

## **Borlaug LEAP- Past Fellows Directory (Spring 2016)**

### **Berhanu Tadesse Ertiro**

**Country:**

Ethiopia

**University:**

University of the Free State, South Africa

**Department & Degree:**

Plant Breeding, PhD Candidate

**US Mentor institution:**

University of Minnesota

**CGIAR Mentor Institution:**

International Wheat and Maize Improvement Center (CIMMYT)

**Research:**

Breeding for Nitrogen Use Efficiency (NUE) and Maize Lethal Necrosis (MLN) Disease Tolerance in Tropical Maize

**Email:**

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Berhanu Tadesse Ertiro, a Spring 2016 Borlaug LEAP Fellow, obtained his BSc in Plant Sciences and his MSc in Plant Breeding from Haramaya University, Ethiopia. He is currently pursuing his doctorate degree in Plant Breeding at the University of the Free State (UFS) in South Africa. He is also a visiting student at CIMMYT- Kenya, where he is running field experiments for his PhD thesis dissertation. His research focuses on Nitrogen Use Efficiency (NUE) and Maize Lethal Necrosis (MLN) disease tolerance. Low soil fertility and MLN are among the major maize production constraints in eastern and southern Africa, where maize is staple food. The use of new tools could increase breeding efficiency and reduce the time needed for the release of new stress tolerant hybrids. Such hybrids have the potential to contribute greatly towards food security among farmers and their families through increased productivity. Berhanu is looking at the feasibility of genome-wide selection for improvement of NUE in tropical maize.

After receiving his undergraduate degree in 2003, Berhanu started his career as junior maize breeder at Bako National Maize Breeding Centre, part of the Ethiopian Institute of Agriculture Research (EIAR). He also coordinated the Ethiopian maize research program from June 2011 to August 2013, and at the same period, he worked as Centre Director for Bako Maize Research Centre. During his time with the maize program, he was involved in germplasm development and evaluation for multiple stress tolerance including NUE. From his experiences, he learned that phenotyping is an indispensable part of germplasm development, but it is both expensive and time consuming. Genotyping, however, with advances in technology, is becoming more accessible for routine use. Complementary use of phenotypic and genotypic information, particularly for identifying quantitative traits, could increase efficiency in variety development and release thereby increasing productivity and enhancing food security. Because of this advantage, he developed an interest in learning about integrating marker-based selection methods such as genomic selection and how they could enhance the maize breeding efforts of

his home country. In this project, he will assess the suitability of Genomic Prediction for NUE and MLN tolerance breeding in tropical maize germplasm adapted to Eastern and Southern Africa.

During his fellowship, he will be mentored by Professor Rex Bernardo and Dr. Biswanath Das. Dr. Bernardo is a professor of Corn Breeding and Genetics at the University of Minnesota. He explores how best to use inexpensive and abundant DNA fingerprints in maize improvement, and is investigating diverse maize lines and populations to enhance the current hybrids grown in the U.S. Corn Belt. As Berhanu's project is in line with Dr. Bernardo's expertise, he will benefit from his research experience in the area of quantitative genetics, molecular methods and genomic selection. Dr. Biswanath Das is a Maize Breeder who has been working at the International Maize and Wheat Improvement Centre (CIMMYT) in Kenya since 2010. He leads the Nitrogen Use Efficiency (NUE) breeding program at the center. He is also actively involved in the development of MLN screening protocols, and identification and introgression of MLN tolerant germplasm into the abiotic stress breeding pipelines in East Africa. Berhanu will work with Dr. Das on tropical maize germplasm development and testing, and protocol development for stress tolerance. Berhanu expects to complete his research and receive his PhD in Summer 2017.

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## **Cedric Habiyaremye**

**Country:**

Rwanda

**University:**

Washington State University

**Department & Degree:**

Crop Science, PhD Candidate

**US Mentor institution:**

Washington State University

**CGIAR Mentor Institution:**

International Center for Tropical Agriculture (CIAT)

**Research:**

Assessing the Adaptability of Quinoa, Proso and African Millets in Rwanda and Understanding the Current Situation of Millet and Adoption of Quinoa in Farming Communities in Rwanda

**Email:**

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Cedric Habiyaremye is a PhD Candidate in Agronomy/Crop Science at Washington State University (WSU). Fueled by his past as a young refugee, he vowed that when he grew up, he would study agriculture so he can improve agricultural systems and fight against hunger in his home country of Rwanda and other countries in Africa. Today, he is an accomplished agricultural consultant and researcher working in higher education and international agricultural development. His area of community development expertise includes women and youth empowerment in Agriculture, health, entrepreneurship and SME development, and career advisory and youth employment.

Habiyaremye earned his MSc in Crop Science from Washington State University in 2016 and BS in Agricultural Science with Honors in Irrigation and Drainage from Higher Institute of Agriculture and Animal Husbandry (ISAE-Busogo), Rwanda in 2013. His PhD research focuses on agronomic practices of small grains such as quinoa, millet, and food barley to enhance the nutrition and utilization of novel and sustainable food and farming systems through interdisciplinary approaches: crop diversity, food science, and social anthropology. His Borlaug LEAP fellowship enabled him to return to Rwanda to conduct field trials and to work with Dr. Eliud Birachi of CIAT-Rwanda. His US mentor is Dr. Kevin Murphy, a professor of Plant Breeding and Genetics at WSU.

In addition to his Borlaug LEAP fellowship, Habiyaremye has received a number of other awards. He is a 2017 U.S. Borlaug Summer Institute on Global Food Security Fellow, a WSU Department of Crop and Soil Sciences Mug Award Recipient 2017, a Fellow of the Association for International Agriculture and Rural Development (AIARD)/Future Leaders Forum (FLF), Class of Leaders, 2015 and a WSU College of Agricultural Human and Natural Resource Sciences Interdisciplinary Research Team Award recipient, 2015 (Quinoa Research and Extension Team). He serves on the Board of Directors of Building Bridges with Rwanda and committee member of CAHNRS Student Experience Advisory Council. He also serves as a member of the 2019 Global Food Security Report Task Force of the Chicago Council on Global Affairs.

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## **Crocus Hamsini**

**Country:**

Malawi

**University:**

Lilongwe University of Agriculture and Natural Resources, Malawi

**Department & Degree:**

Plant Breeding, MSc Candidate

**US Mentor institution:**

Washington State University

**CGIAR Mentor Institution:**

International Center for Tropical Agriculture (CIAT)

**Research:**

Characterization of twenty-one common bean genotypes for biological nitrogen fixation under drought stress

**Email:**

[hcrocus@yahoo.com](mailto:hcrocus@yahoo.com)



Crocus Hamsini joins the Borlaug LEAP Fellowship as a Spring 2016 Fellow. She is currently pursuing a Master's degree at the Lilongwe University of Agriculture and Natural Resources (LUANAR) in Malawi. Her research, titled Characterization of Twenty-One Common Bean Genotypes for Biological Nitrogen Fixation under Drought Stress, will focus on the nitrogen-fixation capacity, nodulation frequency, and yield capacity of twenty-one common bean genotypes under drought stress conditions. She hopes to use these findings to help identify

bean genotypes to be used to breed a drought-resistant, better quality bean that can be provided to Malawian farmers. These beans will hopefully not only provide more income to the farmers through higher yields, but also help strengthen food security in Malawi and its surrounding countries.

Crocus envisions a self-sustaining Malawi that is in line with Feed the Future's in-country goals: no poverty, zero hunger, and sustainably reducing negative environmental impacts. She feels that one step towards these goals is providing farmers with adequate education and improved seed varieties. While pursuing her Bachelor's degree at LUANAR's Bunda College, she was introduced to the world of scientific research. In an undergraduate plant-breeding course, she discovered how much plant genetics could potentially make a difference not only in the agricultural field, but also in many other different and important arenas. During her fellowship, Crocus hopes to increase her knowledge and skills in plant genetics, and also to learn from her mentors and others the art of becoming a more effective leader. Her previous employment had her working with farmers to train them in improved production techniques and helping them to secure small loans. Having already worked with farmers on a basic level, she would like to take the next step in finding new ways to collaborate with and inspire others towards a better future by becoming better informed herself.

Crocus will be working with two mentors during her Borlaug LEAP Fellowship. Dr. Phillip Miklas, a professor and Research Geneticist at Washington State University, will guide Crocus in learning new techniques to classify and understand bean genetics. He is currently involved in phenotypic and genotypic studies and breeding relative to abiotic and biotic stress resistance. He will help Crocus focus her research and develop her thesis. Dr. Rowland Chirwa, a Bean Breeder at CIAT in Malawi, will provide her with field training, helping her design and carry out experiments both in and out of the lab. He is currently coordinating bean research for development activities in all countries where the common bean is considered to be an important crop in southern Africa, by distributing bean lines and varieties and monitoring the evaluation process for future variety releases. He will guide her through the Malawi growing season and help her assess her findings. Crocus expects to finish her thesis and receive her Master's degree in 2017.

