

Seed Info

Official Newsletter of WANA Seed Network

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Editorial Note

Seed Info aims to stimulate information exchange and regular communication between seed staff in the Central and West Asia and North Africa (CWANA) region and beyond. Its purpose is to help strengthen national seed programs and thus improve the supply of high-quality seed to farmers.

WANA Seed Network News provides information on activities relating to global or regional cooperation and collaboration in facilitating the development of a vibrant regional seed industry. We present the achievements of Technologies for African Agricultural Transformation (TAAT) a Feed Africa agenda flagship of the African Development Bank. The report highlights the activities of the TAAT Wheat Compact in Sudan.

In the **News and Views** section, we present an article *Nagoya Protocol Celebrates its Tenth Anniversary—Is There a Lot to Celebrate?* by Niels Louwaars from the Dutch Seed Trade Association. The *Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization* was adopted on October 29, 2010, as a supplementary agreement to the 1992 Convention on Biological Diversity. The Protocol aims at improving the implementation of one of the three objectives of the CBD: the fair and equitable sharing of benefits arising out of the utilization of genetic resources. The other two are the conservation of biological diversity and the sustainable use of its components.

In addition, in this newsletter we present news from regional and/or international organizations, such as the International Seed Testing Association and the International Union for the Protection of New Varieties of Plants.

The section on **Seed Programs** presents news from Afghanistan, Ethiopia, Syria, and Turkey. From Afghanistan we report on the release of high yielding and drought-tolerant bread wheat varieties from a collaboration between the Agricultural Research Institute of Afghanistan and ICARDA. From Ethiopia we present the

experience and lessons learned on direct seed marketing started in 2011 and currently implemented in 350 districts across four regions. We revisit cooperative-based seed production in capturing its institutional transformation including capacity building, highlighting their performance. From Turkey we report on the farmer registration and the seed subsidy system. From Syria, we report on the ongoing efforts to rehabilitate the agricultural and seed sector to enhance the capacity of crop production to achieve food and nutritional security in the country under the new Food and Agricultural Organization of the United Nations project supported by the European Union.

The **Research** section of *Seed Info* captures information on research activities or issues relevant to the development of seed programs in the CWANA region and beyond. This issue features an article by Yetsedaw Aynewa and colleagues from ICARDA, *Farmers preference of food barley (*Hordeum vulgare* L.) varieties*. The paper discusses the participatory variety selection (PVS) carried out in Bakelo and Gudoberet kebeles in Basona-Worana district under an Africa RISING project in which ICARDA is a partner implementing PVS and community seed production.

Seed Info encourages the exchange of information among national, regional, and global seed industries. We encourage our readers to share their views and news through this newsletter. Your contributions are most welcome. Take time to share and contribute to your newsletter.

Happy New Year

Zewdie Bishaw, Editor



WANA Seed Network News

This section presents information about the WANA Seed Network, including network activities and reports from meetings of the Steering Committee and the WANA Seed Council.

Bumper Harvests and Record Wheat Production Propelling Sudan Toward Wheat Self-sufficiency

Wheat production, demand, and supply

Sudan's current population of around 42.8 million people is projected to reach 49.4 million by 2025. With wheat consumption per capita at 65 kg (which will likely increase), the current national consumption of 2.8 million metric tons (hereafter tons) in 2019 will soon hit 3.2 million tons. Sudan continues to meet its increased domestic demand through expensive imports, but this is unsustainable. From 2012/2013 the Support to Agricultural Research for Development of Strategic Crops (SARD-SC) wheat project and more recently the Technologies for African Agriculture Transformation (TAAT) project, became game-changers in the wheat sector in the country. Both projects are under the African Development Bank initiatives that focus on major staple crops and are aimed at transforming African agriculture toward meeting self-sufficiency. The TAAT Wheat Compact (TWC) employed the Innovation Platform (IP) as an effective approach for scaling-up proven wheat technologies and for linking farmers to input and output markets. The IP framework both at strategic and operational level provides an excellent forum to bring all wheat value chain actors together for defining the roles and responsibilities and stimulating multi-stakeholder interactions and devising sustainable solutions for generation of innovation and impact at scale along the value chain. Led by ICARDA, the TWC shows significant achievements in production area expansion, individual farm productivity and production, providing employment opportunities, and improving farmer incomes and quality of life. Such accomplishments were not possible without

strong commitment and support from the Government of Sudan, which established the Supreme Committee for Wheat Self-sufficiency to oversee this national agenda.

Dramatic increase in production and employment

In 2014/2015, the wheat production area in Sudan was 224,700 ha and at a productivity level of 2.1 tons ha⁻¹ producing 472,000 tons, a self-sufficiency ratio of 28 percent. By 2018/2019, wheat was cultivated on a total area of 294,000 ha and, at an average productivity level of 3.1 tons ha⁻¹, producing about 900,000 tons of grain, a self-sufficiency of 45 percent. A bumper harvest and record production were achieved in the 2019/2020 crop season and an area of 315,500 ha was harvested with a total wheat production of 1.15 million tons. This was the highest production level ever for wheat in Sudan, with a self-sufficiency ratio of almost 50 percent. Average national wheat productivity reached 3.5 tons ha⁻¹ whereas at IPs it was 3.8 tons ha⁻¹. The increased area coverage, production, and productivity were remarkable achievements resulting from strong partnerships, support, and dedication from all stakeholders not least from the farming communities themselves.

Since the start of TWC in 2018 about 76,000 (42 percent youth and women) additional jobs have been created in wheat farming and support services and 39,000 beneficiaries (42 percent youth and women) were directly reached through project activities, plus tens of thousands more people through access to certified seed of improved heat-tolerant varieties, field days, and traveling workshops word of mouth. Moreover, through an innovative ICT-based technology episode, more than 3,240,000 views have been recorded through the YouTube channel accessing such items as online video training.

Future expansion

In 2020/2021, Sudan planned to expand the wheat production area to 350,000 ha from the current level (Figure 1). A continuation and expansion of the project at this rate would reach self-sufficiency by 2024-2025. Ensuring the availability of seed commensurate with area expansion is key to achieving the targeted plan. Strong partnerships now in place with private

and public seed companies and farmer associations have enabled the countrywide production of close to 65,000 tons of certified seed in 2019, compared to never exceeding 5,000 tons in previous years. However, to achieve a similar or even greater result in the future, seed companies need to be guaranteed of the seed market to incentivize them to prepare and supply the seed to farmers for planting in 2020/2021.

The right wheat technologies

Under the SARD-SC project, several new heat-tolerant wheat varieties were identified and released for commercial cultivation. Almost all previous and recent releases of ICARDA-Agricultural Research Corporation (ARC) heat-tolerant varieties have a protein content in the range of 12–15 percent. Most of the new heat-tolerant wheat varieties released under SARD-SC have a 14–15 percent protein content and wet gluten percentage above 35 percent, which meet the required quality for industrial processing showing available choices for flour millers. Generally, a protein content of 12–15 percent is acceptable for industrial processing by flour millers and this can be enhanced with better genetics and agronomic practices to meet the standard.

Strengthening the wheat value chain

In Sudan, the farmers (producer associations and cooperatives), the wheat producing schemes (for example Gezira Scheme), the seed producers, input suppliers, financial institutions—microfinance, the Agricultural Bank of Sudan, agroindustry (flour millers), and the Ministry of Agriculture and Natural Resources (and its affiliated departments such as ARC)—all have a significant and integrated role in the wheat sector. Wheat-producing irrigation schemes would provide basic services such as development, irrigation, and public goods (for example research, plant protection, technology support, agricultural extension, technical studies, training, as well as supervisory management and indicative planning).

To increase domestic wheat production there should be support for some of the key areas:

- Ensure area expansion for wheat with adequate facilities for irrigation schemes (for example rehabilitation and cleaning) and

improved irrigation management to reduce the amount of water used per ton of wheat produced.

- Increase the volume of wheat seed delivery by incentivizing private seed companies through assured markets and access to capital.
- Ensure production of better grain quality by introducing grain grading system and premium pricing.
- Improve logistics in aggregation, storage, and transportation by cooperatives and producer associations.
- Facilitate capital and credit for farmers and value chain actors financed by the agricultural, rural microfinance, and commercial banks.
- Creating forward and backward linkages in the wheat value chain introducing contract farming involving farmers' cooperatives/associations, seed producers, and flour millers.
- Ensure system sustainability by introducing legume crops in wheat-based cropping systems to avoid wheat monocropping.

Conclusion

The TAAT wheat project has so far shown remarkable results—not just in the increased yield, production and area, and seed multiplication—but perhaps more importantly is clear evidence that with the right coordination and integration, stakeholders from a wide range of interested parties can not only work together toward a common goal, but are motivated to do so, with a proven benefit of a win-win for all. There are strong opportunities, good reasons, and important choices to make in boosting sustainable domestic wheat production in Sudan rather than depending on imports, as long as there is consistent government policy, capital, and incentives for the value chain actors and the blueprints in place to do so. ICARDA strongly believes that by continuing the project, these fledgling structures will become solid and resilient frameworks that will contribute to the greater picture of self-sufficiency and food security, particularly in times of uncertainty and global crises.



Irrigated wheat production in Gezira Scheme, Sudan



Harvesting wheat production in Gezira Scheme, Sudan

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News and Views

News, views, and suggestions relating to the seed industry are included in this section, providing a forum for discussion between seed sector professionals.

Nagoya Protocol Celebrates its Tenth Anniversary—Is There a Lot to Celebrate?

The *Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization* was adopted on October 29, 2010, as a supplementary agreement to the 1992 [Convention on Biological Diversity](#) (CBD). The Protocol aims to improve

implementation of one of the three objectives of the CBD: the fair and equitable sharing of benefits arising out of the utilization of genetic resources. The other two are the conservation of biological diversity and the sustainable use of its components.

In 1992, the CBD stressed the concept that genetic resources fall, just like other natural resources, under the national sovereignty of the countries where they have evolved. Countries could thus make access to their resources subject to Prior Informed Consent and Mutually Agreed Terms. Such terms would include benefit sharing in monetary or non-monetary ways. A few countries have effectively negotiated deals with users, notably in the pharmaceutical sector, with very few examples in plant breeding. Regarding genetic resources for food and agriculture, the result of the CBD was rather that collection and exchange of genetic resources almost came to a halt compared to prior to 1992. The frequent exchanges of plant genetic resources for food and agriculture (PGRFA) made the bilateral negotiations impractical, which illustrates the need to introduce the International Treaty on PGRFA, which was concluded in 2001. The multilateral system of this treaty aims to support the exchange of PGRFA, but many countries did not include significant amounts of genetic resources under the system.

