New facilities inaugurated in Kenya to aid agriculture in East Africa

CIMMYT, in partnership with the Kenyan Agricultural Research Institute (KARI), established two major maize facilities in Kenya last week. The Maize Doubled-Haploid Facility for Africa at KARI-Kiboko aims to accelerate the development of stress-resilient and nutritionally-improved maize varieties while the Maize Lethal Necrosis Screening Facility at KARI-Naivasha will focus on tackling deadly maize lethal necrosis (MLN).

The doubled-haploid (DH) facility, established with funding support from the Bill & Melinda Gates Foundation, was inaugurated on 25 September by Felix K. Koskei, Kenya’s cabinet secretary for Agriculture, Livestock and Fisheries. Representatives from the ministry and country government, the CIMMYT board of trustees and management committee and the KARI director and board of management attended the inauguration.

“Just as agriculture is the driver of economic growth, so is agricultural research the engine of agriculture,” Koskei said. “I take this opportunity to congratulate maize research scientists for their tireless efforts in conducting cutting-edge agricultural research directed at solving the constraints that hinder agricultural growth.”

The facility will help serve African agriculture for years to come, said CIMMYT Director General Thomas Lumpkin. “The Maize DH Facility will be key to fast-tracking the development and delivery of drought tolerant, disease and insect-pest resistant and nutritionally enriched maize varieties for the benefit of Kenyan and African farmers at large,” he said.

The MLN screening facility will address another challenge: while maize is Africa’s most important food crop, the 2011 drought in East Africa – combined with the emergence of MLN in eastern Africa in 2012 – resulted in significant crop losses and severe food shortages across the region. The accelerated development and delivery of MLN-resistant maize varieties with other important adaptive traits is an urgent priority for CIMMYT and its partners in the region. The MLN Screening Facility at KARI-Naivasha is central to achieving this goal and was made possible with funding support from the Bill & Melinda Gates Foundation, and the Syngenta Foundation for Sustainable Agriculture.

Inaugurating the MLN Screening Facility at KARI-Naivasha, Kenya’s Principal Secretary to the Ministry of Agriculture Sicily Kariuki commended CIMMYT and KARI for their rapid response to MLN and for establishing a screening facility that...
will benefit the entire region. The facility aims to provide MLN phenotyping services and effectively manage the risk of MLN on maize production through screening and identifying MLN-resistant maize germplasm. It will make use of public and private sector research partners in Africa to contribute to food security and to the livelihoods of farming communities in Eastern Africa.

Through the KARI-CIMMYT partnership, several promising maize inbred lines and hybrids with resistance to MLN have already been identified and are being further validated and used in breeding strategies to develop MLN-resistant maize hybrids.

Prasanna Boddupalli, director of the CIMMYT Global Maize Program, emphasized the facility “will serve not only CIMMYT and KARI, but other interested public and private sector institutions that are engaged in developing and delivering improved maize varieties to farmers in Africa.”

Submitted by Miriam Shindler

Partnering to build the capacity of seed companies in Africa

By Florence Sipalla

CIMMYT and partner organizations are helping to build the human capacity of seed companies, which contribute to food security by ensuring farmers have access to quality seed. Certified seed is one of the most important inputs farmers need to improve their grain yields and livelihoods.

CIMMYT organizes regular training sessions for seed companies in different countries across Africa, in collaboration with the Seed Enterprise Management Institute (SEMs) project, which is funded by the Alliance for a Green Revolution (AGRA) and hosted at the University of Nairobi College of Agriculture and Veterinary Services. “AGRA realized that many seed companies across the continent lacked knowledge on seed production, processing, marketing and aspects of seed quality,” said David Ndung’u, project manager for the SEMs project. Both AGRA and CIMMYT receive funding from the Bill & Melinda Gates Foundation.

In the past three years, SEMs has trained more than 450 seed producers from 17 Sub-Saharan African countries, including Burkina Faso, Ethiopia, Ghana, Kenya, Liberia, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Sierra Leone, Tanzania, Uganda and Zambia. “This training has been identified as one of the triggers for the huge increase in production of high-quality seed by AGRA-funded seed companies all over Sub-Saharan Africa,” Ndung’u said.

