



# Grain Research and Innovation (GRAIN)

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Program Year Three, First Quarter Report  
(October 01, 2019– December 31, 2019)



# Grain Research and Innovation (GRAIN)

## Program Year Three, First Quarter Report (October-December 2019)

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<b>Implementing Partner:</b>	Global Center for Food Systems Innovation, Michigan State University
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Cover: Land preparation for Effect of Organic Manure (Animal Manure) and Organic Fertilizer on Wheat Growth, Yield and Quality Characteristics under Irrigated Condition experiment [Exact location address is redacted] in Balkh province

### DISCLAIMER

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## Table of Contents

<b>List of Annexes*</b> .....	<b>iv</b>
<b>List of Acronyms</b> .....	<b>v</b>
<b>1. Executive Summary</b> .....	<b>1</b>
1.1 Program Description.....	1
1.2 Summary of Key Accomplishments.....	1
1.3 Summary of Performance Indicator Progress to Date.....	3
<b>2. Key Program Activities Accomplished</b> .....	<b>5</b>
<i>Sub-IR 1.A: Improved knowledge and skills of wheat researchers to design and conduct wheat research in lab and field settings.</i> .....	5
1.A.1 Sponsorship of Long-Term Degree Training in Fields Relevant to Wheat Research... 5	5
1.A.2 Facilitation of Short-Term Training for Wheat Research .....	6
1.A.3 Creation of Locally Adapted Procedures for Implementation of Field and Lab Research .....	8
1.A.4 Implementation of Field and Lab Research (including Gender Responsive Research) .....	8
1.A.5. Facilitation of the ARIA Research Internship Program.....	11
<i>Sub-IR 1.B: Improved knowledge and skills and opportunities for women to design and conduct research in lab and field settings.</i> .....	13
1.B.1 Implementation of Women in Agricultural Research Mentorship Program.....	13
1.C.2 Implementation of ARIA Data Management System (DMS) .....	14
1.C.3 Support the Sustainable Operations of Current or New ARIA Research Lab and Field Facilities.....	16
<i>Sub-IR 2.A: Improved knowledge and skills of wheat research to develop conclusions from research findings and to disseminate results that informs future research.</i> .....	17
2.A.1. Facilitation of Research Conferences and Workshops .....	17
2.A.2 Short-Term Training on Presenting and Publishing Research Results .....	18
<i>Sub-IR 2.B: Improved knowledge and skills of researchers and extension personnel to develop research-based best practice recommendations for farmers and others in the wheat value chain.</i> .....	19
2.B.2 Training on Translation of Research into Extension and Outreach.....	19
2.B.3 Development of Zone-Specific Packages of Best Practice Recommendations .....	19
<i>Sub-IR 3.A: Strengthen collaboration between MAIL research units, public extension systems and private sector stakeholders along with the wheat value chain.</i> .....	19
3.A.1 Facilitation of Work Groups between ARIA, Extension, Universities and Private Sector .....	19
3.A.2 Participation in and Facilitation of Stakeholder Conferences and Workshops.....	20
<i>Sub-IR 3.B: Strengthened collaboration between MAIL and University researchers to respond to priorities in the wheat sector.</i> .....	20

3.B.1 Implementation of Small Grants Research Program (SGP) for Collaborative Research .....	20
<i>Sub-IR 3.C: Improved knowledge and skills of wheat researchers and extension staff to recognize gender roles in the wheat value chain and develop research priorities that are gender responsive.</i> .....	21
3.C.1 Gender Mapping in the Wheat Value Chain.....	21
3.C.2 Assessing Research for Gender-Responsiveness.....	22
3.C.3 Training on Gender-Responsive Research Design and Implementation .....	22
<b>3. Project Management .....</b>	<b>23</b>
3.1 Monitoring, Evaluation, and Learning .....	23
3.2 Learning and Adaptation .....	23
3.3 Communications and Outreach .....	24
3.4 Partner and Stakeholder Collaboration .....	25
3.5 Security .....	<b>Error! Bookmark not defined.</b>
3.6 Environmental Compliance.....	26
3.7 Staffing .....	<b>Error! Bookmark not defined.</b>
3.8 Sub-Awards.....	26
3.9 Formal Project Submissions.....	27
3.10 Summary Budget.....	<b>Error! Bookmark not defined.</b>

## List of Annexes\*

Annex 01	Detailed Performance Indicator Table (PIT)
Annex 02	Performance Indicator Table Explanations
Annex 03	List of Trainings and Workshops
Annex 04	Golden Jubilee Conference Success Story

\*Annexes submitted to USAID as separate files accompanying the main report.