To resolve the limited benefits that came to countries, an additional mechanism for access and benefit sharing was created in 2010. The Nagoya Protocol not only deals with access and benefit sharing, but particularly also with compliance. User-country governments have the obligation to check whether users comply with the national legislation of provider countries. Users of genetic resources therefore need to carefully track and trace the genetic resources in their research and product development, and their own governments are now responsible to check if they comply with rules and legislation of the provider country. Several countries, including those in the EU, have mechanisms in place to see to it that the administrative systems of users are checked, connected to their agreements with supplier countries. This includes companies involved in seeds, medicines, cosmetics, and biotechnology for agricultural, medicinal, and

industrial uses, as well as botanical gardens, public research institutes, and universities.

The expectation was that the Nagoya Protocol would yield a lot more funds for the provider countries. There is very little proof that the Nagoya Protocol has indeed generated a lot more benefit sharing—although it clearly created more costs—an administrative burden for governments and for the researchers and breeders in the countries that implement the Protocol.

Breeders know that access to genetic resources is essential for their current and future work, which contributes to global food security, creating a better life for farmers, and for making agriculture more sustainable. We also know that conservation of genetic resources is an important insurance policy for future generations who need to feed themselves and who will have to produce more ‘green’ raw materials for the industry, now that we realize that our dependence on oil creates serious damage. Such conservation requires a global public effort, and it is fair that the users of genetic resources contribute a fair share.

However, it runs against logic that the generation of such contributions is accompanied by a large administrative burden, and that this may lead to reduced use of diversity, less investment in innovation, and in agriculture, less diversity offered to farmers to choose from.

It is fine to celebrate the anniversary of the Nagoya Protocol, given the lengthy negotiations needed among governments to conclude it. It would, however, be especially nice if the anniversary is also used to critically look back and to learn from the experiences of its implementation and the yield in shared benefits. This will be even more necessary to avoid similar risks that are now arising when certain parties want to make rules to share benefits not only on the use of the genetic resources themselves, but also on knowledge associated with these. Proposals to include so-called Digital Sequence Information in the benefit-sharing obligation require a proper study on the (administrative) costs, on the impact on the open data principle, public–private partnerships, enforceability, and most importantly on the effect on innovation.

The Nagoya Protocol was an achievement aiming at fairness, but its 10-year celebration should be a very modest one.

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CGIAR Innovations Reach Majority of Ethiopia’s Rural Households

An independent study published last year (October 2020) documented the extensive reach of CGIAR-related agricultural innovations in Ethiopia over the past 20 years. The study represents the culmination of years of work by the independent CGIAR Standing Panel on Impact Assessment (SPIA), together with the Ethiopian Central Statistics Agency (CSA) and the World Bank Living Standards Measurement Study (LSMS) team, to develop and test a country-level approach to assessing adoption and diffusion of agricultural innovations using national surveys.

Piloting this new approach for the first time in Ethiopia, a CGIAR research hotspot, the study finds that a sample of CGIAR-related agricultural innovations have potentially reached 11 million rural Ethiopian households—nearly 80 percent of all rural households in the country—with substantial adoption among poor smallholders, women, and youth.

To document the reach of CGIAR-related innovations, SPIA started with a stock-take of all such innovations disseminated in Ethiopia in the period 1999–2019. Consultations with CGIAR and national stakeholders revealed 52 different innovations across the domains of animal agriculture, crop germplasm improvement, and natural resource management, and 26 instances of policy influence. Working with partners LSMS and CSA, 18 shortlisted innovations were integrated into nationally representative household surveys in 2016 and 2019, which were then used to track uptake.

The study found that CGIAR innovations have reached between 4.1 million and 11 million Ethiopian households, evidence of CGIAR’s broad contribution to Ethiopia’s agricultural

development. The importance of CGIAR research for increased agricultural productivity in Ethiopia is apparent and, with agriculture being one of the main drivers of the country's economic growth over the past decade, it can be inferred that these productivity gains have contributed not just to food security, but also to broader poverty alleviation.

For more information please read the study: *Shining a Brighter Light: Comprehensive Evidence on Adoption and Diffusion of CGIAR-Related Innovations in Ethiopia* ([full report](#), [two-pager](#))

New Tool Seeks to Improve Seed Delivery

A new online tool to improve the delivery of seeds in West Africa was launched at a virtual event on Tuesday, October 27, 2020.

Initiated by CORAF and funded by the United States Agency for International Development [West Africa](#) within the [PAIRED](#) (Partnership for Agricultural Research, Education and Development) framework, this tool is expected to considerably improve seed delivery.

The Seed Demand Forecasting Tool is a practical instrument used in projecting the potential and actual seed demands to support both the public seed sector and private seed companies.

What does the tool look like?

The Seed Demand Forecasting Tool is an Excel spreadsheet that works based on a series of basic assumptions such as the potential area to be used for seed production, seeding rate, and seed yield. It is meant to assist producers in planning the seed production effort through a process of demand projections and examining past and present performance levels, combined with assessing available products and current markets.

What challenge does it seek to solve?

Previously seeds could be produced at the start of the farming season without due consideration to what is demanded, leading to shortfall or substantial carryover of the seed stock.

What are the advantages?

- Development of seed production roadmap

- Preparation of business plans
- Developing the sales promotion strategy
- Making financial arrangements
- Arranging storage and transportation
- Working out quantities of inputs to procure.

As part of efforts to leverage digital technology for agricultural production to enhance the food system in West and Central Africa, CORAF and partners are currently deploying the following tools:

- [FeSeRWAM](#)
- [Market for Agriculture Technologies and Innovations \(MITA\)](#)
- [Agripreneur TV](#)
- WASIX (under development).

Experts argue that these tools can be game-changing steps given the relatively high Internet penetration and mobile telephony use in West and Central Africa.

Also read:

- [Upscale Seed Demand Forecasting Tool, Actors Urge](#)
- [FeSeRWAM, a New Digital for Agriculture \(D4AG\) Tool Launched](#)
- [New Online Tool to Empower Thousands of West African farmers Access Critical Agriculture Information](#)

Source: CORAF This Month, October 2020

APSA and ISTA Ink MoU to Strengthen Seed Testing Science and Technical Capacity Building in Asia Pacific

The Asia and Pacific Seed Alliance (APSA) and the International Seed Testing Association (ISTA) have signed a Memorandum of Understanding (MoU) “to facilitate collaborative projects to strengthen seed research and training initiatives and promote seed testing programs and the ISTA accreditation system in the Asia-Pacific region.”

Due to ongoing international restrictions on travel and meeting, the MoU was formalized recently via an online ceremony, which facilitated signing by ISTA Secretary General Dr Andreas Wais and APSA President Mr Tahir Saleemi. Also signing the document as witnesses

were Dr Florina Palada (ISTA Head of Accreditation and Technical Department) and Dr Kanokwan (May) Chodchoey (APSA Executive Director).

Establishing a basis for future public–private partnership collaboration, the agreement formalizes a well-established working relationship between APSA and ISTA, which has gained momentum in recent years.

Most recently, in February 2020, the two organizations joined with Thailand’s Department of Agriculture to co-organize a Seed Quality Management Seminar for some 100 quality assurance personnel representing both seed companies and government agencies from throughout the region. The seminar was followed by a Seed Vigor Testing Workshop for laboratory and field technicians from across the region (for more details see [Asian Seed Magazine](#) and [Seed Testing International](#)).

Partnering in such activities—which facilitate capacity building and the exchange of information and technical expertise in seed science, technology, and testing methods—is the essence of the MoU.

Commented Mr Tahir Saleemi, “I have great pleasure in knowing that this agreement shall serve to fortify and formalize an already-strong relationship between our two esteemed organizations. APSA and ISTA’s relationship goes back many years.”

“Through our members, APSA has associated with ISTA since our founding and some of our legacy members have worked with ISTA long before that. Most of our members are directly or indirectly involved in the international seed trade, and ISTA plays a major role in helping them to assure and communicate that their product is of the highest international standards.”

“This is only the first step of many more ahead.”

Dr. Kanokwan added: “This MoU represents a pledge by the seed industry to improve seed quality systems in the region and serves APSA’s mission to sustainable agriculture through the

production and trade of quality seeds for the world.”

Dr Wais mentioned in his keynote, that “nowadays a great number of APSA members are also ISTA members and most of them are accredited to issue ISTA Orange International Certificates for Seed Trade. Both of us, APSA and ISTA, believe that this is the key to ensure safe trade of high-quality seed, not only in the Asia-Pacific region, but also outside this area.”

“ISTA, including myself, is very honored and proud to have with APSA a regional partner with similar interests.”

“This memorandum is the start of a lot of projects in Asia together with APSA and the base for further expansion of ISTA in the Asia-Pacific region.”

Dr Palada added that “this is a remarkable day for both our organizations.”

Founded in 1994, initially as the Asia and Pacific Seed Association, APSA is the world’s largest regional seed association in terms of member countries and territories. Its Secretariat is based out of Singapore and Bangkok, Thailand.

Headquartered in Zurich, Switzerland, ISTA is a leading global authority in seed science and technology that has developed and validated internationally recognized seed testing methods since 1924. Visit their website [here](#).

Click [here](#) for the full-length online signing ceremony video on ISTA’s YouTube channel, and on APSA’s YouTube channel [here](#). APSA and ISTA members can download and read the full MoU in the online document section on the organizations’ respective sites: APSA members, please click [here](#), and ISTA members, please click [here](#).

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News from UPOV

UPOV membership

The purpose of the International Union for the Protection of New Varieties of Plants (UPOV) is to provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of society. UPOV is an intergovernmental organization based in Geneva, with 76 members, covering 95 states.

The members of UPOV are (as of November 2020) two regional organizations (the African Intellectual Property Organization¹ and the European Union²) and [74 sovereign countries](#) (see map below for September 2020).



Positive Decision on Draft Law of Zimbabwe and Draft Act of United Arab Emirates

In August 2020, the UPOV Council took a positive decision on the conformity of the *Draft Plant Breeders Rights Act of Zimbabwe (Draft Act)* with the 1991 Act of UPOV Convention, which allows Zimbabwe, once the Draft Act is adopted with no changes and the Law is in force, to deposit its instrument of accession to the 1991 Act.

Similarly, in August 2020, the UPOV Council took a positive decision on the conformity of the *Draft Law on Plant Variety Protection of the United Arab Emirates (Draft Law)* with the 1991 Act of the UPOV Convention, which allows the United Arab Emirates, once the Draft Law is adopted with no changes and the Law is in force, to deposit its instrument of accession to the 1991 Act.

¹ Operates a plant breeders' rights system that covers 17 member states (Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Guinea, Guinea-Bissau, Mali, Mauritania, Niger, Senegal, and Togo)

Appointment of Secretary General

The UPOV Council appointed Mr. Daren Tang as the Secretary General of UPOV for the period from October 30, 2020, to September 30, 2026.

