Female cooperatives as drivers to boost the wheat value chain in Nigeria

Report for period June 2021 to June 2022

Kachalla K Mala, Ashish Pande, Damilola Adeniyi, Filippo M Bassi.

General summary

On October 27th 2021 a virtual ceremony of signature was held to celebrate the launch of the "Seeds for the future" project between OLAM AGRI's Crown Flour Mill and Lake Chad Research Institute (LCRI). This far- reaching initiative seeks to use a participative approach to integrate farmers as drivers for change, identifying jointly with researchers the best wheat varieties and agronomic practices to deliver the top harvests. Moreover, it integrates a "local to global" strategy where the rural communities are put front and center, with a specific target on empowering female associations to become the local enabler for the adoption of technologies, which are then commercialized globally thanks to the interest of the national mills. On November 24th 2021 the partners called upon several high-level Nigerian stakeholders' to seek their approval and advise on the goals set by the project. Several valuable suggestions were gathered and incorporated into the project. Overall, the project set goals and its core structure was seen as aligned within the larger investment promoted by the Federal Government and the Central Bank of Nigeria to make wheat farming a reality.

To further understand the reality on the ground, a detailed survey was conducted across 40 farm households from four villages that ensure the livelihood for some 387 rural people, of which more than half are children. All interviewed farmers identified their main crop as rice, with nearly all of them conducting two rice seasons (rainfed and irrigated). Still, all the interviewed had at least tried wheat cultivation, and many still cultivate it today. Those experienced farmers that started wheat cultivation more than four years before achieved yields beyond 2,5 tons per hectare, while the novice farmers only 2 tons per hectare, as demonstration that experience is a factor of success. The best varieties available to them were identified as Norman and Borlaug 100. However, the main concern that all shared about wheat cultivation was the fact that it is less profitable than rice, and that the varieties that they currently have are too late. Hence, the wheat cultivation is too long, and it prevents one of the second seasons of rice. Also, the farmers indicated that at the end of the rainfed rice season it is economically very difficult for them to start a wheat season before having sold their rice harvest.

The survey conducted resulted in two very clear guide point: 1. early fast-growing wheat varieties are the main technological priority; 2. A form of economic support for wheat planting is needed to favor the wide adoption of this crop rather in the form of a small credit or as a "contract farming" strategy.

With these points clear in mind, on November 17th 2021 seeds were planted at the LCRI Wheat Research Farm at Azumbu village, Mallum Madori/Hadejia LGA, Jigawa State-Nigeria. Even though this farm was used for the first time for wheat research, the field results were of sufficient quality to confirmtwo ideal lines for further multiplication (Bob and Hoffimilmus), which ensured yields similar to Norman,but completing the full cycle four days ahead of it. In parallel, the testing of 23 new potential elites allowed to identify 3 new lines that yielded more than Norman, and one that matched its yield, but completed the cycle 7 days earlier.

Farmers were invited to visit these trials as part of an open-door day, and some 50 participated, confirming their appreciation for the work carried out.

In conclusion, the first year of the project achieved all set milestones timely and effectively, opening the door for a second year that should gather even more inputs from local communities and identify the next round of innovations, while at the same time promoting for adoption those already identified.

Table of contents

Output1. Identify the ideal varieties for Nigeria

In season 2020-21 the entries Bob, Tillejihan, and Hoffmilmus were identified as the best ones when combining data from Nigeria (LCRI), Mauritania, and Senegal (**Fig 1**).

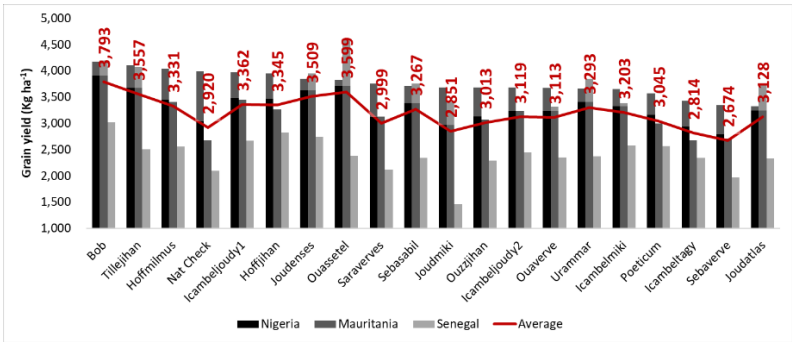

Fig 1. Grain yield comparison of different ICARDA's elite across Nigeria, Senegal, and Mauritania.

For these entries, 1 Kg of seed were recovered from the stores and planted at the research farm at Azumbu village, Jigawa State, in 100 m^2 plots during season 2021-22 on November 17th 2021 (**Fig 2**). Unfortunately, LCRI has used for the first time this season the station in Azumbu, since the one in Kano became inaccessible, and some issues were encountered in terms of herbicide treatment and irrigation.

Fig 2. Different stages of the crop cycle for the seed multiplication at Azumbu village. The issues in herbicide treatment and irrigation are evident.