## List of Acronyms

AMELP	Activity Monitoring, Evaluation, and Learning Plan
ARIA	Agricultural Research Institute of Afghanistan
AVI	Agricultural and Veterinary Institute
B&M	Branding and Marketing
BISA	Borlaug Institute for South Asia
BSC	Balanced Scorecard
CAAI	Catalyzing Afghan Agricultural Innovation
CIMMYT	International Maize and Wheat Improvement Center
Co-PI	Co-Principal Investigator
CoP	Chief of Party
CV	Curriculum Vitae
DAIL	Directorate of Agriculture, Irrigation, and Livestock
DCoP	Deputy Chief of Party
DG	Director General
DMS	Data Management System
EMMP	Environmental Mitigation and Monitoring Plan
ERF	Environmental Review Form
ERR	Environmental Review Record
FAO	Food and Agricultural Organization of the United Nations
FGD	Focus Group Discussion
FY	Fiscal Year
GCFSI	Global Center for Food Systems Innovation
GenCen	Center for Gender in a Global Context
GIS	Geographic Information System
GoA	Government of Afghanistan
GPS	Global Positioning System
GRAIN	Grain Research and Innovation
GV	Green Village
HAU	Haryana Agricultural University
ICARDA	International Center for Agricultural Research in the Dry Areas
IP	Implementing Partners
KU	Kabul University
LOP	Life of Project
M&E	Monitoring and Evaluation
MAIL	Ministry of Agriculture, Irrigation and Livestock
MEL	Monitoring Evaluation and Learning
MoHE	Ministry of Higher Education
MSc	Master of Science
MSU	Michigan State University
NGO	Non-Governmental Organization
NOFO	Notice of Funding Opportunity
NWBC	National Wheat and Barley Conference

OAG	Office of Agriculture
OJT	On-the-job Training
PAU	Punjab Agricultural University
PDP	Personal Development Plan
PERSUAP	Pesticide Evaluation Report and Safe Use Action Use Plan
PhD	Doctor of Philosophy
PI	Principal Investigator
PIRM	Premier International Risk Management
PIRS	Performance Indicator Reference Sheet
PIT	Performance Indicator Table
POC	Point of Contact
PPP	Public-Private Partnership
PY	Program Year
RRC	Regional Resource Center
RS	Remote Sensing
RSI	Rahman Safi International Consulting
SAP	Strategic Action Plan
SGP	Small Grants Research Program
SOW	Scope of Work
SRA	Student Research Assistant
STTA	Short-term Technical Advisor
TBC	To Be Confirmed
TOT	Training of Trainers
TVET A	Technical & Vocational Education Training Authority
USAID	United States Agency for International Development
USG	United States Government
USWDP	University Support and Workforce Development Program
WLD	Women's Leadership Development (PROMOTE program)
WSDP	Wheat Sector Development Program

# 1. Executive Summary

## 1.1 Program Description

The Grain Research and Innovation (GRAIN) project was conceived in response to the Government of the Islamic Republic of Afghanistan's need to build the wheat research capacity of the Ministry and Directorates of Agriculture, Irrigation and Livestock (MAIL/DAILs) and the Agricultural Research Institute of Afghanistan (ARIA). This USAID-funded project is being implemented by Michigan State University's (MSU) Global Center for Food Systems Innovation (GCFSI).

The principal objective of GRAIN is to enhance the performance of Afghanistan's Ministry of Agriculture, Irrigation and Livestock in filling its mandate to lead responsive research to identify and disseminate technologies and practices that promise the greatest benefits to wheat sector stakeholders in Afghanistan. Emphasis on (a) building the capacity of and creating opportunities for women in agricultural research and (b) improving the gender-responsiveness of research and subsequent extension messaging in the wheat sector is integrated throughout program activities. Specific goals are to improve the capacity of MAIL/ARIA to:

1. Conduct wheat research (design, implementation, data collection and analysis) that identifies technologies and practices with the potential to improve productivity in the wheat sector;
2. Interpret and share research findings and translate research results into recommended best practices for wheat sector stakeholders, in different agro-ecological zones; and
3. Identify research priorities in response to key constraints in the wheat sector.

## 1.2 Summary of Key Accomplishments

GRAIN jumped into the start of its third program year with significant emphasis and achievements in research implementation, training, and partner coordination. Even while



***Use of the ARIA Data Management System continues in PY3 with training and field support for ARIA researchers.***

responding to the constraints of the security situation in Afghanistan, and with comprehensive revisions to GRAIN's management and implementation approach which required substantial review and revisions to GRAIN's annual and life-of-project (LOP) work plans, budget, staffing, and partner agreements (reference Section 3.4 and 3.8), the GRAIN field team persevered in implementing high quality programming for GRAIN's partners at MAIL, ARIA, and Afghan Universities. The notes below highlight several key accomplishments, with further details of each accomplishment or activity provided in later report sections.

**Over 200 Researchers, Educators, and Students Participate in GRAIN Training:** The start of Program Year Three (PY3) saw impressive achievements in the facilitation of in-country training programs focused on building the capacity of agricultural researchers, educators and students. With 202 attendees (12% women) this reporting period, GRAIN technical staff facilitated training in areas such as: research design, scientific writing and presentation, use of the ARIA Data Management System (DMS), and environmental safety. Full training details can be found in *Annex 03: List of Training and Workshops*.

