projects were granted in 2017.

### Farmer-desired agri-services delivered by youth entrepreneurs

This project is based on a human-centered design (HCD) approach to research the needs & desires of rural farmers, and translating these insights into valuable agri-(e-)services that can be delivered by youth entrepreneurs, leading to improved agri-productivity, farmers income and job creation for youth. We aim to hit three birds with one stone: increased food security, farmers' income growth, and job creation for youth.

The market-oriented and human-centered approach will be conducted by a multi-disciplinary team of HCD & business modelling experts (ProPortion), rural Youth (Vijana Reloaded), soiltesting technology (SoilCares), expertise in available e-farming services & farmer groups (SNV) and Digital marketing expertise (360 Degrees International).

The team will engage with at least 30 farmers, 6 farmer groups, 4 farmer field shops, 6 Agriculture Development agents, vets, 6 NGOs, 6 agri-technology suppliers, 6 e-farming service providers, 3 suppliers of seeds and inputs, 3 wholesale buyers of commodities, relevant ministries at county and national level.

## Kenya Market Thrust (KMT)

The key aim of this project is to trial the business model where most suitable service providers are identified and trained to provide soil-testing as a paid-for service to farmers. The project will be seeking to understand how the model could work, factors affecting or inhibiting the adoption and success of the “soil testing business” among service providers in Kenya.

### Market orientation

To have a sustainable market introduction, it is important to understand the current level of service provision to farmers in the selected areas. SoilCares wishes to make linkages with complementary service providers to provide (near to) ‘total solution packages’. SoilCares will identify current actors in the field of agriculture. The most suitable partner for providing soil testing services is selected on the basis of i) access to farmer networks, ii) commercial skills and understanding, iii) linkages to complimentary stakeholders and iv) vision on commercial agriculture.

### Business Model

Service providers will invest in the SoilCares Scanner and a subscription for 800 Scans. The service-providers will then offer the service to farmers at a fee that allows them to make a margin for every soil test they carry out. For the model to be successful, the service providers should be able to make a reasonable margin while providing the service. A sample business case is attached in Appendix 2. The success of this model will indicate sustainability or viability of the venture and lead to a confident scale-up of the idea across the country.

### Project Activities

Project activities are geared towards marketing the idea to the service providers, promoting the idea to stakeholders and lastly building the capacity development of input providers to promote soil testing among their farmer customers.

# Partnerships



United Nations  
Convention to Combat  
Desertification

SoilCares Foundation was accredited by the UNCCD.

## Training and capacity building

SoilCares Foundation is increasingly aware of the need for trainings. It therefore put substantial efforts to improve its training programme. It is now a standardized, modular programme that is offered at 250 Euro per day for 15 participants.

Each training is linked to a booklet. One more booklet on interpretations of recommendation was produced.

Low resolution booklets are shared free of charge. High resolution booklets are shared at 100 Euro per booklet and modifications are made for 250 Euro per booklet.



### SoilCares Training Package

Learn to know your soil!

#### Soil: the invisible resource

Soil is the most important, yet invisible resource of millions of farmers worldwide. Yet, soils often do not receive the attention it deserves; it is complex and its functioning is not visible for the human eye. SoilCares Foundation makes soil visible and builds the capacity of land managers worldwide. Join our training and become your own soil expert.

#### Practice makes perfect

For practical learning experience counts. In all our trainings we go out to the field, in many cases using the SoilCares Scanner to put knowledge in the hands of the practitioners. See [www.soilcares.com](http://www.soilcares.com).

#### The SoilCares Training Package

SoilCares Foundation has developed a dedicated training package covering different topics and using different training methods; what we learn we bring into practice! SoilCares Foundation offers the following trainings:

- soil testing
- soil sampling
- soil fertility
- soil testing and interpretation
- introduction to soil science

Our trainings score 4.8 out of 5<sup>(1)</sup>

#### Knowledge in your hands: the soil Scanner

We use the state of the art technology to assess soil fertility status. Know your soil status with one click!



"Now I know how to handle my soil!"

#### Book your training now

SoilCares offers its training as a modular package at 250 Euro (ex. works) for a 1 day training for 15 participants including training material, booklets, certificates and evaluations. For questions and bookings please contact [info@soilcaresfoundation.com](mailto:info@soilcaresfoundation.com).



Per September 2017, n = 55



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