Despite that, it was possible to confirm that Bob and Hoffmilmus were indeed the best entries, surpassing Norman in terms of yield and doing so in a reduced amount of time. In that sense, the team was able to meet the set goal of producing 10 Kg of pre-multiplication seed for the best 2 entries.

Table 1. Performances of seed multiplication trials in Azumbu

Name	Weight harvested	Grain yield	1,000 kernel weight
	Kg	Kg ha-1	(g)
Sebajihan	2.82	282	44.1
Saharita	0.52	52	32.2
Icaurartu	1.64	164	43.1
Ouasserno	9.50	950	41.4
Icakassi	8.14	814	40.6
Ouaverve	2.27	227	46.9
Hoffmilmus	25.00	2,500	40.4
Bob	37.00	3,700	51.4
Tillejihan	4.55	455	41.8
MAB-Maja	8.19	819	40.7
Altar-84	12.77	1,277	37.3
Norman	20.00	2,000	34.9

The set goals are presented in **Fig 3**, together with the goal for prong 4. These 10 Kg will be planted next season in 1,000 m^2 plots at Azumbu station for producing nucleus seed. However, to ensure larger quantities of seeds as backup, a subset will be planted also during the rainy season in August.
Overall, the approach of combining data from across West African stations confirmed to be extremely successful, with the best 2 entries identified achieving top performances. This outcome gives some insurance that the investment of OLAM AGRI to accelerate seed production pre-release should lead to an actual improvement on farms productivity.

Year	Cycle 1	Cycle 2	Cycle 3
2021 (y0)	Select top 4 varieties using data from Nigeria, Mauritania, Senegal, Sudan, and ICARDA		
2022 (y1)	Pre-multiplication: 1 Kg of each variety planted at LCRI in 100 m^2 plots	Select top 4 varieties using data from Nigeria, Mauritania, Senegal, Sudan, and ICARDA	
2023 (y2)	Nucleus seed: 10 Kg of 2 best varieties planted at LCRI in 2 x 1000 m^2 plots LCRI uses 1 Kg to test agronomy practices	Pre-multiplication: 1 Kg of each variety planted at LCRI in 100 m^2 plots	Select top 4 varieties using data from Nigeria, Mauritania, Senegal, Sudan, and ICARDA

Fig 3. Project timeline and deliverables for prong 1 and 4 for the first three years.

Time progression for prong 1:
Year 1: ICARDA – LCRI identify together the "best bet" 4 varieties. 1 Kg of *pre-multiplication* seed is planted in plots of 100 m2 at LCRI to produce 10 Kg of *nucleus* seeds. ***COMPLETED***
Year 2: 10 Kg are planted in 1000 m^2 plots to produce 100 Kg of *breeder* seeds. In parallel, the selected entries will be tested against the best commercial varieties to confirm their performances. *On time*

Output 2. Define management practices that best fit the value chain needs

The ability of a variety to deliver top yield and high protein content is dependent on its genetics, but also on the way it is managed. To better understand the management practices currently followed by farmers, it was originally planned to simply visit some farmers and discuss with them their methodologies. However, this method was deemed too weak, and instead a formal survey with some 40 farms across four villages was performed instead. The questionnaire used for the survey is available as **Annex 1**, while here below are reported the main findings.

Across the four villages, 15 female and 25 male farmers were interviewed, with ages varying between 15 and 57 years old, for an average of 36.6 (**Table 2**). Each farm household hosted on average 4 to 5 adults and 5 childrens, for a total of 10 people depending on the farm for their livelihood. The farms of the interviewed set spanned mostly between 1 and 2 hectares (ha) in size, averaging 1.7 ha across the survey. Therefore, this is deemed a good socio-economic representation of the rural areas surrounding the research station and hence the data are considered as valid to be used to draw conclusions.

Table 2. Socio-economic information of the interviewed farmers

Villages	Female	Male	Age	Dependent		Farm size
	N	N	Years	Adult	Children	Hectares
Azumbu	3	7	36.5 (25-43)	4.9	4.9	1.6
Biyamusu	5	5	37.6 (25-52)	4.2	5.2	1.7
Ringim	5	5	33.6 (25-51)	5.0	5.3	1.7
Taura	*2*	*8*	*38.5 (15-57)*	*4.4*	*4.8*	*1.7*
Total	*15*	*25*	*36.6*	*4.6*	*5.1*	*1.7*

To understand the farming system used by the interviewed set, they were requested to explain their cultural rotations (**Table 3**). Most farmers (N=31) harvest rainfed rice at the end of October, while few (N=9) do so by the middle of November. The planting date for irrigated rice is end of March (N=12) to early April (N=28). This leaves a period between late November and early March to cultivate wheat. During this same period (*harmattan*) potentially dedicated to wheat, farmers also cultivate maize or beans. In fact, the *harmattan* season of wheat, maize or beans is the most important for the farms, with full farm surfaces (1.75 ha) planted with these crops. The second most important production is irrigated rice (1.43 ha), followed by rainfed rice (1.15 ha). All the interviewed farmers are already cultivating wheat. Most of them do so in rotation with 2 rice seasons (irrigated and rainfed) (N = 33), while few (N=7) cultivate it in rotation with only one rice season (N = 7). There does not seem to be any gender bias or preference for the farming system used.

