SOIL VALUES

MAINSTREAMING SUSTAINABLE SOIL MANAGEMENT IN THE SAHEL

SOIL VALUES PROGRAM NEWSLETTER

NUMBER 04

Kingdom of the Netherlands

IFDC Developing Agriculture from the Ground Up

SNV

WAGENINGEN UNIVERSITY & RESEARCH

AGRA Sustainably Growing Africa's Food Systems

IITA Transforming African Agriculture

IWMI International Water Management Institute

ISRIC World Soil Information

CIFOR

World Agroforestry

TABLE OF CONTENTS

MESSAGE FROM THE DIRECTOR OF THE SOIL VALUES PROGRAM..... 1

CONSORTIUM MEMBER HIGHLIGHT..... 2

AGRA: Strengthening Sustainable Agriculture and Soil Health in the Sahel

NEW PARTNERSHIP TO ENHANCE SOIL HEALTH AND SUPPORT 1.5 MILLION FARMERS..... 4

FOCUS ON MAJOR THEMES..... 5

In West Africa, Rural Women Are at the Forefront of Change through Soil Enhancement

Agricultural Technologies Enhancing Soil Health and Fertility in the Sahel

REFLECTIONS ON THE INTERVENTIONS OF SOIL VALUES 9

Improving Soil Health and Fertility, Thanks to Barbary Plante Technology

Soil Values Strengthens Agricultural Entrepreneurship Among Young People in Northern Nigeria

Fostering New Rural Ambitions In the Sahel

Accelerating the Adoption of Organo-Mineral Fertilizers in West Africa

Strengthening the Capacities of Agricultural Stakeholders through the SoilSmart Online Course

Restoring Soil Fertility with Local Inputs in Niger

PARTICIPATION IN SAHEL AGRICULTURAL EVENTS..... 22

Toward a Harmonization of Tools for Measuring Agronomic Gains in West Africa and the Sahel

The Soil Values Program Strengthens Its Partnerships at agrofood 2026

The Soil Values Program Showcases Practical Innovations at IDR's 50th Anniversary Celebration

RESOURCES..... 27

MESSAGE FROM THE DIRECTOR OF THE SOIL VALUES PROGRAM

SOIL VALUES PROGRAM VISION FOR 2026

Dear partners, colleagues, and stakeholders in agricultural development,

As of 2026, the Soil Values program is driving an unprecedented momentum for sustainable soil fertility and health management in the Sahel. As the region faces major challenges related to land degradation and food security, it is now benefiting from new initiatives and partnerships designed to strengthen soil health and directly support the livelihoods of 1.5 million Sahelian farmers.

Our vision is grounded in an integrated and collaborative approach in which institutional, private, and community-based stakeholders each contribute their expertise and resources. Strengthening partnerships is central to this strategy. It enables us to align actions, share data and best practices, and mobilize the resources required to achieve sustainable results.

We warmly acknowledge and appreciate the commitment of our partners, whose efforts are making the Soil Values program a true driver of innovation and transformation for Sahelian agriculture. Thanks to this collective work, farmers are gaining increased access to appropriate technologies, training, and participatory approaches that strengthen their autonomy and resilience to climate risks. The current Middle East crises reveal again that building an integrated and sustainable fertilizer management approach is the best way to strengthen the resilience of farmers.

In 2026, we remain fully committed to serving rural communities, promoting sustainable agricultural practices, and contributing to a more prosperous and resilient Sahel. This message is a call to continue working together, in a spirit of collaboration and innovation, to ensure that our actions deliver concrete and lasting impact on the lives of farmers and the future of our soils.

With kind regards,

Alain Sy Traoré
Directeur du Programme Soil Values

AGRA: STRENGTHENING SUSTAINABLE AGRICULTURE AND SOIL HEALTH IN THE SAHEL

Founded in 2006, AGRA is an African-led, African-based institution that puts smallholder farmers at the heart of the continent's agricultural transformation. It works to move subsistence farming into successful agribusinesses that improve livelihoods and strengthen food security. Operating in 12 countries, AGRA fosters inclusive agricultural growth by collaborating with governments, the private sector, and local institutions.

As a knowledge partner of the Soil Values program, AGRA provides technical expertise, policy support, and field-proven approaches to promote sustainable agriculture, restore soil fertility, and strengthen the resilience of smallholder farmers in three of the program's four intervention countries: Burkina Faso, Mali, and Nigeria. These activities are aligned with AGRA's four strategic pillars: public policy and government capacity building, seed systems, sustainable agriculture, and inclusive markets, trade, and finance.

Country Approach: Strengthening Local Systems in Burkina Faso and Mali

AGRA's interventions in Burkina Faso and Mali combine community-level actions with the strengthening of national systems. In Burkina Faso, AGRA supports projects such as PRORES, implemented by TREE AID, to promote integrated soil fertility management, agroforestry, and climate-resilient agricultural practices in degraded areas. This approach mobilizes village advisors, women's cooperatives, and producer groups to encourage the adoption of improved inputs and sustainable land-use techniques. In Mali, AGRA collaborates with the Institute of Rural Economy (IER) and national authorities to improve soil mapping, guide land-use planning, and strengthen agricultural advisory services and input distribution through agricultural distributors. By linking field innovations with institutional reforms, AGRA supports these two countries in developing more sustainable and productive agricultural systems.

Accelerating Fertilizer Innovation in Burkina Faso

AGRA's support to the Institute of Environmental and Agricultural Research (INERA) enabled the development and validation of two fertilizer formulas adapted to the crops and soils of Burkina Faso: NPK 12-30-10 for rice and NPK 12-30-10-4.5 CaO for maize. These innovations resulted in yield increases of up to 30% for maize and over 10% for rice during demonstration trials. More than 17,000 farmers have already tested these fertilizers, while the Ministry of Agriculture has ordered over 4,000 tons for nationwide deployment.

Demonstration plots, farmer training, and a strategic distribution model involving agricultural distributors and village advisors have made this program a major driver of agricultural transformation. AGRA's collaborations demonstrate that targeted soil fertility solutions can produce systemic results: improved food security, increased farmer incomes, and reduced reliance on widespread fertilizer recommendations.

