Breaking New Ground

AFRICAN PLANT NUTRITION INSTITUTE

www.apni.net

Annual Report 2020

Mission and Vision

Vision: Prosperous African farmers sustainably managing crop nutrition to provide consumers with a secure supply of nutritious foods at a reasonable price.

Mission: Enhanced plant nutrition for a resilient and food-secure Africa.

apni AFRICAN PLANT NUTRITION INSTITUTE

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APNI ANNUAL REPORT 2020

FOREWORD

Breaking New Ground

It is a great pleasure to share my thoughts within the first report of the African Plant Nutrition Institute (APNI). Several years ago, the urgency for a more focused approach to improving African agriculture was identified by many stakeholders. This need resulted in the creation of a new independent scientific organization working solely on improving plant nutrition across the African continent.

Faced with considerable challenges of beginning a new Scientific Center in 2019, APNI has already established itself as an emerging leader in addressing pressing scientific and societal issues with other valuable partners.

Africa faces a wide range of issues that limit food production. The Northern part of Africa faces agricultural limitations resulting from reoccurring water stress. Much of Sub-Saharan Africa must cope with crop production constraints from nutrient-depleted soils and degraded landscapes. The lack of adequate knowledge on proper crop nutrition limits farmer productivity in too many areas. The availability of the most appropriate crop nutrients in the market at affordable prices is also a barrier.

I am pleased that APNI has selected three major themes to organize their initial efforts. The first theme tackles the issue of how to improve managing plant nutrients in the era of climate change and increasingly variable weather.

The second theme seeks to improve soil health across the continent in order to restore natural resources and boost farmer health and productivity. The third theme aims to provide tools for farmers to more precisely offer the plant nutrition required for them to thrive. All three of these ambitious themes have great potential to improve the livelihood of African farmers.

We appreciate the support and engagement of the sponsors that have generously contributed to the vision of this new organization.

I would like to address my special thanks to the OCP Foundation and Mohammed VI Polytechnic University for their involvement and provision of resources during the challenging time of APNI's establishment.

APNI's Director General, Dr. Majumdar, has assembled a world-class group of scientists into teams that will allow them to address their mission of enhanced plant nutrition for a resilient and food-secure Africa. This first progress report highlights the impressive accomplishments of this new organization.

I am looking forward to the future of APNI and its success, and I would like to reiterate my support and encouragement for this scientific organization.

Hicham El Habti, APNI Board Chair

Dr. Kaushik Majumdar,
Director General

Message from the Director General

Welcome to the first Annual Report of the African Plant Nutrition Institute (APNI). APNI was established in 2019 to contribute to and strengthen the existing research for development efforts in Africa.

After our predecessor, the International Plant Nutrition Institute (IPNI) ceased operation in 2019, the African Plant Nutrition Institute, generously supported by the OCP Foundation and Mohammed VI Polytechnic University (UM6P), provided a ready home to the three African Programs of IPNI and several of IPNI's multi-national staff engaged in plant nutrition research and education globally.

We recently concluded the first five-year strategy of the Institute that identified three key areas to focus our resources towards innovative and scaled interventions. We envision excellent science supported through farmer-centric co-innovation with public and private sector partners, and a clear focus on outreach and capacity building to support our mission ***"Enhanced Plant Nutrition for a Resilient and Food-Secure Africa."***

The last year and a half was an exciting period of development for us. We extended our strategic partnership network that allowed deeper understanding and engagement in sustainable plant nutrition issues in the Continent. New funding support bolstered our on-going research and outreach initiatives. We organized several events including the ***West African Forum on Precision Agriculture (WAFPA)***. The success of WAFPA led us to plan the ***1st African Conference on Precision Agriculture (AfCPA)*** to connect the science and practice needed to put precision agriculture in action for Africa.

While we were intensifying our activities, COVID-19 triggered the global pandemic. Like many other organizations, this unprecedented event made us rethink and reorient our plans and actions to match the business unusual.

Capacity building is a core part of our strategy and we quickly adapted to a virtual mode to support graduate courses at UM6P, and field operations and training at remote locations. Our plans for AfCPA continued in collaboration with the International Society of Precision Agriculture (ISPA) and UM6P. This unique one conference-multiple site format attracted over 750 participants from more than 50 countries globally. We created the African Association of Precision Agriculture (AAPA) during the event to continue the forward momentum and enthusiasm created by AfCPA.

With the support from UM6P and the OCP Group, we instituted several awards and fellowships in 2020 to recognize outstanding contributions in the field of plant nutrition in the continent. An ***African Plant Nutrition Research Fund*** was also created to support innovative research in African institutions through competitive grants. We strongly believe that these awards and grants will promote scholarships and innovation in the field of crop nutrition, and will initiate transformational change on the ground.

APNI was created at a very opportune time. To address the persistent food and nutritional insecurity and livelihood challenges, Africa will need to consistently produce ample nutritious food and other agricultural commodities through resilient production systems, and improved plant nutrient management will be a critical part of this success. With its competence in contextual crop nutrition, focused on the three well defined thematic areas, APNI will be at the forefront of such efforts, supporting public and private sector partners and farmers, and creating impact through an innovation-knowledge-scaling pathway.

Breaking New Ground provides a glimpse of the newly created APNI, its intended role and commitment to agricultural development in Africa, and its recent progress towards realizing those goals. I also take this opportunity to extend my deep appreciation to our donors, partners and collaborators for their trust in our organization to hasten the momentum of inclusive growth in Africa through better plant nutrition.

Dr. Kaushik Majumdar, Director General

Advisory Committee

We are honoured to acknowledge the guidance from our outstanding Scientific Advisory Committee as we established our initial priorities and direction. Our sincere thanks for their invaluable advice.

MS. FATIHA CHARRADI

Ms. Fatiha Charradi is Vice President of Farming Development for OCP Group. Ms. Charradi graduated as an ICT Engineer from Ecole Mohammadia des Ingénieurs. She holds an MBA from École Nationale des Ponts et Chaussées in Paris, a Certificate in Strategic Management and Geopolitics from HEC Paris, and Certificates in Executive Management and Leadership from MIT in 2014 and 2018. In 2016, Fatiha was selected to participate in the Regional Entrepreneurship Acceleration Program (REAP) of the prestigious MIT University to contribute to the emergence of strong entrepreneurial ecosystems in different regions of Morocco. As an intrapreneur, Ms. Charradi spent 19 years in major Moroccan and multinational companies. Ms. Charradi is also a board member of many national and international institutions, and an active member in many local NGOs and social initiatives.

DR. SIMON COOK

Dr. Simon Cook is a strongly inter-disciplinary scientist with interests in subjects such as digital agriculture, precision agriculture, and the development of sustainable global food and water systems. Trained at Swansea, Reading and Cambridge Universities in in the UK, Dr. Cook moved in 1990 to CSIRO Australia to develop digital methods of soil mapping. During his time at CSIRO, he built a team to develop precision agriculture for grains, grapes and sugar cane. In 2000 he moved to the GIS Group at the International Center for Tropical Agriculture [CIAT] in Colombia, where he was drawn into global-scale research programs to support agricultural development, including the Challenge Program for Water and Food and the CGIAR program on Water, Land and Ecosystems, where he was the inaugural director. In 2016 Dr. Cook returned to Australia to take up a professorship at Curtin and Murdoch Universities as the Western Australian Premier's Fellow, where he initiated research on digital agriculture and on-farm experimentation.

DR. ACHIM DOBERMANN

As Chief Scientist, **Dr. Achim Dobermann** provides strategic scientific advice to the International Fertilizer Association (IFA) and its members on promoting responsible plant nutrition and enhancing nutrient stewardship worldwide. He served as Director & CEO of Rothamsted Research in the UK (2014-2019), Deputy Director General of the International Rice Research Institute (IRRI, 2008-2014), Professor of Soil Science and Nutrient Management at the University of Nebraska-Lincoln, USA (2000-2007), and as a Soil Nutrient Specialist at IRRI (1992-2000). He received his MSc in Tropical Agriculture and PhD in Soil Science from the University of Leipzig in Germany. Dr. Dobermann has over 30 years of field experience working in every region of the world on science and technology for sustainable farming, with particular emphasis on soil science, plant nutrition and agronomy. He has published on a wide range of agricultural issues. He believes that taking risks, working in the field, and being critical and unselfish are the most important things for succeeding in agricultural research.