The seed production course, taught by John MacRobert, seed systems lead for CIMMYT, is among the most popular with seed companies, Ndung’u said. The course focuses on challenges companies face in managing hybrid maize seed. “John brings a wealth of experience in this field,” Ndung’u continued. “He is helping seed companies plan better and improve their seed production capabilities.” MacRobert’s book, Seed Business Management in Africa, is included in the course materials. CIMMYT’s Drought Tolerant Maize for Africa project (DTMA) also utilizes MacRobert’s book in training sessions for seed company staff.

CIMMYT has conducted seed production management courses in Angola, Ethiopia, Swaziland, Tanzania, Uganda and Zimbabwe, training more than 200 personnel from the private and public sectors over the past six years. The trainings emphasize cooperative learning while providing technical information and management tools. CIMMYT seed systems specialists also made more than 80 follow-up visits to seed company partners in 2013.
Two-wheel tractor seed drill modified for African smallholder maize farmers

By Frédéric Baudron

The Farm Mechanization and Conservation Agriculture for Sustainable Intensification (FACASI) project is addressing the decline of farm power in Africa. The project is working with smallholder farmers to deliver small mechanization based on inexpensive, two-wheel tractors and introduce power-saving technologies, such as conservation agriculture.

Last March, participants evaluated the performance of the Gongli seeder – a seed drill sold in China – under the typical conditions of maize smallholder farmers in Kenya and Tanzania. Gongli inventor Jeff Esdaile, engineers from the Centre for Agricultural Mechanization and Rural Technology (CAMATEC) and engineers from the Kenya Network for Dissemination of Agricultural Technologies met at a CAMATEC workshop from 9 to 20 September in Arusha, Tanzania, to modify the Gongli seeder and produce the Gongli Africa +.

The original Gongli seeder is well-suited to seed small-grain crops in close rows into fields without long, loose residue or heavy weeds. For sowing maize in a typical field around Arusha, however, the machine had several shortfalls: it handled loose maize residues and heavy weeds poorly; the pressing wheels got in the way of the operator’s walk; the seed and fertilizer hoppers were too high and blocked the operator’s visibility; the seed meters were not precise enough for maize planting; and transporting the machine from field to field required walking long distances because the machine cannot be ridden and does not fit in a trailer.

The modified Gongli Africa + features cutting discs that can be fitted in front of the standard tines for heavy mulch and weed loads. Two large back tires, used as pressing wheels in the field, were added, as well as a platform for the operator to stand on, facilitating transport to and from the fields. Because the machine will be used to sow a maximum of two rows, the third bar was removed from the seeder. The seed and fertilizer hoppers were lowered, and, finally, specialized seed metering systems for large seeds such as those of maize were installed.

Results from initial field testing were encouraging. Thorough field testing will take place next November in Tanzania and Kenya. After minor modifications, the specifications of the Gongli Africa + will be sent to Gongli LTD for commercial manufacturing.
Beginning in August, the Hill Maize Research Project (HMRP-IV), has worked with the Seed Entrepreneurs Association of Nepal and the District Agriculture Development Office to facilitate formal contracts between 51 community-based seed production (CBSP) groups and 25 seed buyers/traders for a total of 201 tons of improved seed of different maize varieties. Of the total contracted seed, seed companies account for 55 percent; agrovets, 20 percent; community seed banks, 13 percent; and cooperatives, 12 percent.

Launched in 1999, HMRP is in its fourth phase. The project focuses on improving the food security and income of resource-poor farm households in the hills of Nepal by raising the productivity, sustainability and profitability of maize-based cropping systems. Work now covers 20 hill districts of Nepal and is jointly funded by the Swiss Agency for Development and Cooperation (SDC) and the United States Agency for International Development (USAID). CIMMYT implements the project in partnership with an array of public and private sector institutions in Nepal. Principal partners include the National Maize Research Program under the Nepal Agricultural Research Council, the Crop Development Directorate under the Department of Agriculture, the Seed Quality Control Centre and the National Seed Board under the Ministry of Agriculture Development. Other partners include community-based organizations, farmer groups, NGOs, private entrepreneurs, seed companies and universities.