Table 3. Farming system followed by the interviewed set

Harvest date rainfed rice		Planting date irrigated rice		Area (ha)			Farmers (N)	
October	November	March	April	Rainfed rice	Irrigated rice	Wheat, maize or beans	1 rice + wheat	2 rice + wheat
31	9	12	28	1.15	1.43	1.75	7	33

Since all interviewed farmers are already cultivating wheat, the survey was used to deepen the understanding of their preferences and experiences (**Table 4**). Only 4 farmers have been cultivating wheat for more than 4 seasons, and in fact their experience resulted in average higher grain yields (2,888 Kg ha^{-1}), which was superior to the overall average of 2,556 Kg ha^{-1}. This was also true for the 11 farmers that have been cultivating wheat for more than 3 seasons (2,668 Kg ha^{-1}), while for those that had done so for one season or less the yield was low. This confirms that experience in wheat cultivation can be obtained in just four years and it results in a 18% increase in yield. However, it is also evident that the average yields are low, and an intervention is required to increase them beyond 3,000 Kg ha^{-1}, which is estimated as being the minimum yield to draw profit from this crop.
Four different varieties were used (Atilla, MBA Maja, Norman, Borlaugh 100), with a preference for Norman for both female and male farmers (N=18). However, it was Borlaug 100 that achieved the highest yields (3,000 Kg ha^{-1}), while MBA Maja had overall the lowest (2,489 Kg ha^{-1}). Female farmers achieved slightly lower yields than male (-1%), mostly due to their poorer performances when growing Attila (-6%). Overall, there does not seem to be a strong gender component affecting varieties preference, maybe with the exception that women were more attracted by Norman. Instead, there is a clear yield advantage in cultivating Borlaug 100, and >2 years experience raised yield by +18%.

Table 4. Grain yield effect of experience, gender, and varieties preferences

First season of wheat	**Before 2018**	**2018/2019**	**2019/2020**	**2020/2021**	**Overall**
Farmers (N)	4	11	17	8	40
Average yield (Kg ha^{-1})	2,888	2,668	2,443	2,475	2,556
Variety	**Atilla**	**MBA Maja**	**Norman**	**Borlaug 100**	**Overall**
Farmers (N)	9	8	18	5	40
Female (ratio)	20%	13%	53%	14%	15
Male (ratio)	24%	24%	40%	12%	25
Overall (yield Kg ha^{-1})	2,461	2,492	2,508	3,000	2,556
Female (yield Kg ha^{-1})	2,367	2,500	2,506	3,000	2,543
Male (yield Kg ha^{-1})	2,508	2,489	2,510	3,000	2,563

The group of 40 farmers was then interviewed to understand the most common management practices (**Table 5**). The majority (N=25) combined a pre-emergence herbicide (Butachlore) with a post emergence herbicide (2,4-D). In other cases 2,4-D (N=9) alone was used, while few farmers (N=6) conduct manual weeding. It appears that the use of 2,4-D alone resulted in the highest average yield (2,630 Kg ha^{-1}) while manual weeding was the overall worst (2,383 Kg ha^{-1}). Since Butachlore + 2,4 D are already heavily used for rice cultivation, it would be important to test new herbicides more specific for wheat.
All farmers practiced a weekly irrigation, mostly during the day (N=30) and only few of them at night (N=10), with the practices of doing so at night resulting in slightly higher yields (+5%). In terms of water saving the night practices would be best and should be promoted whenever possible.
Most farmers preferred NPK in dosages of 15:15:15 (N=34) while few used 20:10:10 (N=6). All farmers followed NPK at planting with a dosage of Urea after emergence. On average, farmers using the 15 NPK dosage had better yields than those using the 20 dosage (+7%), probably due to the poor soil content in P and K. Those farmers that practices a second dosage of Urea (N=9) 8 weeks after planting did not gain in grain yield, but certainly achieved higher protein content, which is a very desirable trait for millers.

Fertilization strategies to improve protein content should therefore be tested, possibly reducing Urea amounts, and attempting liquid fertilization after flowering.
Most farmers obtained wheat seeds from commercial shops (N=25), while 5 received them from the Central Bank via the Anchor Borrower Program. Some (N=6) used farm saved seeds, while 2 obtained them from their association. This demonstrates a vast array of seed sources available to farmers and promote the goal of this project to reach faster seed adoption via local community seed enterprises.
Most of the farmers sell their wheat grains to the local market (N=26), while for 5 these are purchased back by the Central Bank, and 9 sell them directly at the farm gate to local populations. The average price for 1 quintal is 32,750 NAIRA, equal to 790 USD per ton, which is more than double the wheat international price. However, these sales still mostly occur in units of 1 Kg bags. Considering the average yield, the expected revenue per hectare would equate to 838,504 NAIRA (2,020 USD) of which less than half would be sold, while the rest is consumed in the farm.
Straw is also an important output of wheat cultivation, and most of the farmers use it as fodder for their livestock (N=34), some manage to sell it for use by others (N=5), and one uses it to make bricks.