Supporting Regional Alignment through the Africa Fertilizer and Soil Health Action Plan

As a technical and consultative partner of the Soil Values program, AGRA supports regional dialogue on soil health and fertilizer sector development, in line with the Africa Fertilizer and Soil Health Action Plan (2023–2033). Through its participation in platforms such as the Africa Food Systems Forum and its collaboration with stakeholders at national workshops in Burkina Faso and Mali, AGRA contributes to knowledge sharing, political engagement, and regional coordination. These exchanges strengthen the momentum around integrated soil fertility management, efficient fertilizer use, and the establishment of regulatory frameworks adapted to local realities.

From Field Action to Systemic Impact

AGRA's work within the Soil Values program exemplifies a systemic approach to sustainable soil management, linking local innovation and institutional reform. By connecting producer-centered interventions to public policies and markets, AGRA helps increase productivity while sustainably preserving soil health. At the national level, these efforts contribute to building more resilient food systems and inclusive rural development.

Strategic Pillars for Lasting Impact

AGRA's action is based on four interdependent pillars:

- Public Policies and State Capacities: Support for the design and implementation of effective agricultural policies.
- Seed Systems: Expanded access to quality seeds adapted to the climate.
- Sustainable Agriculture: Promoting environmentally friendly practices, restoring soils and improving yields.
- Inclusive Markets and Trade: Strengthening value chains, market access and finance for small producers.

For more information: www.agra.org

NEW PARTNERSHIP TO ENHANCE SOIL HEALTH AND SUPPORT 1.5 MILLION FARMERS

The Soil Values program has taken another step in its commitment to soil restoration in West Africa and the Sahel through a strategic partnership with the Regional Hub for Fertilizers and Soil Health for West Africa and the Sahel. The two initiatives formalized this collaboration on February 26 by signing a Memorandum of Understanding (MoU) aimed at strengthening the coordination of actions to promote soil health in the region.

This agreement will align the efforts of the Soil Values program, which operates primarily in the Sahel, with the Regional Hub's technical expertise and regional functions. The objective is to improve the complementarity of interventions, avoid duplication of initiatives, and maximize the impact of actions carried out on the ground. Through this partnership, the two initiatives aim to restore 2 million hectares of degraded land and improve the livelihoods of 1.5 million smallholder farmers in West Africa and the Sahel. The collaboration also relies on a consortium of technical partners, including the International Fertilizer Development Center (IFDC), the International Institute of Tropical Agriculture (IITA), the African Plant Nutrition Institute (APNI), Mohammed VI Polytechnic University (UM6P), OCP Africa, and ISRIC–World Soil Information.

The MoU was signed at IITA headquarters in Ibadan, Nigeria, by Alain Sy Traoré, Soil Values Program Director, and Dr. Bernard Vanlauwe, Deputy Director General for Research for Development (R4D) at IITA. For both institutions, this collaboration marks an important step toward a more integrated and coordinated approach to sustainably improve soil health in the region. This partnership aligns with the dynamics of regional frameworks for soil health, notably the Lomé Declaration on Fertilizers and Soil Health (2023), the Nairobi Declaration (2024), and the Economic Community of West African States (ECOWAS) Soil Health Roadmap (2023–2033). It also establishes an operational framework to strengthen joint planning, data sharing, and coordinated implementation of actions across different countries.

Under this agreement, the two initiatives will focus their efforts on four areas of collaboration: sharing data and knowledge, strengthening the capacities of agricultural advisory institutions and systems, engaging in policy dialogue to promote soil health, and jointly mobilizing resources to support investments in this area.

https://ifdc.org/2026/03/06/new-partnership-to-strengthen-soil-health-and-secure-livelihoods-for-1-5-million-sahelian-farmers/

IN WEST AFRICA, RURAL WOMEN ARE AT THE FOREFRONT OF CHANGE THROUGH SOIL ENHANCEMENT

During International Women's Month, IFDC celebrates the voice, leadership, and resilience of rural women in West Africa – women who, through their knowledge, solidarity, and action, are driving sustainable agriculture and inclusive development. In Burkina Faso, Mali, Niger, and northern Nigeria, these women are strengthening their leadership skills, improving their farming practices, and developing more resilient livelihoods with support from the Soil Values program.

Through practical participatory training, women farmers, cooperative leaders, and entrepreneurs acquire skills that go beyond production, advancing gender equality and women's empowerment in agriculture, in line with Sustainable Development Goal 5: Gender Equality. The Soil Values program organizes these training sessions in its countries of operation in collaboration with existing projects and programs in the Sahel, such as the Agri-Food Program for Integrated Resilience and Economic Development in the Sahel (Pro-ARIDES), the Food Systems Resilience Program (FSRP), and others.

From leadership and organizational governance to sustainable soil management and climate-smart agriculture, the Soil Values program equips women with knowledge they can immediately apply within their communities. Women trained by the Soil Values program adopt innovative practices, such as organic soil inputs, natural pest management solutions, and collective approaches to savings and income generation. These practices help improve productivity, product quality, and household incomes while conserving natural resources in increasingly fragile environments.

With Soil Values, women play an active role in soil restoration. As key players in agricultural development, they strengthen their skills and adopt innovative and sustainable practices, making concrete contributions to soil restoration and preservation.

FOCUS ON MAJOR THEMES

Advancing Gender Equality through Agricultural Training

Participants in the program's multi-day training sessions exchange information on fertilizer use, focusing on the production of organic fertilizers. The first few days are generally devoted to theory, while the following days focus on practical application, including the production of bokashi, an organic fertilizer composed of several elements. Rosalie Dabiré, a farmer in Burkina Faso, found bokashi production to be one of the main benefits of the training. Yacine Sanou Ouattara, also from Burkina Faso, remarked on post-training experiments on tomato cultivation using Barbary Plante technology, which showed encouraging results with visible progress in the nursery and faster plant development.

Aissa Koubra Seydou, a farmer from Niger, described her experience based on the knowledge she has acquired, saying, "We have seen a great improvement in our agricultural activities. Compared to previous years when we did not use bokashi, we applied it this year, and the difference is clear: our crops have yielded well, and the harvest is greater than in previous years. We believe that with this innovation, we can double, or even triple, our yields."

Sophie Dembélé, a farmer in Mali, observed how the training has enabled other farmers like her improve their agricultural practices and find solutions to soil degradation. Sophie also feels better equipped to face the challenges facing her land, especially in a context of increasingly depleted soils.