Community Based Maize Seed Production

The project began multiplying seed of improved maize varieties through CBSP groups in 2000. That year, about 14 tons of improved maize seed were produced by seven CBSP groups. By 2011, more than 1,140 tons of improved maize seed were produced by 195 CBSP groups and, in 2012, 207 groups produced 1,036 tons. Of the total marketable surplus seed produced in 2011, about 75.1 percent was marketed or exchanged, compared to 83.3 percent in 2012. The seed was marketed mainly across the 20 hill districts of the HMRP project area.

Seed production through CBSP groups has been a successful model in Nepal and has contributed to increasing the adoption of improved maize varieties and technologies. The CBSP model helps ensure the availability of improved maize seed in remote hill areas on time at lower prices.

Pre-sowing seed contract

Maize seed marketing is one of HMRP’s major challenges. Until 2012, CBSP groups did not consider the supply and demand in markets, resulting in surplus seed in some areas and deficits in others. The 2013 project phase initiated pre-sowing seed contracts for improved maize varieties, assisting and guiding CBSP groups and seed buyers/traders (agrovets, community seed bank cooperatives and seed companies) to sign formal agreements.
Travelling seminar shows project progress in Nepal

By Nirmal Gadal

A three-day travelling seminar organized by CIMMYT’s Hill Maize Research Project (HMRP) and partners gave policy makers a first-hand look at the status of maize varietal development, source seed production, agronomic interventions and seed multiplication and marketing in 20 districts of Nepal.

In close partnership with the Nepal Agriculture Research Council (NARC) and the Department of Agriculture (DoA), HMRP hosted this third annual seminar from 27 to 30 August for 25 officials representing donors such as the Swiss Agency for Development and Cooperation (SDC) and the United States Agency for International Development (USAID), as well as organizations including the National Planning Commission, Ministry of Agriculture Development (MoAD), Ministry of Finance, non-government organizations, private companies and the media.

Participants visited a variety of sites. At the Agriculture Research Station (ARS) in the district of Dailekh, attendees interacted with scientists and observed maize research activities and conservation agriculture trials. In this area, the project is promoting intercropping white quality protein maize (Poshilo Makai-1) and off-season vegetables such as bitter gourd, tomatoes and radishes. HIV/AIDS-infected women farmers in Rakam village of Dailekh were also invited to participate.

“Our main resource is land,” said 30-year-old farmer Mana Sara Sijapati during a group discussion. “We must increase our production from this land to have food security in our households during the entire year.” She asked the participants for a program targeted toward farmers affected by HIV/AIDS. Ram Prasad Pulami, joint secretary at the MoAD, asked NARC and DoA representatives to respond to the request immediately.

The group then participated in an interactive program with farmers, observed seed production activities and assessed on-farm trials and demonstration plots at the Basnatamala and Jeevanjyoti Women Community Based Seed Production (CBSP) Group. Dr. G. Ortiz-Ferrara, team leader for HMRP/CIMMYT, and Pulami jointly inaugurated an HMRP-funded seed store house that was built for the CBSP group. The team also visited the Sambriddhi Agriculture Cooperative, Ltd., as well as a quality protein maize village, where conservation agriculture trials will soon be established.

Ortiz-Ferrara thanked all the participants, including the HMRP team, for their active participation and support in making the seminar successful. Pulami said during his closing remarks that he appreciated HMRP’s efforts and progress, especially the partnerships between the project and a number of diverse stakeholders. He said the government of Nepal is implementing a “Mid-hill Mega Maize Production Program” focused on 40 hill districts and will utilize HMRP’s experiences and research innovations.
Pakistan program aims for agricultural innovation

By Imtiaz Muhammad

International and Pakistani scientists are expanding efforts to accelerate access to climate-resilient maize and rust-resistant wheat varieties in Pakistan, as well as to improve farmers’ access to quality seeds, as part of the Agricultural Innovation Program (AIP). Project partners discussed these priorities during a cereals and cereal systems meeting at the National Agricultural Research Center (NARC) in Islamabad from 29 to 30 August.