FAQ: How does the UPOV system support sustainable development?

The UPOV Council adopted the following FAQ: [*How Does the UPOV System Support Sustainable Development?*](#) as annexed to press release 112. The vision of the 2030 Agenda for Sustainable Development Goals (see <http://www.un.org/sustainabledevelopment/sustainable-development-goals/>) includes a world where *food is sufficient, safe, affordable, and nutritious, there is sustained and inclusive economic growth, social development, environmental protection, and the eradication of poverty and hunger and one in which development and the application of technology are climate-sensitive, respect biodiversity, and are resilient.*

Adoption of documents

The UPOV Council adopted revised versions of the following documents:

1. UPOV/INF/4: Financial Regulations and Rules of UPOV
2. UPOV/INF/16: Exchangeable Software (Revision); UPOV/INF/22: Software and Equipment Used by Members of the Union
3. TGP/5: Experience and Cooperation in DUS Testing
4. Section 6: UPOV Report on Technical Examination and UPOV Variety Description
5. TGP/7: Development of Test Guidelines
6. TGP/14: Glossary of Terms Used in UPOV Documents
7. TGP/15: Guidance on the Use of Biochemical and Molecular Markers in the Examination of Distinctness, Uniformity and Stability (DUS).

All adopted documents will be published in the UPOV Collection (see http://www.upov.int/upov_collection/en/).

² Operates a plant breeders' rights system that covers 28 member states (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom)

Election of the new Chairpersons

The UPOV Council elected the following as Chairpersons of the technical working parties and the BMT for a term of three years ending with the fifty-seventh ordinary session of the Council, in 2023:

1. Ms Renée Cloutier (Canada), Chairperson of the Technical Working Party for Agricultural Crops
2. Mr Christopher Barnaby (New Zealand), Chairperson of the Technical Working Party for Fruit Crops
3. Ms Ashley Balchin (Canada), Chairperson of the Technical Working Party for Ornamental Plants and Forest Trees
4. Ms Marian van Leeuwen (Netherlands), Chairperson of the Technical Working Party for Vegetables
5. Ms Beate Rücker (Germany), Chairperson of the Working Group on Biochemical and Molecular Techniques, and DNA-Profiling in Particular (BMT)

Technical Working Party on Testing Methods and Techniques (TWM)

The UPOV Council approved the establishment and terms of reference for the TWM, to encompass the work of the Technical Working Party on Automation and Computer Programs and the BMT, and elected Ms Beate Rücker (Germany) as Chairperson of the TWM for a term of three years ending with the fifty-seventh ordinary session of the Council, in 2023.

Cooperation in the Examination of New Plant Varieties

The number of plant genera and species for which there were agreements between members of the Union for cooperation in the examination of distinctness, uniformity, and stability increased from 2,016 (corrected) in 2019 to 2,071 in 2020 (3 percent increase).

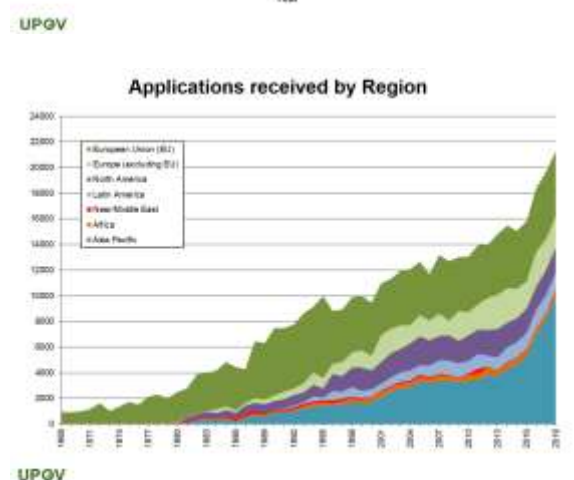
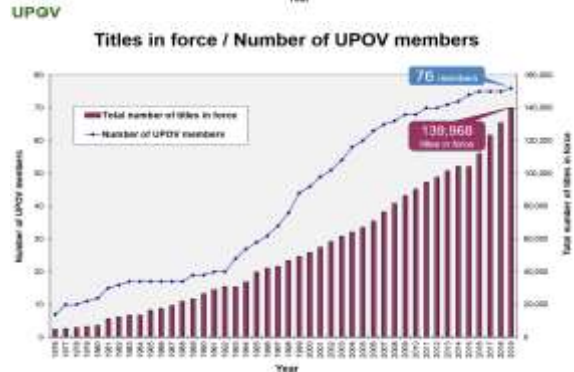
Plant Variety Protection Statistics

The number of applications for plant variety protection increased from 19,681 in 2018 to 21,265 in 2019 (8 percent increase).

The number of titles issued increased from 13,274 in 2018 to 14,688 in 2019 (11 percent increase).

The total of 139,968 titles in force in 2019 represented a 7 percent increase on figures for 2018 (130,849).

The following selected graphs indicate trends in applications filed and titles issued since 1986. Information provided on the 10 members of the Union receiving the largest number of applications in 2009, 2018, and 2019 and an analysis of applications by residence of breeders for the same years are available but not presented here.



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Contributions from Seed Programs

In this section, we invite national seed programs, projects, universities, and regional and international organizations to provide news about their seed-related activities.

Afghanistan Releases Three New Drought-Tolerant Wheat Varieties

ICARDA and the Agricultural Research Institute of Afghanistan (ARIA) have released three new drought-tolerant wheat varieties in Afghanistan to help overcome the increasing menace of recurring droughts in the country and help get the agricultural sector back on its feet.

The new varieties—Mirdad-19, Sharq19, and Jawahir-19—were developed and field-tested through ICARDA's and ARIA's intensive research program under the CLAP project of the Ministry of Agriculture in Afghanistan funded by International Fund for Agricultural Development and are producing optimum yields in water-scarce environments and showing excellent performance under supplementary irrigation conditions (2–3 irrigations). These varieties are also resistant to yellow rust disease which causes significant yield loss in the region.

ICARDA, part of the global CGIAR agricultural innovation network, researches and releases adapted crops that grow well under stress conditions such as high levels of heat, regular droughts, and acute water scarcity. These are a game-changer in vulnerable dry countries like Afghanistan, disproportionately affected by climate change. The new wheat varieties can potentially increase wheat production in water-scarce regions in the country by 17–18 percent,

saving money in the use of fungicides and other inputs, bolstering the wheat self-sufficiency and agriculture food systems of Afghanistan, and strengthening food security and resilience of struggling dryland rural communities.

The new varieties should perform well both under rainfed and irrigated conditions all over Afghanistan, including in the drier, drought-affected areas. Rainfed wheat is grown in 1.1 million hectares in water-scarce regions of Afghanistan, and 1.6 million hectares are under irrigated conditions. If farmers cultivate the new varieties in just 30 percent of both rainfed and irrigated plots, the annual incremental yield and income gain will be 265,000 tons amounting to US\$97 million, respectively.

Performance of wheat varieties released in Afghanistan

Variety	Yield (metric tons ha ⁻¹)	Key traits
Jawahir-19	4.74	High yield, drought tolerant
Mirdad-19	4.77	High yield, drought tolerant
Sharq19	4.72	High yield, drought tolerant



Joint evaluation of wheat trials by ARIA and ICARDA

During the past five years, ICARDA has conducted 314 research trials consisting of 8,997 genotypes in 18 agriculture research stations in 13 provinces of Afghanistan, with ARIA covering all the agro-climatic zones of the country. The trials also resulted in the identification of promising lines for wheat, chickpea, mung bean, potato, tomato, and alfalfa, with high performers submitted for future release as new varieties. For more details visit the [website](#).

Source: ICARDA Communication Team

Direct Seed Marketing in Ethiopia: Experiences and Lessons Learned

Background

In Ethiopia, the organized formal seed production and distribution has been centralized and dominated by the public sector. Since 1991, although public research through federal and regional agricultural research institutes and quality assurance through regional seed regulatory agencies appear to be decentralized, certified seed production by public seed enterprises and seed distribution through cooperatives is centralized under the Ministry of Agriculture (MoA). The seed demand assessment is highly centralized and is managed by the MoA, which employs a bottom-up demand assessment, where the regional Bureaus of Agriculture and Natural Resources (BoAs) compile annual seed demand based on information received from zonal and woreda offices of agriculture, development agents, and individual farmers. This information is aggregated into woreda, regional, and national demand statistics which provide an estimate of the types and quantities of seed that farmers want to purchase the following year in each region. This target is loosely apportioned to public seed enterprises (SEs)—Ethiopian SE, Amhara SE, Oromia SE, and South SE. At the end of the production cycle, the government allocates the available seed proportionally through the cooperatives based on the original demand from the regions.

The system had many drawbacks, including unavailability of improved seed in sufficient quantity and at the right time and place to farmers; mismatch between demand and supply resulting in shortage or excess in some areas; burden on government structure in terms of finance, logistics, and staff; and lack of accountability and traceability in the distribution system. Moreover, limited seed supply has been frequently cited as one of the major causes of underdevelopment of Ethiopian agriculture.

Having recognized these challenges, the direct seed marketing (DSM) project was designed and

piloted with hybrid maize varieties in two woredas of the Amhara region in 2011 by the Integrated Seed Sector Development and the MoA. This was later scaled up to 33 woredas in 2013 in Amhara, Oromia, and Southern Nation, Nationalities and Peoples (SNNP) regions. In 2013, the Agricultural Transformation Agency (ATA) commissioned a study on the performance of DSM by the International Food Policy Research Institute, which identified the challenges and recommended the way forward. The study found promising results and encouraged ATA to expand the project for visible impact starting from 2014. The DSM has become a national agenda and has been gradually expanding to more geographies and crop types through adaptive learnings and adjustments on DSM design and implementation. This article briefly explains the DSM project, focusing on its background, operational models and approaches, major achievements, challenges, and the way forward for scaling the lessons learned in different regions of the country.

DSM operational model

The DSM is an alternative seed marketing approach in which seed producers (public, private, and unions) can directly market their seed through multiple channels (cooperative agents, private agents, or own outlets) in a competitive manner contrary to centralized conventional seed distribution through cooperatives adopted in Ethiopia. The DSM aims to create an efficient seed marketing system ensuring that smallholder farmers (SHFs) have access to improved seeds in a competitive manner, thereby enhancing their productivity and production and ultimately their income. This operational model provides an opportunity for SHFs to get access to improved seeds of different crops types through different channels and improves accountability and traceability, and addresses some of the challenges encountered by the conventional seed marketing system.

DSM activities and achievements

The DSM project activities performed by ATA in partnerships with the MoA and BoAs during the project implementation periods are described below.