Strengthening Leadership in Local Communities

Beyond technical skills, the impact of Soil Values is both personal and collective. The women report renewed confidence, strengthened collaboration, and a shared commitment to passing on what they have learned so that others can benefit. Diao Kadiatou Tall, President of the Professional Association of Rural Women (ASPROFER) in Mali, reflected, "We learned a great deal from the Soil Values program, particularly regarding leadership. Although we are active in organizations and cooperatives, sometimes we think we know everything, whereas being a good leader requires real learning."

By fostering leadership development among rural women, the program helps ensure that women not only participate in agricultural value chains but also play a central role in decision-making, management, and community development. "This training allowed me to do a real introspection on my role within my association. It helped me to get to know myself better, to strengthen my self-confidence, and to improve the management of our organization to progress collectively," said Diao.

Ogechi Okebugwu, Program Coordinator at the Small-Scale Women Farmers Organization in Nigeria, stressed that the inclusive approach of the Soil Values program is essential so that women, the main actors in agricultural production in many African countries, can make their voices heard, express their needs, and actively contribute to finding solutions to address the challenges related to agriculture and sustainable soil management.

Supporting Women Leaders in the Agriculture Sector

During International Women's Month, IFDC celebrated the achievements of women farmers, whose stories demonstrate that empowering women with knowledge, confidence, and leadership opportunities strengthens entire communities. By fostering leadership development among rural women, it ensures they not only participate in agricultural value chains but also play a central role in shaping decisions, managing organizations, and driving community development.

https://ifdc.org/2026/03/16/rural-women-leading-change/

AGRICULTURAL TECHNOLOGIES ENHANCING SOIL HEALTH AND FERTILITY IN THE SAHEL

The Soil Values program continues its commitment to restoring soil fertility in West Africa by providing agricultural stakeholders with a series of fact sheets dedicated to proven, innovative technologies adapted to local conditions. Available in French and English, these fact sheets are a key resource for improving access to information, strengthening technical capacities, and encouraging the adoption of sustainable agricultural practices. Developed by the Soil Values Technical Team, the published fact sheets cover a range of agricultural practices and tools used in the program's intervention areas, including the following.

The Zainer is a relatively unknown but very promising technology for improving soil structure. It is an innovative agricultural tool that mechanizes the traditional practice of zaï, a technique originating in the Sahelian regions of Burkina Faso that uses pits to control runoff, promoting deep root development, stabilizing soil structure, and restoring the productivity of degraded land. Despite its numerous advantages, zaï itself is manual in nature, limiting its widespread adoption: hence the appeal of the Zainer, whose rotating auger under its handles creates zaï basins.

Neem-based biopesticide is a natural and accessible solution for crop protection. Obtained from fresh neem leaves, it acts as a natural insecticide, fungicide, and repellent, while preserving human health and the environment. Its active ingredient, azadirachtin, disrupts the growth, reproduction, and feeding of harmful insects without affecting beneficial organisms.

Bastol is a local fertilization product that utilizes available biomass. It is a liquid biofertilizer and pesticide produced by the controlled fermentation of organic matter, water, and microorganisms. It enriches the soil with essential nutrients, stimulates biological activity, improves soil structure and aeration, and increases its water retention capacity. Easy to produce from local resources, Bastol is a simple, inexpensive solution particularly well-suited to smallholder farmers facing poor or degraded soils. Its manufacturing process is reproducible at low cost, making it an accessible and inclusive technology.

A biodigester is a sealed device that enables the anaerobic (oxygen-free) decomposition of organic matter, such as manure and animal waste, and produces biogas and biofertilizers. This technology offers an ecologically sound, economical, and sustainable solution for smallholder farmers. It is integrated into climate resilience and food security strategies and contributes to soil fertility and the energy transition in rural areas.

Bokashi is an organic amendment of Japanese origin, obtained through the fermentation of organic matter. Rich in nutrients and beneficial microorganisms, it is easy to produce and particularly well-suited to small-scale farmers.

Tomato nursery demonstration plot for testing barbary plant technology, Mouhoun Watershed, December 22, 2025, Bagassi, Burkina Faso.

FOCUS ON MAJOR THEMES

Barbary-Plante Biofertilizer is a water-retaining fertilizer innovation that improves water management in soils. This agricultural amendment combines conventional fertilizers encapsulated in a biodegradable, super-absorbent hydrogel. This technology helps improve fertility of the soil, strengthen its resilience to water stress, and optimize its water use.

Some of these technologies, such as the Zainer or Barbary-Plante, are new or still not widely used in rural areas. Documenting them makes it easier for producers, farmers' organizations, NGOs, and agricultural technicians to understand, disseminate, and adopt them.

Content Validated by Communities and Distributed

All the technologies presented have been tested and validated by farming communities in Soil Values' intervention areas. This participatory process ensures the relevance, feasibility, and effectiveness of the recommended practices.

The program has also disseminated these technologies through numerous regional and local agricultural events, providing opportunities for exchange, learning, and capacity building for hundreds of stakeholders in the sector.

The fact sheets are now available online on the Soil Values page, offering free and easy access to farmers, technicians, researchers, and partners wishing to deepen their knowledge of soil restoration practices. Through these tools, the Soil Values program is strengthening its role in promoting sustainable agricultural technologies adapted to local contexts and capable of addressing the challenges of soil degradation in West Africa.

https://ifdc.org/resources/technical-fact-sheets-to-improve-soil-health/

Barbary Plant technology installed at the base of a pepper plant in an experimental plot to assess its potential for improving soil health and crop yields, Kou Watershed, January 2026, Bobo-Dioulasso, Burkina Faso.

IMPROVING SOIL HEALTH AND FERTILITY, THANKS TO BARBARY PLANTE TECHNOLOGY

Barbary Plant technology prepared for tomato transplanting in an experimental plot, Mouhoun Watershed, December 22, 2025, Bagassi, Burkina Faso.

In Burkina Faso, the Soil Values program supports farmers in experimenting with innovative solutions to improve soil fertility, water management, and agricultural productivity. Among these solutions is Barbary Plante technology, tested through several field trials, notably in Bagassi and Bobo-Dioulasso. Although conducted in different contexts, these initiatives share a common goal: to strengthen the resilience and performance of agricultural systems in the Sahel.

In the commune of Bagassi, about 220 kilometers west of Burkina Faso's capital of Ouagadougou, field trials are underway to evaluate the impact of Barbary Plante technology on tomato cultivation. The project is taking place on a demonstration site comprising 16 individual plots, divided into four replication groups and four treatment groups. Four types of plots have been established: a control plot, a plot receiving the normal recommended dose of Barbary Plante, a plot receiving 75% of this dose, and a plot using the nitrogen, phosphorus, and potassium (NPK) mineral fertilizer commonly applied during the dry season.