Advisory Committee

DR. KEN GILLER

Dr. Ken Giller is Professor of Plant Production Systems at Wageningen University. He leads a group of scientists with profound experience in applying systems analysis to explore future scenarios for land use with a focus on food production, including impacts of climate change. Dr. Giller's research focuses on smallholder farming systems in sub-Saharan Africa. Particular emphasis is given to problems of soil fertility and the role of nitrogen fixation in tropical legumes, with emphasis on the temporal and spatial dynamics of resources within crop/livestock farming systems and their interactions. He leads a number of initiatives such as N2Africa – Putting Nitrogen Fixation to Work for Smallholder Farmers in Africa. Dr. Giller is a member of the Unilever Sustainable Sourcing Advisory Board. He is co-chair of the Thematic Network 7 on Sustainable Agriculture and Food Systems of the Sustainable Development Solutions Network (SDSN) of the United Nations. Dr. Giller joined Wageningen University as Chair of Plant Production Systems in 2001 after holding professorships at Wye College, University of London, and the University of Zimbabwe.

MS. LUCY MUCHOKI

Ms. Lucy Muchoki is the Chief Executive Officer of Pan African Agribusiness and Agroindustry Consortium (PanAAC), a Pan African Private Sector organization created to support the African Agribusiness through enhanced productivity and competitiveness in the regional and global market. She is also the coordinator of Kenya Agribusiness and Agroindustry Alliance, the national chapter of PanAAC. She also serves as the National Chair of the Technical Business Committee at the Kenya National Chambers of Commerce and Industries. Ms. Muchoki is a social scientist with a master's degree in strategy and business management. Ms. Muchoki is currently a member of the recently formed African Union task force to support the organization of Regional Agribusiness platform for mobilizing and supporting the domestic private sector in Africa. She has previously served under the Ministry of Industrialization in Kenya, as the private sector member representing Agro-processing. Ms. Muchoki advocates for the inclusion and leadership of the domestic private sector as the driver of agricultural development in Africa. She serves on the board of Micro Small Enterprises Authority, the only institution mandated under the act of parliament authority in supporting the development of the below pyramid companies in Kenya.

DR. MICHAEL WIRONEN

Dr. Michael Wironen is a Senior Scientist at The Nature Conservancy's Center for Sustainability Science. In this role he provides technical and strategic leadership to collaborations with the agri-food sector to drive investment into the sustainable intensification of agriculture. His portfolio includes place-based projects to improve soil health, increase resource use efficiency, and protect habitat in Kenya, Brazil, Argentina, the United States, China, and India. In this role, he has collaborated with companies including Syngenta, Walmart, AB InBev, and McDonald's. As Science Lead for the Syngenta collaboration, Dr. Wironen helped secure and structure Syngenta's $2 billion commitment to invest in technology innovation to support sustainable agriculture. Prior to joining TNC, Dr. Wironen worked for a private consultancy, where he led sustainability and climate action projects with an array of private and public-sector clients in the US and Africa. He holds a PhD in Natural Resources Science from the University of Vermont and has published on nutrient cycling in forests and agroecosystems, among other topics.

▶ CLICK TO WATCH OUR VIDEO

APNI core competence in plant nutrition research and development is well positioned to activate the fundamental changes needed for sustainable transformation of agricultural systems in Africa.

While many principles of plant nutrition have been well explored, APNI has identified three strategic research and development themes to address major knowledge gaps, and expand farmer-centric plant nutrition concepts in Africa.

1) Climate and Weather-Smart Plant Nutrition;

2) Soil Health for Improved Livelihoods; and

3) Precision Nutrient Management.

OUR STRATEGIC PLAN:
Setting the Path

THEME ONE:

Climate and Weather-Smart Plant Nutrition

Climate change affects plant nutrition, in part, through increasingly variable weather patterns. APNI will explore the consequences of both slowly changing climate trends and the more frequent weather extremes on farming systems and generate strategies on how farmers can adapt plant nutrient management practices to these novel conditions. These climate insights will then be used to provide guidance on

1. how changing weather patterns influence the interactions of crop nutrition and yield, the nutritional quality of food, and soil health;
2. adjusting plant nutrition interventions to variation in weather patterns; and
3. farm management options for reducing the effect of plant nutrition practices on climate change.

THEME TWO:

Soil Health for Improved Livelihoods

This theme brings together existing and new knowledge on the impact of plant nutrition on soil health. The potential of plant nutrition to simultaneously boost soil health and crop quality has not yet been extensively explored. There are many unexploited opportunities for plant nutrition interventions to improve soil health, crop quality, and the nutritional value of human food and livestock feed. However, farmers are unlikely to adopt improved management practices that enhance soil health and crop quality unless there are incentives.

We will also explore how plant nutrients can be managed within healthy agricultural systems and landscapes to sustain yields of more nutritious and better-quality crops. Under this theme, APNI will

1. evaluate the role of plant nutrients in enhancing soil health;
2. develop business models that provide better livelihoods for farmers from healthy soils and greater crop quality associated with proper plant nutrition; and
3. assess how balanced plant nutrition confers benefits through the soil-plant-animal-human health continuum.

THEME THREE:

Precision Nutrient Management

The precision nutrient management theme brings together knowledge from multiple sources (including those generated in Themes One and Two) to provide African farmers with the capacity, information-management tools, the social and economic environment, and other resources required to provide better nutrition for crops. The requisite research and development for precise nutrient management relies on co-innovation with strategic partners from a wide range of agencies and businesses working together.

Research will provide the knowledge required for the establishment of social, policy, commercial, and technical environments that foster enhanced plant nutrition. This outcome will empower farmers to better manage the source, rate, time, and place of crop nutrition within their specific environmental, social, and economic context. Under this theme, APNI will

1. develop protocols and processes for obtaining and analysing information on plant nutrition and its interactions with cropping systems, soil health, crop yield, and product quality;
2. generate data according to the FAIR Guiding Principles;
3. implement decision-support systems for precise nutrient management;
4. establish networks for scaling knowledge and building capacity in precision nutrient management; and
5. identify the reasons for low fertilizer use by farmers to enable changes in policy and infrastructure.

Dr. Shamie Zingore
Director of Research & Development

APNI Research Program

There is growing urgency for innovative and transformative solutions that are better directed to spur and fast-track the growth of agricultural sector and fully harness its potential. Innovation in nutrient management research and development for the heterogenous cropping systems in highly diverse growing condition will be a key catalyst for unlocking this potential.

Our newly developed research program is conceived to offer an innovative and business unusual approach that will deliver effective, practical and actionable interventions for improving nutrient management for the much-needed sustainable transformation of agricultural landscapes in Africa.

APNI's research program has a core focus on working with stakeholders to generate farmer-centric and applied research methodologies to capture and analyse nutrient and agronomic information and translate that knowledge into actionable and scalable practices that are applicable to a wide range of cropping systems. Initially focusing on cereal and tree-based cropping systems, the design and implementation of our research undertakings is guided by a cropping systems framework that aims to identify relevant systems-level plant nutrition interventions with high prospects for impact. The research processes, channelled through a cropping system perspective will also enable the incorporation of farmer knowledge, and address issues of spatial and temporal variation of cropping patterns, the multiple functions of crop production systems, as well as climate, value chain and socio-economic drivers of change.

Despite being a newly established institution, continuation of research projects carried over from our preceding institution has given a head start for our research activities. Against the tide of the unprecedented global challenges in 2020, we marked excellent progress in several projects across the continent.

- The 4R Solutions project implemented in partnership with Fertilizer Canada, Cooperatives Development Foundation of Canada and several other partners in Ethiopia and Ghana was officially launched. We led the successful establishment of diagnostic trials in Ethiopia and Ghana that will be used as basis for developing site-specific nutrient management practices guided by the principles of 4R Nutrient Stewardship.
- In a partnership with The Alliance for Green Revolution in Africa (AGRA) we are spearheading efforts to improve fertilizer recommendations in Kenya with focus on enhancing the use of multi-nutrient fertilizers that provide an improved balanced of nutrient over the commonly applied fertilizers that supply only nitrogen and phosphorus.
- Support continued for the 5th year of the Africa Cassava Agronomy Initiative. The project has been instrumental in increasing the availability of appropriate and affordable technologies to sustainably improve cassava productivity in the short- and long-term.
- A cross regional research and development initiative funded by the OCP Group supported the establishment of pilot research trials that are generating key datasets for guiding site-specific fertilizer for several crops including maize and rice (East Africa), maize (West Africa), and wheat, rice and lentils, olives, data palm, citrus (North Africa). In 2020, the combined cross regional projects were successful in disseminating knowledge on improved nutrient management practices to more than 5,000 farmers.