Seed demand assessment and varietal promotions

Annually, seed demand is compiled in DSM woredas by the BoAs in Amhara, Oromia, SNNP, and Tigray regions. The data are shared with seed producers during DSM learning and planning workshops conducted in each region. Moreover, seed producers are also encouraged to undertake their own seed demand validation in DSM woredas together with their respective marketing agents. This has reduced the annual average seed carryover in the DSM woredas to about 1 percent. Ultimately a reliable seed demand forecasting system would solve the seed demand and supply mismatch of the country.

Performance evaluation, learning, and planning workshop

The DSM performance evaluation, learning, and planning workshops are a major component of the project and are conducted annually in each region. During the workshops, all the challenges and lessons learned—identified by the team of experts from seed regulatory authority, BoA, ATA, seed producers, and the Regional Cooperative Promotion Agency—are shared with workshop participants (see photos below).

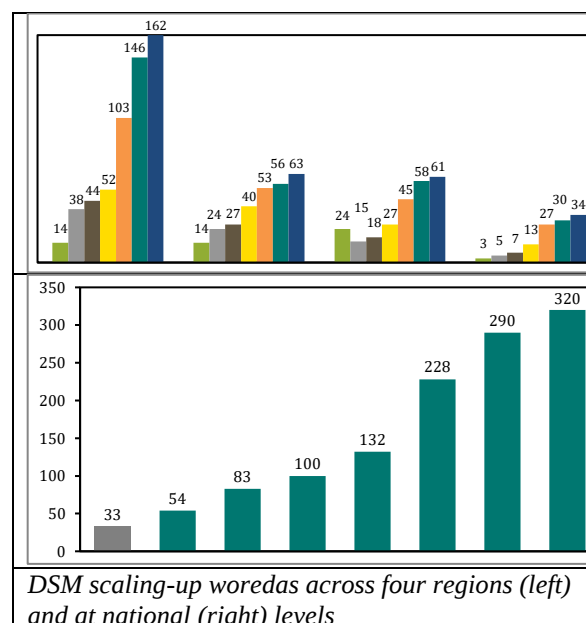


DSM evaluation, learning, and planning workshop in SNNP (top) and Oromia (bottom) regions

Selecting woredas for DSM scaling-up

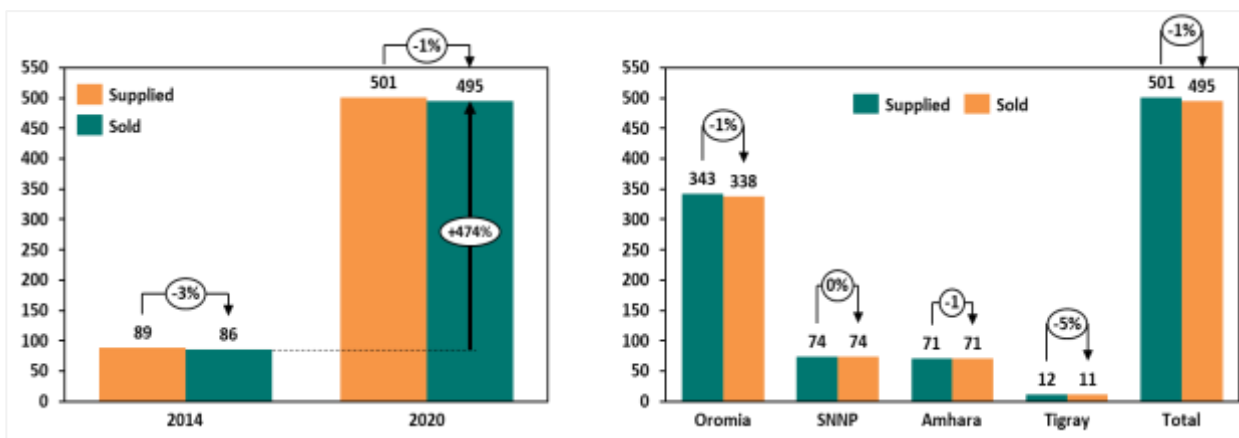
The BoAs identify and propose woredas for scaling-up DSM in consultation with zonal agricultural offices and present it to the regional DSM workshop on a yearly basis. The participants in the workshop validate the scaling-up woredas after rigorous discussions.

From its modest beginning in 2011, the ATA scaled up the DSM program to 54 woredas in 2014, including the Tigray region and covering more crops such as wheat, tef, and haricot bean in addition to hybrid maize originally piloted in 2011–2013. The DSM has reached 320 woredas across the four regions in 2020. The figure below depicts the growth of DSM scaling-up woredas at national and four regional levels over the project period.



Monitoring seed sales

In partnership with the regional BoAs, the project team facilitated, supported, and conducted monitoring and compiling of seed sales statistics annually. Seed sales significantly increased from 86,192 quintals (1 quintal = 100 kg) in 2014 to 495,160 quintals in 2020 in DSM woredas across the four regions. In 2020, a total of 500,749 quintals of improved seeds of different crops were supplied and 495,160 quintals were sold with a value of ETB1.72 billion reaching over 1.95 million SHFs. The trend of seed supplied and sold, and the 2020 seed supplied and sold across the four regions are depicted in the figure below.

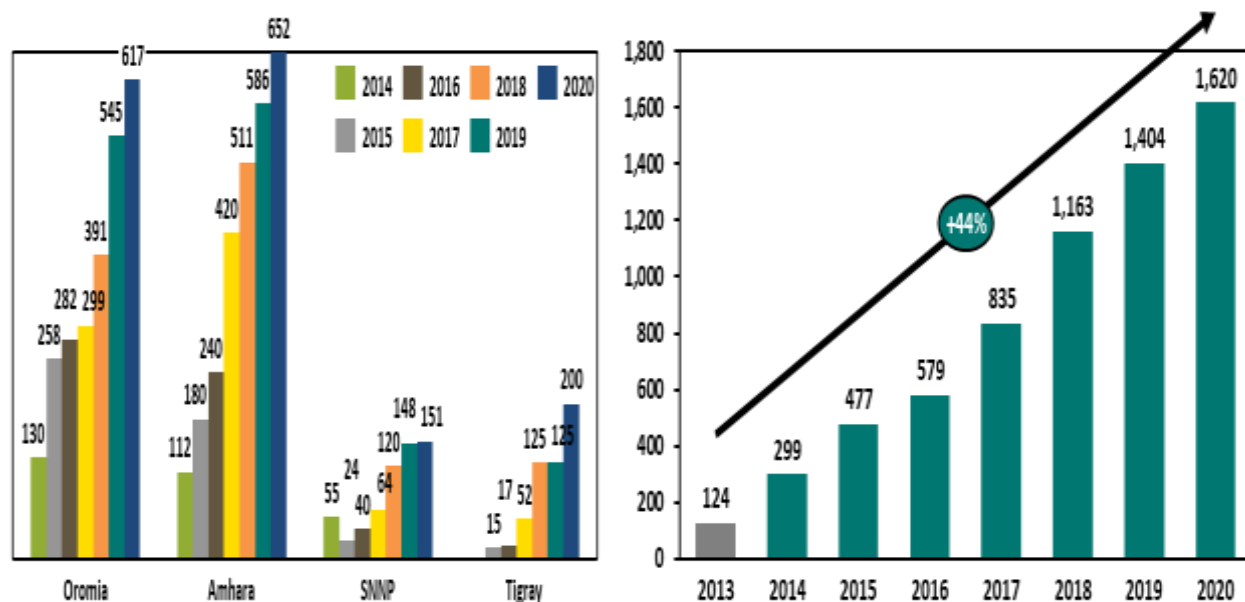


Quantity of seed supplied and sold ('000 quintals) in 2014 and 2020 (left) and seed supplied and sold across the four regions in 2020 (right)

Selection, training, and certification of seed marketing agents

Seed producers usually nominate their seed marketing agents, who are evaluated by the respective regional input regulatory authorities for a certificate of competency. The eligible agents participate in seed business management training and are allowed to work as marketing

agents. Accordingly, a total of 1,620 marketing agents in DSM woredas across the four regions have been trained for two cycles (two consecutive years) as seen in the following figure. The objective was to enhance the agents' skill in seed business administration, which enabled them to satisfy the needs of SHFs with good seed marketing approaches.



Growth in seed marketing agents at regional (left) and national (right) levels during 2014–2020

The ATA has supported the regional input of regulatory authorities with logistics and field operations for evaluation of marketing agents and seed certification every season. A total of 1,529 marketing agents from the 320 DSM woredas across the four regions were evaluated and received a seed marketing certificate of competency. Moreover, the inspection teams in all regions have provided on-the-spot technical support and feedback to the marketing agents.

Strengthening capacity of technical staff and officials

Over 2,000 experts and officials in the DSM woredas and zones of the four regions have received training on DSM core principles, operations, and seed business management. The major objective was to create common understanding among stakeholders, especially for zone and woreda agriculture offices on DSM annual operations, scaling-up targets, and refresher courses on DSM basics. The learning experiences from the existing DSM woredas were presented and discussed with the woreda officials and experts. According to DSM principles, woreda officials and experts were advised to have a limited role in the allocation of seed and focus largely on the overall monitoring of the system.

Establishing and strengthening capacity of regulatory agencies

The DSM project also entails establishing and strengthening seed regulatory agencies in each region to conduct effective field inspection, laboratory seed testing, and certification. The ATA supported the establishment of three regional input regulatory authorities in Amhara, Oromia, and SNNP regions (with the exception of Tigray). Moreover, the DSM team facilitated experience-sharing visits to India and Kenya for federal and regional seed regulatory agency technical and leadership staff to gain exposure to seed policy frameworks and regulatory services. The visits included both theoretical and practical field visits to agro-dealers, subagents, and stockists to observe their business management systems.

Developing and endorsing seed marketing directive

To ensure access to quality seed, the DSM technical guideline was developed and used

for launching the project, and the seed marketing directive was developed and endorsed by the MoA in March 2019. The seed marketing directive was developed by the working group experts from region and federal input marketing and regulatory agencies, DSM, one-stop shops (OSS), and the cooperative-based seed production project.

This directive was developed to ensure both private and public seed producers and sales agents accessed equal opportunity in the seed marketing of the country. It is also a regulatory tool that makes the government responsible for institutionalizing DSM and provides seed producers/marketers the right to participate with confidence in a competitive spirit with the goal of allowing the end user to access improved seed at the right time, quantity, quality, and at a competitive price. The DSM team facilitated the popularization of the new seed marketing directive both at national and regional level.