Each plot contains 32 tomato plants, spaced 50 centimeters apart within the row and 80 centimeters between rows. The objective is to compare the performance of different practices in terms of plant growth, soil fertility, and water management.

To better observe early stage differences, nurseries were also established both with and without Barbary Plante application. The initial results are already encouraging.

According to Ziminansan Sieza, president of the Vanoussan Association, the seedlings from the nursery treated with Barbary Plante are more advanced in development. "The nursery using Barbary Plante is clearly more developed than the one without Barbary Plante," he explained.

Observations will continue until the production phase to evaluate yields and agronomic performance.

REFLECTIONS ON THE INTERVENTIONS OF SOIL VALUES

Bobo-Dioulasso Trials Conducted Directly by Farmers

In Bobo-Dioulasso, the approach is different. Here, the experiment is conducted directly on farmers' plots under the supervision of agricultural agents to compare the results obtained with and without the Barbary Plante technology under real-world production conditions, applied to tomatoes, peppers, and corn. Local farmer Fernand Sanou established two plots: one using the Barbary Plante and the other following conventional farming practices.

Observations during a period of irrigation disruption revealed notable differences. "We had a pump break down, and before the repair, the plants in the control plot had already begun to wilt," he explained. In contrast, the plants in the plot treated with Barbary Plante fared better thanks to the soil's improved water retention capacity.

Other producers have also conducted trials. Yacine Sanou Ouattara carried out an experiment on tomato cultivation after receiving training from the Soil Values program in Houndé. She reported that the plants treated with the technology showed rapid development, with fruit appearing as early as 35 days after transplanting, while the control plot only showed flower buds.

A Technology Deemed Promising by Agricultural Stakeholders

For Serge Kambiré, promoter of the Barbary Plante technology, these trials offered a valuable opportunity to demonstrate the potential of this innovation to producers and stakeholders in the agriculture sector. "This experience has been very beneficial. It has allowed producers, agricultural agents, and other stakeholders in the sector to discover firsthand what the Barbary Plante technology is and to appreciate its performance," he pointed out.

Agricultural agents like Wekpouri Dabiré share this view. After observing the plots, he said he believes that the treated plants appear more robust, having already developed flower buds and the first fruits.

For many of the farmers involved, these trials represent their first experience with Barbary Plante. Producer Moussa Sanou expressed satisfaction with the initial results and encouraged the continuation of the experiments.

As the trials continue through to the final harvest stage, Soil Values and its partners and participants hope that the results will lead to wider promotion of this innovation, with the objective of contributing to the sustainable improvement of soil fertility and soil health in Burkina Faso and the wider Sahel region.

https://ifdc.org/2026/04/13/improving-soil-health-and-fertility-in-burkina-faso-with-barbary-plante/

SOIL VALUES STRENGTHENS AGRICULTURAL ENTREPRENEURSHIP AMONG YOUNG PEOPLE IN NORTHERN NIGERIA

The Soil Values Program supports young people by providing kits for producing organic soil amendments and managing nurseries.

The Soil Values program recently equipped young entrepreneurs in northern Nigeria to launch compost and tree nursery businesses that can rebuild depleted soils, expand access to organic inputs, and strengthen climate resilience at the community level. On March 10-13, the program trained youth community interest groups in entrepreneurship, compost production, and nursery management, pairing skills with basic resources to help groups start local production units and nurseries.

Delivered in collaboration with the World Bank-funded Agro-Climatic Resilience in Semi-Arid Landscapes (ACReSAL) and Livestock Productivity and Resilience Support Project (L-PRES), this training reflects a deliberate shift from simple information transfer to youth-led enterprise development of localized production systems.

The sessions therefore empowered participants not only with knowledge but also with practical equipment, including wheelbarrows, watering cans, and other tools needed to establish organic fertilizer production and nursery businesses.

In total, 48 participants representing 16 community interest groups from Nigeria's Kano, Jigawa, and Bauchi states took part. These groups include 10 compost production groups and six tree nursery groups, whose businesses, once established, will provide smallholder farmers with easier access to organic manure and other fertility inputs needed to boost agricultural productivity. The equipment granted to the trainees will help enable their success as they earn income for themselves while supporting local farmers.

The technical training focused on the fundamentals that make compost production reliable and scalable, including material selection, temperature control, and moisture management. Sessions also covered conventional composting approaches, rapid composting using the Bokashi method, and the use of biochar to improve soil organic matter.

Training on entrepreneurship introduced trainees to business development tools and frameworks, and they developed business ideas, identified target markets, explored customer engagement, and learned revenue diversification.

REFLECTIONS ON THE INTERVENTIONS OF SOIL VALUES

Professor Jibrin Mohammed Jibrin, president of the Nigerian Society of Soil Sciences, emphasized the importance of soil health in addressing productivity and climate change as these young entrepreneurs open their businesses. Healthy soils help retain nutrients and water, improve crop yields, and act as a carbon sink that can mitigate climate change.

Firdausi Aminu Sambo, a trainee from Jigawa State, who represented the Alkalawa Rice Farmers Association, said, "The training equipped us with the knowledge we needed to transform agricultural waste into valuable products."

Sabiu Alhassan, a trainee from Bauchi State, remarked, "The initiative provided us with practical knowledge on soil restoration and sustainable agriculture. We are now prepared to contribute to both environmental sustainability and improved agricultural productivity."

This activity importantly fits within Soil Values' broader ambition to improve soil fertility, reduce yield disparities, and strengthen smallholder resilience to climate shocks across its implementation countries. In northern Nigeria specifically, the program targets approximately 600,000 smallholder farmers (about 50% women) and aims to restore around 800,000 hectares of degraded land - outcomes that depend on practical, locally available soil fertility solutions and the people who deliver them.

By equipping youth groups to produce compost and seedlings locally, Soil Values is turning skills and starter tools into youth-run enterprises that can supply farmers with organic inputs while advancing soil restoration across Kano, Jigawa, and Bauchi.

https://ifdc.org/2026/06/11/strengthening-agricultural-entrepreneurship-among-young-people/

FOSTERING NEW RURAL AMBITIONS IN THE SAHEL

In Burkina Faso, farmers trained in integrated soil fertility management (ISFM) are already transforming their practices and perspectives. Thanks to training offered by the Soil Values program, these farmers are adopting appropriate solutions, improving soil health, and increasing yields. Some are even launching new economic initiatives to benefit their communities.

