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WHEAT 4 Africa Updates

Unlocking the potential of wheat in sub-Sahara Africa

WHEAT 4 Africa Updates is a Newsletter of the SARD-SC Wheat program, an initiative funded by African Development Bank, AfDB. The project is implemented by ICARDA in 12 countries across Africa in partnership with the NARS.

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A wheat field with one of the new varieties in Eritrea

WHEAT TECHNOLOGIES INTRODUCED BY SARD-SC PRODUCE FIVE TONS PER HECTARE, TO IMPROVE FOOD SECURITY OF ERITREA

"For many years wheat productivity in Eritrea has been just about 1.2 t / ha in the highlands with little or no production in the lowlands," says Dr. Izzat Tahir. "SARD-SC Intervened and now farmers are getting 4.0 and even up to 5.0 t / ha from those very same farms. As a result, wheat production has now been expanded into the lowlands. This has encouraged the government which has now taken wheat as a priority crop," he adds. Dr. Izzat Tahir is the East Africa Lowland Hub Coordinator for SARD-SC and researcher with Agricultural Research Corporation, ARC Sudan.

A major contributing factor to increased productivity has been the development of new high yield varieties through the AfDB funded SARD-SC Wheat project of ICARDA working with the National Agricultural Research Institute (NARI) Halhale. The new varieties are 'SIDAA-1' 'CROC-1' and 'SANDALLA-4' for highlands, 'JEWAHIR-3' 'GOUMRIA-3' and 'ATILLA-7' for lowlands of Eritrea. Average yield from these varieties in the seed multiplication farmer fields is 4.4 t/ ha which is well over 300% higher compared to the national average yield of 1.1 t/ha (2011-2014 MOA report). In fact some of these varieties are recording 6-8 t/ha in some model farmer fields within the SARD-SC wheat established IP sites in Eritrea.

The identified varieties are under seed multiplication in farmers' fields. The project is also conducting 13 research studies (trials) that are focused on; Improvement of wheat productivity, identification of high yielding, good quality varieties that are disease and insect resistant. Other studies are for environmental stress tolerance and optimum agronomic adaptive varieties for Eritrean condition.

The limiting factors affecting high wheat crop production in Eritrea include moisture stress, diseases, and weed infestation. This is coupled with low yielding cultivars, weak seed system and insufficient agricultural inputs. The problems of low yielding cultivars, heat and disease tolerance is being solved by identifying high yielding landraces, introducing promising varieties from neighbouring countries and international research centres and research into better agronomic practices.

Wheat is an important staple crop in Eritrea and is mainly grown in the highlands of Maekel, Debub and parts of Anseba region, and also in Gash Barka and Semenawi-Keyhbahri regions. The crop is now being introduced in the lowland where there is great potential for irrigation and ample land area.

Photo credit: Tesfu Isaac / National Agricultural Research Institute (NARI) Halhale, ERITREA

A wheat farmer admiring his thriving wheat farm in Gezira, Sudan

Mohagoub Ahmed (r) Regional Manager Agricultural Bank of Sudan

IMPROVED WHEAT SEED CREDIT FACILITY CHANGING LIVES OF WOMEN FARMERS IN ETHIOPIA

"Last year I planted the local wheat varieties but lost my crop due to disease, but when I saw that the new wheat variety, Ude did very well for other farmers, I applied for it and was given 27kilograms of seed on credit," says Hawa Seid, 39 and a mother of five. At the time of this interview, Hawa was expecting a bountiful wheat harvest.

Hawa Seid is a wheat farmer from Emenay in the northern region of Ethiopia and a member of the Emenay Innovation Platform of SARD-SC. She has a one hectare farm where she grows wheat and other crops and also practices sharecropping (renting land from people and in return shares the produce with them as payment). She grows a wheat variety called Ude, an improved variety introduced to Ethiopia through the AfDB funded SARD-SC Wheat project of ICARDA and the Ethiopian Institute of Agricultural Research, EIAR.