We are excited about the enhanced prospects for research projects in 2021 as we explore new opportunities and roll out new initiatives supporting our fresh research strategy.

Dr. Shamie Zingore, Director of Research & Development

Ongoing Projects

4R SOLUTIONS PROJECT

APNI Research and Development Theme

Precision Nutrient Management

Target Regions and Crops

- Ghana: Maize, Rice, Groundnut, Soybean
- Ethiopia: Wheat, Teff

Focus

The 4R Solutions Project seeks to improve the socio-economic well-being and resilience of **80,000** smallholder farmers—particularly women—in Ethiopia, Ghana and Senegal by improving agricultural productivity and farm incomes. The project is centered around the integration of the principles of **4R Nutrient Stewardship** practices (i.e., use of the Right Source of nutrients, at the Right Rate, at the Right Time, and in the Right Place) into crop management regimes while also incorporating important gender and environmental-resilience strategies.

Key Achievements in 2020

- Detailed agronomic survey data collected from **240** households in Northern Ghana and the Amhara region of Ethiopia on key constraints limiting crop productivity in key cereal cropping systems. This data will inform the development of 4R-based crop and nutrient management strategies for enhancing crop productivity.
- Establishment of on-farm nutrient omission trials for rice and maize in Northern Ghana; and for wheat and teff in the Amhara region of Ethiopia, which will form the basis of the development of a framework for site-specific fertilizer recommendations for smallholders in these regions.

Timeframe

2019-2024

Implementing Partners

- Global Affairs Canada (GAC)
- Co-operative Development Foundation of Canada (CDF)
- Fertilizer Canada
- Plant Nutrition Canada

Local Implementing Partners

- SEND Ghana
- Savanna Agricultural Research Institute (SARI)
- Ethio-Wetlands and Natural Resources Association (EWNRA)
- Amhara Region Agricultural Research Institute (ARARI)

APNI Website

https://www.apni.net/project/4r-solution

Dr. Njoroge, *Program Manager, assesses improvements in maize growth and performance following application of 4R-based crop and nutrient management practices at an on-farm 4R learning site.*

Ongoing Projects

Cross Regional Research and Development Initiative

Dr. Agneroh, Program Manager, and Dr. Amouzou, Program Coordinator, training researchers, extension workers, students, and farmers to identify nutrient deficiency symptoms and assess soil fertility through nutrient omission trials in Sudan Savannah Zone (SSZ) in Côte d'Ivoire.

APNI Research and Development Theme

Precision Nutrient Management

Regions

- Hub Countries: Kenya, Tanzania, Nigeria, Côte d'Ivoire, Senegal, Morocco
- Spill-over countries: Wide network throughout North, West, East, and Southern Africa

Target Crops

- Cereal-based systems and legumes (wheat, maize, rice)
- Perennial cropping systems (olive intercropping systems, cocoa, oil palm, tea, coffee)

Focus

Development and dissemination of improved fertilizer recommendations and agronomic practices is essential to enhance the benefits of growing investments by governments and the private sector to support African famers in increasing crop productivity, in particular by optimizing fertilizer use. The **4R Nutrient Stewardship** approach—the science-based concept for best nutrient management practices—is able to provide a framework for nutrient management within each agro-ecosystem despite the diversity amongst farming and food production systems across Africa due to soil type, climate, production economics and system scale. **Nutrient Expert** was developed to be used by growers and advisors to assist decision-making for an individual farm field in the presence or absence of soil testing data. A significant proportion of the field work undertaken within this program is working to adapt NE to important crops and regions, as well as demonstrate best nutrient management practices.

Timeframe

2019-2025

Key Achievements (2019-2020)

- Establishment of pilot research trials generating key datasets for guiding site-specific fertilizer for several crops including: maize and rice (East Africa), maize (West Africa), and wheat, rice, lentils, olives, data palm, and citrus (North Africa).
- The project was instrumental in the development of the Nutrient Expert decision support system for wheat in Morocco, which is currently being used to deliver farm-specific nutrient management recommendations to smallholder and large-scale farms.
- Research activities and delivery of research, extension and farmer training programs for wheat, lentils, olives, and date palm.
- Since establishment in 2019, the combined cross regional projects were successful in establishing over **400** nutrient management trials, **600** demonstrations, and disseminating knowledge on improved nutrient management practices to more than **80,000** farmers.

Implementing Partners

- Mohammed VI Polytechnic University
- OCP Group
- OCP Africa
- OCP Foundation

Local Partners

- National stakeholders (NARS, Universities, International Organizations)

APNI Website

https://www.apni.net/project/crrd-initiative

Ongoing Projects

African Cassava Agronomy Initiative (ACAI)

Dr. Ezui, *Program Manager, gives feedback to ACAI partners during a field visit in south east Nigeria.*

APNI Research and Development Theme

Precision Nutrient Management

Target Regions and Crops

Nigeria, Tanzania: Cassava

Focus

Cassava yields are low but tailored agronomic advice is lacking in Sub-Saharan Africa. Hence, the African Cassava Agronomy Initiative (ACAI), a Bill and Melinda Gates Foundation funded project, set to reduce cassava yield gaps through the delivery of tailored agronomy advice using simple decision support tools (DST). This project has led to the development of a suite of different formats of DSTs called **AKILIMO** (from two Swahili words: Akili, meaning Smart/Intelligent and Kilimo meaning Agriculture), which provide agronomic advice on nutrient recommendations, planting, weed management, intercropping, and practices promoting crop quality.

Key Achievements in 2020

- Upgrading the modelling framework for delivering agronomic advice for cassava production through the AKILIMO app, which can be downloaded from **Google PlayStore**;
- Validation of AKILIMO recommendations on site-specific fertilizer recommendations for cassava production in Nigeria and Tanzania;
- Engagement of fertilizer industries to develop interest in supplying fertilizer blends for cassava production in Nigeria and Tanzania; and
- Engagement of national agricultural extension service providers to support and integrate AKILIMO into their extension programs.

Timeframe

2016-2021

Partners

- International Institute of Tropical Agriculture (IITA)
- National Agricultural Research Institutes and Universities
- Local Extension Systems
- Fertilizer Companies
- Cassava-processing Factories
- Farmer Organizations
- Digital Service Providers

APNI Website

https://www.apni.net/project/acai

Ongoing Projects

Availability, Dissemination and Use of Effective Fertilizer for Enhanced Food and Income Security among the Smallholder Farmers in Kenya

APNI Research and Development Theme

Precision Nutrient Management

Target Regions and Crops

Kenya: Maize, Potato, Beans, Green gram

Focus

Transformation of fertilizer recommendations in Kenya to enhance the use of adapted fertilizer that supply balanced nutrients, including secondary and micronutrients. The project has a target to directly reach **120,000** smallholder farmers based in 14 breadbasket counties with the aim of reducing the yield gaps of maize, grain legumes and potatoes.

Key Achievements in 2020

- Successful implementation of more than **100** fertilizer response trials for validating new fertilizer formulations;
- Demonstrations on new fertilizer formulations established in **400** Kenyan villages;
- **60,000** farmers trained on best nutrient management and agronomic practices;
- **600** government extension workers trained to enhance the capacity for dissemination of information on balanced nutrient management;
- **1,000** private extension agents trained to provide last-mile agronomic services to compliment the Kenya government and main stream extension; and
- **400** policy-makers trained.