In 2024, Soil Values initiated a cascading capacity-building effort by training technical agents, in collaboration with partner programs such as the West Africa Food System Resilience Program (FSRP), the Agri-Food Program for Integrated Resilience and Economic Development in the Sahel (Pro-ARIDES), and the Ministries of Agriculture from Burkina Faso, Mali, Niger, and Northern Nigeria. The agents then trained intermediary producers in their communities, who in turn directly reached producers.

In March 2026, the Soil Values teams returned to several farming communities in Burkina Faso to observe the ongoing results of these trainings. Some areas illustrated profound transformation: producers are taking the initiative, innovating, investing, and bringing other local actors along with them. They are building a more resilient and inclusive agriculture sector in the face of economic and climate challenges.

From Field to Entrepreneurial Initiative

In Péni, a commune located 36 kilometers from Bobo-Dioulasso, local farmer Moussa Dao exemplifies this positive action. After his training, Moussa produced 5 tons of bokashi, a fertilizer composed of organic matter, which he used on his field. Given the yields he obtained compared to using only mineral fertilizers, Moussa decided to launch his own organic fertilizer production unit, both to nourish his fields and to share his knowledge with other farmers.

REFLECTIONS ON THE INTERVENTIONS OF SOIL VALUES

Owning the solution, Moussa purchased equipment with his own funds and began operations to train fellow farmers on producing bokashi and to produce enough bokashi to meet his own needs and surplus to sell locally.

Producing Bokashi and Serving the Local Market

In Péni's rural village of Finlandé, Ouattara Issa Jean Baptiste, a young local farmer, embodies the growing commitment of rural youth. In 2025, he received training from a mentor farmer and recognized the value of the practices he was learning. "I saw that it was a good thing. I decided to produce bokashi myself and set up a small garden with tomatoes and okra," he stated. Beyond simply adopting the right practices, Ouattara also emphasized the importance of producing locally, which facilitates easier access to healthy food for consumers and reduces the burden on women, who are most likely to attend markets to shop for their families. "Producing directly here allows women to access products without having to travel long distances, thus saving them money," he said.

Access to water remains a major constraint. "My ambition is to expand the space and mobilize other young people from the village so that we can help each other. But with the difficulties related to water, I need a water tower to produce more and contribute to the country's vision, particularly food self-sufficiency," Ouattara stressed. Nevertheless, he has invested in helpful equipment, including a pumping system for a 27-meter well, to do what he can toward this challenge.

Women Beneficiaries Organize to Produce on a Larger Scale

In Bama, 25 kilometers northwest of Bobo-Dioulasso, Aoua Guindo and other participants have benefited from cascade training as well, specifically on composting, bokashi, and the production of organic pesticides. Organized into a cooperative, they initially experimented with these practices on small plots and observed improved soil fertility and better plant growth.

"After seeing the results, we produced large quantities of bokashi for our onion fields," Aoua noted. Before this training, the cooperative had never produced bokashi at all, but afterward, they produced approximately six cartloads, or about 3 tons, which they used to enrich their soil and improve their yields.

Now, on slightly less than half a hectare, the cooperative produces about six 50-kilogram sacks of bokashi, and they experience no significant post-harvest losses, whereas in the past, such losses had cost them nearly half their production. Their collective organization allows them not only to stabilize production but also to progressively improve their working conditions and income. The sacks of onions, for example, are sold for between 10,000 and 12,000 CFA francs (approximately U.S. $17.92-$21.50), which strengthens their autonomy.

REFLECTIONS ON THE INTERVENTIONS OF SOIL VALUES

Thanks to ISFM, and the cascade training that introduced it to them, producers in Burkina Faso have a set of complementary practices they can combine to suit the specific needs of their plots and the characteristics of their soils. Among the techniques being implemented in addition to bokashi and compost production are stone bunds, which reduce soil erosion, promote water infiltration, and trap sediment; the zaï technique, which involves filling small holes with compost or manure before sowing to concentrate water and nutrients around seedlings; and other methods chosen according to production objectives and soil type.

This flexibility enables farmers to optimize the fertility of their land while strengthening the resilience of their farms to climatic and environmental pressures. These techniques improve yields, restore degraded soils, and promote soil fertility.

As seen in the inspiring stories of Moussa, Ouattara, Aoua and her cooperative, and many others like them, the Soil Values program demonstrates that restoring soil fertility and health can become a major driver of economic and social transformation in rural Sahelian communities. By championing local ownership of innovations, agricultural entrepreneurship, and the engagement of young people and women, the program helps to foster a new generation of producers capable of building agricultural resilience.

In the Sahel, these successes show that when knowledge is put into action, soils regenerate and ambitions grow.

https://ifdc.org/2026/05/20/fostering-new-rural-ambitions-in-the-sahel/

ACCELERATING THE ADOPTION OF ORGANO-MINERAL FERTILIZERS IN WEST AFRICA

With fertilizer supply disruptions and rising input costs continuing to pressure farming systems, strengthening locally adaptable soil fertility solutions is more urgent than ever. In response, the Soil Values program organized a tree-day Training of Trainers on organo-mineral fertilizers on March 30-April 1 in Lomé, Togo, to build strong regional pools of trainers and technical specialists ready to support production, quality assurance, and adoption at scale across the Sahel region.

The Training of Trainers gathered 39 experts drawn from Soil Values field teams, implementing partners, government technical services, and major regional initiatives, including the Agri-Food Program for Integrated Resilience and Economic Development in teh Sahel (Pro-ARIDES) program funded by the Dutch Government and several World Bank-supported projects, such as the Livestock Productivity and Resilience Support Project (L-PRES), Agro-Climatic Resilience in Semi-Arid Landscapes (ACReSAL), and the Food System Resilience Program (FSRP).

This mix of public, private, and development actors reflects a shared interest in practical solutions that can improve soil health while supporting productivity and resilience across the Sahel. Designed as an interactive and participatory course, the training sessions helped participants deepen their knowledge of organo-mineral fertilizers, from definition and regulatory framework to formulation, production techniques, and quality control. Discussions also addressed environmental and climate challenges, as well as public policies governing the use of these fertilizers.

Organo-mineral fertilizers combine locally available organic resources with mineral fertilizers. They are increasingly recognized as a pathway to improve nutrient use efficiency, strengthen soil organic matter, and enhance the resilience of farming systems to climate variability.