"Ude is a very good variety for making injera, a popular local dish and difo, kuch kuch, kolo, kinche, genfo and dabo koloe," Hawa explains. Apart from wheat, she has two cows and a heifer, both of which will benefit from fodder from wheat straws. Hawa plans to use money from wheat to support her daughter Meka, who is 16 years old and in 8th grade and also her school going son. She has opened a small window shop to supplement her income and hopes to start baking bread for sale very soon. Through the SARD-SC Wheat initiative, 1,016 women benefitted from improved wheat seed in Ethiopia in the 2016 season.

Hawa Seid (r) in her wheat farm in Emenay, Ethiopia

WITH HIGHER PRODUCTIVITY, BETTER REPAYMENT AGRICULTURAL BANK OF SUDAN INCREASES LENDING

"Because of increasing wheat acreage and productivity, the number of farmers borrowing money from our Bank to grow wheat has increased to over 50,000 and this expanded our loan disbursement portfolio from USD 770,000 in 2012 to over USD 70 million by end of 2016," says Mohagoub Ahmed Mohammed, Regional Manager Agricultural Bank of Sudan. "Further our loan recovery rate has risen from 70% in 2012 to over 93%," he adds.

Unlike other countries, farmers in Sudan don't have to deal directly with millers and private marketers. The Agricultural Bank of Sudan purchases all grains produced by farmers and sells these to millers and also provides the inputs required by farmers to produce wheat. The Bank gives to farmer's loans of USD 400 per feddan (0.42ha) for production inputs like pesticides, fertilizer, harvesters and seeds. Based on the current government-set wheat purchase price of USD 57 per 100kg bag, this is equivalent to seven (7) bags. "With support from SARD-SC and ARC, farmers are getting up to 15 sacks per feddan and this means that the balance of 8 sacks is basically a profit," explains Mohammed. The main function of the Agriculture Bank of Sudan is to finance strategic crops like wheat, sorghum, cotton and groundnuts. The bank allows farmers to repay in cash if the open market prices for the commodities are better than the government offer price. Farmers can also repay in kind using the harvested produce. One such beneficiary of the bank loans is Awad Hamad, a 78 year old wheat farmer from the Rai Ebasatna, Gezira, Sudan. "Selling through the bank is a good idea because it gives farmers options. When the open free market price is bad, we give our produce to the bank and when not so bad, we sell directly to the market," says Awad Hamad.

The AfDB funded SARD-SC Wheat project of ICARDA and its local partner Agricultural Research Corporation, ARC Sudan have developed new high yield wheat varieties, supported provision of clean seeds and provided trainings to farmers and these have led to an increase in wheat production and productivity in Sudan. Mohagoub Ahmed says that working with SARD-SC and ARC Sudan, has helped the bank to reach all the other stakeholders through the innovation platform approach thus making it easier for the bank to support farmers.

INTEGRATING WHEAT INTO VEGETABLE FARMING

Zambia: "I am expecting to harvest at least 2.5 tons, part of which I will use for my household consumption and the rest I will sell," says Theresa Kuku. "If I get a good harvest and good market, I intend to cultivate an even bigger portion next year," she adds.

For many years, Theresa Kuku has been growing maize and other traditional vegetables, but in the 2016 season, due to training and extension support from the AfDB funded SARDSC Wheat project of ICARDA and the Zambia Agricultural Research Institute, ZARI, she decided to also venture into wheat farming for the first time. Fifty year old Theresa has a family of five, and apart from the regular challenge of taking good care of her family, she is also living with a disability. This disability has however not stopped her from pursuing her dreams of a better more financially secure household. On her five hectare farm, she dedicated one hectare to wheat production. Theresa is now one of the lead farmers in the Mpika Innovation Platform that has over 200 farmers. She has been taught conservation agriculture, crop rotation, benefits of the use of certified and improved seeds as well as proper crop rotation and use of mini farrows in wheat planting. Due to her dedication, she was one of the farmers who exhibited at the April 2016 IP field day and is also a trainer to other farmers.