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## **Demis Mengist Wudeneh**

**Country:**

Ethiopia

**University:**

Addis Ababa University, Ethiopia

**Department & Degree:**

Socioeconomic Development Planning and Environment, PhD Candidate

**US Mentor institution:**

Oklahoma State University

**CGIAR Mentor Institution:**

International Water Management Institute (IWMI)

**Research:**



The Implications of Large-scale Agricultural Investment for Livelihood Security and Regional Development: the case of the Gambella Region, Southwestern Ethiopia

**Email:**

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Spring 2016 Borlaug LEAP Fellow Demis Mengist Wudeneh joins us from Ethiopia where he is currently pursuing a doctorate in Socioeconomic Development Planning and Environment at Addis Ababa University. His interests lie in how best to integrate large-scale farming and land development with the needs of smallholder farmers and other local businesses and his end goal is to provide data to policy-makers so they can insure food and income security in Ethiopia alongside encouraging economic development in the country. Demis is currently working in the Gambella Regional State, considered an investment hotspot, with many agricultural, service and industrial development projects in the works. He sees this research as an opportunity to help secure the agricultural future for his country for years to come and is eager to create an example that can be emulated around East Africa and beyond.

Demis has both a Bachelor's and a Master's degree in Geography and Environmental Studies from Addis Ababa and has long been interested in environmental causes in Ethiopia. He has worked in various positions and on various research projects throughout the years, including those in agriculture extension, urban agriculture and small-scale irrigation. He has also spent time working in higher education as a graduate program curriculum developer and an organizer of economic development conferences and trainings. He has seen his leadership style and views change over the years as his responsibilities have evolved and he looks forward to working with his mentors to hone his skills in both research and leadership. Demis then hopes to use those skills to increase capacity development in higher education in Ethiopia to increase the country's ability to combat issues like food insecurity and agricultural sustainability.

Demis will be working with his US mentors, Dr. Shida Henneberry and Dr. Art Stoecker at Oklahoma State University, and his CGIAR mentor, Dr. Gebrehaweria Gebregziabher at the International Water Management Institute (IWMI) in Ethiopia, during the fellowship. Dr. Henneberry and Dr. Stoecker both have extensive experience in the field of Agricultural Economics and will be working very closely with Demis throughout his time in the US. Dr. Gebregziabher is a respected researcher and economist at IWMI who will help Demis create real-world scenarios to compliment his research. Demis expects to complete his research and receive his doctorate in 2017.

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**Elisabeth Nebie**

**Country:**

Burkina Faso

**University:**

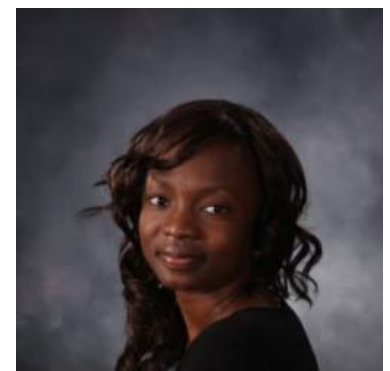
University of North Carolina at Chapel Hill

**Department & Degree:**

Anthropology, PhD Candidate

**US Mentor institution:**

University of North Carolina at Chapel Hill



**CGIAR Mentor Institution:**

International Livestock Research Institute (ILRI)

**Research:**

Identifying Sustainable Pathways to Climate Change Adaptation in African Drylands

**Email:**

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Having grown up in Burkina Faso—one of the most food-insecure countries of West Africa, with 90% of its population involved in farming and agriculture—Elisabeth Nebie understands the challenges faced by rural communities. As a doctoral student in Anthropology, she has conducted exploratory fieldwork in southern and northern Burkina Faso (Bam and Sissili provinces) to evaluate the state of food insecurity and to develop an understanding of what farmers and herders think about the situation. In Bam, many farmers stated that they have seen an increase in income and have become less vulnerable to drought. In Sissili, however, there are increasing concerns about food insecurity. Her work and analysis contributed to the writing and publishing of the co-authored article “Famines are a Thing of the Past: Food Insecurity Trends in Northern Burkina Faso” in *Human Organization* in 2014. Findings from this exploratory research have informed her proposed dissertation project titled “Social Differentiation of Adaptive Capacity to Climate Change: Analyzing Adaption as a Social Practice” among the pastoralists of Sondré-Est and the farmers of Biéha (Burkina Faso) who are increasingly food insecure.

As a Spring 2016 Borlaug LEAP Fellow, Elisabeth will conduct the fieldwork research and data analysis that are essential to completing her dissertation. As a researcher and future leader in international development, she believes that true leadership and problem solving starts by learning to listen and then assessing people’s needs, rather than imposing her own views and assumptions on others. The expertise of farmers and herders is crucial to mobilizing resources and creating appropriate policy in a country where the majority of the population is involved in smallholder farming activities. Working as a consultant under the supervision of the Chief of Section for Small Islands and Indigenous Knowledge at UNESCO, Elisabeth explored the literature on pastoralist knowledge of weather, climate, and climate change in West and East Africa in order to inform national adaptation processes. This consultancy increased her understanding of the link between indigenous and scientific knowledge. She hopes to continue her work in Burkina Faso and inspire young researchers to continue the job of being a voice for the underrepresented.

Elisabeth’s research will be supervised by her US mentor Dr. Colin Thor West, an Assistant Professor at the University of North Carolina at Chapel Hill and CGIAR mentor Dr. Todd Andrew Crane, a Climate Adaptation Scientist at the International Livestock Research Institute (ILRI). Both share similar research interests on social ecological research in the Sahel region. Dr. West has concentrated his research on household adaptations to climate change while Dr. Crane emphasizes connecting local knowledge, socio-technical change and development interventions. Dr. Crane is also involved in the Local Governance and Adapting to Climate Change in Sub-Saharan Africa (LGACC) research project in Zoundweogo, Burkina Faso. Dr. West and Dr. Crane, who have known each other since graduate school, are looking forward to working together to supervise her research that has also been funded through the UNC-Chapel Hill’s Chancellor’s Doctoral Candidacy award and the Graduate School’s Off-Campus Dissertation Award. Elisabeth will use the Borlaug LEAP award specifically to help fund her and her mentors’ travel to Burkina Faso so that she can conduct her field research. Elisabeth is on track to complete her research and degree in 2018.

## **Emmanuel Ahenkorah**

**Country:**  
Ghana

**University:**  
University of South Africa

**Department & Degree:**  
Environmental Science, MSc Candidate

**US Mentor institution:**  
University of California, Davis

**CGIAR Mentor Institution:**  
International Centre for Tropical Agriculture (CIAT)

**Research:**  
A Critical Investigation into the Effectiveness of Soil and Water Remediation Efforts in Steel Valley, Vanderbijlpark, South Africa

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Emmanuel Ahenkorah, a Spring 2016 Borlaug LEAP Fellow, is studying pollutants and developing remediation models for contaminated agricultural lands. Emmanuel has an undergraduate background in chemistry, and currently pursuing his Master's degree in Environmental Science at the University of South Africa. His research is aimed at helping restore farming activities to abandoned agriculture lands as it seeks to analyze and develop pollutant-specific remediation techniques. Practically speaking, his research will help reduce the impact industries have on the environment, especially the mining industries. They often take over agricultural lands and destroy their arability, and then abandon them, making it hard for farmers to re-use the land afterwards. Agricultural outputs have decreased over the years in areas where this practice is predominant, hence, his decision to embark on this study and to contribute to the core principles that the Borlaug LEAP fellowship is built upon.

A career in agriculture-environmental interactions is something Emmanuel has always had in mind. The eye-opening results obtained from his undergraduate research in water quality analysis in Ghana led him to develop an interest in contaminants and their remediation. Analytical and instrumentation experience gained while working in chemistry laboratories kindled his interest in modeling environmental remediation techniques in the laboratory. Emmanuel's job as a high school agriculture teacher allowed him not only to impart agricultural-based skills to the learners, but also serve as a tool to channel the interest of the youth into agriculture. Agriculture is traditionally an area that many youth perceive to be for the poor or less fortunate. Emmanuel feels that his style of leadership combines scientific methodology and the art of managing others to guide and inspire people. He often led student groups, embarking on door-to-door campaigns to advocate for backyard gardens in households. He has also had the opportunity to train and mentor interns while working as a laboratory assistant and a teacher.

Emmanuel feels privileged to be mentored by Professor Thomas Young at the University of California, Davis and Dr. Fred Kizito at International Centre for Tropical Agriculture (CIAT) in Kenya. Dr. Young's research explores issues of water and soil contamination and

remediation. He will equip Emmanuel with new research methods, which can be used in his work on pollutants that pose a threat to agriculture. Dr. Kizito researches agriculture-environment interactions, helping to restore degraded landscape and soil fertility. His work will be an ideal match for the research Emmanuel is currently conducting, considering both of their research seeks to evaluate the potential of soil and water to be used for agriculture, following pollution degradation. His mentors will be assisting him with his methodology and thesis writing and will supervise his work in person both in the lab and in the field in Kenya. Emmanuel is on course to complete his MSc by 2018 and looks forward to enrolling for a Ph.D. in Soil and Water Science upon completion.