**Afghan Agricultural Researchers Joining Scientists from Around the World to Present Research Results and Share Knowledge:**

Twelve Researchers from Afghanistan joined 600 presenters from 20 countries at and international conference on ‘New Millennium Agriculture—Novel Trends and Futures Scenarios’ in India this November, as a collaborative effort between GRAIN and the Catalyzing Afghan Agricultural Innovation Project (CAAI). Researchers presented results were drawn from GRAIN-supported research related to improved agronomic practices, conservation of water resources, and mapping gender and family roles in the wheat value chain. Additional details are provided later in the report and summarized in *Annex 04: Golden Jubilee Conference Success Story*.



**Dean of Agriculture of Nangarhar University presents the results of collaborative research funded by GRAIN's Small Grants Program, which connect Afghan University researchers with scientists from MAIL.**

**Afghan and US Researchers Discuss Gender-Transformative Research:**

GRAIN launched the first Women in Agricultural Innovation international speaker series webinar on 19 November. Presenters from MSU’s Center for Gender in a Global Context (GenCen) introduced the concept of gender-transformative research. Groups of researchers, faculty, students, and other invited guests joined via Zoom software from four provinces. A total of 63 (25 women) participated in this activity which aims to connect Mentees and other project beneficiaries to women from around the world who are leading research, extension, production, and innovation in various value chains, specifically highlighting wheat innovations.



**Dari invitation to first Women in Agricultural Innovation Speaker Series presentation.**



**GRAIN Partners with ARIA to Launch the 2019-2020 Agronomic and Breeding Program**

**Year:** After a significant collaborative effort to identify gaps in the agronomic data currently available in Afghanistan, and to coordinate efforts with ARIA, CIMMYT, and ICARDA, GRAIN and ARIA finalized research designs for the 2019-2020 research year (Nov 2019-July 2020) establishing agronomic experiments in four provinces and establishing the breeding program plots in Kabul and Nangarhar. The results of these studies will inform improved farmer practices. In the meantime, the trials and research sites serve as “outdoor classrooms” for experiential learning and on-the-job-training as GRAIN provides the technical and financial backstopping for implementation. Refer to Activity 1.A.4 for additional details.

**1.3 Summary of Performance Indicator Progress to Date**

All indicators that are reported quarterly are included in the summary Performance Indicator Summary Table (PIT) below. Further performance indicator information is provided, including required disaggregation, in *Annex 01: Detailed Performance Indicator Table (PIT)* and *Annex 02: Performance Indicator Table Explanations*. Note that targets listed are not reflective of the revised Activity Monitoring, Evaluation, and Learning Plan (AMELP) which was submitted to USAID in November, and was at the time of this report, still under review in light of broader work plan changes.

**Table 1. Performance Indicator Summary Table**

PIRS #	PERFORMANCE INDICATOR	ADDED THIS PERIOD		TOTAL TO DATE	LOP TARGET	FY'20 Achieved	FY'20 Target
1.1 (EG.3.2-7) (HESN 1.1.1_In2)	Number of technologies, practices and approaches under various phases of research, development and uptake as a result of USG assistance	#	55	227	75	55	25
Indicator 1.6 (EG.3.2-1)	Number of individuals who have received USG-supported short-term agricultural sector productivity or food security training <sup>*^</sup>	#	202	724	750	202	170
Indicator 1.7	Change of knowledge for ARIA, MAIL and DAIL staff and other GRAIN program participants from pre-test to post-test <sup>**</sup>	Num.	122	47%	40%	55%	40%
		Denominator	220				
Indicator 1.8	Percentage of females who report increased self-efficacy at the conclusion of USG-supported training/programming <sup>^*</sup>	Num.	0	33% (43/131)	50%	0%	50%
		Denominator	0				
Indicator 1.10	Number of Data Management System	#	23	66	60	23	20

PIRS #	PERFORMANCE INDICATOR	ADDED THIS PERIOD		TOTAL TO DATE	LOP TARGET	FY'20 Achieved	FY'20 Target
	active users						
Indicator 2.1 (HESN S.2.2_In1)	Number of research products developed and publicly released with GRAIN support	#	5	32	100	5	25
Indicator 2.2	Number of new extension materials developed for training and outreach	#	0	21	75	0	15
Indicator 2.3 (HESN S.2.3_In3)	Number of individuals attending GRAIN-supported working groups or technical gatherings intended to inform research priorities and/or disseminate research findings.	#	161	1569	875	161	200
Indicator 3.2	Amount of cost share for ARIA research and extension activities provided by other institutions	\$ USD	0	\$2,123	\$35,000	\$0.00	\$10,000
Indicator 3.3	Number of new research collaborations established between USG-supported beneficiaries and other institutions*	#	0	11	47	0	12
Indicator 3.5 (GNDR-8)	Number of persons trained with USG assistance to advance outcomes consistent with gender equality or female empowerment through their roles in public or private sector institutions or organizations*	#	61	559	450	61	100
Indicator 3.6 (EG 3.2) NEW	Number of individuals participating in USG food security programs	#	274	1077	2703	274	600
Indicator 3.8 EG.3.2-25	Number of hectares under improved management practices or technologies	#	0.96	2.06	5.0	0.96	1.0

## 2. Key Program Activities Accomplished

**Intermediate Result 1:** Improve the capacity of MAIL/ARIA to conduct wheat research (research design, implementation, data collection and analysis) that identifies technologies and practices with the potential to improve productivity in the wheat sector.