For Dr. Alimata Bandaogo, Soil Values Deputy Program Director, Technical, the training marked an important milestone in building regional capability: "At the end of the training, we were able to strengthen the capacity of our stakeholders regarding the various materials needed to produce these fertilizers, their characteristics, as well as the analytical methods and regulations governing their production."

Participants echoed the value of the exchange. Ahmadou Oumarou, Soil Values focal point in Tahoua, Niger, praised the level of expertise at the sessions and noted, "We leave feeling strengthened and convinced that this knowledge will be very useful in the field."

REFLECTIONS ON THE INTERVENTIONS OF SOIL VALUES

Beyond technical information, the training highlighted the economic opportunities linked to the development of organo-mineral fertilizers. Aly Traoré, representative of HortiPlus Burkina Faso, stressed the importance of a structured approach: "We learned that three key steps are necessary: exploring the types of organic fertilizers, improving them, and then scaling them up."

In an international context marked by crises affecting fertilizer supplies, particularly in Europe and the Middle East, this initiative is even more relevant because it also addresses environmental and political issues. Rokia Coulibaly Daou, Soil Values focal point in Ségou, Mali, underscored the importance of coordinated advocacy: "We must play an active role in influencing policies so that they better integrate organo-mineral fertilizers." Because the core objective of the Training of Trainers was to ensure that technical information and practical skills move quickly from regional learning to national action through a cascade approach, trainers were equipped to adapt organo-mineral fertilizer options to local farming systems and resource levels.

After a detailed walk-through of the organo-mineral fertilizer manufacturing process, the sessions concluded with a certificate ceremony to recognize participants' commitment to share and apply the learning in their respective countries.

In the coming months, Training of Trainers participants will conduct national knowledge sharing sessions with agricultural actors, according to defined templates and in consultation with Soil Values, to accelerate the adoption of organo-mineral fertilizers and contribute to a sustainable transformation of agricultural systems in West Africa. Through this initiative, the Soil Values program is reaffirming its key role in promoting innovative and sustainable solutions to improve soil fertility, strengthen the resilience of agricultural systems, and support economic development in the region.

https://ifdc.org/2026/05/08/accelerating-the-adoption-of-organo-mineral-fertilizers/

STRENGTHENING THE CAPACITIES OF AGRICULTURAL STAKEHOLDERS THROUGH THE SOILSMART ONLINE COURSE

Agricultural extension agents and partner-organization staff in northern Nigeria are better equipped to promote sustainable soil management after completing the SoilSmart online course, supported by the Soil Values program. Developed by Wageningen University and Research (WUR) and delivered through the TalentLMS platform, the course strengthened participants' practical and technical knowledge through its alignment with the program's agroecological approach and its push for more resilient, productive farming systems.

Organized as a single module with progressive sections, the training began with an introduction and pre-test and went on to cover essential topics for day-to-day advisory work and field support, including soil health, fertilization, cover crops and green manures, irrigation practices, agricultural calculations, and principles of adult learning.

Participants were drawn from the Soil Values program's three intervention states in northern Nigeria: Kano, Jigawa, and Bauchi. The cohort included extension agents from state agricultural services: Kano State Agricultural and Rural Development Authority (KNARDA), Jigawa State Agricultural and Rural Development Authority (JARDA), and Bauchi State Agricultural Development Program (BSADP). Staff from partner organizations also took part, including the Centre for Dryland Agriculture (CDA), the Savannah Institute for Sustainable Development (SISDev), Al-Raj Agro Enterprise Limited, Community Advocate for Rural Development (CARD), the Women Empowerment Initiative (WEIN), Agro-Climatic Resilience in Semi-Arid Landscapes (ACReSAL), and the Livestock Productivity and Resilience Support Project (L-PRES). Bringing together this range of institutions encouraged peer learning, practical exchange, and stronger coordination across actors working on sustainable agriculture.

REFLECTIONS ON THE INTERVENTIONS OF SOIL VALUES

WUR delivered the online training between October 2025 and February 2026. Participants worked through lectures and learning materials and completed assignments, quizzes, and assessments throughout the course. Every two weeks, they also joined question-and-answer sessions to reflect on what they had learned, discuss challenges, and explore how to apply new concepts in real-world contexts.

To reinforce learning beyond the screen, the course concluded with a practical field activity. During this final phase, participants visited farms, assessed local production systems, spoke directly with farmers, and developed recommendations grounded in SoilSmart principles. This hands-on component strengthened their ability to analyze farming systems and support producers in adopting more sustainable practices. As part of the overall learning journey, two thematic webinars on agroecology and agroforestry were also organized in March.

The learning sessions generated strong engagement and offered a deeper dive into approaches central to transforming agricultural systems. Participants were required to pass and meet key requirements in the course to earn a certificate.

Beyond certification, the webinars created opportunities for meaningful exchange between experts and practitioners. The learning cycle concluded with a virtual graduation ceremony on March 31, where successful participants received either a Certificate of Excellence, Certificate of Achievement, or Certificate of Participation, based on performance.

Equipped with practical SoilSmart tools, a shared learning experience, and field-tested insights, participants are now positioned to turn sustainable soil management principles into real-world guidance that farmers can apply across northern Nigeria.

RESTORING SOIL FERTILITY WITH LOCAL INPUTS IN NIGER

In Kolar Village, located in Niger's Zinder Region, farmer Ibrahim Inoussa is changing how he nourishes his fields by using locally available ingredients instead of costly external inputs. He farms year-round, growing millet, sorghum, cowpea, and groundnuts in the rainy season, then shifts to irrigated and market crops such as onion, tomato, watermelon, sugarcane, and squash in the dry season.

Like many farmers who depend on the same land season after season, Ibrahim was focused on keeping his system running and finding practical, affordable ways to maintain soil fertility while protecting crop productivity. Crucial to this goal were field-ready skills that he could apply right away and materials he could access locally.

Training That Transforms Practice

An opportunity arose for Ibrahim to gain both when his cooperative recommended him for a series of training sessions in 2024 and 2025 given by the Soil Values program in his village and led by an officer from the Directorate-General for Agriculture. As one of the 20 participants, known as "relay producers," Ibrahim found the sessions meaningful. "The partnership with the Soil Values program was good for us because I benefited from several trainings," he said.