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## **Emmanuel Kyereh**

**Country:**

Ghana

**University:**

Louisiana State University

**Department & Degree:**

Food Science, PhD Candidate

**US Mentor institution:**

Louisiana State University

**CGIAR Mentor Institution:**

AfricaRice Center

**Research:**

Evaluation of Maize-Cowpea Weaning Food Blend Fortified with Probiotic Bacteria *Lactobacillus Plantarum* to Improve Child Gastrointestinal Health in Ghana

**Email:**

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Spring 2016 Borlaug LEAP Fellow Emmanuel Kyereh is a Ghanaian citizen who is currently pursuing his doctoral degree in Food Science, majoring in Food and Bio-processing Engineering at Louisiana State University (LSU) with help from Borlaug Higher Education Agricultural Research and Development (BHEARD) funding. He is a passionate young scientist who feels a sense of responsibility to ensure food and nutritional security, and to help with hunger eradication in developing countries. His doctoral research is focused on evaluating the effect of cereal-legume weaning food fortified with the probiotic bacteria *Lactobacillus plantarum* as a way to improve infant gastrointestinal health in Ghana. Although the cereal-legume blend is not a new concept, fortifying with probiotic bacteria is a novel idea, which may not only help bridge the protein-energy malnutrition and child wasting gaps, but also improve infant gut health. The probiotics, with their health benefits when administered in adequate amounts, can decrease other harmful bacteria that cause diarrhea and gut inflammatory disease. Those issues are currently major causes of infant mortality in developing countries. By helping to prevent these illnesses, Emmanuel will hopefully also help reduce nutritional and food insecurity as well as child mortality as outlined in the Feed the Future Multi-Year Strategies for Ghana.

As a young food and postharvest researcher, Emmanuel has had the opportunity to partner with institutions and governmental organizations such as the National Institute of Agronomic



Research of Niger (NIRAN) and the Ministry of Food and Agriculture, Ghana, both of which have had influence on his current research. With Bachelor's and Master's degrees in Postharvest Technology from the University of Ghana, he has been taking steps towards making a change on the African continent and especially in sub-Saharan Africa, where many are crippled with food and nutritional insecurity. His current research comes as results of his previous work while he was an officer in-charge of women in agriculture development at the Ministry of Food and Agriculture. He is currently on study leave from this position as he attends LSU. He also worked with small-scale farmers in Ghana whose children had had multiple incidences of diarrhea and were, as a result, malnourished. Conducting research in this area was a great opportunity for Emmanuel to help those families and others who found themselves in that situation. Since then, Emmanuel has been motivated to help find appropriate scientific solutions to these health issues and to help mentor others to do the same.

Emmanuel will work with US mentor Dr. Sathivel Subramania, a professor in both the Department of Food Science and Department of Biological and Agricultural Engineering at LSU. Dr. Subramania has done extensive research on probiotics and bio-fortification and will be guiding Emmanuel in bacteria strain selection and the fortification process. His CGIAR mentor Dr. John Manful a Grain Scientist currently at AfricaRice with a wealth of experience in working with legumes and cereal and will be helping Emmanuel with the cereal-legume formulations at the center. Emmanuel is thrilled to have the chance to collaborate with Dr. Manful as a part of his Borlaug LEAP fellowship, a chance that he would not have otherwise had without their funding and research support. He is on course to finish his PhD in 2018.

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## **Fikirte Asrat Gelaw**

**Country:**

Ethiopia

**University:**

Addis Ababa University, Ethiopia

**Department & Degree:**

Environmental Science, PhD Candidate

**US Mentor institution:**

University of California, Davis

**CGIAR Mentor Institution:**

International Water Management Institute (IWMI)

**Research:**

Quantitative Classification of Carbon Density of Soil and Forest Vegetations in Choke Mountain

**Email:**

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2016 Borlaug LEAP Fellow Fikirte Asrat Gelaw hails from Ethiopia and is currently studying at Addis Ababa University, the country's oldest and largest educational institution. She is pursuing a PhD in Environmental Science, focusing on conservation efforts in the Choke Mountain ecosystem through the analysis of forest carbon storage. Fikirte is looking to compare carbon storage amounts in both protected and unprotected forested areas to see if there are any noticeable differences. Her goal is to figure out how the carbon mass stored by these forested

areas is indicative of the health of those respective ecosystems and whether placing the land under protection has made a difference. By preserving these areas and ensuring their health, governments can help make sure that farmers have land that can be used for sustainable agricultural practices in addition to preserving the native species. This will in turn help increase income stability and food security in country into the future.

Fikirte started her academic career at Debub (now Hawassa) University in Ethiopia, where she obtained her BSc in Farm Forestry. After working for various agricultural research centers, she realized in order to make more of an impact in her field, she would have to return to school. In 2011, she completed her MSc in Agroforestry and Soil Management and went to work again as a researcher. It was then that she began to understand the devastation land and soil degradation can have not only on the environment, but also among the people who live and work on that land. After working for the Amhara Region Agricultural Research Institute (ARARI) as a Forestry researcher, she decided to pursue work at a higher education institution, where she would have ability to instruct and mentor budding scientists. She first became a lecturer and then the Department of Natural Resource Management head at Debre Markos University and she remains in that position currently while on study leave. Fikirte has made it her mission to help create ways to sustainably develop land while still respecting and conserving the overall environment. She hopes to find ways to use the knowledge and expertise she gains during her fellowship to inspire others to pursue environmental causes.

As a part of the Borlaug LEAP Fellowship, Fikirte will be working with two mentors who both have a wealth of knowledge and experience in their fields. Dr. David Smart, a professor of Viticulture and Enology at the University of California, Davis, will be working with her to design and implement soil carbon testing trials. His lab works quantifying carbon sequestration into soils and other carbon stocks and he has done research in several other countries as well. Dr. Smart will also help Fikirte use innovative lab techniques that she may not have ad access to while in Ethiopia. She will also be working with Dr. Wolde Mekuria Bori, a researcher at the International Water Management Institute (IWMI) in Ethiopia, whose work focuses on sustainable resource management, ecological restoration and land rehabilitation. He will work with Fikirte to flesh out her work in the Choke Mountain ecosystem and use real-world experiments to help her with her research. Fikirte plans on completing her PhD in 2018.

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## **Ijeoma Akaogu**

**Country:**

Nigeria

**University:**

University of Ghana

**Department & Degree:**

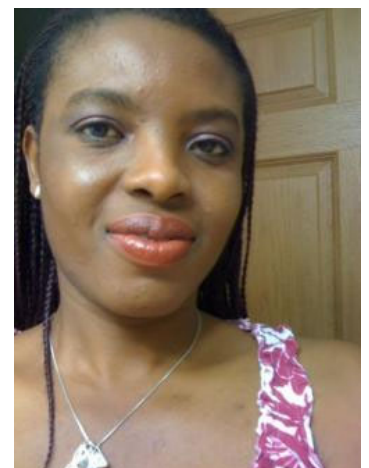
Plant Breeding and Genetics, PhD Candidate

**US Mentor institution:**

Cornell University

**CGIAR Mentor Institution:**

International Institute of Tropical Agriculture (IITA)



**Research:**

Linkage Mapping for Striga Resistance Genes in Early Maturing Tropical Maize Lines

**Email:**

[ijeangel2013@gmail.com](mailto:ijeangel2013@gmail.com)

Ijeoma Akaogu is currently a PhD candidate at the University of Ghana-Legon, and is working on her thesis research that deals with mapping the genes that deal with Striga weed resistance in maize. As a 2016 Borlaug LEAP Fellow, she will have the opportunity to expand on her research and discover new breeding techniques as well as the practical application of those techniques. Ijeoma joins us from Nigeria where, as a child, she originally dreamed of becoming a doctor because she admired their ability to save lives. While her interest in science continued through high school, she decided to pursue agricultural rather than medical sciences, where she could still put her skills to work saving lives. Her Master's research allowed her to identify maize hybrids that possessed genes for both drought tolerance and Striga resistance. Her work won her an award at the Third Africa-wide Women and Young Professionals in Science Competition in 2013 and those hybrids are currently being used in Mali, Ghana and Nigeria as a part of their plan to combat food insecurity. She hopes the research she is conducting as a part of her PhD thesis will continue to add to the fight against food insecurity in her home country of Nigeria and beyond.

After receiving a BS in Plant Science and Biotechnology at Imo State University and an MS in Plant Breeding at the University of Ibadan, both in Nigeria, Ijeoma went on to work as a researcher. She spent time at the International Institute of Tropical Agriculture (IITA) and the National Biotechnology Development Agency (NABDA), working on various plant breeding projects, including the general genetic improvement of crops liked maize, soybeans and cassava. She is currently on study leave from her position at NABDA while she works on her PhD. In addition to her studies, Ijeoma is excited about expanding her leadership knowledge and developing new strategies that can be used to make a greater impact in her field. She has already taken on a mentoring role with other women at NABDA, encouraging them to pursue their higher education goals, the completion of which directly lead to some of the women receiving promotions within the institute. Her approach to leadership is always to lead with a listening ear and an open mind and she intends to continue this with the help of the Borlaug LEAP fellowship.