**Sub-IR 1.A: Improved knowledge and skills of wheat researchers to design and conduct wheat research in lab and field settings.**

### 1.A.1 Sponsorship of Long-Term Degree Training in Fields Relevant to Wheat Research

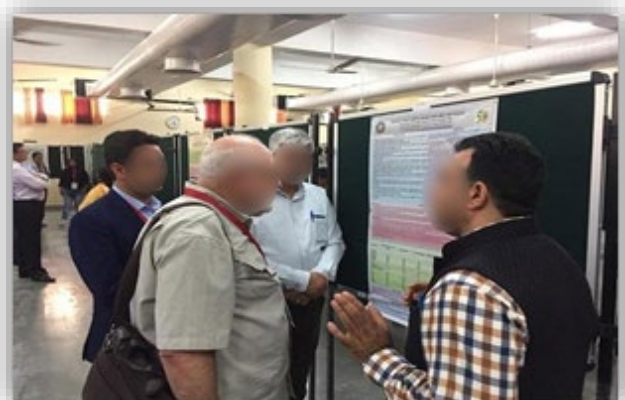
GRAIN's Graduate Degree Scholarship Program will increase the number of Afghan scientists within the country's agriculture and wheat research institutions, and strengthen MAIL capacity to address priorities for wheat sector development, as aligned with MAIL's recently approved National Research Strategy. The degree-granting program underscores a priority to expand institutional wheat research expertise in order to improve wheat production in Afghanistan.

#### Support for Cohort 1 and Cohort 2 Scholars in India

As of 31 December, GRAIN is supporting seven Doctor of Philosophy (Ph.D.) and 11 Master of Science (MSc) Scholars at Haryana Agricultural University (HAU) and Punjab Agricultural University (PAU). During the period, the MSc student temporarily in Afghanistan withdrew from the program due to family circumstances and will not be returning to PAU in January 2020. Additionally, one Ph.D. student at PAU withdrew for personal reasons.

Fall 2019 classes resumed at the beginning of August. Scholars were busy throughout the semester not only with classes but with research and professional development opportunities. On 6-8 November, HAU hosted the Golden Jubilee International Conference on 'New Millennia Agriculture—Novel Trends and Future Scenarios', with oral and poster presentations by researchers from 20 different countries. The 14 HAU-based Scholars attended, supporting two fellow HAU Scholars (an MSc and a PhD) who presented their research. Both gained real-world experience preparing for and presenting research at a professional international conference. One presented on the response of four wheat varieties to five different nitrogen levels under saline water irrigation, looking at growth parameters, yield, nitrogen uptake, and protein yields. The other presented on the best herbicide mixture to control broadleaf weeds in wheat crops, considering the need to decrease environmental pollution and to increase weed control efficacy while maintaining wheat productivity.

Additionally, on 16-17 December, two Ph.D. students in Plant Pathology at PAU attended the National Symposium on 'Mitigation of Emerging Plant Diseases under Changing Climate Scenario' at Tamil Nadu Agricultural University (Coimbatore) in southern India. The



*Poster Presentation by GRIAN Scholar currently studying in PhD Program in India*

conference presentations and workshops focused on the use of molecular tools to detect and manage plant diseases, understanding plant diseases' role in climate change and management strategies, and new technologies in the control of post-harvest disease.

### **Cohort 2 MSc Scholars at Kabul University (KU)**

In PY2, GRAIN's Graduate Degree Scholarships Program for Cohort 2 awarded 15 MSc scholarships (nine to women) to KU's newly established MSc Agronomy Program. GRAIN established eligibility criteria (described in GRAIN's PY2Q1 report) in close association with MAIL/ARIA, which had a particular focus on ensuring more females could be competitive candidates (aiming for 51% female scholarship recipients in Cohort 2). The selection process was detailed in the PY2Q4 report. By offering scholarships within Afghanistan at KU, GRAIN is supporting a local institution and addressing barriers that confront some students, particularly females. It enables government employees to maintain their jobs while furthering their education. It also significantly assists women, who may encounter family resistance to permitting them traveling to study abroad.

During the quarter, GRAIN finished gathering all forms from the Scholars and continued to work with KU and the Ministry of Higher Education (MoHE) to finalize the Letter of Partnership and other procurement requirements. With the signed scholarship agreements in place, classes are expected to start in March 2020.

In the meantime, GRAIN launched the internship program for female Scholars. The paid internship is intended for those not currently employed by MAIL, ARIA, or working in a job related to their degree plan, it provides an opportunity to gain relevant, professional field experience. Three of the nine Scholars were interested in the opportunity and began internships in relevant fields in mid-December with ARIA in Kabul; the remaining six will have another chance to consider joining when classes begin in March.