APNI Website

https://www.apni.net/project/kenya-smallholders

*Farmers being trained by **Dr. Mutegi**, Sr. Program Manager, on fertilizer use, water management and good agronomic management in green gram.*

Implementing Partners

- Alliance for a Green Revolution in Africa (AGRA)
- Kenyan Ministry of Agriculture
- County Governments
- Fertilizer Companies

Timeframe

2019-2022

SEE ALL OUR PROJECTS AT:

https://www.apni.net/projects

Dr. Thomas Oberthür
Director of Business & Partnerships

Business and Partnerships

APNI aims to realize the inspiring and exciting vision that *"Prosperous African farmers sustainably managing crop nutrition to provide consumers with a secure supply of nutritious foods at a reasonable price."* The single most important goal of APNI's business and partnership development is to make this vision credible.

Institutional credibility is the fundamental platform needed to move APNI along its path towards building respect as an established organization. Credibility is what must come first. Credibility engages the gradual and ongoing process of creating successful partnerships that deliver incrementally larger results. APNI's business and partnership development underpins and supports this process by building trust-based partnerships that can realize the business opportunities within its research framework.

Most young institutions must overcome a common credibility paradox[1] wherein respected partners provide credibility, but it takes ample credibility to attract great partners. Our early success has fostered the networks and relationships formed by APNI's predecessor (IPNI).

APNI's partnerships are the instruments currently at work establishing the credibility needed for successful business development in the future. Progressive partnerships are built on an understanding of what partners need, and are focused on delivering those needs. Partnership engagements may vary in size and scope, but if a relationship creates value it often leads to one partnership forming the next, and so forth.

The central core and critical ingredient around which partnerships are built are solid research concepts. Research concepts are developed by APNI staff based within, and upon, the guidance provided by the institutional research strategy. They describe actionable and meaningful opportunities, stipulate the research questions that need to be answered to realize these opportunities, identify the methods proposed to do so, and describe the envisioned outcome. They thereby significantly contribute to achieving APNI's development goals. Once designed, research concepts become the platform for resource mobilization for business development through progressive partnerships. APNI aims to create a portfolio of research concepts that can be used to form partnerships that address specific funding opportunities.

Dr. Thomas Oberthür,
Director of Business & Partnerships

[1]Laing C. 2016. Progressive Partnerships. The Future of Business. Rethink Press. United Kingdom.

Progress in Concept Development

1. CLIMATE & WEATHER-SMART PLANT NUTRITION

- Whole-of-chain collaboration to harness the potential of nutrients.
- On-Farm experimentation with benchmarking.
- Understanding the potential of soil and plant carbon sequestration.
- Mining agronomy performance data and forecasted weather indices.

2. SOIL HEALTH FOR IMPROVED LIVELIHOODS

- Forages and nutrients as systems change catalysts in degraded landscapes.
- Resilience in smallholder systems through nutrient-driven, value chain upgrading.

3. PRECISION NUTRIENT MANAGEMENT

- Assessment of nutrient use, nutrient use efficiencies, and nutrient balances.
- Integrating long-term trials and on-farm experimentation.
- Genotype x environment x management analyses to understand nutrient responses.
- Yield enhancement networks for Africa.
- Scaling balanced nutrient management solutions through digital solutions.
- Enabling south-to-south knowledge transfer.

Moving Forward

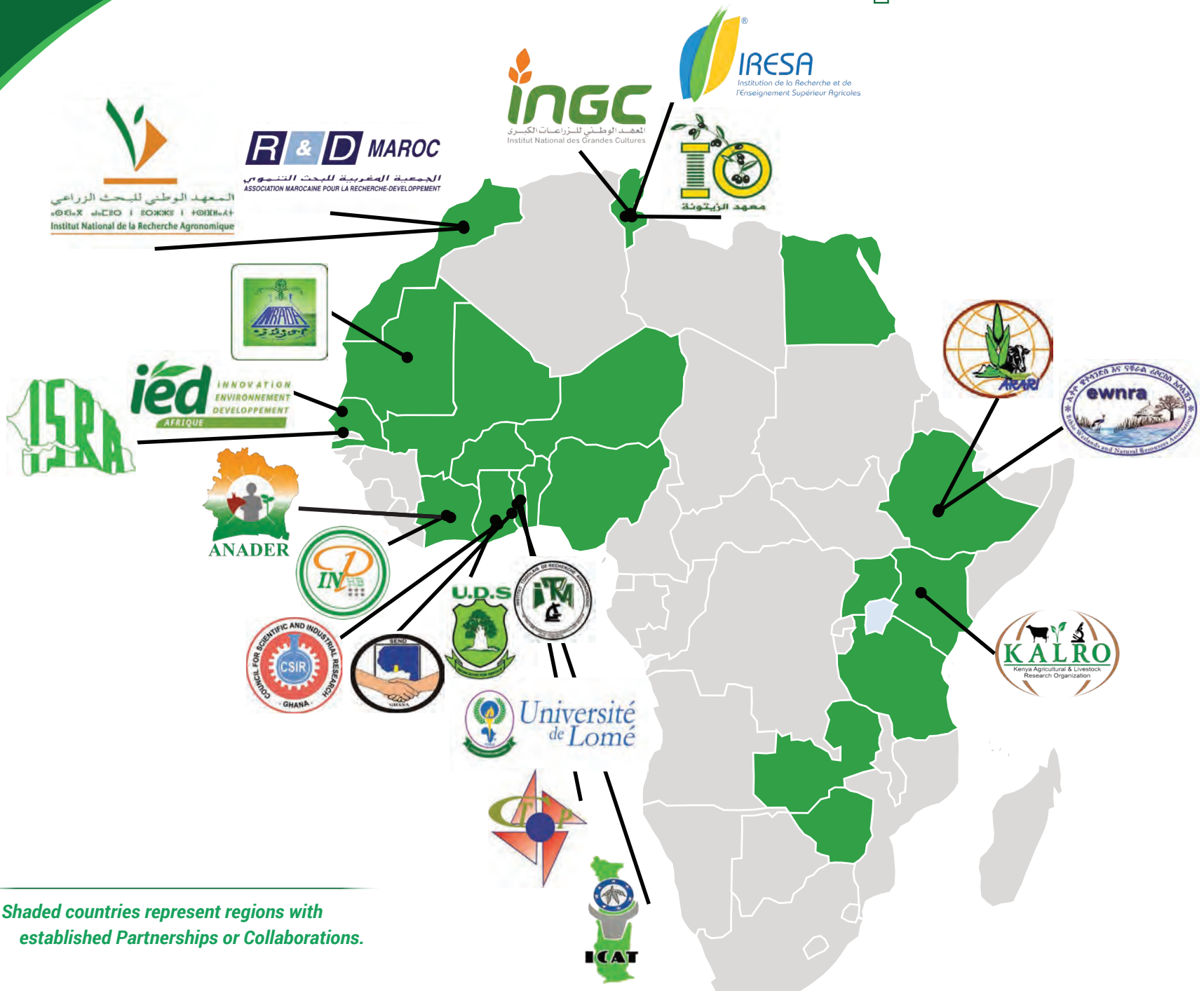
To continue systematic development of APNI's portfolio of research concepts, we aim to increase our effectiveness in 2021 and onwards through two main enhancements:

1. Systematic inclusion of APNI staff and partners into concept and proposal generation; and
2. Addition of dedicated staff.

This is enabled by advances in operationalizing APNI's research strategy. What guides us in this next phase is:

1. Continued focus on value creation for APNI's partners through the use of the existing platform to create further traction;
2. Refining our approach by learning from initial efforts to leverage value from existing partnerships through expanding and replicating successful components; and
3. Broadening our engagement horizon and identifying and realizing new, yet complementary opportunities.

National Partnerships



Shaded countries represent regions with established Partnerships or Collaborations.