Ijeoma looks forward to working with her US mentor Dr. Edward Buckler and to continuing her work CGIAR mentor Dr. Baffour Badu-Apraku. Dr. Buckler is a Research Geneticist at Cornell University, whose work deals with identifying and cataloging the genes for flowering, sugar and starch contents and row numbers in maize. He has extensive international experience and he will be working with Ijeoma on innovative plant breeding techniques she can use to compliment the more conventional ones she has been using. She will also be learning how analyze her molecular data using state of the art software programs. With Dr. Badu-Apraku, a Maize Breeder at the International Institute for Tropical Agriculture (IITA) in Nigeria, Ijeoma will have the opportunity to expound upon the work she started while working at the IITA as a part of her Master's program. His work with Striga resistance in maize will compliment the research she is currently doing. He will give her assistance in the practical applications of her research and help her with the hands-on aspects of the work. Ijeoma is looking forward to completing her PhD by the end of 2017.

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## **Mary Adjepong**

**Country:**

Ghana

**University:**

Michigan State University

**Department & Degree:**

Human Nutrition, PhD Candidate

**US Mentor institution:**

Michigan State University

**CGIAR Mentor Institution:**

International Food Policy Research Institute (IFPRI)

**Research:**

Association of Whole Blood Fatty Acids and Growth and Cognitive Function in Ghanaian Children

**Email:**

[madjepong2020@gmail.com](mailto:madjepong2020@gmail.com)

Spring 2016 Borlaug LEAP Fellow Mary Adjepong completed her BS in Biochemistry and MPhil in Human Nutrition and Dietetics at Kwame Nkrumah University of Science and Technology (KNUST) in Ghana. She is currently pursuing a PhD in Human Nutrition and a Certificate Program in Epidemiology at Michigan State University (MSU). At MSU, she is undertaking a project to understand the importance of essential fatty acids (EFA) in growth and cognitive function in Ghanaian children. Poverty among Ghanaian women leads to under-nutrition in their children as a result of inadequate food in households and an inadequate diet while pregnant and breastfeeding. Sometimes there is food under-utilization as well, as many of the women have limited education and often do not have adequate knowledge concerning proper nutrition. Though there have been numerous vitamin and mineral interventions put in place to curb stunting in Ghana, the situation still persists, especially in the north. Additionally, there are no interventions that focus on the use of EFAs, even though they play a crucial role in growth and cognitive development. Mary seeks to understand whether there is an association between EFAs in growth and cognitive function and how local Ghanaian foods that have high EFA content can be identified and used in creating appropriate interventions. She is also looking to find the constraints of the micronutrient policy process in Ghana with the long-term goal of putting EFA supplementation on the policy agenda in Ghana.

After her undergraduate project exposed her to the nutritional challenges of pregnant women in Ghana and those of their children, Mary also encountered several people who suffered from complications that required dietary intervention while pursuing her Master's degree. These triggered her passion for issues related to food security in her country and inspired her to research how the situation could be resolved. Being a field research assistant on an International Development Research Chairs (IDRC) project titled "Childhood obesity in Ghana" enlightened her to the dietary patterns, and possible deficiencies, of many Ghanaian children. As a BHEARD (Borlaug Higher Education in Agricultural Development) scholar at Michigan State University, she is working on a project to see if EFAs could be another potential cause of stunting in Ghana and to find possible remedies. She is also grateful that the Borlaug LEAP



Fellowship will allow her to receive hands-on training in Ghana at IFPRI and to engage with her CGIAR mentor, an experience she would not have been able to take advantage of without their support.

Dr. Jenifer Fenton, a professor of Food Science and Human Nutrition at Michigan State University, works with fatty acids, including long chain omega-3 fatty acids, EPA and DHA, to understand their role in disease prevention and reducing inflammation. Her extensive work in this field will help Mary undertake this unique research which otherwise would not have taken place in Ghana, due to logistics and lack of resources. She will provide valuable lab space as well as personal input on Mary's work and help guide her eventual dissertation. Dr. Suresh Babu, Mary's CGIAR mentor at International Food Policy Research Institute (IFPRI), with his expertise in human and organizational strengthening of food policy systems and policy processes, will help her design her project to understand the constraints of policy process in Ghana. He will also help supervise any fieldwork she undertakes while participating in the fellowship. Mary's expects to receive her PhD in 2018.

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## **Oluwatoba Omotilewa**

**Country:**

Nigeria

**University:**

Purdue University

**Department & Degree:**

Agricultural Economics, PhD Candidate

**US Mentor institution:**

Purdue University

**CGIAR Mentor Institution:**

International Institute of Tropical Agriculture (IITA)

**Research:**

The Adoption and Impacts of Improved Storage Technology among Smallholder Households in Uganda

**Email:**

[oomotile@purdue.edu](mailto:oomotile@purdue.edu)



Oluwatoba Omotilewa joins the Borlaug LEAP fellowship in Spring 2016 from Nigeria and is currently attending Purdue University where he is pursuing a PhD in Agricultural Economics. He is interested in the adoption and impacts of improved storage technology among smallholder households in Uganda. With the understanding that increasing productivity without proper post-harvest management will also increase losses, he hopes to extend his findings to his country of Nigeria and sub-Saharan Africa (SSA) at large. While he began his graduate studies in geomatics engineering and remote sensing, with the intent of helping find and clean up oil spills in Nigeria, he soon realized that he could make an even greater difference by turning his attention to development work. Using sound technical knowledge and empirical approaches he is currently developing, Oluwatoba is hoping to see food insecurity and

poverty reduced among smallholder farmers through a combination of increased productivity and reduction of post-harvest losses.

Oluwatoba is committed to making an impact in a country where poverty and hunger are still widespread. As a student at Purdue, he has had the opportunity to work as the Managing Editor of the Journal of Terrestrial Observation (JTO). On the Purdue Terrestrial Observatory (PTO) website he used data gathered from remote sensing projects to help educate K-12 students about remote sensing of vegetation and how it can help with conservation and other environmental issues. He is proud to be able to contribute to the education of young students. He has also contributed to capacity development through training of extension staff and farmers in Uganda and Ethiopia. He eventually wants to affect change in Nigeria and surrounding region at the policy level and challenge others to do the same as young leaders in their country. He looks forward to participating in the Borlaug LEAP fellowship, which will help give him the skills to be able to accomplish these goals.

While with Borlaug LEAP, Oluwatoba will have the privilege of working with his US mentor, Dr. Jacob Ricker-Gilbert and his CGIAR mentor Dr. John Herbert Ainembabazi. Dr. Ricker-Gilbert is an assistant professor in the Purdue Department of Agricultural Economics, whose work in multiple countries deals with post-harvest and storage issues. Dr. Ricker-Gilbert will continue his work with Oluwatoba as his advisor and mentor, guiding him on how to compile survey data and approach his dissertation writing, including research framework and design. Dr. Ainembabazi, an Agricultural Economist the International Institute for Tropical Agriculture (IITA) in Uganda, will be supervising Oluwatoba's fieldwork and data collection, working with him to use best practices in research methodology. This hands-on approach will allow Oluwatoba to get vital real-world experience in development work. Oluwatoba is on track to receive his PhD in Summer 2017.

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## **Richard Bukenya**

**Country:**

Uganda

**University:**

University of Illinois, Urbana-Champaign

**Department & Degree:**

Nutritional Sciences, PhD Candidate

**US Mentor institution:**

University of Illinois, Urbana-Champaign

**CGIAR Mentor Institution:**

Bioversity International

**Research:**

Development and Validation of a General Nutrition Knowledge Questionnaire for Adults in Uganda

**Email:**

[bukenya2@illinois.edu](mailto:bukenya2@illinois.edu)



2016 Borlaug LEAP Fellow Richard Bukenya is a doctoral student in the Division of Nutritional Sciences (DNS) at the University of Illinois, Urbana-Champaign (UIUC). He is also Fellow with the Borlaug Higher Education for Agriculture Research and Development (BHEARD) Program. He obtained a BSc in Economics and Human Nutrition, and an MSc in Human Nutrition at Sokoine University of Agriculture in Tanzania. His research aims at developing and validating a questionnaire to assess nutrition knowledge among adults in Uganda. Having the appropriate knowledge is a fundamental step in decision making and behavior change, however that knowledge is often wrongly assumed to be widely available, or misunderstood. After the questionnaire is validated and available to local institutions, it will help facilitate the development of educational programs that hire community resource persons (i.e., head teachers and health workers) to train and disseminate nutrition messages to the population. Richard believes that promoting nutrition education and healthy behaviors with adequate monitoring and evaluation strategies will have multiple benefits. His work is a step toward improving nutrition practices by identifying gaps in knowledge, improving the effectiveness of interventions, and deciphering potential associations with food utilization, a component of food security.

Richard has worked in the areas of community nutrition, education and counseling, and assessment with various organizations including Mildmay Center, the Ministry of Health Kampala, Community Action for Health, and at Makerere University in the Department of Food Technology and Human Nutrition. He wants to continue his academic and research aspirations at Makerere University. Richard views leadership as volunteering to serve others in order to shape the future, and that starts by building capacity at all levels. He is interested in empowering individuals and communities to address food and nutrition security challenges in Uganda and beyond. Richard envisions himself in the future as a competitive scholar and a leader in Global and Community Nutrition Research. He is currently a Graduate Assistant in the UIUC Nutrition department.