### **1.A.2 Facilitation of Short-Term Training for Wheat Research**

#### **Research Farm Management Program**

The sixth and final session of the Research Farm Management Training Program was held on 22-23 October in Kabul, with 13 participants (one woman) from 12 provinces. This training, titled 'Innovation Technology in Agriculture and Common Experimental Designs,' was designed to enhance the capacity of Farm Managers from ARIA research stations across the country, with a focus on application of modern technologies in agriculture and using common experimental design to improve research planning and implementation. Training included instructions on: the role of proximal sensing, precision agriculture using Global Positioning Systems (GPS), introduction to laser land leveling, and review of several common experimental designs used in agriculture such as Randomized Complete Block Design (RCBD),



***Final session of the Research Farm Management Training in Kabul***

Complete Random Design (CRD), and split-plot and augmented design. Practical sessions allowed all participants to apply their learning, as participant groups drafted example trial layouts. As this represents the final requirement in this training series, participants who met the attendance and post-test requirements were recognized with certificates with closing remarks provided by the Deputy General (DG) of ARIA.

### **CIMMYT Academy**

The CIMMYT Academy program, launched in PY2, is a partnership between MSU and CIMMYT to provide medium-term training and field learning for ARIA researchers to work alongside CIMMYT researchers in India, gaining advanced research skills that are immediately applicable to the Afghan context. Four CIMMYT Academy Research Fellows, all ARIA researchers from four provinces, traveled to India on 01 November to begin their six-month hands-on training program in the areas of plant pathology and wheat breeding at CIMMYT's Borlaug Institute for South Asia (BISA) in Ludhiana.

At the start of the program, each Fellow was assigned to assist a CIMMYT researcher with a particular study, with the topic based on their personal interest, qualifications, role within ARIA, and goals for research in Afghanistan. These studies include:

- Effect of heat stress on association among some agro-morphological traits and their effect on yield in wheat
- Genetic variation for tillering potential in wheat
- Screening Elite advanced breeding lines for Yellow Rust resistance using prevalent races in field conditions
- Evaluation of International Yield Trials for various agronomic, physiological and yield traits

In addition to daily field activity and on-the-job learning, CIMMYT organizes formal training sessions and field visits. This quarter,



**CIMMYT Academy Research Fellows and their CIMMYT Advisor practice the use of hand-held technology to measure crop nitrogen uptake**

training and visit topics included: green fodder systems, use of precision sprayer technologies, use of the 'Green Seek' (a hand-held instrument that is employed to manage nitrogen nutrition in crops), basics of breeding and genetics, basic statistics, intellectual property rights, and international treaties and policies related to genetic resources. In total, participants completed 17 formal training sessions and four structured field trips. All participants returned to Afghanistan in late December for home leave, and will travel back to India in early February.

### ***1.A.3 Creation of Locally Adapted Procedures for Implementation of Field and Lab Research***

The GRAIN Research Team, along with the ARIA department heads and researchers have invested significantly in improving, replacing, and developing agronomic research protocols for ARIA. Prior to these efforts, ARIA's protocols were either nonexistent, outdated, difficult to interpret, and/or inconsistent from location to location. Protocols describe the experiment including the experimental design, treatments, and treatment methods. The protocol must also identify a statistical model for analyzing outcomes. Well-rounded research proposals and protocols are the first step in encouraging accurate, consistent, and rigorous trial implementation and data collection across each experimental region. This quarter, through several meetings and an iterative review process, GRAIN's Research Team and ARIA partner researchers in Kabul developed new research protocols for the five new experiments being implemented in the 2019-2020 growing season. These studies were selected through a gap analysis process initially conducted in July of PY2 (further described in Activity 1.A.4).

### ***1.A.4 Implementation of Field and Lab Research (including Gender Responsive Research)***

#### **1.A.4a: Support to ARIA in Implementation of Agronomic Field Research**

The GRAIN-supported field research between ARIA partners contributes to medium and longer-term objectives that support sustainable efforts to build MAIL's capacity and performance in conducting future research. This reporting period, all site selection, land preparation, and sowing was completed for all 2019-2020 GRAIN-supported agronomic trials.

The final coordination meeting to identify priority research topics was held on 15 October. Ten ARIA lead scientists along with representatives from CAAI, CIMMYT, and ICARDA gathered at [Exact location address redacted] ARIA in Kabul to review progress made in the gap analysis and to finalize prioritization for GRAIN-supported research in PY3. The analysis was used to identify research gaps that hinder the formulation of farmer-ready agronomic practices and farmer recommendations for specific agro-ecological wheat zones. The participants for this effort included the ARIA Agronomy researchers from the Crop Improvement Department and Plant Protection Department, as well as CIMMYT and ICARDA. Members of the GRAIN Research Team organized and led this discussion. This effort resulted in the selection of eight research topics conducted in 18 sets over four provinces (Kabul, Nangarhar, Balkh and Herat), as described in Table 2.