AIP is a U.S. Agency for International Development (USAID)-funded project focusing on cereals, vegetables and livestock in Pakistan, a country challenged by rapid population growth and climate change. CIMMYT is working with the Pakistan Agricultural Research Council (PARC), the International Rice Research Institute (IRRI) and other partners to increase agricultural productivity and the value of agricultural commodities in the country.

The program is supporting Pakistan in agricultural research for development, which includes building partnerships between research and those it serves; increasing investments; generating, sharing and making use of agricultural knowledge for development; and demonstrating and building awareness of the development impact and returns from agricultural innovation.

Farmers throughout the world face similar problems from increasing production costs, fluctuating market prices, water and soil degradation and potential implications of climate change, said Ken Sayre, a CIMMYT consultant on conservation agriculture. Sayre also described the benefits of conservation agriculture crop management technologies and their main principles. These include seeding systems that allow major reductions in tillage, retaining adequate levels of crop residues on the soil surface and using diversified crop rotations.

There are many challenges AIP can address. Maize yields in Khyber Pakhtunkhwa Province are low due to a lack of technology. Most maize farmers in Pakistan use manual sowing, which is not cost or time-effective, and farmers need more confidence in hybrid seeds before they will pay a premium for them.

Meeting participants discussed several options for commissioned projects in wheat, including rapid diffusion of high-yielding, rust-resistant wheat; introducing fungicides for wheat management; and generating a durum wheat value chain in Pakistan. Participants also discussed potential projects and goals related to climate-resilient wheat, the cultivation of durum wheat in Balochistan province, the standardization of fungicides to combat yield losses and strengthening communication.

For the rice work plan, top priority areas include developing tolerance to submergence and heat in locally adapted varieties such as super basmati, basmati 515, IR-6 and IR 9, in addition to bacterial leaf blight resistance and superior grain quality. Abdul Rehman and Surapong Sarkarung represented IRRI, where some of the activities have already begun.

Priorities for the maize work plan include introducing climate-resilient maize hybrids, developing biofortified maize, developing cultivars with resistance to biotic stresses and strengthening the maize seed sector. CIMMYT maize expert R. Sadananda and national partners joined to refine the maize work plan. Kay Simmons from the U.S. Department of Agriculture (USDA)-Agricultural Research Service and Ian C. Winborne, plant health advisor for the USDA Animal and Plant Health Inspection Service at the U.S. Embassy in Islamabad, also attended the meeting to discuss wheat productivity enhancement in Pakistan.
CIMMYT and USDA support wheat improvement in Pakistan

By Yahya Rauf

A meeting last month highlighted the efforts of the Pakistan Agricultural Research Council (PARC) and CIMMYT to improve wheat in the country. PARC and CIMMYT-Pakistan organized the annual wheat planning and Wheat Productivity Enhancement Program (W-PEP) meeting from 17 to 18 September at the National Agriculture Research Centre (NARC) in Islamabad. The meeting reviewed progress and achievements during the last three years under the United States Department of Agriculture (USDA) funded W-PEP program and refined work plans for 2013-14. The program is aimed primarily at developing wheat varieties that resist Ug99 stem rust as well as fostering seed multiplication and distribution, improved agronomic practices and human resource development in the agriculture sector to ensure food security.

During the inaugural session, USDA Agriculture Counselor Clay Hamilton said the USA and Pakistan have a long history of agricultural collaboration. The U.S. will continue to provide support for wheat productivity in Pakistan, he said. Shahid Masood, PARC scientist from the Plant Sciences Division, highlighted PARC’s role in strengthening the national and provincial agricultural research system in coordination with national and international collaborators and research partners.

Intiaz Muhammad, CIMMYT country liaison officer for Pakistan, briefed the participants about W-PEP’s achievements during last three years and the impact of this program on the national wheat research system in rust surveillance, breeding, pre-breeding and capacity building, which led to the release of Ug-99 resistant wheat varieties like NARC-2011. National partners from all provinces, including Azad Jammu and Kashmir and Gilgit Baltistan, presented their achievements and work plans for 2013-14. They acknowledged the role of USDA, CIMMYT and PARC in supporting wheat productivity enhancement in Pakistan.
Training in Turkey stresses experimental error prevention
By Alexey Morgounov

The International Winter Wheat Improvement Program (IWWIP) hosted the “Improvement of station management and enhancement of experimental work precision” workshop for 24 participants from 10 research institutes participating in IWWIP activities in Turkey. The workshop was held at Bahri Dagdas International Agricultural Research Institute in Konya, Turkey, from 26 to 27 September.