Key Challenges

The DSM has shown promising results in improving Ethiopia's seed marketing system. Nonetheless, addressing its existing challenges can help the modality to achieve greater results during the expansion period. This includes the following:

- Limited accuracy in seed demand assessment: the current seed demand assessment system does not consider the seed replacement periods and factors limiting farmers' seed demand, which leads to both over- and under-estimation of demand.
- Limited number and capacity of seed producers: DSM is meant to ensure competition and enhance SHFs' access to seed. However, considering the growing demand for improved seed, the seed producers have been unable to meet the demand and match the desired competition. Among others, lack of adequate technical and infrastructure capability of seed producers (storage and transportation) is known to be a major limiting factor preventing them from meeting the SHFs' seed demand.
- Limited capacity of marketing agents: although the project has made efforts to address the capacity of the marketing

agents, this problem persists because marketing agents engaged in seed marketing have limited technical know-how and infrastructure (storage) capability to provide advisory services for SHFs and maintain seed quality as per the standard.

- Weak input regulatory system: an effective and impartial input regulatory system is crucial to ensure competitive seed marketing. However, the current input regulatory system across the regions is limited to conducting evaluation and certification of marketing agents, outlet inspection, and avoiding illegal seed circulation.

Key lessons and way forward

- Promoting DSM agents into wider input dealership like OSS is critical in sustaining the business of seed dealership. Efforts have been exerted to promote agents to transit to DSM agents and further grow to OSS over the last three years and remarkable results have been registered. As such, alignment and joint planning are needed with key partners to further promote DSM agents to OSS.
- Institutionalization of DSM: development of the DSM implementation guideline; endorsement of the seed marketing directive, and the subsequent popularization and awareness creation of relevant stakeholders at regional, zonal, and district levels are positive steps that boosted confidence of government structures in implementing the DSM program, which was previously considered as a one-off project.
- Addressing systemic bottlenecks: setting up a market-based seed delivery system requires the active participation of multiple seed suppliers to compete for customers in terms of price, quality, reach, and service. The current number and capacity of seed producers, however, is very limited, particularly in the Tigray region. Therefore, continued efforts need to be directed to attract new and support existing seed companies so that they can significantly address supply shortfall and enhance competition.
- Build effective seed demand assessment system: the current public-led demand assessment system has demonstrated many

shortfalls such as overlooking real-time farmers' demand and a wide time gap between seed demand assessment and seed supply. This has led to demand and supply mismatch and forced seed producers to shift from one woreda to the other at their own cost. Therefore, there is a need to build an effective seed demand through encouraging seed producers to conduct or verify seed demand using their own system.

- More awareness on DSM: it has been noted that some producers have not yet fully realized the benefits of channeling their seed in a competitive market environment. As a result, they are hesitant to invest in branding and establishing marketing infrastructure. This calls for a strong government effort in implementing the directive and enhancing awareness of producers regarding the benefits of DSM.
- Marketing agent capacity building: it has been strongly suggested that an agro-dealership development program is required to ensure the availability of capable and trustworthy agents in the market. Moreover, developing a clear certification standard for marketing agents of varying categories and levels is needed.
- Strengthening agricultural input regulatory system: an effective input marketing system is said to be in place if it is supported with effective input regulatory systems that ensure supply of quality seed to farmers, guarantee the actors in seed marketing, and reduce illegal seed marketing.

Existing strategy

The DSM project was coordinated by ATA until the end of the Growth and Transformation Plan II and is to be fully owned by and institutionalized with the national program by the end of June 2020. The ATA ownership readiness assessment identified gaps in technical capacity and commitment at federal and regional levels which could potentially be addressed through technical backstopping by DSM experts and alignment with the national program. Following the recommendations, ATA conducted a series of discussions with the MoA on how to seamlessly transit the project to ensure its sustainability.

Finally, it was agreed that the MoA and BoAs would fully take over, mainstream, and lead implementation of the DSM project based on seed marketing directives, while ATA would provide support by secondment of the project team during a one-year transition period.

Conclusion

The progress and achievements of the DSM project are encouraging. The model has addressed many of the critical challenges in the conventional seed marketing system, shortening the seed supply chain, and ensuring that seed is available for purchase well in advance of planting time. In this model, farmers not only have a wider variety of options in seed types but also competitive pricing, which encourages them to buy and utilize improved seeds. Furthermore, there is an improved match between seed demand and supply, with about 3 percent average annual seed carryover, which has reduced the financial burden and workload of government from regional to kebele level. Finally, by facilitating direct contact between farmers and producers/seed agents, the approaches ensure greater accountability, responsibility, and traceability in the seed marketing system.

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Ethiopia Sustaining Cooperative-Based Seed Production and Marketing Program

Introduction

In *Seed Info No 53* and *No 54*, we reported that Ethiopia is embracing cooperative-based seed production (CBSP) as an alternative strategy to fill the seed demand and supply gap in the country. The CBSP project, initiated by the Ethiopian Agricultural Transformation Agency (ATA) and partner organizations, has been bearing fruit. The initiative is structured on the cooperative promotion framework of the national Cooperative Promotion Agency, in which farmers become members of primary cooperatives at district or kebele (lowest administrative unit) level and the primary cooperatives become members of the farmers' cooperative union at the zonal/regional level. During 2016–2018, the CBSP project worked

with 177 primary seed producer cooperatives to establish 13 seed production and marketing unions—an umbrella organization at zonal level. These seed unions operate in different geographies, commodities, and scales across four major crop production regions of Ethiopia.

The objective of this initiative is to build institutionally and financially sustainable seed unions that can play a significant role in the national seed sector. The project aimed at addressing the weak institutional capacity of cooperatives, poor governance and leadership, knowledge and skills, physical capacities, access to early generation seed, and output financing. Project achievements along these lines were reported in *Seed Info No 53* and *No 54* editions. This article focuses on institutional framework of seed unions, geographic distribution, physical and human resources capacity, and recent performances in seed delivery.

Institutional Transformation

Ultimately, the CBSP project aims to transform Ethiopia's intermediate seed sector (cooperative-based seed businesses) to significantly increase the quality and volume of improved seeds produced and marketed through unions, resulting in higher yields and incomes for farmers. This can happen only when there is a structural transformation in the CBSP system.

At the beginning of Growth and Transformation Plan (GTP) II, there was only one union that could produce, process, and market seed on its own located in the Gurage zone in SNNP region. The rest were primary cooperatives that were in a weak financial and institutional position to effectively manage seed business. Most were operating as occasional out-growers for other seed producers and were fully dependent on the plan and interest of their partners.

The ATA successfully established 13 cooperative unions and supported one existing union composed of 196 primary cooperative members and transformed them from out-growers to registered and licensed seed producers. A total of 16,750 (2,613 female) farmers were engaged in seed business, ensuring that the youth and women were

targeted and engaged as seed producers across the SNNP, Oromia, Amhara, and Tigray regions. It also enabled the cooperatives to sustainably engage in seed business. Furthermore, over the years, the seed unions

have created 753 permanent and temporary jobs for 753 youths (131 female). Geographic distribution, membership, and major crops produced by unions are presented in Table 1.

Table 1. List of seed unions, membership, geographic distribution, and focus crops

Region	Union	Zone (City)	# of primary cooperatives	Membership (female)	Year established	Crops handled
SNNP	Edget	Gurage (Butajira)	21	1,950 (292)	2010	Wheat, tef, haricot bean, forages
	Hibret Firie	Gamo Gofa (Arba Minch)	16	737 (111)	2016	Maize, wheat, potato, forages
	Halabi Horsinka	Halaba (Qulito)	12	1,043 (62)	2016	Teff, haricot bean
	Zereta Kambata	Kambata Tambaro (Doyo Genna)	9	1,148 (267)	2016	Wheat, faba bean, potato
Oromia	Galema	Arsi (Bekoji)	16	1,420 (109)	2016	Wheat, durum wheat, barley, faba bean, forages
	Raya Wakena	West Arsi (Dodola)	18	837 (137)	2016	Wheat, barley
	Erer	West Shewa (Bishoftu)	21	1,286 (112)	2016	Durum wheat, tef, lentil, chickpea
	Chefe Bulke	Woregudru Wolega (Shambu)	9	857 (133)	2018	Maize, tef, faba bean
	Jimma	Jimma (Jimma)	10	517 (65)	2018	Maize
Amhara	Tegulet	North Shewa (Debre Birhan)	11	1,594 (244)	2016	Wheat, food barley, malt barley, faba bean
	Guna	South Gonder (Debre Tabor)	14	1,462 (119)	2016	Maize, malt barley, potato, rice
	Edget Behibret	West Gojam (Burie)	13	1,659 (512)	2015	Maize, wheat, forages
Tigray	Handnet Raya	Southern Tigray (Maychew)	14	1,808 (350)	2016	Maize, wheat, faba bean, forages
	Mi'ebale	Central Tigray (Axum)	12	432 (78)	2016	Tef, wheat, chickpea, forages
Total			196	16,750 (2,613)		

Strengthening physical capacity

Seed businesses require standard physical infrastructure or facilities such as farm machinery, seed processing machines, seed storage, mini seed laboratory, transportation, and office facilities. To aggregate production, processing, and marketing of seed, each union was assisted in constructing standard facilities and provision of basic logistics facilities. A significant milestone was the construction and completion of 8 office buildings, 13 seed processing plants, 29 seed storage facilities, 12 mini seed laboratories, 7 cleaning shades, 3 diffused-light stores, and 1 potato lath house. In addition to construction of facilities, 7 tractors, 7 field vehicles, 5 trucks, and 26 motorbikes were provided in a cost sharing arrangement with the unions, in which ATA provided funds and the cooperatives covered 30 percent as matching funds.

The purpose of the seed facilities goes beyond aggregation, storage, and processing. Seed unions have used the seed facilities as collateral to access formal loans from commercial banks; for example, enabling the unions in SNNP, Oromia, and Amhara to obtain loans for more than ETB150 million over the last three years (see the pictures below).



Seed processing plant at Galema Seed Union



Seed storage facility at Chefe Bulke Seed Union

Strengthening human resources capacity

Knowledge/training centers constructed: The ATA has been supporting seed unions in delivery of training to farmers and experts for the last five years, with more than 13,500 (2,613 female) farmers trained. The number of member farmers has increased by 15 percent annually and demand for training has increased at a similar rate. Farmers trained previously also need refresher training. The ATA cannot continue providing training beyond the project period. To fully address skill gaps after the project life, unions need to be equipped with facilities that will enable them to become self-sufficient in delivering farmer training. Taking this into account, six knowledge centers were constructed, and three existing buildings revitalized. The knowledge centers will be equipped with audio-visual facilities, training CDs, and published training modules. The assumption is that union staff can easily manage farmer training using these facilities.