Mpika Innovation Platform was one of the IPs established by SARD-SC and the Zambia Agricultural Research Institute, ZARI in 2015 to promote smallholder wheat farming in Zambia. This particular innovation platform is working with agro-chemical dealers ATS and MRS Sigente, machineries suppliers ZNS, Research centres of Lucheche, Mt. Makalu and Malashi, several offices in the Mpika District of Agriculture and Financial Institutions ZNBS and Vision Fund among others.

Credit: Dr. Christopher Mwaba and Dr. Moses Mulenga, Zambia Agricultural Research Institute, ZARI

Mathewos checking on his lab-raised wheat seedlings

Patrick inspecting Trime-Pico 64-32 moisture meter at the KALRO lab in Kenya

SUPPORTING RESEARCH TO ADDRESS STEM RUST AND DEVELOP CLIMATE-SMART AGRICULTURE IN ETHIOPIA AND KENYA

Mathewos Ashamo - sponsored PhD Student, Ethiopia

"At the end of this study, I will be able to identify wheat materials with anticipated resistance genes for stem rust through molecular analysis," says Mathewos Ashamo from Ethiopia.

"Further I will be able to identify new sources of stem rust resistance through evaluation of synthetic and elite wheat lines and also identify new markers linked to stem rust resistance through association mapping," adds Mathewos Ashamo. Mathewos is specializing in the subjects of 'Phenotypic and molecular characterization of stem rust resistance in wheat.' He will later this year be awarded his PhD from the University of the Free State, UFS Bloemfontein, South Africa.

Whereas his home country Ethiopia is one of the leading wheat producers in the sub-Sahara Africa, older varieties of wheat widely grown are faced with a number of evolving pathogens, a major one being stem rust that is currently a big challenge to wheat production in Africa as a whole. Therefore deeper knowledge into gene pyramiding is very important to ensure durable resistance, and Mathewos' subject of study will contribute directly into this area. With his specialization, he hopes to develop wheat varieties that are high yielding and at the same time resistant to stem rust. So far he has completed his course work, defended his proposal and has had it approved. He has also done first and second round field and greenhouse experiments at Debrezeit and Kolumsa Agricultural Research Centres in Ethiopia.

Currently Mathewos is back at the University in South Africa to complete his experiments at the molecular lab of UFS. After graduation he intends to join the National Wheat Improvement Research Program in his country.

These scholarships by AfDB funded SARD-SC Wheat project of ICARDA are meant to build the next generation of wheat scientists and researchers who will help the continent address challenges to wheat production and support countries in their efforts towards wheat self-sufficiency, increased income for local farmers, lower import bills and job creation for Africa through wheat. The scholarships are comprehensive and include stipend, research costs, tuition, travel and insurance.

Mathewos Ashamo innoculating wheat at one of his experimental plots

Patrick Awuor Ooro - sponsored PhD Student, Kenya

"In Kenya, wheat is grown in the relatively drier parts of the country and as such my PhD studies on Climate-Smart Wheat Interventions will significantly contribute to the improvement of water and nutrient use efficiency to enhance productivity of wheat per unit sector," says Patrick Awuor Ooro. This he adds will help save unnecessary wastage of nutrients and moisture.

Patrick is a PhD level student at Egerton University, Kenya where he is specializing in the 'Evaluation of Climate-Smart Interventions for Enhancing Nutrient and Water Use Efficiency in Wheat and Potato Productivity in Kenya.' Some of the key areas he hopes to address through his studies are, Inefficient use of nutrients especially nitrogen fertilizers, declining soil fertility due to unprofessional crop rotation and how to address moisture constraint due to unreliable rainfall and recurrent drought in low potential wheat growing areas.