REFLECTIONS ON THE INTERVENTIONS OF SOIL VALUES

Through these sessions, he and his fellow participants were introduced to new options for improving soil fertility and organizing production, including composting, strip cropping (cultivating in bands), knowledge related to certain forage crops, and the production and use of bokashi and bastol (complementary organic inputs created through fermentation that nourish the soil and stimulate plant growth, respectively).

The relay producers saw these principles in practice. "We also benefited from the establishment of demonstration plots for irrigated crops," Ibrahim noted. These plots created space for the producers to observe practices in real field conditions and build confidence before integrating them at their own farms.

Local Inputs Driving Cost Savings and Productivity Gains

One change Ibrahim implemented on his farm after the training has made an especially significant impact: "I make my own compost, which I use on my farm thanks to the knowledge gained during trainings with the program," he said. In fact, before each rainy season, he produces around 23 bags, each weighing 100 kg, and without the need to purchase so much costly fertilizer, Ibrahim now has more funds to pay for farm labor.

Alongside composting, Ibrahim linked bokashi and bastol to a broader shift farmers can control locally. Bokashi and bastol are made from ingredients that are mostly available on their own farms or their immediate surroundings. Materials such as dry leaves, manure, wood ash, wood shavings, and molasses are easily obtainable, and after being trained on the processes, farmers can make and use these organic substances themselves, supporting both their productivity and the health of their soils.

"The partnership with the Soil Values program helped us understand that we can restore the fertility of our soils with ingredients available locally, without major expense, while also helping to fight certain crop pests," Ibrahim remarked.

Improved Yields and Strengthened Livelihoods

Ibrahim is seeing encouraging signs on his farm. "All this knowledge will help us increase the yields of our crops – something we have already observed on irrigated crops," Ibrahim said. "In terms of yields, my family and I are now harvesting much more than before. For example, where we used to harvest 30 baskets of millet and sorghum, we're now able to harvest more than 40 baskets."

While he acknowledged that the millet and sorghum harvests also depend largely on rainfall patterns, Ibrahim pointed out that during the dry season, yields have consistently improved, especially for onions used for seed and bulb production.

As a relay producer, Ibrahim shared the knowledge and skills he gained from the Soil Values training at the village level. He explained, "For the 2025 irrigation season, we brought together 121 young men and women in the village of Kolar and also in two neighboring villages." He added that the work strengthened local support systems too, citing "increased collaboration with agricultural agents through field visits and the adoption of the technologies learned."

Ibrahim revealed his commitment to learning and improving his farming practices through the Soil Values training. Then in passing on his expertise afterward, he created a positive ripple effect. When farmers like Ibrahim can rebuild soil fertility with low-cost local inputs and then teach others, the benefits move beyond one plot and take root across communities.

https://ifdc.org/2026/04/29/restoring-soil-fertility-with-local-inputs-in-niger/

TOWARD A HARMONIZATION OF TOOLS FOR MEASURING AGRONOMIC GAINS IN WEST AFRICA AND THE SAHEL

The development of harmonized tools for measuring agronomic gains brought together the main partners of the Regional Hub for Fertilizer and Soil Health in Accra, Ghana, on January 19-20 as part of a workshop organized by the International Institute of Tropical Agriculture (IITA). This strategic meeting aimed to strengthen common approaches to monitoring agricultural performance in West Africa and the Sahel.

The Soil Values program played a significant role in the workshop. Its involvement was deemed essential in the technical discussions aimed at harmonizing tools for measuring agronomic gains and improving the quality of data collected in the field. This participation confirms the program's commitment to regional initiatives for the sustainable transformation of agricultural systems.

Launched in June 2024 under the auspices of the Economic Community of West African States (ECOWAS), the Regional Hub aims to improve soil fertility, fertilizer efficiency, and agricultural productivity in the region. It places particular emphasis on generating reliable data to measure the real impact of agricultural innovations at the farm level.

Discussions at the workshop focused on the need to develop a common approach to measuring agronomic gains, defined as improvements achieved through the adoption of innovative agricultural practices resulting in better productivity, increased profitability, resource efficiency, and enhanced resilience of agricultural systems.

The partners stressed that the current lack of a harmonized framework leads to divergences in the indicators used by governments, research institutions, and development actors, thus limiting the comparability of results at the regional level.

Tools Focused on Collecting Field Data

Workshop participants agreed that practical and standardized tools would be developed, primarily for field workers, including extension agents, farmers' organizations, and students. Emphasis will be placed on data collection, considered the most critical link in the monitoring process. The tools will be simple, accessible, and structured step by step to facilitate their use in real-world farming conditions.

The system currently under development will be structured around four main indicators: land and crop productivity, input use efficiency, soil health, and the resilience of agricultural systems. These indicators will allow for comparisons between innovative and reference practices, in order to better assess the impacts of interventions.

Toward a Regional Platform for Disseminating Tools

The partners plan to develop a downloadable toolkit, accessible via the Regional Hub platform. This toolkit will be accompanied by an introductory video explaining the concept of agronomic gains and how to use the tools. Dissemination will be supported by webinars and awareness-raising workshops at the regional level. Through this initiative, the Regional Hub and its partners, including the Soil Values program, are reinforcing their commitment to more efficient, sustainable, and resilient agriculture. Harmonizing tools for measuring agronomic gains is a key step in improving agricultural policies, guiding investments, and accelerating the adoption of sustainable practices in West Africa and the Sahel.

THE SOIL VALUES PROGRAM STRENGTHENS ITS PARTNERSHIPS AT AGROFOOD 2026

Members of the Soil Values program, financed by the Netherlands Directorate-General for International Cooperation (DGIS) and implemented by IFDC and its partners, attended the 11th edition of the agrofood Nigeria International Trade Show March 24-26 in Lagos, Nigeria, taking advantage of the high-impact platform to deepen partnerships, showcase practical innovations for sustainable agriculture, and open new opportunities for collaboration with Dutch and Nigerian private sector actors.

The three-day fair brought together more than 130 exhibitors from 17 countries. With the Kingdom of the Netherlands serving as the guest of honor, the event gave added visibility to Dutch innovations in agriculture, food processing, packaging, and technologies linked to horticulture and potato value chains. Alongside partners from Burkina Faso, Mali, Niger, and Nigeria, the Soil Values program connected international solutions with field realities and market needs across West Africa.

As part of the Dutch Trade Mission, the program also enabled business-to-business (B2B) connections for partners from implementing countries.