Richard will be mentored by Dr. Juan Andrade and Dr. Beatrice Ekese-Onyango throughout his fellowship. Dr. Juan Andrade is an Assistant Professor of Global Nutrition at UIUC. His research has focused primarily on translating bench-top concepts into applications, technologies, and programs that will result in improved nutrition and food security among people living in low-income countries. He has developed several lines of research aimed at strengthening the agricultural continuum namely evaluation of agricultural programs, point-of-care diagnostics for micronutrient status, nutrition technologies for fortification, and internationalization of curricula through study abroad programs. Dr. Andrade will use this expertise to guide Richard's proposed project and dissertation writing. Dr. Beatrice Ekese-Onyango is currently at Bioversity International, where she studies and implements agrobiodiversity-based strategies for the alleviation of micronutrient and protein deficiencies among smallholder households in banana growing regions of Uganda and Tanzania. Dr. Ekese-Onyango will provide Richard with critical mentorship and logistical support while conducting his work in Uganda. He is excited that the Borlaug LEAP Fellowship will allow him to receive hands-on training with a CGIAR mentor, something he would not have had access to without their funding and support. Richard is expected to complete his Ph.D. in 2017.

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## **Tigist Shiferaw Girsil**

**Country:**  
Ethiopia



**University:**

University of KwaZulu Natal, South Africa

**Department & Degree:**

Plant Breeding, PhD Candidate

**US Mentor institution:**

Michigan State University

**CGIAR Mentor Institution:**

International Center for Tropical Agriculture (CIAT)

**Research:**

Genetic Improvement of Local and Exotic Common Bean Germplasm for Bruchid Resistance and Participatory Evaluation for Agronomic Performance in Ethiopia

**Email:**

[tshiferaw2006@gmail.com](mailto:tshiferaw2006@gmail.com)

2016 Borlaug LEAP fellow Tigist Shiferaw Girsil obtained her Bachelor's degree in Plant Sciences and her Master's degree in Crop Protection (Entomology) from Haramaya University, Ethiopia. She is currently pursuing her PhD in Plant Breeding at the University of KwaZulu-Natal, South Africa. Her doctoral thesis and research are focused on the "Genetic Improvement of Local and Exotic Common Bean (*Phaseolus vulgaris* L.) Germplasm for Bruchid (*Zabrotes subfasciatus*) Resistance and Agronomic Performance in Ethiopia". The bean bruchid (*Zabrotes subfasciatus*) is among the greatest threats to common bean production in Ethiopia, where the common bean is an important source of dietary protein within the country, and is an increasingly important export crop. By developing high-yielding and bruchid-resistant bean cultivars and reducing post-harvest losses in Ethiopia, her project will help contribute to improved food security, nutrition, and the household income of subsistence farmers.

Tigist started her first research position at the Amhara Agricultural Research Institute (ARARI), based at Sirnika Agricultural Research Center, in 2005, as a Pulses and Horticultural Crops Entomologist. In 2009 she transferred to the Melkassa Agricultural Research Center at the Ethiopian Institute of Agriculture Research (EIAR) as a lowland pulse Entomologist, where she is currently on study leave in order to complete her degree. Drawing from her research experience as entomologist, she has learned that in her home country little work has been done to increase pest resistance in crops through breeding programs, especially against post-harvest menaces, even though they contribute significantly to crop and income loss among farmers. In addition, and despite general recognition of the importance of common bean genetic improvement for bruchid resistance in across East Africa, inadequate marker systems have been put in place in order to address these issues in many breeding programs. Tigist looks to use her fellowship and her time at her current graduate program to acquire the knowledge and skills used in advanced marker-based insect resistance breeding to help improve these breeding programs. She recognizes that this is very important for the future growth and competitiveness of Ethiopian common bean Improvement program.

While participating in the Borlaug LEAP fellowship, Tigist will be working with Dr. Karen Cichy, Assistant Professor of Plant, Soil, and Microbial Sciences at Michigan State University (MSU) and Dr. Bodo Raatz, leader of the Andean Bean Breeding Program at the International Center for Tropical Agriculture (CIAT) in Colombia. With the help of Borlaug LEAP funding she will spend three months at MSU conducting laboratory research under the mentorship of Dr. Cichy. She will also have the opportunity to collaborate and learn from Dr. Raatz at CIAT. She will be



introduced to molecular and biotechnological research techniques at the MSU and CIAT facilities and acquire new skills and experiences that could go a long way toward helping to ensure food security and sustainable agricultural development in East Africa, particularly in Ethiopia. In addition, her work will also lay the necessary groundwork for continued collaboration and strong partnerships with both MSU and CIAT, an opportunity she may not have otherwise had without the help and support of the fellowship. Tigist plans to complete her PhD in 2017.

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## **Borlaug LEAP- Past Fellows Directory (Fall 2016)**

### **Ademola Aina**

**Country:**

Nigeria

**University:**

University of Ibadan, Nigeria

**Department & Degree:**

Plant Genetics and Molecular Biology, PhD Candidate

**US Mentor institution:**

University of California, Davis

**CGIAR Mentor Institution:**

International Institute of Tropical Agriculture (IITA)

**Research:**

Next Generation Sequencing, Genetic Diversity and Nodulation Studies of African Yam Bean Accessions

**Email:**

[ainaademola@ymail.com](mailto:ainaademola@ymail.com)

Ademola Aina hails from Nigeria, and is currently pursuing a PhD in Plant Genetics and Molecular Biology from the University of Ibadan, Nigeria. His research focuses on harnessing the potential of African “orphan crops”, which have long been neglected by scientists, researchers and agricultural policy makers. Ademola is particularly interested in the African yam bean, which he feels is one of the more important neglected and underutilized species of tropical origin. He is working on characterizing, sequencing, and annotating the genomes of the African yam bean so as to improve its nutritional value, productivity and climate adaptability. The findings of this study will help to identify superior varieties to be used in future crop improvement programs, which will in turn help reduce poverty, hunger and malnutrition in Nigeria and sub-Saharan Africa and could raise the profile of these long neglected native crops, hopefully unleashing the potential of the African yam bean as a food security crop.

As an undergraduate at Ahmadu Bello University in Zaria, Nigeria, a plant breeding and genetics course spurred Ademola’s interest in genetics and led him to enroll as a graduate student in Plant Genetics in the University of Ibadan. After earning his MSc, he took up a position as a research technician at the Bioscience Center of the International Institute of Tropical Agriculture (IITA), where he was exposed to hands on activities and projects involving the use of molecular techniques and procedures. He also worked as the public relations officer for the International Association of Research Scholars and Fellows (IARSAF) at IITA and was responsible for publicizing all activities and programs of the association and organizing and coordinating the monthly journal club.

As a Fall 2016 Borlaug LEAP fellow, Ademola’s US mentor will be Professor Daniel Potter, a renowned plant scientist at the University of California, Davis, with interests and experience in



plant phylogeny, evolution, and taxonomy, specifically in relation to diversity and the relationships between wild crops and plants and their domesticated relatives. Dr. Potter will assist Ademola with DNA extractions and genomic library preparation in his lab coupled with sequencing, which will be conducted at the UC Davis Genome Center. Dr. Michael Abberton, Ademola's CGIAR mentor, was a former professor of plant breeding at the University of Aberystwyth, United Kingdom and is the current head of the Genetic Resources Center at IITA. Dr. Abberton will supervise Ademola as he conducts morphological and nodulation diversity studies there at the IITA lab facilities. Ademola expects to complete his research and receive his PhD in March 2018.

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## **Clement Kubuga**

**Country:**  
Ghana

**University:**  
Michigan State University

**Department & Degree:**  
Human Nutrition, PhD Candidate

**US Mentor institution:**  
Michigan State University

**CGIAR Mentor Institution:**  
Bioversity International

**Research:**  
Community-based Agriculture Project to Improve Trace Minerals Status in Mother-Child Dyads in Northern Ghana

**Email:**  
[kubugacl@msu.edu](mailto:kubugacl@msu.edu)



Clement Kubuga, a PhD candidate in Human Nutrition at Michigan State University, joins the Borlaug LEAP Fellowship in Fall 2016 as he continues his research into community-based agriculture programs designed to improve trace mineral levels in mothers and children in northern Ghana. As a self-described “missionary of nutrition”, Clement takes his role in improving the nutritional status of those in his home country very seriously: “Throughout my life, I experienced personally and witnessed rampant food insecurity in the northern region”, he says. Since his time as an undergraduate, Clement has explored the interplay between food insecurity and nutritional status in Ghana, from the nutritional value of local beer to the connection between prisoner nutrition and character reformation. He sees his time as a Borlaug LEAP fellow as an opportunity to sharpen his research skills and create new linkages toward improving local and national nutrition security.

As a researcher and emerging leader, Clement will be working with two mentors, one from a US institution and one from a CGIAR center throughout his Borlaug LEAP fellowship. Dr. Won Song, a long time professor of Human Nutrition and Clement’s current PhD advisor, will continue to work with Clement on designing appropriate research proposals and interpreting their results for broader dissemination. Dr. Gina Kennedy, who is the component leader for the

Healthy Diets for Sustainable Food Systems program at Bioversity International, will work with him to create activities designed to assess agricultural biodiversity and food security on smallholder farms. Both will lend their years of leadership experience to his work and help him mold his own leadership style for the future. Clement plans to complete his dissertation research and earn his doctorate in 2018.