Training modules published: Quality of training material is one factor that significantly affects training quality. Particularly, training materials for adult learners and farmers need to be carefully prepared. The ATA has developed high-quality farmers' training modules in three local languages. The modules were reviewed by adult learning experts before publication. Two different versions were prepared for trainers and farmers. A total of 4,000 training modules were published and distributed to seed unions. The modules were developed for six major commodities. These modules are part of the materials that will be used in the knowledge centers for future use and reference.



Farmers trained: Knowledge and skill gaps concerning the basics of seed production is one challenge faced by primary seed cooperatives. The project has trained more than 13,500 farmers over the last five years. The ATA trains new farmers joining cooperatives every year and organizes refresher training for existing members. In this way, 880 (130 female) farmers were trained in the current year.

Seed production

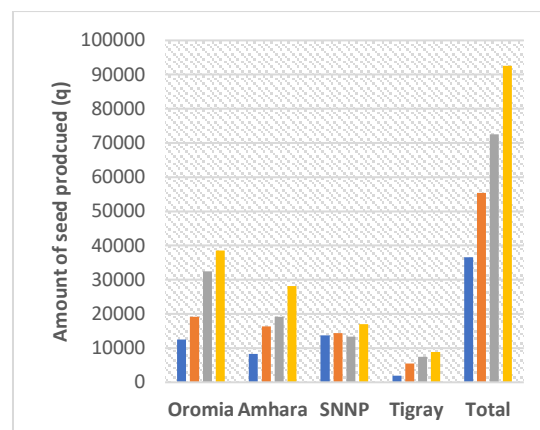
At the beginning of GTP II, the volume of national seed supply for self-pollinated crops ranged within 10–15 percent, covering about 10 percent of the total land area, while 85–90 percent of seed was from the informal sector. The CBSPs have huge potential to meet part of this demand at the national level. Additionally, there are specific gaps that are not effectively served by the formal sector, particularly for self-pollinating crops for which it is not as commercially feasible as for hybrid maize, thus limiting private sector involvement.

Encouraging a decentralized production and marketing system to bridge the formal and informal seed sectors is critical, especially to fill gaps for less commercial self-pollinated crops that cannot be adequately addressed by public and private producers. In the formal sector, several factors affect the scale of seed production and marketing, presenting a major challenge to effective delivery of seed to farmers, particularly in marginal and remote geographies and for neglected crops. As a result, the formal sector tends to focus on a few commercial crops (hybrid maize and wheat) while neglecting less profitable crops (most cereal, pulse, oilseed, and root crops) that are critical for the food and nutritional security of smallholder farmers. Therefore, the intermediate sector (cooperatives) can fill this gap through decentralized or localized production and marketing. Investing in CBSPs is a strategic intervention to supply seeds of

neglected crops and meet the demands of farmers in diverse agro-ecologies.

In 2013, CBSP's share of total seed production was 12 percent, mainly focused on self-pollinated varieties of which wheat and tef accounted for 76 percent of production. This percentage refers to CBSP's contributions as out-growers only and the actual market share of CBSP in the formal sector is far below this percentage. These unions covered at least 15 percent of the national seed demand on average in 2018 and 2019. Through these targeted efforts, 52 percent of Tigray, 20 percent of Amhara, 10 percent of Oromia, and 30 percent of SNNP's seed supply is met through this CBSP. The model also guarantees that unions are helping farmers adapt to and mitigate the impacts of climate change through provision of climate-smart seeds. Seed unions are producing a range of commodities including crops that are not commercially viable. Table 2 illustrates the aggregate performance of seed unions across regions in 2019.

The production capacity of CBSPs increased by 30 percent on average from 2016 to 2019 across the regions, except for SNNP, and is expected to increase at least by a similar rate in the years to come. If more unions are established, the contribution of the cooperative sector will double or triple over the next five years (see the graph in the right column).



Performance of CBSP in 2019 cropping season

Through the CBSP project, the ATA has proved that strong unions are the ultimate solution to the seed shortage farmers face during the planting season. In addition, engaging farmers in a modern seed production business is one of the best strategies to narrow the mismatch between demand and supply.



Seed storage facility of Tegulet Union, North Shewa Zone, Amhara Region

Table 2: Quantity of seed produced and supplied (quintals) by unions in 2019 cropping season

Crop	Yield estimates for 2019 across four regions					Actual seed collected in 2019 across four regions				
	SNNP	Oromia	Amhara	Tigray	Total	SNNP	Oromia	Amhara	Tigray	Total
Wheat	15,850	16,717	13,834	1,622	62,626	13,825	12,717	12,488	6,168	45,198
Maize	1,155	20,180	8,200	0	29,535	1,600	17,180	11,080	0	29,860
Teff	991	720	1,937	3,454	7,102	440	720	2,468	608	4,237
Food barley	340				340					
Malt barley		9,800	1,766		11,566		8,800	385		9,185
Faba bean	1,134				1,134	446				446
Haricot bean	1,386				1,386	328				328
Chickpea		300		200	500		160		32	192
Rape seed			22		22			10		10
Potato			5		5	150		600	1,000	1,750
Rice								1,101		1,101
Forage									5	5
Sesame				1,098					460	
Sorghum				22					616	
Finger millet						204				204
Total	20,856	47,717	25,764	21,000	114,217	16,993	39,577	28,132	8,889	92,510

With the aim of creating a vibrant and a competitive seed sector, ATA will continue to build the capacity of CBSPs in the current year and beyond. The outcome is expected to significantly decentralize the seed production and distribution system and also liberalize through bringing competent seed unions on board. This will enable smallholder farmers, particularly women and young farmers, to access quality seed at a reasonable price.

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Editor's note:

The CBSM has shown dramatic progress over a short period of time, contributing to supply of significant quantity of seed for crops neglected by the formal public and private sectors. The software (strengthening human resource capacity) coupled with hardware (provision of infrastructure and financial resources) support are clear examples of the pathway for transforming the small- and medium-sized enterprises in seed business as alternative forces in national seed supply. This is a clear message for policy makers, development practitioners, and donors alike to embrace farmer-based seed enterprises as an alternative force and business model for future growth and development of the seed sector.

ICARDA Continues Rebuilding the Seed System in Syria

In 2020/2021, the Phase II one-year project of the *FAO Syria Smallholder Support Program* was signed between the Food and Agriculture Organization of the United Nations (FAO) and ICARDA. The project is funded by the European Union, aimed at empowering vulnerable smallholder farmers to become more competitive and more resilient, as the agricultural sector emerges from the ongoing crisis. Increasing the access of smallholders to good quality seed of improved varieties and enhancing their contribution to seed production is one of the key components of the project in which ICARDA is contracted to deliver the services.

Under this project, the community-based seed production to complement the formal seed sector will be piloted in Syria by re-establishing and empowering pioneer farmers to become specialized and market-oriented community-based seed producers.

During Phase II, the project will focus on the following key outputs:

- Pre-basic seed of wheat, barley, chickpea, and lentil varieties distributed (9.85 tons) and basic seed produced (200.7 tons)
- Two existing farmer seed producer groups (SPGs) supported and one new SPG in Deir-ez-Zor established, and agricultural inputs and services provided
- Strengthened capacity of SPG members, project partners, and stakeholders along the seed value chain through training of trainers and farmers
- Integrated seed production management technologies demonstrated, and field days organized
- Raised-bed machine technology in some farmers' fields in Aleppo province demonstrated.

These are strategic seed system development issues, which can only be adequately addressed through partnership among the national and international research for development practitioners and donors. Both FAO and ICARDA will give due attention to this partnership to ensure long-term sustainability.

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Farmer Registration System and Subsidies for Crop and Seed Production in Turkey

Turkey has made remarkable progress in liberalization of its economy since the 1980s. The agricultural subsidy program in the country is anchored on three key areas for agricultural production, domestic certified seed use, and certified seed production announced and published annually for selected agricultural, horticultural, and fruit tree crops. These are (i) the Farmer Registration System (FRS)—the agricultural database on which farmers are registered and structured by the Ministry of Agriculture (MoA); (ii) the Agriculture Information System (AIS)—the system in which data, information, documents, and processes of all agricultural activities grouped based on the type of activity for those authorized users of AIS; and (iii) the Seed Data Management System (SDMS)—this provides the traceability of registration of plant varieties and seed certification processes, through the certificates generated from the system. For example, in the *Communique on Subsidy Payment for Crop Production for 2020*,

about 19 field crop species were selected for both certified seed use and production; whereas, for certified sapling (tree) use, all crop species will be subsidized except for banana and pomegranate.

The Direct Income Support (DIS) for farmers began nearly 20 years ago with support from the World Bank and is one of the main components of the agrarian reform programs. The reform aimed at reducing the pressure on the governmental budget and to stimulate growth in the agricultural sector. However, many amendments have been made since 2000 in DIS and other agricultural support policies with changes in legislation and practices. A DIS pilot project was started in March 2000 with the establishment of the FRS. This pilot project was carried out in 71 selected villages in four provinces. After the pilot program, the Agricultural Reform Implementation Project was initiated by the Government. After the loan agreement³ with the World Bank in 2001, the DIS payment to eligible farmers and the FRS were implemented in 81 provinces across the country based on applications from farmers and data collected from farmers. Data concerning farmers and their land parcel were collected offline for the first year of FRS but became automated and online in all provinces and districts in 2003. Although various items have been added over time for both crop and livestock production for agricultural subsidies paid by the MoA, FRS has remained at the heart of agricultural subsidy programs since 2001.

The FRS applications were governed with a first regulation published on April 16, 2005. This regulation was repealed on May 27, 2014 and replaced with the new comprehensive regulation on FRS⁴, which entered into force immediately. According to the provisions of the regulation, ‘farmer’ refers to real and legal persons engaged in agricultural production permanently or in one production season or cultivation period as a landowner, tenant farmer, renter, or sharecropper. All farmers who want to benefit from agricultural supports and subsidies must register in FRS and regularly update the necessary information. Private companies engaged in agricultural production must also be included in FRS as legal entity farmers. Farmers applying for FRS need to fill in the Farmer Registration Form⁵ and other relevant documents and submit them to the provincial units of the MoA or apply via Internet or the e-Government Gateway. The applicants are asked for their personal data, cadastral data of their land parcels, agreements of land rented, and relevant letters of undertaking and

consent. Agricultural subsidies paid to farmers in Turkey are performed under different legislation which is updated for crop and livestock production separately and published annually. However, the FRS regulation and the subsidy legislation for crop production⁶ (communiqué) are compatible with each other and the practical training of personnel responsible for enforcing each legislation is carried out in a coordinated manner to overcome any problems encountered in its implementation.