The participatory workshop covered agronomic and management options for handling the stations and experimental fields. Crop rotation, weed control and tillage are important factors in reducing experimental errors, according to workshop speakers. Recommendations and action plans for the future were generated at the event.

Jharkhand tribal farmers adopt maize and conservation agriculture to battle drought
Contributed by S.P. Poonia, CIMMYT India

A CIMMYT project working in the rural districts of Jharkhand, India, is encouraging farmers to grow maize and use conservation agriculture practices to adapt to decreased rainfall and a changing climate. CIMMYT’s Sustainable Intensification of Smallholder Maize-Livestock Farming Systems in Hill Areas of South Asia project is funded by the International Fund for Agricultural Development.

The project is working with scientists from Krishi Vigyan Kendras research and extension centers (KVKS), Birsa Agricultural University, the state agricultural department and farmers to promote maize as a viable alternative to rice in stress-prone and rain-dependent districts of Jharkhand.

The rural farming population is vulnerable to rainfall fluctuations and drought is recurrent in Jharkhand. Almost 90 percent of the cultivated area is monocropped (mostly with rice), and only 9 percent of the cropped area is irrigated.

The local non-governmental organization Vikash Bharti Farm Science Centre and CIMMYT organized Maize Day on 29 August in Gumla district. The event brought together 400 farmers, state agricultural department scientists, district officials and extension agents to highlight the benefits of cultivating maize, using conservation agriculture to enhance productivity. They also discussed the need for better policies. “Quality protein maize (QPM) is nutritionally superior to normal maize and provides additional dietary benefits to the tribal farmers who consume maize. It’s also a nutritious feed for poultry,” said A.K. Singh, KVKS zonal director for the Indian Council of Agricultural Research.

In Basuwa village in Gumla district, farmers cultivated more than 80 hectares of the QPM hybrid HQPM 1 for the first time this year and have committed to increase maize cultivation to 323 hectares next year. “Earlier, farmers in my village were interested in growing only rain-fed rice because it’s their staple food,” said Joni Uraon, head of the Basuwa village council. “But now they are very happy with maize because it is giving them higher profits.”

Farmers also asked for stronger market linkages to ensure competitive prices for their produce. Panai Uraon, the Gumla district government collector, welcomed the efforts of scientists and farmers to promote maize cultivation and announced additional funds will be allocated to the Basuwa village council for agricultural development activities and to supplement local irrigation systems.
Wheat conference highlights modern tools
By Roberto Javier Peña

The benefits of conservation agriculture practices and the efficiency of modern tools such as remote sensing were highlighted at the 8th International Wheat Symposium, “Challenges, opportunities, and actions to enhance wheat production in Mexico.” Mexican wheat producers from all over the country met 21 to 24 August in Mazatlán, Sinaloa.

Fire extinguishers save lives

“From now on, when I see a fire extinguisher, I will not think it is only a rare and untouchable device but a valuable instrument that can help save lives,” said one of the 43 participants who took a theoretical and practical firefighting course at the Tlaltizapán experiment station on 27 September. Station Superintendent Oscar Bañuelos said the course was a valuable experience for newly-recruited staff and served as a good refresher for those who had already taken it. Antonio Ayala, a specialist in industrial security, gave the course. Fernando A. Rodríguez and Gerardo Hurtado represented the Risk Management Unit.

Recent publications by CIMMYT staff


Weekly photo contest winner: Karma Chameleon

Bhoja Raj Basnet submitted this week’s winning photo of two chameleons who wandered into the wheat field at the stem rust screening nursery in Njoro, Kenya. Sridhar Bhavani, coordinator of the DRRW-International stem rust screening nurseries in eastern Africa, is pictured holding them.

Runner Up: Rogelio Arias from the Seed Health Laboratory submitted this photo of a wheat field at CIMMYT headquarters in El Batán, Mexico.