Table 5. Number of farmers adopting various management strategies

Herbicide strategy			**Irrigation strategy**		**Fertilization strategy**		
But. + 2,4 D	*2,4-D*	*Manual*	*Day*	*Night*	*NPK15 + 1 x U.*	*NPK15 + 2 x U.*	*NPK20 + 1 x U.*
25	9	6	30	10	25	9	6
Seed origin							
Shop	*CBN-ABP*	*Association*	*LCRI*	*Neighbor*	*Farm saved*		
25	5	2	1	1	5		
Grains sale					**Straw use**		
Market	CBN-ABP	Farm gate	Price	*Revenue (ha)*	*Fodder*	*Sold*	*Bricks*
26	5	9	32,750	838,504	34	5	1

Finally, the farmers were asked to rank the main issues they faced that prevent them to further adopt wheat cultivation (**Fig 4**). The two most widely mentioned issues were the absence of money to plant and the absence of wheat seeds, however the one that was most frequently ranked 1st (main issue) was the fact that wheat would be competing with the already existing crops. To further understand, the farmers were asked to list the main issues they are facing with wheat production. The lack of early varieties ranked by far the highest, while the damages caused by birds came second.
Assessing these responses together, it is clear that farmers are keen in cultivating rice and consider wheat only if this does not prevent rice production. For that reason, they indicate the competition with existing crops as the main issue, and the fact that early wheat varieties would be best to avoid delaying the planting of irrigated rice. In parallel, maize and beans are good crop adapted to the *harmattan*, and better known than wheat. Maize however requires a longer season, which would then prevent the planting of irrigated rice, while beans tend to have lower yields. Hence, wheat could be widely adopted if its cultivation cycle does not prevent rice production, and its profitability remains higher than that of beans. One element to be promoted with the CBN is that for wheat planting to be successful, it is

important that farmers have access to credit to invest in wheat planting in November, before they manage to get liquidity from the sale of rainfed rice in December/Janaury. Finally, birds are extremely damaging for wheat, so ideal practices to prevent their attacks could further favor wheat adoption.

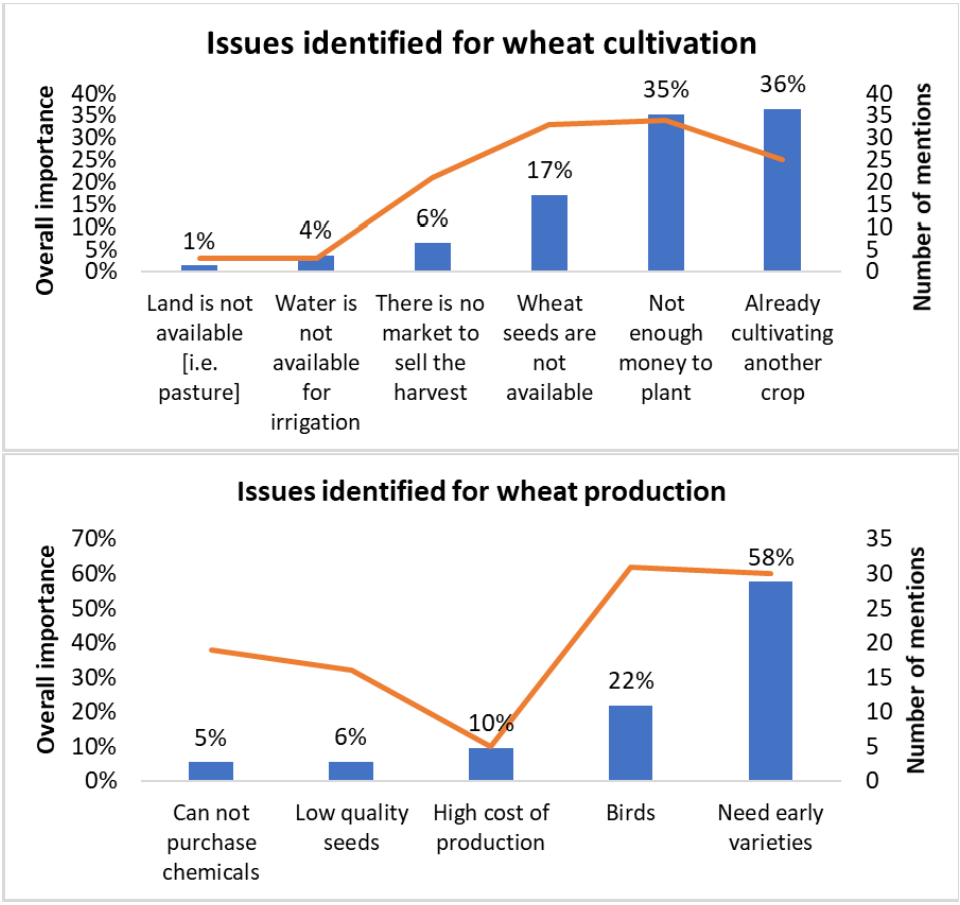

Fig 4. Main issues declared to prevent the adoption of wheat cultivation and hindering wheat production