**Table 2. List of 2019-2020 GRAIN-Supported Agronomic Trials**

No	Experimental Title	Objective	KBL	NGR	BLK	HRT
1	Nitrogen fertilizer rate experiment with new varieties	Determine the optimum nitrogen fertilizer rate for newly released wheat varieties. optimum Nitrogen for the newly released wheat varieties	√			
2	Nitrogen and Potassium fertilizer experiment on facultative wheat	Determine the effect of Nitrogen and Potassium on growth, yield, and quality of Facultative wheat (triticum aestivum)		√		√
3	Nitrogen and Zinc fertilizers experiment	Measure the effects of Zinc on wheat yield and quality parameters	√	√		√
4	Sowing Date experiment	Measure the response, including quality responses, of different genotypes to sowing dates in multiple growing zones.		√		√
5	Seed Rate experiment on Rain-fed condition	Determine the optimum seed rate in rain-fed conditions for the Northern region.			√	
6	Organic manures (Animal manure) and inorganic fertilizers experiment	Measure the effects of animal manure on growth, yield, and grain quality parameters.	√	√	√	√
7	Rain-fed conservation agriculture experiment	Identify suitable methods of planting based on conserved resources and sustainable wheat production.			√	
8	Nitrogen and Sulphur Fertilizer experiment	Determine the effects of Sulfur on yield and quality of wheat grain.	√	√	√	√

As is the GRAIN approach, these trials are being implemented by ARIA researchers with technical and financial backstopping from GRAIN. As such, GRAIN Research Team members provide ongoing on-the-job training and support to ARIA researchers, especially during site selection and trial establishment. In mid-October, following the finalization of the trial protocol, GRAIN facilitated the organization and shipping of the required research materials (seed and fertilizer) for each experiment from the ARIA central office in Kabul to each region. At the same time, ARIA and GRAIN researchers completed the experiment site selection in each region, followed by soil sampling and testing. In late October through November, land preparation was completed, which generally includes shallow plowing, disking, and leveling. Further, during land preparation, each trial was then marked to designate the plot and sub-plots and with the ditching required for irrigation arranged around and through the plots. By the end of December, all trials were sown with initial irrigation and fertilizer applications completed according to trial protocols.

### 1.A.4.b Support to ARIA's Wheat Breeding Program

It is very important to have a functioning wheat breeding program in Afghanistan to address critical gaps and challenges in wheat production and productivity by utilizing locally well-adopted wheat germplasm. New cultivars developed through the breeding program shall carry traits important to increasing grain yield, improving wheat quality, increasing disease resistance, and improving tolerance to heat and cold. These improvements, in turn, will contribute to food security and self-sufficiency in wheat production. Launched in PY2 with GRAIN technical and financial support, ARIA's basic breeding program is implemented through a crossing block system, located at the Kabul research station, and a Shuttle Breeding program that operates between Nangarhar and Bamyan Provinces.



*Left to Right: Land preparation for agronomic experiments underway in Kabul, Nangarhar, and Herat provinces*

A crossing block is constructed by planting rows of individual lines, unique genetic types, that are crossed manually with parent types grown in the same block. The yield from the crossing block harvested in Nangarhar is planted in Bamyan resulting in two harvests in a single growing year. Therefore, a projected ten-year breeding program can be reduced to a five-year breeding program. Future single lines grown in Kabul will move to Nangarhar and Bamyan the following season for shuttle breeding. Wheat lines developed in this program will eventually move from the shuttle breeding program to breeding programs in other agro-ecological zones.

Kabul was chosen as a central crossing block site because of proximity to ARIA research resources and infrastructure. Nangarhar and Bamyan were selected because of geographical and climatic differences for initiation of the Shuttle Breeding program. Nangarhar has a hot and humid subtropical arid climate ideal for selection for heat tolerance and disease resistance. By contrast, Bamyan has a high mountain semi-arid climate with short growing seasons, having very cold winters and hot summers providing ideal conditions for selections of cold tolerance and winter survival. Nangarhar's early planting date and Bamyan's early harvest date are ideal for harvesting two crossing blocks in one growing season.

Planting of 243 F1 wheat lines was completed at the Kabul Research Station in November. In addition, ten new parent lines were planted, five of which were CR5 lines known for improving wheat quality. Furthermore, wheat lines planted in Bamyan in mid-June and harvested in late August resulted in the planting of 445 F4 lines and 66 F2 lines in ARIA's Nangarhar research station. An additional 20 additional parental lines from other crosses were planted in early October in Nangarhar. These parental lines carry important traits that will be used for future crosses and selection of improved progenies.



#### **1.A.4c: Implementation and Support of Laboratory Research**

In October and November, GRAIN extensively sampled all 2018-2019 agronomic trials for quality analysis, with the aim of identifying the impact of the various agronomic practices on grain quality and end-use quality of wheat. A total of 240 samples were carefully selected from nine experiments conducted in four provinces with each sample carefully bagged and identified by location, trial, and treatment. Beginning in early Q2 of PY3, quality analysis will be conducted by GRAIN interns following extensive training in analysis methods, data collection, and standard t-test methods. This activity will provide valuable information for ARIA researchers and will give the interns specialized training in quality analysis. At the advice of GRAIN's Wheat Quality Consultant, priority will be given to the analysis of those trials most likely to have an impact on end-use quality, especially those related to soil fertility and irrigation.