Strategic Partner

MOHAMMED VI POLYTECHNIC UNIVERSITY

International Partnerships

OUR PARTNER ORGANIZATIONS

STRATEGIC PARTNER

Morocco
- Mohammed VI Polytechnic University

NATIONAL PARTNERS

Morocco
- National Institute for Agricultural Research (INRA)
- R&D Maroc

Senegal
- Senegal Institute for Agricultural Research (ISRA)
- IED Afrique

Tunisia
- Agricultural Research and Higher Education Institute (IRESA)
- National Institute of Field Crops (INGC)
- Olive Institute (IO)

Togo
- Advanced School of Agronomy/University of Lomé (ESA-UL)
- Institute for Agricultural Extension Services (ICAT)
- Togolese Agricultural Research Institute (ITRA)
- Togolese Coordination of Farmers' Organizations and Agricultural Producers (CTOP)

Côte d'Ivoire
- National Agency for Rural Development (ANADER) of Abidjan
- National Polytechnic Institute Félix Houphouët-Boigny (INP-HB) of Yamoussoukro

Ethiopia
- Amhara Agricultural Research Institute (ARARI)
- Ethio-Wetlands and Natural Resource Association (EWNRA)

Kenya
- Kenya Agricultural and Livestock Research Organization (KALRO)

Ghana
- Savanna Agricultural Research Institute (SARI)
- Send Ghana
- University for Development Studies (UDS)

Mauritania
- National Agricultural Research and Development Center (CNRADA)

INTERNATIONAL PARTNERS

- Alliance for a Green Revolution in Africa (AGRA)
- Cooperative Development Foundation of Canada (CDF-Canada)
- International Center for Tropical Agriculture (CIAT)
- International Fertilizer Association (IFA)
- International Fertilizer Development Center (IFDC)
- International Development Research Centre (IDRC)
- International Institute of Tropical Agriculture (IITA)
- Fertilizer Canada (FC)
- Global Affairs Canada (GAC)
- OCP SA
- Plant Nutrition Canada
- Purdue University
- Wageningen University

OUR COLLABORATING ORGANIZATIONS

Austria
- Cropster

Belgium
- KU Leuven

Burkina Faso
- Direction of Extension Services, Research and Development (DVRD)
- Interprofessional Committee for Cereals and Cowpea in Burkina Faso (CICB)
- Institute of Environment and Agricultural Research (INERA)
- University of Bobo-Dioulasso
- West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL)

Côte d'Ivoire
- AfricaRice
- Federation of Maize Producers of Ivory Coast (FEMACI)
- International Fertilizer Development Center (IFDC-Côte d'Ivoire)
- National Agricultural Research Center of Ivory Coast (CNRA)

Egypt
- National Authority for Remote Sensing & Space Sciences (NARSS)

Ethiopia
- Ethiopia Institute of Agricultural Research (EIAR)

Germany
- Agri Benchmark

Ghana
- University of Cape Coast (UCC)

Kenya
- Bayer East Africa Ltd.
- Cereal Growers Association (CGA)
- Chiromo Fertilizers
- Crop Nutrition Laboratory Services Ltd. (CROPNUTS)
- Export Trading Company Inputs Kenya Ltd. (ETG)
- MEA Ltd.
- Ministry of Agriculture, Livestock, Fisheries and Cooperatives
- National Potato Council of Kenya (NPCK)
- OCP Kenya Ltd.
- Pannar Seed Company (Pannar)
- Producers Direct
- Seed Co Ltd. (SeedCo)
- SGS Kenya Ltd.
- Toyota Tsusho Fertilizer Africa Ltd. (TTFA)
- Yara East Africa Ltd.

Lebanon
- International Center for Agricultural Research in Dry Areas (ICARDA)

Morocco
- Al Moutmir Program (OCP SA)
- Doukkala Regional Office for Agricultural Development (ORMVAD)
- Hassan II Institute of Agronomy and Veterinary Sciences (IAV-Hassan II)
- INRA Marrakech
- INRA Kenitra
- Mohammed VI Polytechnic University
- National Agency for the Development of Oasis and Argan Areas (ANDZOA)
- National Office of the Agricultural Council (ONCA)
- National School of Agriculture of Meknes (ENA Meknes)
- Ouarzazate Regional Office for Agricultural Development (ORMVAO)
- Provincial Direction of Agriculture (DPA) of Essaouira
- Regional Direction of Agriculture of Marrakech-Safi
- Regional Direction of Agriculture of Grand Casablanca-Settat
- Regional Direction of Agriculture of Beni Mellal-Khenifra
- Regional Direction of Agriculture of Rabat-Salé-Kenitra
- Regional Direction of Agriculture of Fez-Meknes
- School of Agriculture, Fertilizers and Environmental Sciences (ESAFE)
- Tadla Regional Office for Agricultural Development (ORMVAT)

Nigeria
- Institute of Agricultural Research and Training (IART), Obafemi Awolowo University

Senegal
- Debre-Birhan Agricultural Research Centre (DBARC)
- Federation of Maize Producers of Saloum (FEPROMAS)
- National Agency for Rural Advisory Services (ANCAR)

Tanzania
- Tanzania Agricultural Research Institute (TARI)

Tunisia
- National Institute of Agronomic Research of Tunisia (INRAT)

UK
- ADAS

USA
- ASA-CSSA-SSSA (Tri-Societies)
- Africa Soil Information Service (AFSIS)
- International Society of Precision Agriculture (ISPA)
- Oklahoma State University (OSU)
- University of Maryland
- Michigan State University

Zambia
- Zambia Agricultural Research Institute (ZARI)

Zimbabwe
- University of Zimbabwe

Dr. Rob Mikkelsen
Director of Communications

Communications and Outreach

As I reflect on our accomplishments from this first year, I can't help but be proud of the foundation that has been laid. Improving plant nutrition practices is at our core, but research alone will never result in improving the livelihoods of African farmers without a strong outreach component.

Starting with a "blank page" provided us with the opportunity to develop a modern communication and outreach plan that will grow along with our other programs. We had many accomplishments to be proud of – a few that I highlight here.

We established our website as our public face. The www.apni.net site is loaded with information on our programs, people, research accomplishments, scientific papers, and the activities of our scientific staff. A monthly electronic newsletter was developed to keep our subscribers informed of our staff accomplishments, and strategic use of social media was initiated as an essential part of our outreach initiative.

Prior to the Covid lockdown, APNI scientists initiated a series of successful local and regional training meetings. These sessions set a model for effective capacity building that will resume once the pandemic restrictions are lifted. We also participated in continent-wide webinars to reach our audience when face-to-face interaction was not possible.

Many new publications were prepared and distributed during our first year. Acknowledging our diverse target audiences, APNI scientists developed printed and electronic publications that range from relatively simple illustrated wall posters to complex scientific bulletins. One particular highlight was the release of the open access book: Improving potassium recommendations for agricultural crops. Co-authored by the world's leading specialists, this book brings a fresh look at the need for improved potassium management in African soils and around the world.

Our scientists engage in graduate student training at Mohammed VI Polytechnic University (UM6P). We teach several classes for M.Sc. students on topics of nutrient management and fertilizer behaviour in African soils. We've begun the important work of mentoring student interns and preparing a new generation of African agronomic professionals.

An award program set up by APNI allows us to recognize excellence in plant nutrition. This year's recipients included 10 outstanding African graduate students. Additionally, two African scientists received awards to sponsor their work in nutrient outreach. Finally, five early-career scientists were given awards to encourage their work in improving phosphorus management on African farms. These awards provide financial incentive for excellence and also allow APNI to closely connect with the future leaders in African agricultural science.

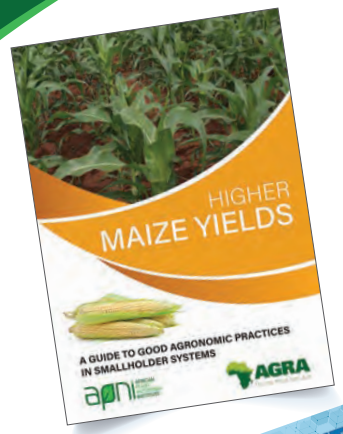
We organized and hosted the 1st African Conference on Precision Agriculture (AfCPA) in cooperation with the International Society of Precision Agriculture (ISPA) and UM6P. To deal with limitations imposed by Covid, the in-person meeting was switched to a virtual conference with 140 presenters speaking to 750+ registrants representing 50+ countries. The main program was simulcast to 14 satellite conference sites across the continent. We look forward to organizing a follow-up conference in the future.