Focus: Results, Visibility, and Inclusion

Soil Values centered on three goals: showcasing real-world results; strengthening visibility with key stakeholders, including small and medium enterprises, non-governmental organizations (NGOs), donors, processors, and technology providers; and reinforcing the program's inclusive approach by supporting local partners to engage directly with international networks. Partner organizations, such as Agro France Investissements Immobiliers Agricole Solidaires (AFIIAS), Agro Mali Sud, Agro Business Center, and Seed Pro Africa and East West Seed Knowledge Transfer, seized this opportunity to strengthen peer exchange through B2B networking and engage in practical conversations with visitors and prospective partners.

PARTICIPATION IN SAHEL AGRICULTURAL EVENTS

High-Level Engagement and Strong Audience Interest

The Soil Values booth received a visit from Bengt van Loosdrecht, Ambassador of the Kingdom of the Netherlands to Nigeria, who discussed the program's work and commended its contribution to sustainable and inclusive agricultural development in Nigeria.

A representative of Helen Eno-Obareki, the First Lady of Akwa Ibom State (Nigeria), also visited the booth, providing additional institutional visibility and interest in innovations linked to soil health, post-harvest loss reduction, and women's empowerment.

A standout moment that attracted audience interest was the presentation on integrated soil fertility management (ISFM) and integrated solutions that combine organic inputs, mineral fertilizers, biofertilizers, improved seeds, and sound agronomic practices.

Results and Next Steps

Beyond visibility, the event produced actionable outcomes. More than 70 visitors agreed to be recorded in contact logs, expanding follow-up opportunities after the fair. Partners also initiated new discussions, including a potential collaboration between AFIIAS and Seed Pro Africa to establish demonstration plots in Nigeria, with possible expansion to Mali and Niger.

Soil Values also explored pathways with other organizations and companies, while some partners reported direct commercial interest and on-site sales.

Overall, agrofood Lagos 2026 confirmed the value of trade fairs as strategic platforms for scaling collaboration, visibility, and sustainable innovation across the region.

https://ifdc.org/2026/05/12/expanding-partnerships-at-agrofood-nigeria-2026/

THE SOIL VALUES PROGRAM SHOWCASES PRACTICAL INNOVATIONS AT IDR'S 50TH ANNIVERSARY CELEBRATION

On March 26-28, the Soil Values program participated in the 50th anniversary celebration of the Institute of Rural Development (IDR) at Nazi Boni University in Bobo-Dioulasso, Burkina Faso. With the theme "Golden Jubilee of the Institute of Rural Development: Contribution to the Development of Burkina Faso, Challenges, and Prospects," the event convened representatives from government institutions, rural sector actors, researchers, and technical and financial partners.

"In Burkina Faso, we support agricultural stakeholders with innovative solutions that address climate change and improve soil health and fertility," said Bedeme Bayoulou, the Soil Values Field Coordinator in Burkina Faso. "We are pleased to take part in IDR's golden jubilee and to share proven technologies that we make available to farmers."

Moussa Dionou, International Fertilizer Development Center (IFDC) Country Director for Burkina Faso and Mali, underscored IFDC's role as lead partner of the Soil Values program and emphasized the organization's long-term engagement with food security and fertilizer sector development. He noted that increasing awareness of the program helps more smallholder farmers access innovations that can raise productivity and incomes.

The Soil Values booth certainly raised awareness, drawing strong interest as the program highlighted its work to strengthen climate-resilient farming, build the capacity of agricultural actors, and promote technologies designed around farmers' needs.

PARTICIPATION IN SAHEL AGRICULTURAL EVENTS

One high-interest innovation featured at the Soil Values booth was Barbary Plante. This drought-friendly hydro-retentive fertilizer, enriched with nitrogen, phosphorus, potassium, and trace elements, was presented by Agro Energie France Investissements Immobiliers Solidaires (AFIIAS), a program partner specializing in water-retaining fertilizers.

Barbary Plante and other technologies attracted visitors seeking practical solutions to soil degradation and climate pressures. Government officials, agriculture professionals, and many others stopped by to learn more about how these solutions can support healthier soils and more resilient production systems. "We welcomed many visitors who wanted to learn more about the Zaïner [a mechanized implement used to create basins], especially its cost, how it works, and how farmers can access it," noted Sandrine Moyenga, an engineer at Practica.

Christian Somda, technical agent for AFIIAS, representing the company at the event, shared a similar observation: "Visitors showed strong interest [in Barbary Plante] ... We also received positive feedback from partners who have already tested the technology."

Through its participation in this milestone event for the rural and agricultural development sector, the Soil Values program stood alongside IDR and other event participants and partners to reaffirm its commitment to long-term support for rural stakeholders in Burkina Faso by expanding access to practical, innovative solutions for more resilient and productive agriculture.

https://ifdc.org/2026/06/05/showcasing-practical-innovations-at-idrs-50th-anniversary-celebration/

RESOURCES

Optimizing Fertilizer Recommendations in Africa (OFRA) – Analytical Tools - IFDC

https://ifdc.org/resources/ofra-analysis-tools/

Fertilizer and Soil-Health Roadmap for West Africa and the Sahel

https://thedocs.worldbank.org/en/doc/35380715cfe0b7564a1bb6d294594693-0360012023/original/Roadmap-English.pdf

SUPERVISIONS

Haoua Ango Sawadogo
Communication and Knowledge Management Manager, Soil Values Program

Olga Kokodé
Regional Communications Officer - North and West Africa, IFDC

Mariano Dossou-Kpanou
Monitoring, Evaluation, Learning, and Sharing (MELS) Lead, Soil Values Program

EDITING AND DESIGN

Diro Bénoit Wilfried Toe
Communications Coordinator, Soil Values Program

Evariste Léon Gbaguidi
Communications and Knowledge Management Specialist, Soil Values Program

IFDC Global Communications Management Team

CONTRIBUTORS

Jessie Lafourcade-Morena, Senior Regional Communications Officer - West Africa, AGRA

Bundling, Brokering, and Convening Leads, Soil Values Program

Country Coordinators, Soil Values Program

Field Leads and MELS Leads, Soil Values Program

Gender Team, Soil Values Program

Technical Team, Soil Values Program

Partnership Team, Soil Values Program

MAINSTREAMING SUSTAINABLE SOIL MANAGEMENT IN THE SAHEL

Soil Values Program | email: soilvalues@ifdc.org |
ifdc.org/projects/soil-values | youtube.com/@SoilValuesProgram