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## **Dadirai Fundira**

**Country:**  
Zimbabwe

**University:**  
Cornell University

**Department & Degree:**  
International Nutrition, PhD Candidate

**US Mentor institution:**  
Cornell University

**CGIAR Mentor Institution:**  
International Food Policy Research Institute (IFPRI)

**Research:**  
Critical Assessment of the Impact of a Package of Complimentary Feeding Interventions on Infant Feeding Practices and Nutrient Intake in Rural Zimbabwe

**Email:**  
[dadiefundira@gmail.com](mailto:dadiefundira@gmail.com)

2016 Fall Borlaug LEAP fellow Dadirai Fundira is a PhD candidate in International Nutrition at Cornell University. She hails from Zimbabwe, which is among the countries with the lowest food security due to widespread poverty stemming from significant economic issues over the past decade. A majority of the population has limited access to food and often lacks sufficient knowledge on how to use the food they do have access to maximize nutrition. Dadirai is currently investigating the impact of behavior change communication strategies and lipid based nutrient supplementation on infant feeding practices and nutrient intake in children 0-18 months. She is also assessing the impact of a novel intervention to minimize fecal oral contamination in children. Her research uses qualitative methods to understand processes at the household level that influence behavior change. She aims to understand how behavior change strategies impacts decision-making, time and daily routines and explore decision-making trajectories that can be leveraged to improve household decisions around food security and sanitation.

Prior to joining the graduate program at Cornell, Dadirai worked as a research assistant for a large Sanitation Hygiene Infant Nutrition Efficacy (SHINE) trial in Zimbabwe where she helped lead the development and implementation of intervention strategies to improve infant feeding and hygiene behaviors in two districts in rural Zimbabwe. Within the project itself she trained, provided support, and supervised a team of thirty-two research nurses, a role that challenged and strengthened her leadership capacities. She has also had the opportunity to work on other research projects, including one that sought to strengthen capacity in delivering nutrition interventions in Tanzania and another that investigated the acceptability of interventions to



reduce fecal-oral contamination in children in Zambia. Experiences with these various projects led her to pursue graduate studies in order to gain expertise and skills to critically assess the impact of these projects.

During her fellowship, Dadirai will be working with Dr. Rebecca Stoltzfus, a professor in the Division of Nutritional Sciences at Cornell University. Dr. Stoltzfus has more than twenty years of experience in the field of maternal and child nutrition and will provide overall guidance needed for Dadirai's research. Dadirai will also be working with a CGIAR mentor Dr. Deanna Olney, who currently serves a theme co-leader for Nutrition-Sensitive Programs in IFPRI's Poverty, Health, and Nutrition Division. Dr. Olney has extensive experience in evaluating integrated nutrition programs. Her work has included comprehensive evaluations of nutrition-sensitive programs to examine their impacts on maternal and child health, nutrition and well-being outcomes, how they are achieved and in some cases, their cost. Dr. Olney will provide mentorship and guidance, based on Dadirai's needs during fieldwork. Both Dr. Stoltzfus and Dr. Olney will also help establish and strengthen networking and contacts future research and collaborations. Dadirai expects to complete her PhD in 2019.

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## **Edgar Okello**

**Country:**  
Kenya

**University:**  
University of Eldoret, Kenya

**Department & Degree:**  
Crop Pathology, MSc

**US Mentor institution:**  
University of Minnesota

**CGIAR Mentor Institution:**  
International Maize and Wheat Improvement Center (CIMMYT)

**Research:**  
Genetic Diversity of Wheat Stem Rust Pathotypes in the Wheat Growing Regions of Kenya

**Email:**  
[edgarotieno30@gmail.com](mailto:edgarotieno30@gmail.com)

Edgar Okello, a 2016 Fall Borlaug LEAP fellow and MSc student at the University of Eldoret, Kenya, in the Crop Protection program, is researching population genetic studies of the wheat stem rust pathogen in Kenya. Farming has long been recognized as the backbone of the Kenyan economy and wheat is the second most widely grown cereal crop after maize in the country. One of the major constraints hampering its production is the stem rust pathogen *Ug99* and its variants. If not controlled at an early stage, up to 99% of yield loss has been known to occur. Not only is it a threat in Kenyan wheat varieties, but also global wheat production due to global vulnerability of the wheat germplasm towards this disease.

For the past year Edgar has been working as a research assistant with Delivering Genetic Gain in Wheat (DGGW) project, in collaboration with Kenya Agricultural and Livestock Organization



(KALRO) in Njoro, Kenya. The project mainly screens wheat germplasms all over the world for *Ug99* and its variants and six distinct lines within the *Ug99* lineage have been identified in Kenya alone. Edgar hopes his time with the Borlaug LEAP fellowship will help further his work and allow for better protection against wheat stem rust in the future. He understands that research like this is vital to improving food security and the income potential of millions of farmers across Africa and beyond and hopes to lead the field in this endeavor.

During his fellowship period Edgar will be working in both at CIMMYT in Kenya and at the University of Minnesota (UMN). He will be under the mentorship of Dr. Les Szabo, a research geneticist working at the USDA-ARS Cereal Disease Laboratory (CDL) at UMN. Dr. Szabo's lab focuses on developing a better understanding of the host-parasite interactions and the evolution of rust fungi. In addition to this, his lab has developed genotyping tools for more in-depth analysis of wheat stem rust pathogens. Dr. Sridhar Bhavani, Edgar's CGIAR mentor, is a wheat scientist working at CIMMYT on rust genetics, pathology and breeding. He currently coordinates the stem rust screening nurseries for East Africa under the DGGW program. He will mentor Edgar in thesis development and writing as well as linking the phenotypic data to the generated genotypic data. Edgar intends to finish his MSc studies by the end of December 2017.

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## **Emmanuel Amoakwah**

**Country:**

Ghana

**University:**

University of Cape Coast, Ghana

**Department & Degree:**

Soil Science, PhD Candidate

**US Mentor institution:**

Ohio State University

**CGIAR Mentor Institution:**

International Institute of Tropical Agriculture (IITA)

**Research:**

Biochar Impact on Carbon and Nitrogen Dynamics, Soil Quality, Crop Yield and Greenhouse Gas Emissions

**Email:**

[emmaamoakwah@yahoo.co.uk](mailto:emmaamoakwah@yahoo.co.uk)



Emmanuel Amoakwah joins the Borlaug LEAP fellowship in Fall 2016 as a PhD student at the University of Cape Coast in Ghana. His research focuses on the impact of biochar on carbon and nitrogen dynamics, soil quality, crop yield and greenhouse gas emissions. Emmanuel graduated with a BSc in Agriculture in 2004 and was awarded a scholarship for further studies at Ghent University in Belgium. He received his MSc in Physical Land Resources in 2008, with distinction, and is currently working as a research scientist at the Council for Scientific and Industrial Research – Soil Research Institute in Kumasi, Ghana in addition to his PhD studies. The objectives of Emmanuel's PhD research are to assess the impact of biochar on the fertility of weathered tropical soils and to evaluate the effect of biochar on greenhouse gas emissions

and crop yield. He hopes his work will contribute to poverty alleviation through agriculture because often the poorer segments of the Ghanaian population live in rural areas where the majority depend solely on agriculture for their livelihoods. Undoubtedly, improving agriculture technologies and increasing food security can be used as a tool in alleviating poverty and hunger in countries like Ghana.

Emmanuel has held many leadership roles throughout his academic and research careers. He led a project team to identify successful agricultural water management technologies practiced in Northern Ghana and Burkina Faso, which were slated to be up-scaled to other parts of those countries. He also represented a group of over thirty Borlaug Fellows in Des Moines, Iowa during the World Food Prize Laureates awards ceremony in 2013. He was nominated by other Borlaug fellows to give a presentation on climate change, food security and agricultural sustainability in Africa.

Emmanuel's U.S. mentor, Dr. Rafiq Islam, is the program director of the Soil, Water and Bioenergy Resources at the Ohio State University. Dr. Islam's major research focus is on sustainable agricultural and climate change mitigation, soil health, and fertility and soil amendments. Dr. Generose Nziguheba will serve as his CGIAR mentor at the International Institute of Tropical Agriculture (IITA) in Kenya. Dr. Nziguheba is a soil scientist who focuses on soil fertility. Most of her research has been on understanding the biophysical and socio-economic factors underlying low agricultural production, food insecurity and poverty for smallholders farming communities, and assessing interventions to address them. Her research interests are perfectly in line with Emmanuel's PhD research and his mentors will be assisting him with both laboratory and statistical analyses. They will also help him in writing his thesis and will provide supervision during his fieldwork. Emmanuel is on course to successfully complete his PhD in 2018.