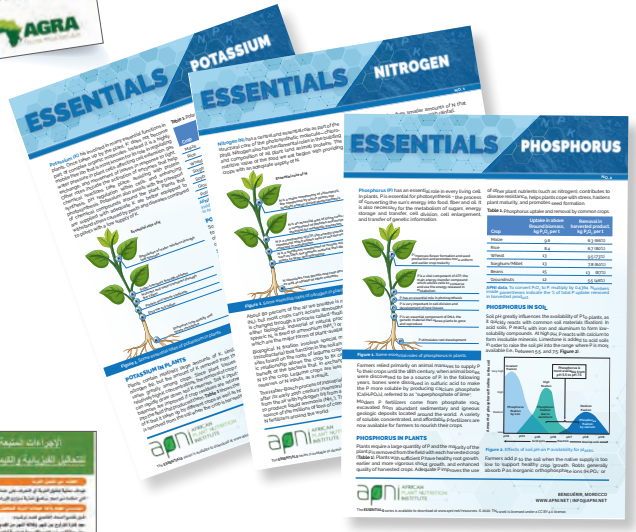
This has been an exciting time to serve as the Director of Communications. I foresee a future where APNI develops training programs and educational materials that make a major impact on nutrient management practices. All our communication efforts have the goal of empowering African farmers to achieve their potential and be significant contributors to their families and communities. We'll keep working with our partners to achieve that vision.

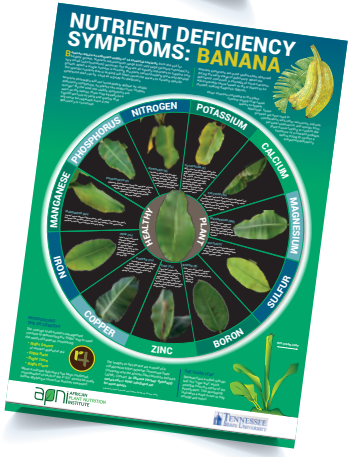
Rob Mikkelsen

Dr. Robert Mikkelsen, Director of Communications

Resources







OUR RESOURCES ARE AVAILABLE AT
https://apni.net/resources

Peer-reviewed Publications

PEER-REVIEWED ARTICLES

T. Bruulsema, I. Cakmak, A. Dobermann, B. Gerard, K. Majumdar, M. McLaughlin, P. Reidsma, B. Vanlauwe, E. Wollenburg, F. Zhang, X. Zhang. 2020. **A new paradigm for plant nutrition. Issue Brief 01, *Scientific Panel on Responsible Plant Nutrition*** PDF

K. Majumdar. 2020. **Does Improved Plant Nutrition Provide a Credible Entry Point for Climate and Weather Adaptive Crop Production?, *Journal of the Indian Society of Soil Science* 66**, pp. S84-S103, PDF

M.P. Hoffmann, T. Oberthür, M. Fisher, R.P. Rötter, K. Janetski, N. Janetski, M. Samson, J. Cock. 2020. **Fertilizer management in smallholder cocoa farms of Indonesia under variable climate and market prices, *Agricultural Systems* 178**, pp. 102759, doi: 10.1016/j.agsy.2019.102759

K. Ray, H. Banerjee, S. Dutta, S. Sarkar, T.S. Murrell, V.K. Singh, K. Majumdar. 2020. **Macronutrient Management Effects on Nutrient Accumulation, Partitioning, Remobilization, and Yield of Hybrid Maize Cultivars, *Frontiers in Plant Science* 11**, pp. 1-19, doi: 10.3389/fpls.2020.01307

S. Dutta, S. Chakraborty, H. Banerjee, R. Goswami, K. Majumdar, B. Li, M. L. Jat. 2020. **Maize yield in smallholder agriculture system: An approach integrating socio-economic and crop management factors, *PLOS One* 15**, pp. e0229100, doi: 10.1371/journal.pone.0229100

G.N. Falconnier, M. Corbeels, K. J. Boote, ..., K.A. Amouzou, et al. 2020. **Modelling climate change impacts on maize yields under low nitrogen input conditions in sub-Saharan Africa, *Global Change Biology* 26**, pp. 5942-5964, doi: 10.1111/gcb.15261

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N.D. Murimi, W.M. Mucheru-Muna, E. Mugi-Ngenga, S. Zingore, J.K. Mutegi. 2020. **Nutrient management options for enhancing productivity and profitability of conservation agriculture under on-farm conditions in central highlands of Kenya, *AIMS Agriculture and Food* 5**, pp. 666-680, doi: 10.3934/agrfood.2020.4.666

A. Larbi, R. Baccar, H. Boulal. 2020. **Response of olive tree to ammonium nitrate fertilization under saline conditions, *Journal of Plant Nutrition*** pp. 1-14, doi: 10.1080/01904167.2020.1862188

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A. Larbi, H. Kchaou, B. Gaaliche, K. Gargouri, H. Boulal. 2020. **Supplementary potassium and calcium improves salt tolerance in olive plants, *Scientia Horticulturae* 108912**, pp. 1-10, doi: 10.1016/j.scienta.2019.108912

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Improving Potassium Recommendations for Agricultural Crops (eds. R. Norton, G. Sulewski, R.M. Mikkelsen, T.S. Murrell, M.L. Thompson), Springer International Publishing, Dec. 15, 2020, 455 p. doi: 10.1007/978-3-030-59197-7

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T.S. Murrell, D. Pitchay. 2020. In, **Improving Potassium Recommendations for Agricultural Crops,** (eds. T.S. Murrell, R.M. Mikkelsen, G. Sulewski, R. Norton, M.L. Thompson), ***Ch. 9: Evaluating Plant Potassium Status,*** pp. 219-261, Springer, doi: 10.1007/978-3-030-59197-7_9

V.K. Singh, B.S. Dwivedi, S.S. Rathore, R.P. Mishra, T. Satyanarayana, K. Majumdar. 2020. In, **Improving Potassium Recommendations for Agricultural Crops,** (eds. T.S. Murrell, R.M. Mikkelsen, G. Sulewski, R. Norton, M.L. Thompson), ***Ch. 11: Timing Potassium Applications to Synchronize with Plant Demand***, pp. 363-384, Springer, doi: 10.1007/978-3-030-59197-7_13

J.J. Volenec, S.M. Brouder, T.S. Murrell. 2020. In, **Improving Potassium Recommendations for Agricultural Crops,** (eds. T.S. Murrell, R.M. Mikkelsen, G. Sulewski, R. Norton, M.L. Thompson,), ***Ch. 14: Broadening the Objectives of Future Potassium Recommendations,*** pp. 385-415, Springer, doi: 10.1007/978-3-030-59197-7_14

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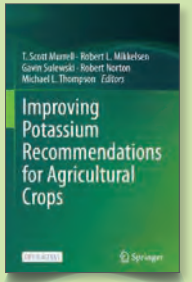
R.L. Mikkelsen, T.L. Roberts. 2020. In, **Improving Potassium Recommendations for Agricultural Crops.**, (eds. M.L. Thompson, T.S. Murrell, R.M. Mikkelsen, G. Sulewski, R. Norton), ***Ch. 2: Inputs: Potassium Sources for Agricultural Systems,*** pp. 47-73, Springer, doi: 10.1007/978-3-030-59197-7_2

K. Majumdar, M. Rani, T.S. Murrell, S. Dutta, T. Satyanarayana, V.K. Singh, J. Timsina, B.S. Dwivedi. 2019. In, **Achieving sustainable crop nutrition,** (eds. Z. Rengel), ***Ch 9: Advances in optimizing potassium-use efficiency in crop production***, pp. 237-270, Burleigh Dodds Science Publishing, doi: 10.19103/as.2019.0062.11



Led by APNI Principal Scientist, **Dr. Murrell** and Communications Director, **Dr. Mikkelsen**, this new open-access book reviews the science supporting potassium recommendations. The work assembled the knowledge of 44 scientific experts from several different disciplines of plant, animal and human nutrition.

Available online at
https://doi.org/10.1007/978-3-030-59197-7

MOHAMMED VI POLYTECHNIC UNIVERSITY

ESAFE
SCHOOL OF AGRICULTURE, FERTILIZATION AND ENVIRONMENTAL SCIENCES

Graduate Student Teaching / Internships

*(1) **Dr. Mikkelsen**, Communications Director; **(2) Dr. Murrell,** Principal Scientist; and **(3) Dr. Dutta,** Scientist, lead cohorts of M.Sc. students through ESAFE-UM6P classes on nutrient management and fertilizer technology for Africa.*

Graduate Student Teaching / Internships

Ms. Khadija Ait Si Mhand
M.Sc. student at ESAFE/UM6P, Morocco.

Mr. M. Coulibaly Zie Aboubakar
M.Sc. student at ESAFE/UM6P, Côte d'Ivoire.