Apart from subsidies for agricultural production, both the domestic use and the production of certified seed have been subsidized in Turkey. Farmers registered in FRS have received a subsidy for certified seed use since 2005 based on cultivated area, and certified seed producer companies registered in FRS have also received subsidies since 2008 based on quantity of seed produced. According to the Communiqué on Subsidy Payment for Crop Production, for farmers who apply for subsidy of certified seed use it is not sufficient to only register to FRS; they are also required to register seed certification data to AIS. With this system, all corporate authorization and audit processes can be carried out, and the data inventory of all relevant processes can be tracked in an integrated manner. The certification agencies record the information on the certificates they have issued in the certificate database of AIS. Support payments are not made for certificates that have not been introduced to AIS, which checks that the sales invoices of certified seed do not exceed the lot size of the certificates to which they are attached. After completion of all other controls on applications, the payment lists are prepared and approved by the MoA for the farmers eligible for certified seed use subsidies.

The payment of subsidies for certified seed production requires more detailed process than for certified seed use since a third database, SDMS, is required in addition to FRS and AIS. For this subsidy, the licensed seed companies authorized by the Ministry and registered in FRS, which have produced certified seed on a contract in agricultural parcels registered in FRS, and/or seed growers registered in FRS can apply. Seed producer companies can get subsidies for certified seed use and certified seed production, if they use their own land or rented land provided that there is a contract for rent and the rented land is registered in FRS on behalf of the seed company. In cases in which a seed producer company contracted a seed grower for seed production, the farmer will get a subsidy

³Loan Agreement (Agricultural Reform Implementation Project/Loan), 2001 ([Link](#))

⁴Çiftçi Kayıt Sistemi Yönetmeliği (Regulation on Farmer Registration System), 2014 ([Link](#))

⁵Çiftçi Kayıt Formu (Farmer Registration Form), 2016 ([Link](#))

⁶Bitkisel Üretime Destekleme Ödemesi Yapılmasına Dair Tebliğ (Tebliğ No: 2020/31), (Communiqué on Subsidy Payment for Crop Production (Communiqué No: 2020/31), 2020 ([Link](#)))

for certified seed use only and the seed company will receive the subsidy for seed production only. The applicant's authorized seed company certificate, FRS registration, and membership of the relevant sub-union are checked online by AIS. The FRS records of the production year are controlled through satellite images and field control reports. If a non-compliance is detected because of the control, for example the seeds produced failed to meet the required conditions, it is considered ineligible for subsidies. Certificates are usually issued in SDMS but if the certificates cannot be issued in SDMS, for technical reasons, then the public certification institutions in the field of duty can issue the certificate.

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Research Notes

This section contains short communications on practical research or relevant information on agriculture or seed science and technology.

Farmers Preference of Food Barley (*Hordeum vulgare* L.) Varieties Adapted to Central Ethiopia

Yetsedaw Aynewa^{a*}, Seid Ahmed,^b and Zewdie Bishaw^{a7}

Abstract

Participatory variety selection (PVS) of food barley was conducted to identify and recommend farmer-preferred varieties. Ten released food barley varieties were evaluated at Gudoberet and Bakelo kebeles in Basona-Worana district of North Shewa Zone, Central Ethiopia. The experiment was of mother trial type and conducted during the 2019/2020 main cropping season. The barley varieties were evaluated through farmers' PVS in Africa RISING integrated research sites. Varieties IAR (H) 485, Hagere, and HB1307 were matrix ranked by farmers as first, second, and third, respectively. Farmers' evaluation provides key information to design and develop appropriate techniques of variety selection that are better adapted to their nutrient-deficient environments.

Key words: Central Ethiopia, farmers' preferences, food barley, matrix ranking

Introduction

Barley (*Hordeum vulgare* L.) is one of the most important cereal crops in Ethiopia, ranking fifth in terms of area and production after tef, maize, sorghum, and wheat (CSA 2019). In the 2018/2019 cropping season, about 811,782 ha of land was covered by barley with estimated production of 1.8 million tons at a productivity of 2.2 tons ha⁻¹. Barley is mainly used for consumption and malting, whereas the straw is used as livestock feed. Malt is the second most important use, particularly in beer production—industrial or homemade beer (tella) or spirit (areke). Currently it is utilized in a variety of foods and drinks. Barley malt is added to biscuits, bread, cakes, and desserts. Grains and sprouts from malting barley also have desirable protein content for animal feed (Emebiria et al. 2003).

Farmer participation in research is often advocated based on equity, but there are sound scientific and practical reasons for farmer involvement to increase the efficiency and effectiveness of a breeding program (Ceccarelli and Grando 2002). The PVS has been very successful both in understanding farmers' preferences and in facilitating adoption by smallholder farmers in marginal environments, not previously reached by formal plant breeding (Maurya et al. 1988; Sperling et al. 1993; Joshi and Witcombe 1996).

The main objectives of this study were to (i) identify well-adapted, high-yielding, disease-resistant, and farmer-preferred food barley varieties and (ii) recommend varieties for further seed production and supply based on their performance.

Materials and methods

Study areas

The PVS of food barley was conducted at Bakelo and Gudoberet kebeles of Basona-Worana district, North Shoa Zone, Amhara region in the 2019/2020 main cropping season.

Experimental materials

The experiments were carried out with 10 nationally released improved food barley varieties: Adoshee, Agegnehu, Cross 41/98, EH1493, Hagere, HB1307, HB1965, HB1966, IAR (H) 485, and Shege. These varieties were evaluated through PVS in mother trial types planted in fields of four farmers (two in each kebele) with one replication per farmer. The experiment was planted by hand at

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the seed rate of 100 kg ha⁻¹ in plots of 20 m². Fertilizers were applied at rates of 50 kg ha⁻¹ of urea and 125 kg ha⁻¹ of NPS. The NPS was applied once during planting time whereas urea was applied in an equal split between planting and tillering times.

Data collection

Agronomic data were collected on plant height, tiller number, spike length, number of kernels per spike, thousand seed weight, grain yield, and biomass yield. Plant height, tiller number, spike length, and number of kernels per spike were determined on five randomly sampled plants in each plot. Grain and aboveground biomass yields were measured at crop maturity.

For PVS, a group of male and female farmers randomly selected from the community were organized to participate in the evaluation. Male and female farmers separately evaluated and ranked the varieties at crop maturity. The evaluation criteria were identified during brainstorming with farmers. Farmers used parameters like vegetative growth or vigor, tiller number, disease reaction, spike length, and kernel number to evaluate the varieties.

Agronomic data analysis

The agronomic data were analyzed for all evaluated characters using a randomized complete block design (Gomez and Gomez 1984). The data were subjected to analysis of variance (ANOVA) using SAS software version 8 (SAS 1999). Variance components and genetic parameters were computed. The ANOVA of the randomized complete block design was computed using the mathematical model in which Y_{ij} was the observation for the i^{th} treatment, which was supposed within the j^{th} replication.

Farmer's data analysis

Farmers' criteria were identified through brainstorming with farmers and ranked in groups. Matrix ranking was employed to analyze the data with the criteria arranged in the first row and the varieties in the first column; the score values were entered for each variety.

Results and discussion

Grain yield and the results of farmers' evaluations based on plant height, crop stand, number of tillers, spike length, and number of kernels of tested varieties are presented. The traits studied were categorized to measure the grain yield, and farmers' scores in participatory evaluation were used to select the varieties.

Matrix score ranking

In farmers' evaluations, the weighted mean score value showed significant differences among malt barley varieties. The weighted mean score value range was 64.0–169.5. The highest mean score values were for IAR (H) 485 (169.5), Hagere (156.0), and HB1307 (149.5) which were ranked first, second, and third, respectively (Table 1). Similar results were recorded in grandmother–mother and mother trials of malt barley PVS in northwest and northern Ethiopia (Aynewa et al. 2013, 2019) and mother trials on durum wheat (Aynewa et al. 2016) and food barley (Aynewa et al. 2018).

Table 1. Farmers' evaluation at Gudo-Beret (GB) and Bakelo (BA) kebeles in 2019/2020 cropping season

Variety	GB male	GB female	BA Male	BA female	Weighted Mean	Rank
Agegnehu	110	130	117	55	103	4
Adoshee	60	60	171	95	96.5	6
Hagere	150	180	189	105	156	2
HB1307	240	210	108	40	149.5	3
HB1966	80	90	90	70	82.5	8
Shege	130	120	72	40	90.5	7
IAR(H)485	210	160	198	110	169.5	1
EH1493	60	60	108	75	75.75	9
HB1965	100	110	126	65	100.25	5
Cross 41/98	60	70	81	45	64	10



PVS of food barley varieties by male and female farmers at Bakelo kebele during 2019/2020 cropping season

Grain yield

The analysis of results showed significant differences among malt barley varieties (Table 2). Highly significant differences were recorded for mean grain yield, biomass yield, thousand seed weight, spike length, number of kernels per spike, and plant height. The highest mean grain yield and biomass yield were for IAR (H) 485, followed by HB1307 and HB1965. Non-significant differences were observed in terms of crop stand and number of tillers among the food barley varieties.

Table 2. Performance of food barley varieties in the mother trials in the central highlands of Ethiopia

Treatments	PH	SL	NK	CSD	NT	TSW	BY	GY
IAR(H)485	126a	6.7b	46.6ab	98.3	5.3	52.3a	9.9a	3.99a
Hager e	96.0b	6.4b	44.7ab	93.3	3.3	38.5de	6.0b	2.7ab
HB1307	95.8b	6.6b	45.1ab	98.3	6	49.3ab	8.0ab	3.4ab
Agegnehu	93.0b	6.1b	40.8ab	100	4.5	41.6dc	6.3ab	2.9ab
HB1965	91.8b	7.9a	48.6a	99.3	4.7	35.2de	7.2ab	3.2ab
Cross 41/98	90.3b	6.2b	38.3ab	95	4.8	39.1dce	7.2ab	2.7ab
EH1493	87.3bc	6.1b	38.1b	96.7	5.5	38.1de	6.3ab	2.1b
HB1966	84.9bc	5.9b	36.7b	96	3.3	45.3bc	4.6b	1.9b
Shege	82.4bc	6.2b	38.7ab	89.3	3.9	45.2bc	5.8b	1.8b
Adosh ee	72.2c	6.4b	40.3ab	86.7	5.3	33.6e	5.7b	2.7ab
Mean	91.9	6.4	41.8	95.3	4.7	41.8	6.7	2.7
LSD	15.5	0.9	10.4	-	-	6.4	3.7	1.6
CV	9.9	8.7	14.5	10.2	36.7	8.92	32.3	33.9

Note: *Means followed by the same letter(s) are not significantly different at $P < 0.05$; PH = plant height (cm), SL = spike length (cm), NK = number of kernels, CSD = crop stand, NT = number of tillers, TSW = thousand seed weight (g), BY = biomass yield (ton ha^{-1}), GY = grain yield (ton ha^{-1})

Conclusion

Differences in performance were observed among food barley varieties in overall selection criteria. The highest score for the farmers' evaluation was for IAR (H) 485, followed by Hagere and HB1307; in the researcher analysis, IAR (H) 485 had the highest score, followed by HB1307 and HB1965. Farmers' preferences based on their own selection criteria and researcher analysis had somehow matched for some of the evaluated food barley varieties. Farmers' involvement is crucial in evaluation of preferred food barley varieties for consumption and feed sources. Researcher analysis and farmers' evaluation provide information for designing and developing appropriate techniques to improve or select varieties better adapted to nutrient-deficient environments and provide a better understanding to strengthen future crop and product development.