Report on stakeholder consultation meeting

On November 24th 2021 a group of high level stakeholders was invited to hear about the project and provide their inputs under the general title: *Olam Green Land Webinar Series - Re-thinking wheat farming in Nigeria.* Dr Tiberio Chiari and Dr Amadou Sall were included as invited speakers to provide their inputs inthe value and validity of the project. As part of that consultation the project was approved by the stakeholders and external reviewers, who agreed on its potential to contribute to the larger investment in wheat farming already ongoing in Nigeria. The participatory nature of the project and the fact that farmers were placed at its center were the elements that inspired the most appreciation. However, the stakeholders also identified the same issues as the 40 interviewed farmers: lack of seeds, lack of a large industrial market for purchasing the grains, and the fact that wheat needs to be an "added crop" as it is not a valid replacement for rice.

Report on participatory field day

On the 31st January, 2022 at the Institute's Research Station in Azumbu Hadejia, Jigawa State-Nigeria, a total of 50 farmers (half women) were invited by the Wheat Farmers Association of Nigeria (WFAN). During the visit the farmers were given the opportunity to select from the 12 entries of Seed for the Future demonstration plot to confirm that Bob and Hoffmilmus (and Norman) received the highest appreciation. This was followed by an interactive session with the research team to discuss several aspects of best agronomic practices, pest/diseases and their integrated control, marketing and end-use quality.

Product Profile – summing up all inputs

The sum of the inputs obtained from the survey, field day, and the stakeholder consultations reveal the exact characteristics that the varieties should possess and the ideal management practices:

Variety product profile: the ideal variety should achieve yields equal or superior to Norman, should do so in just 92-95 days from planting (end of November) to harvest (early March), it should provide straw as fodder for livestock, and if possible, have a spike type that reduces bird damage.

Agronomy product profile: a sum of management practices and methodologies that accelerate the transition between rice and wheat seasons, minimize the costs for agro-chemicals and water, ensure yields above 3,000 Kg ha^{-1} in less than 95 days, with the added potential of reducing bird's damage.

Agronomy practices to be tested

On the basis of the list of issues and current practices, the following management practices shall be tested in year 2

The following 4 varieties will be used: Norman, Altar, Bob, and Hoffmilmus
Each variety will be planted in 4 plots x 5 m x 5 m each.
Each plot will follow a different practice (**Fig 5**):

Plot 1 – Current farmer practices: harvest of rainfed rice, tillage and planting in late November, application of NPK15:15:15 during tillage, use of Butachlore pre-emergence and 2,4-D post emergence. One application of Urea at 4-6 weeks. Weekly irrigation during the day. Harvest each variety once it reaches maturity (note the harvest date). Calculate yield and provide grains to OLAM AGRI's Crown Flour Mill to measure protein content and bread making characteristics.

Plot 2 – Good farmers practices: harvest of rainfed rice, tillage and planting in late November, application of NPK15:15:15 during tillage, use of Butachlore pre-emergence and 2,4-D post emergence. One application of Urea at 4 weeks followed by a second application at 8 weeks. Weekly irrigation during the night. Harvest each variety once it reaches maturity (note the harvest date). Calculate yield and provide grains to OLAM AGRI's Crown Flour Mill to measure protein content and bread making characteristics.

Plot 3 – Improved protein practices: harvest of rainfed rice, tillage and planting in late November, application of NPK15:15:15 during tillage, use of different herbicides depending on market availability.

One application of Urea at 4 weeks followed by a second application after flowering of 2 Units of Urea as liquid fertilizer. Weekly irrigation during the night, conduct only 2 irrigations after flowering. Harvest each variety once it reaches maturity (note the harvest date). Calculate yield and provide grains to OLAM AGRI's Crown Flour Mill to measure protein content and bread making characteristics.

Plot 4 – Improved water practices: harvest of rainfed rice, tillage and generation of raised beds using onions machinery. Planting in late November, application of NPK15:15:15 during tillage, use of Butachlore pre-emergence and 2,4-D post emergence. One application of Urea at 4 weeks followed by a second application at 8 weeks. Weekly irrigation during the night, using the channels of the raised beds instead of flood. Harvest each variety once it reaches maturity (note the harvest date). Calculate yield and provide grains to OLAM AGRI's Crown Flour Mill to measure protein content and bread making characteristics.