Our scientists at APNI partner with universities and other institutions to provide mentorship opportunities for graduate students from across Africa.

These summer internship activities commonly include guidance for literature review studies on research topics related to their areas of study, as well as field research and farm demonstration opportunities that develop skills and provide valuable interactions with farmers and the research community.

Examples this past year include the mentorship provided by **Dr. Murrell,** Principal Scientist, and **Dr. Boulal,** Program Manager, to **Ms. Aminata Ndéye Sall,** a Senegalese M.Sc. student at the School of Agriculture, Fertilization and Environmental Sciences (ESAFE/UM6P) in Benguérir. Ms. Ndéye Sall conducted a systematic and meta-analytical review of the evidence on the impact of chickpea intercropping on wheat yield. Dr. Boulal also mentored the summer studies of **Ms. Khadija Ait Si Mhand,** a M.Sc. ESAFE/UM6P student from Morocco.

Dr. Agneroh, Program Manager, and **Dr. Amouzou,** Program Coordinator, mentored **Ms. Mariam Coulibaly** and **Mr. Touré Ali** from Ecole Supérieure d'Agronomie, National Polytechnic Institute Félix Houphouët-Boigny (ESA/INP-HB) in Côte d'Ivoire. In 2020, Ms. Coulibaly and Mr. Ali investigated maize-based cropping systems in both the Dry Savannah and Humid Forest-Moist Savannah of Côte d'Ivoire. APNI West Africa staff also mentored **Mr. M. Coulibaly Zie Aboubakar,** an Ivorian M.Sc. student at ESAFE/UM6P during his literature review of maize responses to macro- and micronutrient fertilization in Côte d'Ivoire.

*1. **Dr. Agneroh**, Program Manager, and **Dr. Amouzou**, Program Coordinator (left), mentored **Ms. Mariam Coulibaly** and **Mr. Touré Ali** (middle right), interns from the Ecole Supérieure d'Agronomie, National Polytechnic Institute Félix Houphouët-Boigny (INP-HB) of Yamoussoukro, Cote d'Ivoire. Ms. Coulibaly is a M.Sc. student specializing in Crop Protection while Mr. Ali is a M.Sc. student of Agronomy and Plant Production.*

Agronomic Training & Extension

(1 & 2) ***Dr. Boulal,*** *Program Manager, delivering training sessions for OCP Al Moutmir agronomic staff in Morocco and extension agents in Senegal. (3) Training of private extension workers in Bungoma county, Kenya, being led by* ***Angela Gitonga****, Research Assistant.* ***(4) Dr. Amouzou****, Program Coordinator, leading the field day portion of a training course near Daloa, Côte d'Ivoire.* ***(5)*** *Field training of county extension workers in Eastern Kenya, led by* ***Joses Muthamia****, Agronomist.* ***(6) Dr. Mutegi,*** *Sr. Program Manager, trains policy makers on fertilizer use strategies for Meru county farmers in Kenya.*

Farmer Training / Field Demonstrations

CLICK TO WATCH OUR VIDEO

1

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CLICK TO WATCH OUR VIDEO

5

(1) ***Video of date palm field day*** *(Alfilahia TV) organized by APNI and INRA at the Saada experimental station (Marrakech).* **(2)** ***Dr. Amouzou****, Program Coordinator, teaching 4R-based nutrient management to farmers using on-farm nutrient omission plots in Côte d'Ivoire.* ***(3) Farmers*** *holding printed fertilizer recommendations for their farms after a fertilizer training workshop in Njombe, Tanzania.* ***(4) Video of farmer field day*** *in Meru county led by Sr. Program Manager,* ***Dr. Mutegi****.* ***(5 & 6) Olive exposition participants*** *receive APNI educational publications, and* ***olive farmers*** *participate in a field day in Marrakech province, Morocco.*

Conferences

WEST AFRICAN FORUM ON PRECISION AGRICULTURE

February 11-12, 2020

University of Cape Coast
Cape Coast, Ghana

The West African Forum on Precision Agriculture (WAFPA) was a 2-day event (11-12 February, 2020) co-organized by APNI and the University of Cape Coast in Ghana.

Precision agriculture experts representing universities, national agricultural research systems, international research centers, and the private sector from Benin, Burkina Faso, Côte d'Ivoire, Ghana, Nigeria, Senegal, and Togo gathered to discuss opportunities and challenges related to the adoption of precision agriculture technologies, and information-driven, transformative solutions for the West African smallholder farmer.

Precision agriculture can begin by making simple observations while spending time in the field. Observing how spatial and temporal data vary in a cropping system informs a better decision, which can increase crop yield and profitability for the farmer.

Some strategies within precision agriculture may prove essential to the sustainability of West African agriculture in the face of increasing pressure and risk related to climate change.

"We want to change the commonly held mindset that precision agriculture practices are out of the reach of smallholder farmers because they lack mechanization and some of the technology commonly used by larger-scale farmers.

Dr. Steve Phillips, WAFPA Program Chair

WAFPA Website: www.apni.net/WAFPA

1st African Conference on Precision Agriculture

AfCPA 2020

PRECISION AGRICULTURE *in* ACTION *for* AFRICA

"The conference's hybrid format successfully connected registrants to an international panel of experts while also generating significant discussion on regional strategies within each traditional conference venue.

Dr. Steve Phillips, AfCPA Program Chair

Conferences

APNI organized and hosted the 1st African Conference on Precision Agriculture (AfCPA) in December 2020 in cooperation with the International Society of Precision Agriculture (ISPA) and Mohammed VI Polytechnic University (UM6P).

The mission of the AfCPA was to create an event that would connect the science and practice needed to put precision agriculture in action for Africa.

AfCPA 2020 program was simulcast to 14 satellite conference sites across the Continent.

The AfCPA featured **140** presenters speaking to **750+** registrants representing **50+** countries globally.

AfCPA Website: www.paafrica.org

Award Programs

Plant Nutrition Scholar Award

Awards of USD $2,000 were conferred to ten African graduate students enrolled in science programs relevant to plant nutrition and management of crop nutrients.

Mr. Sulaimon BASIRU, M.Sc.
NIGERIA
Fertilizer Science and Technology, Mohammed VI Polytechnic University, Morocco.

Mr. Faki Oyédékpo CHABI, Ph.D.
BENIN
Sustainable Management of Soils and Crops (ISCM), Soil Sciences Laboratory, l'Université d'Abomey-Calavi (UAC), Benin

Mr. Richard Kwame DOGBEY, M.Sc.
GHANA
University for Development Studies, Tamale, Ghana

Ms. Layo Yasmine Lynda GODONOU, M.Sc.
BENIN
School of Plant Sciences, Faculty of Agricultural Sciences, University of Abomey-Calavi, Benin.

Mr. Séwatchè Roméo KPODJI, M.Sc.
SENEGAL
Plant Biology Department of Sciences and Technology, Université Cheikh Anta Diop de Dakar, Dakar, Senegal

Ms. Salma MOUHIB, M.Sc.
MOROCCO
University Sidi Mohamed Ben Abdellah, Fes, Morocco.

Mr. Atchala N'GBENDEMA, Ph.D.
TOGO
Ecole supérieure d'agronomie/ université de Lomé, Lomé, Togo

Ms. Rita Bonwi NJABEH, M. Phil.
CAMEROON
University for Development Studies, Tamale, Ghana

Ms. Winnie NTINYARI, Ph.D.
KENYA
Department of Agricultural Science and Technology, Kenyatta University

Mr. Monday USMAN, Ph.D.
NIGERIA
Department of Soil Science (Soil Fertility and Plant Nutrition), University of Agriculture, Makurdi-Nigeria.

Award Programs

Young African Phosphorus Fellowship Award

Awards of USD $5,000 were conferred to five early-career African scientists to encourage scientific programs relevant to understanding and improving phosphorus management in agro-ecosystems.