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## **Eyaya Belay Bisewur**

**Country:**

Ethiopia

**University:**

Entoto Observatory and Research Center at Addis Ababa University, Ethiopia

**Department & Degree:**

Remote Sensing, PhD Candidate

**US Mentor institution:**

Florida International University

**CGIAR Mentor Institution:**

International Water Management Institute (IWMI)

**Research:**

The Response of River Discharge Dynamics to the Eco-environmental Vulnerability of Guna Mountain, Ethiopia

**Email:**

[eyayab@gmail.com](mailto:eyayab@gmail.com)

A common theme among the research topics Borlaug LEAP fellows undertake is the idea of sustainability in the face of climate change and environmental degradation and Ethiopian Eyaya Belay Bisewur's work continues that trend. Eyaya was accepted as a 2016 Fall Borlaug LEAP fellow for his PhD research on how soil erosion and river discharge impact the eco-environmental vulnerability of the Guna Mountain watershed area in the Upper Blue Nile Basin. His research will allow for proper evaluation of the current environmental situation in the area and how proposed development, including the building of dams, will impact the ecological and agricultural systems currently in place and what sustainable solutions can be instituted as a result.

After completing his undergraduate and Master's degrees in Earth Science and Geography at Addis Ababa University (AAU), Eyaya worked as a lecturer in the Geography and Environmental Studies department at the University of Gondar in Ethiopia. He went on to serve as the Dean of the Social Sciences and Humanities College there as well, and is currently on study leave from both positions as he pursues his PhD at the Entoto Observatory and Research Center at AAU. During his time at Gondar University, he has also been involved in community watershed programs, coordinating people and resources to best serve the area's needs. While already well established as a leader, Eyaya is excited to participate in the Borlaug LEAP fellowship not only as a way to further his research, but to hone his leadership skills for future projects.

Eyaya will be working with US mentor Dr. Asefa Melesse at Florida International University and Dr. Alesged Tamiru Haile at the International Water Management Institute (IWMI). Dr. Melesse is a well-respected professor of Water Resources Engineering and has done extensive work with remote sensing and hydrological modeling and has produced many publications on those subjects. He will work with Eyaya to help him refine his remote sensing skills and how they relate to his research project. Dr. Tamiru Haile, a hydrological researcher who has explored the issues of climate change and proper watershed management, will work with Eyaya at IWMI to investigate the effects of river discharge on soil health and the surrounding environment. Eyaya plans to finish his PhD by mid-2018.

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## **James Mushi**

**Country:**

Tanzania

**University:**

Sokoine University of Agriculture, Tanzania

**Department & Degree:**

Virology, PhD Candidate

**US Mentor institution:**

University of California, Davis

**CGIAR Mentor Institution:**

International Livestock Research Institute (ILRI)

**Research:**

Innate Resistance to Newcastle Disease in Selected Local Free-Range Chicken Ecotypes

**Email:**





[jamessalakana\\_1979@yahoo.com](mailto:jamessalakana_1979@yahoo.com)

James Mushi, a 2016 Fall Borlaug LEAP fellow, holds an MSc in Molecular Biology, as well as a Bachelor of Veterinary Medicine (BVM) from Sokoine University of Agriculture (SUA) in Tanzania. James is currently pursuing his PhD at SUA where his focus is on improving productivity for chicken farmers through the selective breeding of Tanzanian free range local chickens (FRLC) for resistance to Newcastle disease, a major killer of poultry birds. He hopes his work will contribute to improving food security, national health and wealth, and improved income potential through these chickens.

After receiving his BVM, James worked as a veterinarian in his immediate community, treating animals and providing consultations to improve animal welfare. However, his true desire was to improve animal production using modern scientific techniques and to contribute to the increase of animal proteins in local diets. James was subsequently hired to work as an assistant research scientist in the Newcastle Disease-Avian Influenza project based at SUA, which focused on the control of the two diseases. He was later employed by the University in 2008 to work as a lecturer and a researcher. He then began focusing his attention on the free range local chicken. The FRLC has high a fecundity rate and is easy and inexpensive to keep even by the poorest household. James is looking forward to fulfilling his vision through this fellowship in addition to receiving help and direction in completing his PhD research.

For this fellowship, James will be under the mentorship of two scientists who have made great contributions in the world of animal production and food quality. Professor Huaijun Zhou at the University of California, Davis is a molecular geneticist and an immuno-geneticist. He will guide James in the molecular and immunological components of his work, attempting to isolate the molecular elements and immunological mechanisms for the resistance to Newcastle disease in the Tanzanian FRLC. Dr. Tadelle Dessie of the International Livestock Research Institute (ILRI), in Ethiopia, is animal geneticist and breeder with great experience and a long track record of research on poultry. He will work with James, giving him hands-on experience at the ILRI lab and giving him exposure to breeding programs for the perpetuation of identified Newcastle disease resistant type FRLC. James is expecting to finish his PhD studies in 2019.

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## **Kwaku Antwi**

**Country:**  
Ghana

**University:**  
Texas Tech University

**Department & Degree:**  
Agricultural Economics, PhD Candidate

**US Mentor institution:**  
Texas Tech University

**CGIAR Mentor Institution:**  
International Institute of Tropical Agriculture (IITA)



**Research:**

Outcome of Food Security Intervention Strategies among Rural Households in the Northern Region of Ghana

**Email:**

[kwaku.antwi@ttu.edu](mailto:kwaku.antwi@ttu.edu)

2016 Borlaug LEAP fellow Kwaku Antwi hails from Kumasi, Ghana. He received his BSc degree in General Agriculture from the University of Cape Coast in 2004. In 2003, while still pursuing an undergraduate degree, he received the Head of State Award from the President of the Republic of Ghana for his outstanding contribution to rural development. After completing his BSc, he enrolled in the Kwame Nkrumah University of Science and Technology to pursue a Master's degree in Agricultural Economics, which he completed in 2009. While studying for his Master's degree, he was employed at the Ministry of Food and Agriculture where he worked as the Assistant Northern Regional Monitoring and Evaluation Officer. He went on to become the Northern Regional Monitoring and Evaluation Officer, which gave him the opportunity to evaluate major agricultural programs, and contributed to the formulation and implementation of policies regarding the agricultural sector of Ghana. Kwaku sees the Borlaug LEAP fellowship as a way to further his leadership skills along with his research skills, and to make vital connections in the world of agricultural economics.

Kwaku is currently pursuing his PhD in Agricultural Economics at Texas Tech University as a BHEARD Scholar, and has already successfully passed his PhD comprehensive exams. His research interests include food security and agricultural policy, and he has published three journal articles since beginning his program in 2014. He was selected as a Borlaug LEAP fellow for his research project in the Northern Region of Ghana and will be working with Dr. Conrad Lyford at Texas Tech and Dr. Bekele Kotu at IITA. They will help him to assess the nutritional outcomes of food security intervention programs among rural households in the Northern Region of Ghana and shape his thesis strategy. Kwaku expects to finish his research and receive his doctoral degree in 2018.

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**Martha Williams****Country:**

Sierra Leone

**University:**

Federal University of Agriculture, Abeokuta, Nigeria

**Department & Degree:**

Nutrition and Dietetics, PhD

**US Mentor institution:**

Virginia Tech University

**CGIAR Mentor Institution:**

International Institute of Tropical Agriculture (IITA)

**Research:**

Retention and Bioavailability of Beta-carotene, Iron and Zinc in Bio-fortified Cassava fufu in Sierra Leone



**Email:**

[mujearose@gmail.com](mailto:mujearose@gmail.com)

Martha Williams joined the Borlaug LEAP Fellowship for the Fall 2016 cycle from Sierra Leone. She received funding from the West African Agricultural Productivity Program (WAAPP-1c), a World Bank funded project, for her PhD research on the bioavailability of beta-carotene, iron and zinc in fufuproduced from bio-fortified cassava roots. Martha has been passionate about food and nutrition security since her time as an undergraduate student when she focused on researching and developing high-nutrient food products. She received her PhD from the Federal University of Agriculture, Abeokuta, in Nigeria, where she conducted research on the viability of bio-fortified root vegetables, especially cassava, for nutritional improvement among the poorer populations of Sierra Leone. Her goal is to improve food security by increasing access to foods that will directly impact the nutritional health of the more disadvantaged people in West Africa.

After completing a Master's in Nutrition and Dietetics at Njala University in Sierra Leone, Martha found employment at the Sierra Leone Agricultural Research Institute (SLARI) as a Nutrition Research Officer. There, she conducted surveys on the nutritional health of mothers and children under 5. Her goal is to take the skills she learned as a Borlaug LEAP fellow and be an exemplary leader in her job and help others move toward better health. She feels that being a good leader is someone who is an "advocate, innovator, and motivator" and she hopes to bring those skills to the forefront of her career.

US mentor Dr. Edward Smith, a fellow Sierra Leonean and a professor at Virginia Tech, guided Martha in conducting research in nutritional genomics and bioavailability at his lab. He had extensive experience not only in research, but in mentoring and working with international graduate students pursuing their degrees. CGIAR mentor Dr. Busie Maziya-Dixon, a crop-utilization specialist at the International Institute of Tropical Agriculture (IITA), worked with Martha to identify cassava genotypes and proper bio-fortification techniques. Martha completed her PhD in June 2018.