Additional tests: try the use of kites and other methods to protect against birds

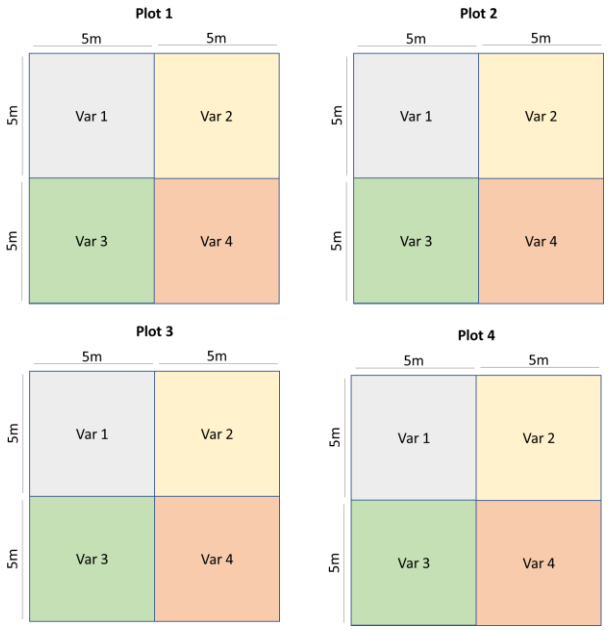

Fig 5. Simplified schematics of agronomic testing for season 2022-23

Time progression for prong 2:
Year 1: use farmers to define current agronomic practices. ***Modified: COMPLETED***
Year 2: plant 4 varieties in large plots and asses the effect on yield, protein, and maturity of four different agronomic approaches. ***Modified to respect survey results,*** *on time*

Output 3. Establish female associations as drivers of community changes

This activity will start in year 4, with a pre-identification in year 3. However, 31st January, 2022 as part of the field day 25 progressive women farmers have been identified and their training has already begun (**Fig 6**). Discussion on seeds and how to obtain it was done with them, to develop initial interactive inputs on possible issues. None has been identified for now. The same women will be further integrated in a new round of discussion on seed maintenance for the varieties they are currently cultivating.

Fig 6. Women progressive farmers participating at the field day organized at Azumbu research station

Time progression for prong 3:

Year 4: OLAM AGRI contracts 10 ha to produce 10,000 Kg of *registered* seeds of the preferred 2 varieties. These fields are then defined as “school farms” and used to train female associations from 10 villages onthe seed business. As part of this “school”, the associations will also be trained on seed business practices and told the best management for wheat cultivation (prong 2). *On time*

Output 4. Never stop developing the next big solution

The 45th International Durum Yield Trial (IDYT) set of ICARDA was received from Lebanon and timely planted at the research farm (**Fig 7**). The performances of the imported entries were compared to those of Norman in a 2 replicates alpha lattice design in experimental plots of 6 m^2. In this trial Norman achieved a yield of 2,200 Kg ha^{-1} and was ready for harvest 101 days after planting (**Table 6**).

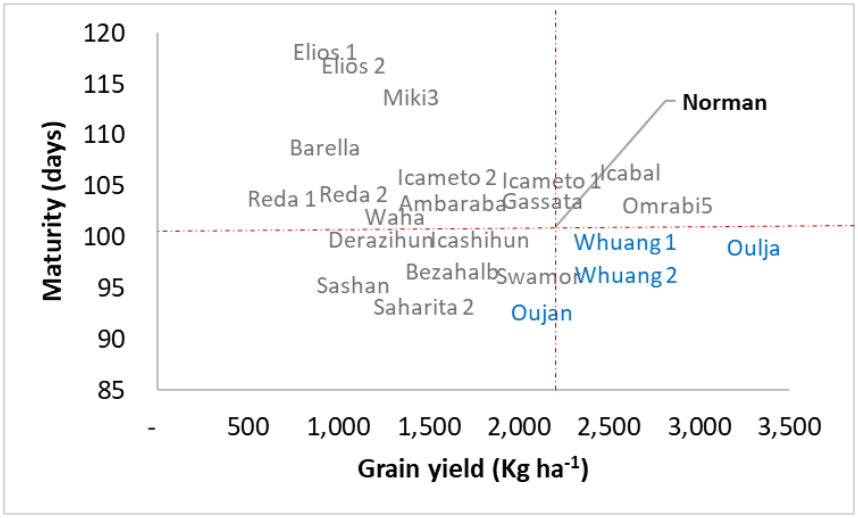

Table 6. Detailed results of 10 entries of IDYT45 trial at Azumbu station season 2021-22

Designation	GY	TKW	DtH	DtM	Straw
Norman	2,200	47	45	101	126
Oulja	3,290	51	45	100	106
Whuang 2	2,580	49	49	99	125
Whuang 1	2,265	51	45	100	84
Oujan	2,000	53	44	93	113
Omrabi5	2,580	47	47	104	97
Icabal	2,501	47	51	104	84
Icameto 1	2,186	48	52	106	116
Elios 2	1,081	43	62	117	80
Elios 1	923	49	63	118	96
Heritability	0.79	0.55	0.92	0.90	0.77
Grand Mean	1,758	49	49	103	94
LSD	1,046	6	4	6	3
CV	12.00	8.21	4.48	3.18	5.95
Genotype sign.	0.00	0.08	0.00	0.00	0.01

GY, grain yield; TKW, 1,000 kernels weight; DtH, days to heading; DtM, days to maturity.