"After I complete my studies I intend to continue serving Kenya Agricultural and Livestock Research Organization, KALRO. I also aim to serve in a post-doctoral position in a CGIAR centre in order to enhance my capacity to contribute to the wheat industry in Kenya and the region," adds Patrick.

Patrick begun his studies mid-2014 and has completed his field work, presented his dissertation and will graduate in November 2017. He is doing his studies through a full scholarship from SARD-SC.

'Kenya is a wheat deficit country, importing 1.5 million tons annually, costing roughly USD 490 million, money that could build a 100 kilometre dual carriage highway ' - Dr. Macharia Ngari, Wheat Researcher at KALRO and SARD-SC Country Coordinator, Kenya.

Charles Kilimon in his five hectare wheat seed multiplication farm in Rukwa, Tanzania

FARMERS REAPING THE BENEFITS OF ENGAGING IN WHEAT SEED PRODUCTION

Tanzania: While other wheat farmers in Ulinji village in Rukwa, south western Tanzania sell their wheat grains for TZs 800 (USD 0.35) per kilogram to millers and in the local market, Charles Kilimon Kanuni sells his wheat seed for 1,200 TZS (0.55 USD) per kilogram. Charles is a trained and contracted wheat seed producer.

Currently Kilimon has a five hectare farm where he multiplies 'Juhudi' and 'Sifa' varieties for ARI, Uyole. These varieties are under on farm trials and seed multiplication respectively. Kilimon is a member of the Rukwa Wheat Innovation platform of the AfDB funded SARD-SC Wheat project of ICARDA and the Agricultural Research Institute, ARI, Uyole Tanzania. This innovation platform has 600 wheat farmers who are using new wheat varieties and improved agronomic practices. As a result their productivity has risen from an average of 1.75 t / ha to 3.8 t / ha making their wheat farming ventures more profitable.

Theresa is another farmer engaging in seed multiplication from the area. She has an 80 ha wheat farm where she multiplies wheat seed. Theresa says she plants 70kg of seed per acre and uses DAP and UREA fertilizers on her farm. This season she expects to harvest 3.5 t / ha. Apart from being a farmer she is the leader of the Rukwa Innovation Platform. She has undergone extensive training on better wheat agronomic practices that included an exchange tour to Kolumsa Training Centre in Ethiopia through the AfDB funded SARD-SC Wheat project of ICARDA.

Over 90 percent of wheat produced in Tanzania comes from the northern highlands (Arusha, Kilimanjaro, and Manyara regions) and the southern highlands (Iringa, Mbeya regions). Production in the southern highlands is predominantly small scale and large scale in the northern highlands. Seed has been a major challenge and involvement of farmers in seed multiplication is going to boost access to seed and production for the farmers and greater income to the farmers doing seed multiplication.

Theresa inside one of her wheat farms in Rukwa, Tanzania

ABOUT THE PROJECT

SARD-SC Wheat is wheat component of Support to Agricultural Research for Development of Strategic Crops in Africa (SARD-SC) an African Development Bank, AfDB funded CGIAR-led project that targets enhanced food and nutrition security and reduced poverty across sub-Saharan Africa through strengthening of value chains of major commodity crops. SARD-SC Wheat is leading efforts to boost the production of wheat in 12 countries: Eritrea, Ethiopia, Mali, Mauritania, Niger, Nigeria, Sudan, Tanzania, Zambia, Zimbabwe, Kenya, and Lesotho.

ABOUT ICARDA

The International Center for Agricultural Research in the Dry Areas (ICARDA) is the global agricultural research organization working with countries in the world's dry and marginal areas to increase productivity, improve rural nutrition, and strengthen national food security through sustainable systems solutions. A member of CGIAR Consortium, ICARDA works closely with national agricultural research programs and other partners in more than 50 countries across North and Sub-Saharan Africa, and Central, South, and West Asia. www.icarda.org

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