Acknowledgment

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Meetings and Courses

Announcements of national, regional, or international conferences, meetings, workshops, and training courses appear in this section.

Conferences

With the COVID-19 pandemic continuing to escalate and national and/or international travel restrictions in place, virtual conferences, workshops, meetings, and trainings have become the order of the day replacing the old person–person interactions.

AFSTA Annual Meeting

The AFSTA Congress 2021 will be held in Kenya and the dates will be announced in due course. Stay tuned.

ISTA Annual Meeting 2021

The ISTA Annual Meeting will be held in Cairo, Egypt, May 31 to June 3, 2021. For more information, please contact: ISTA, Zurichstrasse 50, 8303 Bassersdorf, Switzerland; tel: +41 44 838 6000; fax: +41 44 838 6001; email: ista.office@ista.ch; website: www.seedtest.org

ISF World Seed Congress 2021

The International Seed Federation's (ISF) World Seed Congress 2021 will be held in Barcelona, Spain, May 17–19, 2021. The ISF World Seed Congress is the ISF flagship event that brings together the principal architects and decision makers of the global seed industry. More than 1,000 seed industry professionals are expected to gather to discuss the global issues facing the seed industry. [See the ISF World Seed Congress 2021 website for more information.](#)

Courses

ICARDA Courses

ICARDA organizes both short- and long-term courses in thematic areas related to its research programs under Biodiversity and Crop Improvement; Resilient Agricultural Livelihood Systems; and Water, Land Management, and Ecosystems. For more information on the ICARDA annual training programs, please contact: Charles Kleinermann, ICARDA, Cairo, Egypt; email: c.kleinermann@cgiar.org

CIMMYT Announces 2021 Basic Wheat Improvement Course

The wheat improvement course was established in 1968 with the mission of training plant scientists to overcome challenges in wheat production around the world. During this course, CIMMYT will review core concepts in genetics, conventional breeding, statistics, and discuss cutting-edge technologies implemented in the CIMMYT wheat breeding programs. Plant breeding is both a science and an art, and this course provides the opportunity for the new generation of wheat breeders to learn the science and develop the art.

This course targets junior scientists associated with national breeding programs, but graduate students and qualified self-sponsored visitors are welcome to apply.

Course objectives:

- Familiarize participants with CIMMYT's strategic objectives and breeding priorities for developing wheat cultivars.
- Understand the entire CIMMYT breeding pipeline and how other disciplines support the breeding process.
- Acquire skills and knowledge to successfully design and manage a wheat breeding program.

The deadline to submit applications is December 31, 2020. Applications are received on CIMMYT's Academia platform: <https://academy.cimmyt.org>.

UPOV Distance Learning Courses

Two sessions of each of the following UPOV distance learning courses are planned in 2020:

1. DL-205, Introduction to the UPOV System of Plant Variety Protection under the UPOV Convention
2. DL-305, Examination of applications for plant breeders' rights
3. DL-305A, Administration of plant breeders' rights (Part A of DL-305)
4. DL-305B, DUS Examination (Part B of DL-305).

The timetables of all courses are as follows:

Session I–2021

- Registration: January 11 to February 14
- Study period: March 8 to April 11
- Final exam: April 5 to April 11.

Session II–2021

- Registration: August 2 to September 12
- Study period: October 11 to November 14
- Final exam: November 8 to November 14.

The categories for participants follow:

Category 1: Government officials or members of the Union endorsed by the relevant representative to the UPOV Council (no fee).

Category 2: Officials of observer states/intergovernmental organizations endorsed by the relevant representative to the UPOV Council (one non-fee-paying student per state/intergovernmental organization; additional students, CHF1,000 per student).

Category 3: Others (fee, CHF1,000).

More detailed information about the courses and online registration is available on the [UPOV](#)

SBC offers Online Seed Production Course

The Seed Biotechnology Center (SBC), University of California Davis announces that the next Seed Production course will be offered online during February 22–26, 2021 (dates tentative). To take advantage of our early-bird discount, registration must be received by December 31, 2020. As a bonus for this course, guest speakers bringing decades of hands-on vegetable experience will be invited to participate.

Full course details and registration information available at:

http://sbc.ucdavis.edu/Courses/Seed_Production/

Courses from Wageningen Centre for Development Innovation

The new Course Calendar, which presents an overview of the online short courses that Wageningen Centre for Development Innovation (WCDI) offers in 2021, is now available. Embedded in the Wageningen approach of combining various fields of natural and social sciences, WCDI has an outstanding track record in providing high-quality short courses for professionals working toward inclusive and sustainable food systems in low- and middle-income countries.

The course program focuses on a variety of topics such as:

- Food and nutrition security
- Farmer entrepreneurship
- Climate change
- Agrifood sector transformation
- Monitoring and evaluation
- Multi-stakeholder partnerships
- Landscape learning.

For more information about our courses visit the website at [Download the Course Calendar](#) or visit our [Online Learning](#) page.

Join Soybean Innovation Lab's online training platform

Join the Soybean Innovation Lab (SIL) online training platform and access free courses on a variety of topics, including integrated pest management and soybean agronomy.

Launched in 2019, SIL's suite of course offerings are free and self-paced, allowing learners to complete the courses in their own time. SIL awards certificates of completion to learners around the globe. Courses are currently available in English, Portuguese, and now French.

For more information visit the [website](#).

Literature

Books, journal articles, and other literature of interest to readers are presented here. It may contain relevant information on agriculture-related publications including seed policy, regulation, and technology.

Books

ISTA. 2020. ISTA Handbook for Flower Seed Testing, 2nd Edition

Published by ISTA

(<https://www.seedtest.org/en/home.html>); ISBN 9783906549453; Price: CHF199; 277 pp

After extensive work carried out by the Flower Seed Testing Committee, the first edition of the ISTA Handbook on Flower Seed Testing was published in 2008. A supplement was distributed in 2010 and a new electronic edition released in 2020.

This handbook is a special venture of ISTA to collect all the knowledge in laboratory seed testing of flower seeds. It contains comprehensive laboratory seed testing methods for the most frequently tested flower species. It is intended to assist the practicing seed analyst by collecting as many illustrations and descriptions as possible to give guidance in everyday laboratory flower seed testing of purity, germination, and viability. The handbook also provides assistance in training new

analysts for flower seed testing in accordance with the international principles.

The handbook contains 62 working sheets with a series of procedures and detailed descriptions, full-color pictures, instructions, and conditions of the most important laboratory seed tests on flower species or genera. For easy reference, the families and genera are arranged in alphabetical order.

The Introduction helps in handling and understanding the parts of the working sheets and a glossary is included to give relevant information about the expressions used in seed analysis.

Available as an electronic, downloadable, printable PDF copy only. Non-members can purchase the handbook directly at [Ingenta Connect](#).

Jouanjean, M.A., F. Casalini, L. Wiseman, E. Gray. 2020. Issues Around Data Governance in the Digital Transformation of Agriculture: The Farmers' Perspective

Published by OECD
(<https://ideas.repec.org/p/oec/agraaa/146-en.html>);
38 pp

Agricultural data and their use for better decision-making and innovation are at the core of the digital transformation of agriculture. However, fragmented and unclear data governance arrangements may weaken farmers' willingness to adopt digital solutions. This, in turn, may reduce the availability and accessibility of agricultural data for policy making, for the agricultural innovation system, and for developing services for farmers. A key challenge for policy makers lies in finding a balance between protecting the privacy and confidentiality of agricultural data, and farmers' economic interests in those data, while making it possible to leverage their potential for the sector's growth and innovation. This report focuses on farmers' concerns around access, sharing, and use of agricultural data and explores whether and how existing policy frameworks and other sectoral initiatives can help to foster greater trust.

Websites

AfricaFertilizer.org

In response to COVID-19, [AfricaFertilizer.org](#) and its partners continue to monitor how government interventions to control the virus are affecting fertilizer supply chains. For 12 weeks, it published regional updates with the most accurate and up-to-date information available.

Now, through a partnership with *Development Gateway*, the *African Fertilizer and Agribusiness Partnership*, and *AFRIQOM*, they will regularly update their interactive platform where continent-wide information on the fertilizer supply chains and COVID-19 is made available. This work is made possible with support from the Bill and Melinda Gates Foundation and USAID.

Please explore the interactive [platform](#).

ASARECA

The Association for Strengthening Agricultural Research in Eastern and Central Africa (**ASARECA**) is a sub-regional not-for-profit association. It was established in 1994 by 10 member states represented by their National Agricultural Research Institutes following the approval of the Framework for Action for agricultural research in Eastern and Central Africa by the Special Program for Africa Agricultural Research. The original 10 member states were Burundi, the Democratic Republic of Congo, Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, Sudan, Tanzania, and Uganda. South Sudan joined the association at the General Assembly in December 2011, the Republic of the Congo joined in 2018, and Cameroon and the Central African Republic joined in July 2020 raising the membership of the regional association to 14.

Newsletters

ASARECA Newsletter

The ASARECA Newsletter is electronic news published and distributed by the ASARECA updating information devoted to news related to the agricultural sector in Eastern and Central Africa.

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 deliver sustainable systems solutions that increase productivity, improve rural nutrition, and strengthen national food security. ICARDA's integrated approach includes new crop varieties, agronomy, on-farm water productivity, natural resources management, rangeland and small ruminant production, and socioeconomic and policy research to better target poverty issues and accelerate technology adoption. As a member of the CGIAR Consortium, ICARDA works closely with national agricultural research programs and other partners in more than 40 countries across North and sub-Saharan Africa, and Central, South, and West Asia.



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Note to Subscribers

Subscribers are encouraged to play a proactive role in making this newsletter a useful platform for information exchange. Contributions are most welcome in the broad areas of seed system development; meetings, courses, and electronic conferences; books and reviews; websites of special relevance to the seed sector; funding opportunities; requests to other readers for information and collaboration; and feature articles or discussion issues proposed by subscribers. The Editor always welcomes suggestions on format and content. Please send inputs by email to z.bishaw@cgiar.org

The views published in Seed Info are those of the contributors and do not necessarily imply the expression of any opinion on the part of the Editor, the Regional Seed Network, or ICARDA.