This trial had a heritability of 0.79 and a CV of 12% for grain yield (GY), indicative of a good experiment with valid results. Five entries had higher or matching yields to Norman, of which three achieved it in 1 or 2 days less than Norman (Whuang1, Whuang2, and Oulja). However, the most interesting entry is probably Oujan, which achieved a yield slightly inferior to Norman, but its season was just 93 days in length, which fits the ideal timeline preferred by farmers to avoid delaying rice planting. These four entries will be further tested next year in larger plots.

Time progression for prong 4:
Year 1: test IDYT in Nigeria and Senegal to select the best 4 entries. ***COMPLETED***
Year 2: For the "best bet" 4 varieties, 1 Kg of *pre-multiplication* seed is planted in plots of 100 m2 at LCRI to produce 10 Kg of *nucleus* seeds. *On time*

Output 5. Communication and outreach

Stakeholders' consultation and engagement began with strategic courtesy visits to the primary stakeholdersin Government, Ministers of Agriculture and Rural Development, The Kano State Governor and Minister of Labour and Employment to glean new vista of opportunities. These consultations ultimately gave rise to the virtual stakeholders' consultative forum christened Olam Green Land Webinar Series. **(OGLWS)**

Created to facilitate conversations, the platform enables OLAM AGRI to convene key value chain stakeholders i.e., wheat researchers and scientists from the Lake Chad Research Institute (LCRI) and International Center for Agricultural Research in the Dry Areas (ICARDA); Wheat Farmers Association of Nigeria (WFAN); Flour Milling Association of Nigeria (FMAN); policy makers, regulators, relevant institutions, like the Central Bank of Nigeria (CBN); the Federal Ministry of Agriculture and Rural Development (FMARD); and draws guest speakers from the International Agricultural Research community and Investment Ecosystem to discuss topical issues affecting the sector and proffering solutions to drive sustainable development of the sector. The Webinar series which was inaugurated in March 2021 is now in its 3RD Season.

OGLWS Season One Statistics

- Total Registered – 1232
- Total Attended – 363
- Attendance Rate – 29%
- No of Q&A – 47
- Total Time of Webinar – 215 Minutes

OGLWS Season Two Statistics

- Total Registered – 1646
- Total Attended – 381
- Attendance Rate – 23%
- No of Q&A – 67
- Total Time of Webinar – 233 Minutes

Farmers survey: a total of 40 farmers were interviewed and made aware of the project for which the survey was conducted. In total, 387 dependents were exposed to the survey and are now aware of the project and its goals.

Farmers field day: a total of 25 women and 25 man farmers attended the field day to learn about the project, discuss wheat performances, and learn about the latest methodologies of wheat farming. Considering an average of 4 neighbors that will hear about these approaches from each visitor, and the average farm size of 10 members, it can be derived that some 2,000 rural people were influenced by this field day.

Blog about the release of varieties: https://www.premiumtimesng.com/news/top-news/505788-nigeria-releases-49-high-yielding-new-crop-varieties-for-farmers.html

Sphere of activity and sphere of influence of year 1

- Farmers survey: 40, dependent 387 people, of which 222 children
- Farmers field day: 50 participants, plus 200 neighbors, and 2,500 dependents
- Stakeholders' consultation: 744 participants and 2878 registered people, plus over 5,000 thatheard about the project from the participants
- Press outputs views: >10,000 shares

Project deliverables and milestones

A total of two milestones and 10 activities were due within the first year of the project (June 2021 to June 2022). All have been achieved. In addition, three activities have also been achieved ahead of time.

Milestones of year 1

ID	Y	M	Activity	Goal	Indicator
MS01	2021	6	1.1	Sign agreement	Signatures done
MS15	2021	11	5.2	Define PP	All stakeholders agree

MS01 – *Sign agreement with LCRI*: the project start date was maintained as planned, but signatures were finally completed on October 27th 2021, instead of June as originally planned. *Achieved*

MS15 – *Define product profile*: the stakeholder consultation allowed to define the variety product profile on the 27th of November 2021 as planned. These were further validated via a farmers' survey.*Achieved*

Table 1 – Gnat chart of project timeline 2021-2022

Activity	Task	2021							2022											
		6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Project coordination	1.1 Singature of research agrements	1																		
Project coordination	1.2 Transfer of funds																			
Project coordination	1.3 Annual report																			
Project coordination	1.4 Communication brief																			
Test agronomic practices	2.1 Define practices to be tested																			
Test agronomic practices	2.2 On station field assesment																			
Test agronomic practices	2.3 Analyze results																			
Test agronomic practices	2.4 Define "best bet" practics																			
Validate agronomic practices	3.1 Define practices to be validated																			
Validate agronomic practices	3.2 On station field assesment																			
Trials of ICARDA elites	5.1 Import germplasm																			
Trials of ICARDA elites	5.2 Define product profile						15													
Trials of ICARDA elites	5.3 Conduct on station field assesment																			
Trials of ICARDA elites	5.4 Analyze results																			
Trials of ICARDA elites	5.5 Define "best bet" elites																			
Pre-multiplications	6.1 Test "best bet" elites in Stage 1 trials																			
Pre-multiplications	6.2 Plant "best bet" elites in 100 m2 plots																			