***Sowing of 20 parental lines in Nangarhar province***

Second, improved varieties grown as breeder seed were sampled from three provinces for quality analysis. A total of 56 varieties were selected from Kabul (20), Herat (17), and Helmand (19). A majority of the improved varieties were located in Kabul and the same varieties grown in Herat and Helmand will be paired with the Kabul variety. This analysis will give an indication of varietal quality from each of these provinces and will give a measure of environmental impact on genetic stability across all three provinces. This activity will also provide information on varietal zonal preferences, as well as stability and baking quality. This study builds on an initial study in PY2, in which results raised significant concerns regarding the end-use quality potential of the current varieties distributed to farmers in Afghanistan. As a top priority for MAIL, this study will advance in Q2 as samples are sent to an international laboratory for quality testing. At the same time, milled samples are being prepared and will be sent to Diversity Arrays Technology Pty Ltd, University of Canberra, Australia in early Q2 for DNA analysis, to measure sample purity, thus eliminating previous concerns that samples from ARIA's breeder seed stock may be contaminated with varieties other than those the study intends to evaluate. DNA testing results are expected in mid Q2.

Considering the importance of preparing MAIL to sustain these research programs beyond the life of the GRAIN program, the resources (human, infrastructure, financial, and otherwise) for these other programs critical to the implementation of MAIL's Research Strategy, are included in ARIA's Strategic Action Plan for Wheat Research. With support from GRAIN this program year, fundraising, monitoring, and communication strategies that support the strategy are being developed. Progress made related to SAP development this quarter is explained in Section 3.6.

#### **1.A.5. Facilitation of the ARIA Research Internship Program**

Based on the request by MAIL and ARIA, the internship program was conceived in PY2 to support facilitates the development of high-quality practical skills and provides hands-on experience for senior university students and recent graduates in agriculture faculties, enabling them to successfully compete for careers in agriculture, particularly in research, development, and agronomy. The successful conclusion of the first year of the ARIA Research Internship Program was celebrated with a closing ceremony on 09 October at ARIA's Kabul Research Station.



***Cohort1 Internship Program Closing Ceremony***

All interns (12 women and 11 men) and their ARIA supervisors traveled to Kabul from Herat, Nangarhar, and Balkh provinces. The ARIA DG also attended and listened to presentations

delivered by the interns which covered their activities and achievements (four presentations from Kabul and one presentation per region). The ARIA DG noted her satisfaction and excitement for the internship program. She commented favorably on the high quality of the program, saying, "I knew about this program, but after seeing all the photos that show the engagement of the students and hearing these interns, I am surprised how fruitful it has been, I am very pleased." Each intern was provided with a certificate and recommendation letter to support their professional portfolios as they seek opportunities for employment or scholarships. In Q3 of this year (six months post-program), GRAIN's Monitoring, Evaluation, and Learning (MEL) team will conduct follow-up surveys with past internship program participants to collect further information about their current employment or student status.

### **Recruitment of Cohort 2 Internship program**

On 01 October, internship application forms were distributed through university faculties and announcements were posted on notice boards at GRAIN partner universities to attract applicants from agronomy, soil science, plant protection, and other areas relating to wheat research. GRAIN regional teams issued application forms through Nangarhar, Balkh, and Herat Universities, as well as DAIL and ARIA offices. Interested applicants from agriculture faculties and Technical & Vocational Education Training Authority (TVET A) were given two weeks to submit their applications.

A total of 191 completed applications (74 from women) were received in Kabul, Balkh, Herat, and Nangarhar, of which 109 applicants (45 women) were selected to participate in a



***Written test underway for Cohort 2 ARIA Research Internship Program***

screening exam (knowledge assessment) in November. The interviews by a panel including ARIA, KU, and GRAIN representatives are planned for January. GRAIN anticipates Cohort 2 will begin in February and continue through November for a 10-month period. Table 3 outlines applicant numbers by gender and province.

**Table 3. Summary of Cohort 2 Intern Applications by Provinces and Gender**

Region	# Applications	Male	Female
Kabul	50	26	24
Balkh	48	32	16
Nangarhar	27	24	3
Herat	66	35	31
<b>Total</b>	<b>191</b>	<b>117</b>	<b>74</b>

Also this reporting period, a subset of GRAIN’s KU scholarship recipients joined GRAIN as research interns. GRAIN provided an internship orientation session for three female Scholars on 16 December. These interns will initially work with the GRAIN Research Team for three months until they are able to join the Cohort 2 interns and will remain in the internship program for two consecutive years. For those Scholars who are not employed in a relevant field (this would include only women as male applicants were all required to be MAIL employees), GRAIN offers internship opportunities, linked to the internship program, so that Scholars are gaining two years of practical research experience while studying.

***Sub-IR 1.B: Improved knowledge and skills and opportunities for women to design and conduct research in lab and field settings.***

***1.B.1 Implementation of Women in Agricultural Research Mentorship Program***

The GRAIN Women in Agricultural Research Mentorship Program is specifically designed to empower female university students and young professionals in wheat research or related agricultural fields, as they develop and enhance personal and professional skills. A principal aim is to build capacities that support individuals to pursue careers in the wheat research sector.