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## **Mitiku Asfaw Mengistu**

**Country:**

Ethiopia

**University:**

University of Nevada - Reno

**Department & Degree:**

Biochemistry and Molecular Biology, PhD Candidate

**US Mentor institution:**

University of Nevada - Reno

**CGIAR Mentor Institution:**

International Center for Agricultural Research in the Dry Areas (ICARDA)

**Research:**

Improving Drought Tolerance and Lodging in Tef Grass: a forage, fodder, and highly nutritious, gluten-free grain crop



**Email:**

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2016 Fall Borlaug LEAP fellow Mitiku Asfaw Mengistu obtained his BS in Plant Sciences and his MS in Applied Genetics from Alemaya and Addis Ababa Universities, respectively, in Ethiopia. He is currently pursuing a PhD in Biochemistry and Molecular Biology at the University of Nevada – Reno (UNR). His project focuses on improving tef by using cutting-edge biotechnological approaches. Tef is the most important grain crop in Ethiopia, where it serves as major staple food for more than two-thirds of the residents of Africa's second most populous nation. Despite gaining wide popularity across the globe for its immense nutritional and health benefits, the productivity of tef remains significantly impaired by lodging and drought. Mitiku's project was initiated with the overarching goal of boosting tef productivity with the application of innovative biotechnological solutions. Considering that much of Ethiopia's vast arable land is covered with tef each year, enhancing the productivity of this crop would have a significant impact on the country's food security and would improve the livelihoods of farmers and stakeholders along the entire tef value chain.

Mitiku's research experience began in late 2002 when he joined the Amhara Regional Agricultural Research effort based at the Adet Agricultural Research Center. Initially responsible for development of improved rice varieties for different agro-ecologies of Ethiopia, he soon became a tef breeder with the aim of improving tef productivity within the Amhara region. In addition, he worked as a director for crops research at the Adet Agricultural Research Center and has contributed to the development of several improved varieties of rice and tef and recommendations for superior agronomic practices for commercial production in Ethiopia. He then moved to the National Tef Improvement Project at the Debre Zeit Agricultural Research Center where he again served as a tef breeder. Since the late 1950's, the National Tef Improvement Project has developed more than thirty improved tef varieties, which has increased tef productivity by 30%, but none were found to be lodging resistant. Thus, susceptibility to lodging remains a challenge and an important target for future tef improvement studies.

Mitiku's US mentor, Dr. John Cushman, is a professor in the Department of Biochemistry and Molecular Biology of the University of Nevada – Reno. The Cushman lab focuses on improving the abiotic stress tolerance of plants and in the development of more water-efficient food and bioenergy crops including tef. Mitiku's CGIAR mentor, Dr. Adamu Molla, is a senior agronomist at the International Center for Agricultural Research in the Dry Areas (ICARDA). Dr. Molla will supervise Mitiku's training and hands-on practice at the Debre Zeit Agricultural Research Center. He will also provide timely organization and ensure the successful delivery of training on tef floral biology and the efficient completion of genetic crosses. Mitiku plans to complete his PhD in Spring 2019.

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## **Saba Mohammed**

**Country:**  
Nigeria

**University:**  
University of Ghana

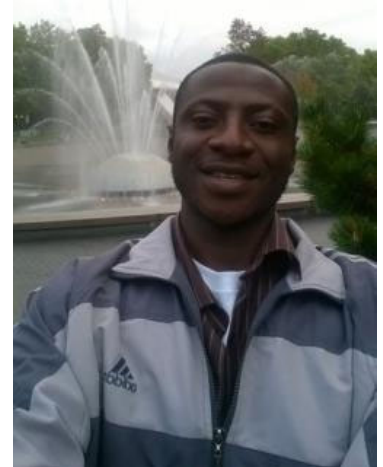
**Department & Degree:**  
Plant Breeding, PhD Candidate

**US Mentor institution:**  
Pennsylvania State University

**CGIAR Mentor Institution:**  
International Institute of Tropical Agriculture (IITA)

**Research:**  
Genetic Improvement of Cowpea for Low Soil Phosphorus Tolerance

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Fall 2016 fellow Saba Mohammed obtained a BSc in Agriculture in 2008 and an MSc in Plant Breeding in 2012 from Ahmadu Bello University Zaria, Nigeria. He is now pursuing a PhD in Plant Breeding at the West Africa Centre for Crop Improvement, University of Ghana. His research is aimed at developing molecular markers for the genetic improvement of cowpeas for low soil phosphorus tolerance. Phosphorus is the most limiting soil nutrient for cowpea production in major growing areas in Nigeria, and areas where cowpeas are grown in sub-Saharan Africa, so this work will help fast track the development of varieties with ability to efficiently use limited soil phosphorus. Developing these varieties can also help with the sustainability of food systems in cowpea growing areas, and will ultimately benefit smallholder farmers.

Mohammed's breeding experience began with his MSc research project, where he worked on trans-genic cowpea lines that were bred to resist the devastating effects of *Maruca vitrata*, a major cowpea pest in West Africa. In January 2012, he joined the Institute for Agricultural Research at Ahmadu Bello University in Zaria as an Assistant Research Fellow. Since then, he has been working on breeding research in their Cowpea Genetic Improvement program. As a scientist, Mohammed strongly believes that he can make great contributions to the growth and development of crop production, utilizing both his theoretical background and his creativity. He also believes that Nigeria and sub-Saharan Africa have the potential to become food secure, if its rich human and agricultural resources are appropriately harnessed. Mohammed would like to see himself at the forefront of crop breeding, introducing varieties with resistance to biotic and abiotic stresses, and mentoring up-coming young scientists.

Mohammed will be working with US mentor Dr. Jonathan Lynch, a professor of Plant Nutrition at Pennsylvania State University. Dr. Lynch has gained expertise of over three decades in crop adaptation to edaphic stress, including drought, and low availability of nitrogen, phosphorus, and potassium. His research has identified several root traits that have been used for breeding more stress tolerant crops in Africa, Asia, and Latin America. His team has also developed tools and concepts that will be useful to Mohammed in furthering his education and career goals. In addition, Mohammed will be working with Dr. Ousmane Boukar at the International Institute of

Tropical Agriculture (IITA) in Nigeria. Dr. Boukar is a seasoned cowpea breeder, with a good understanding of the crop. His knowledge of the cowpea extends back nearly thirty years, and his experience in conducting high-quality research to uncover the genetic basis of resistance to biotic and abiotic stresses will greatly enhance Mohammed's capacity as a young scientist. Mohammed looks to complete his PhD studies by the end of 2018.

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## **Temesgen Desalegn Darago**

**Country:**

Ethiopia

**University:**

Hawassa University, Ethiopia

**Department & Degree:**

Animal Nutrition, PhD Candidate

**US Mentor institution:**

Colorado State University

**CGIAR Mentor Institution:**

International Livestock Research Institute (ILRI)

**Research:**

Improving the Productivity of Ruminants through Proper Nutrition: Case of Mineral Nutrition in Wolaita Lowlands, Ethiopia

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Fall 2016 Borlaug LEAP fellow Temesgen Desalegn Darago obtained his BSc in Animal and Range Sciences from Mekelle University and his MSc in Animal Production from Haramaya University, Ethiopia. He is currently pursuing his PhD in Animal Nutrition at Hawassa University, where his research focuses on improving the productivity of ruminants through proper nutrition. In Ethiopia, animal nutritionists have worked extensively on macro nutrients like protein, assessing energy and crude protein contents of animal feed resources in the country. However, less attention has been given to the mineral and vitamin nutrition of the livestock in the country. Though energy and protein are of primary importance to all animals, optimum performance of any animal is possible only if there is an adequate supply of minerals and vitamins. Therefore, to supply an adequate level of minerals, both conventional and non-conventional feed resources in the country should be assessed for their mineral contents and improved if possible. Temesgen is interested in identifying these potential mineral supplements for livestock raised in the Wolaita Low Lands of Ethiopia. He believes his research will be immensely helpful to farming communities in the area and beyond by improving the productivity of their livestock through better mineral nutrition status.

After receiving his MSc, Temesgen worked at Madawalabu University in Ethiopia in various positions, including as a lecturer, department head and as the director of the School of Agriculture. He also engaged in need-based professional community services such as training and advising to both farming communities and mid-level livestock professionals. The experiences he gained from his research, education and community services were invaluable to

developing his current research project. Temesgen dreams of being a leading scientist in livestock mineral nutrition and hopes to one day establish a regional center for mineral analysis in the country, working to help promote food security across East Africa.

During his fellowship, Temesgen will be mentored by Professor Terry Engle and Dr. Michael Blummel. Dr. Engle is highly qualified mineral nutritionist at Colorado State University (CSU) with experience advising graduate and postgraduate students and with first-hand knowledge of Ethiopia, that will help facilitate Temesgen's research while at the university. Dr. Engle also plans to visit Ethiopia to view Temesgen's research activities and provide guidance while there. Dr. Blummel, Temesgen's CGIAR mentor, will help by providing supervision and technical support in the field and at the laboratory level in Ethiopia and also make the ILRI laboratory accessible during the fellowship. Temesgen expects to complete his research and receive his PhD at the end of 2017.

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