The following activities were planned and **completed by June 2022**:
1.1 Signature of research agreements: *delayed to November 2021, completed*
1.2 Transfer of funds: *delayed to November 2021, completed*
1.3 Annual report: *this report, completed*
2.1 Define practices to be tested: *this report, completed*
2.2 On station field assessment: *this report, completed*
2.3 Analyze results: *this report, completed*
5.1 Import germplasm: *import completed October 21, completed*
5.2 Define product profile: *this report, completed*
5.3 Conduct on station field assessment: *harvest done in March 22, completed*
5.4 Analyze results: *this report, completed*

The following activities are planned for the **next 6 months of 2022**:
2.4 Define "best bet" practices: *this report, completed ahead of time*

3.1 Define practices to be validated: *this report, completed ahead of time*
5.5 Define "best bet" elites: *this report, completed ahead of time*
1.4 Communication brief: *to be written by M9 2022*
3.2 On station field assessment: *planting due M11 2022*
6.1 Test "best bet" elites in Stage 1 trials: *planting due M11 2022*
6.2 Plant "best bet" elites in 100 m2 plots: *planting due M11 2022*

Annex 1 – Questionnaire used for the survey

LAKE CHAD RESEARCH INSTITUTE | ICARDA
Science for resilient livelihoods in dry areas

Survey for farmers Nigeria

Survey ID: xxvillage name-001

General information and informed consent	
Community/village name	*Name*
Community/village GPS	*google map format: 16.1387362734819, -13.550732621697408*
Farmer sex	☐ *Male* ☐ *Female*
Farmer age	*i.e. 33*
Is it ok if we will use this survey for studies, without revealing your name?	☐ *Yes – continue interview* ☐ *No – stop interview*

Survey for all farmers	
1. Number of people depending on the farm for survival	*Number of people including children*
2. Number of children depending on the farm for survival	*Number of children less than 14 years of age*
3. What is the size of your farm?	*Amount in hectares*
4. Area cultivated at rainfed rice?	*Amount in hectares*
5. Typical harvest month of rainfed rice *Mark only the most common one*	☐ October ☐ November ☐ December
6. Area cultivated at irrigated rice	*Amount in hectares*
7. Typical planting month of irrigated rice *Mark only the most common one*	☐ February ☐ March ☐ April
8. What do you produce in between rice seasons	☐ Nothing/fallow ☐ A crop: *_indicate name_____*
9. Have you ever seen wheat cultivation in Nigeria?	☐ Yes ☐ No
10. In your farm, do you think you could grow 95 days wheat between October and March?	☐ Yes ☐ No
11. What issues do you think you will face for wheat cultivation? *Mark the three most important only*	☐ Already cultivating another crop ☐ Water is not available for irrigation ☐ Not enough time between rice ☐ Not enough money to plant ☐ Land is not available (i.e. pasture) ☐ Wheat seeds are not available ☐ There is no market to sell the harvest

icarda.org
International Center for Agricultural Research in the Dry Areas

cgiar.org
A CGIAR Research Center

Additional survey question only for farmers already cultivating wheat	
12. What variety of wheat do you cultivate?	*Name of var*
13. When did you start cultivating wheat? *If multiple seasons of cultivation, please mark all that apply*	☐ Before 2018 ☐ 2018-19 season ☐ 2019-20 season ☐ 2020-21 season ☐ Next season
14. What area are you cultivating with wheat?	*Amount in hectares*
15. What is your average yield?	*Any unit is ok, including number of bags, Kg, and so forth... but ideally tons per ha.*
16. What fertilization approach do you use?	*Describe here the fertilization strategy used*
17. What herbicide approach do you use?	*Describe here the herbicide strategy used*
18. What irrigation approach do you use?	*Describe here how many irrigations, and how much water used*
19. From where you got the wheat seeds? *Mark only the most common one*	☐ Neighbors ☐ Another village ☐ An association ☐ A commercial shop ☐ From LCRI scientists
20. How many seasons of rice do you do in the same field where wheat is cultivated? *Mark only the most common one*	☐ None: I cultivate wheat in a different field than rice ☐ 1 season: Wheat then rainfed rice, ☐ 1 season: Wheat then irrigated rice ☐ 2 seasons: Wheat and both rainfed and irrigated rice
21. Who buys your wheat harvest? *Mark only the most common one*	☐ I consume it at home ☐ People from the village to make food ☐ People from the village to plant it ☐ People from the nearby town ☐ Sell it back to ISRA as seed
22. At what price are you selling 1 Kg of wheat?	*Amount in NAIRA*
23. What are the biggest issues you are facing in wheat cultivation? *Mark the three most important only*	☐ Competing with another crop ☐ Water is not available for irrigation ☐ Water drainage/lagging in field ☐ Not enough time between rice seasons ☐ Not enough money to plant ☐ Birds ☐ Wheat seeds are not available ☐ There is no market to sell the harvest ☐ Can not purchase chemicals
24. Do you give the wheat straw to the animals?	☐ *Yes, they like it* ☐ *Yes, but they do not like it* ☐ *No, I use it for other things*