Dr. Dohan Mariam KIBA/SOMA
BURKINA FASO
Institut de l'Environnement et de Recherches Agricoles, Department Gestion des Ressources Naturelles/ Systèmes de Productions, BURKINA FASO

Dr. Patrick MUSINGUZI
UGANDA
Department of Agricultural Production, School of Agricultural Sciences, College of Agricultural and Environmental Sciences, Makerere University, Kampala, UGANDA

Mr. Seuri MOLLEL
TANZANIA
Tanzania Agricultural Research Institute (TARI), Arusha, TANZANIA

Dr. Esther MUINDI
KENYA
Department of Crop Sciences, School of Agricultural Sciences and Agribusiness, Pwani University, Kilifi, KENYA

Dr. Austin PHIRI
MALAWI
Ministry of Agriculture Irrigation & Water Development, Department of Agricultural Research Services, Bvumbwe Agricultural Research Station, Limbe, MALAWI

African Plant Nutrition Outreach Fellowship Award

Awards of USD $5,000 were conferred to two African scientists exploring innovative ideas on education, training and communication programs relevant to improving the use and efficiency of plant nutrients in African agro-ecosystems.

Prof. Kwame Agyei FRIMPONG
GHANA
University of Cape Coast, Ghana

Prof. Bosede Olukemi LAWAL
NIGERIA
Institute of Agricultural Research and Training, Nigeria

Steve Couch
Director of Operations

Human Resources

The Institute's greatest asset is its people.

Diversity and Inclusion at APNI

APNI values and promotes a culture of diversity and inclusion.

We believe that individual differences, life experiences, knowledge, self-expression, and talent that our employees bring individually translate into a group that has a unique ability to drive innovation.

The founding group that makes up APNI came from a global background with staff coming from Morocco, Kenya, Côte d'Ivoire, Togo, Zimbabwe, India, Germany, Canada, and the United States.

As APNI grows our vision is to foster practices that promote a gender diverse and inclusive workforce.

We are ready for the challenge that growth brings and look forward to the new talent that will enlarge, elevate, and amplify our capacity.

Steve Couch
Director of Operations

Our Staff

Dr. Steve Phillips
Principal Scientist

Dr. Rob Mikkelsen
Director of Communications

Dr. T. Scott Murrell
Principal Scientist

Steve Couch
Director of Operations

APNI Headquarters

Benguérir, Morocco

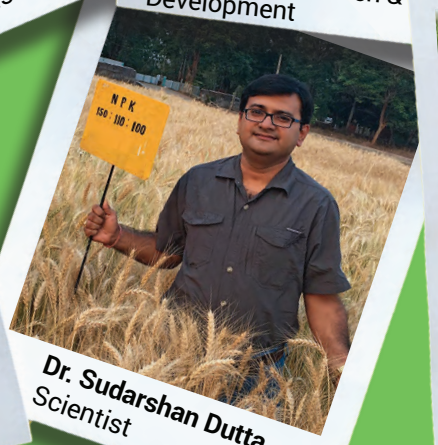
Dr. Mohamed El Gharous
Senior Scientist

Dr. Shamie Zingore
Director of Research & Development

Dr. Kaushik Majumdar
Director General

Gavin Sulewski
Editor

Mohammed Saddiki
Administration Officer



Dr. Sudarshan Dutta
Scientist

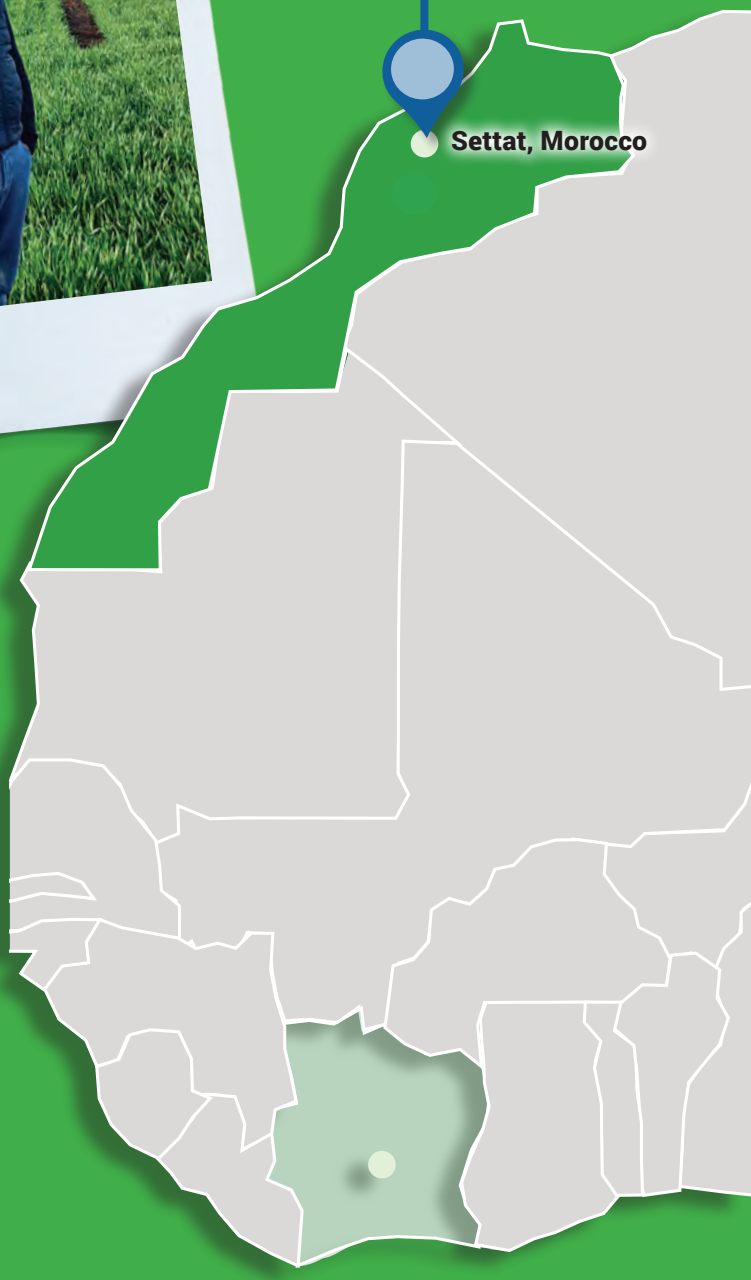
Dr. Thomas Oberthür
Director of Business & Partnerships

Our Staff

Dr. Hakim Boulal
Program Manager

Mahdi Dahane
Agronomist

Mohamed Boutfirass
Agronomist



Our Staff

Dr. Thérèse Agneroh
Program Manager

Dr. Guillaume Ezui
Program Manager

Dr. Kokou Amouzou
Program Coordinator

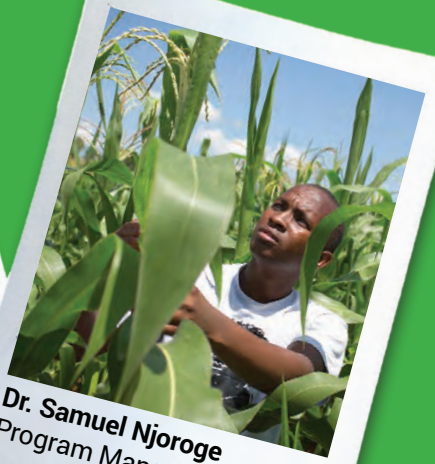
Our Staff

East & Southern Africa Office

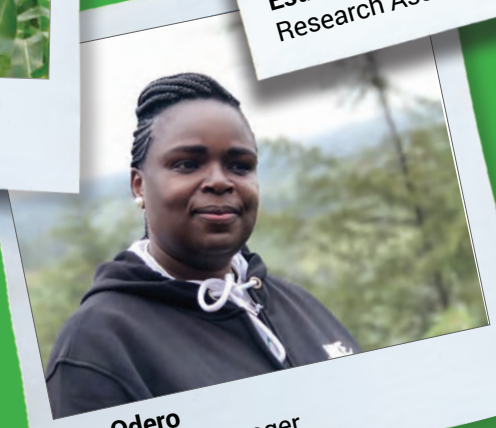
Nairobi, Kenya

Dr. James Mutegi
Senior Program Manager

Esther Mugi
Research Assistant



Dr. Samuel Njoroge
Program Manager



Ann Odero
Operations Manager

Joses Muthamia
Agronomist

Dr. Ivan Adolwa
Scientist

Angela Gitonga
Research Assistant

AFRICAN PLANT NUTRITION INSTITUTE

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Winter wheat fields in the foothills of the Atlas mountains near Marrakesh, Morocco.

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