**Celebrating Completion of the Women in Agriculture Research Mentorship Program**

In PY2, 63 Mentees from four provinces and six mentors were engaged in the inaugural cohort of the Mentorship Program, with 61 Mentees successfully completing all requirements of the program by the end of the project year. In total, Mentees completed 2,267 hours of structured learning through classroom and field-based programs in PY2 (about 38 hours on average for each Mentee). A few key program accomplishments during the reporting period are outlined below.



***Mentorship Program closing ceremony in Kabul***

The last in a series of regional celebrations of the successful completion of the Women in Agricultural Research Mentorship Program for 2018-2019 was held at KU on 16 October, postponed slightly due to security concerns in September related to the Afghan presidential elections. In total, 55 participants from ARIA, KU, other related projects, program partners and supporters, Mentors, and Mentees attended this event. The theme of the event was “Sisters in Agriculture”, with speakers emphasizing the importance of mutual respect and fellowship among women in the agriculture sector, highlighting that all are stronger when working together. GRAIN acknowledged the support of partners who helped implement the program with appreciation letters and recognition. In addition, each successful Mentee received program completion certificates.

### **Evaluation of the Mentorship Program**

An end-of-program evaluation survey was developed and conducted during September and October by the Monitoring, Evaluations and Learning (MEL) staff and interns who were deployed to the field to administer the survey using the tool designed by the MEL department of the GRAIN project. Out of a total of 61 participants in the mentorship program, 45 (74%) were interviewed. Only half of the participants from Kabul (14 of 28) were interviewed, as the remaining participants were on seasonal holidays from university. Respondents were asked whether they felt their overall learning goals were achieved. Eighty percent said that they had achieved their learning goals, including all respondents in Balkh, 87% of respondents in Herat, 71% of respondents in Nangarhar, and 64% of respondents in Kabul. A similar percentage, 82%, said that their training expectations were fully fulfilled during the program. A large majority (91%) reported a perceived increase in their knowledge or skills through participation in the program. When asked how their skills had improved, many Mentees stated that their confidence had improved. Others said that their curriculum vitae (CV) writing and leadership skills had improved. The survey results demonstrate that the first phase of the GRAIN mentorship program was successful. Participants were largely satisfied with the program and reported increased knowledge and abilities. Participants were particularly positive about the practical learning activities and the field exposure trips.

Similar to the Internship Program (Activity 1.A.4), GRAIN’s MEL team will conduct a survey of 2019-2020 program participants in late Q3 to gain an understanding of how Mentees are applying the knowledge and skills gained through the Mentorship program in their careers, further studies, or job searches. This will be informative in understanding the medium-term outcomes of the program and to further inform program development for future cohorts, supporting GRAIN’s continued adaptive management (CLA) approach.

### **Preparation of Mentorship Program Curriculum and Compilation of Training Materials**

During the reporting period, the GRAIN Gender and Social Inclusion Advisor committed considerable efforts towards compiling all mentorship program training materials, as well as preparation of the curriculum for the second cohort of the mentorship program. Sub-IR 1.C: Improved institutional processes and facilities conducive to effective, collaborative wheat research.

#### ***1.C.2 Implementation of ARIA Data Management System (DMS)***

##### **Use of the DMS in 2019-2020 Trial Implementation**

The custom-developed ARIA DMS is intended to drastically improve ARIA's capacity to carry out consistent trial implementation and data collection practices while equipping lead scientists in Kabul to remotely monitor and manage research across the country. With the initial design of the ARIA DMS completed in PY1, and further refined and tested in PY2, PY3 marks the first year of full system field testing with ARIA researchers in six provinces (Balkh, Baghlan, Herat, Kandahar, Kabul, and Nangarhar).

As ARIA and GRAIN researchers rolled out the 2019-2020 winter wheat agronomic trials, GRAIN's MEL team supported ARIA researchers to upload each trial design into the DMS and "push" the designs to ARIA field researchers in each province (reference Activity 1.A.4 for more details on the trial locations and objectives). In addition to uploading new trial designs, the GRAIN MEL and Research Teams also provide almost daily support to the provincial ARIA researchers, helping to troubleshoot issues, providing on-the-job support, and monitoring real-time data collection using the tablets.

The Rahman Safi International (RSI) database team continued to fine-tune new DMS features as per the feedback by the ARIA researchers and program team during previous DMS lessons learned workshop. Throughout Q1, and previous reporting periods, ongoing and frequent discussions were held with ARIA and GRAIN researchers through training and real practices in order to improve the DMS functionality to meet ARIA's needs and expectations. So far, ARIA researchers shared positive feedback on the integration of new features as more user-friendly and practical.

This quarter, three new DMS users have been registered, bringing a total of up to 66 active users to date. GRAIN has so far provided 18 digital tablets to ARIA researchers in support of the formal training program and DMS data collection. Support, training, and regular follow up will continue to build capacity for ARIA researchers to continue using the DMS for their experiments.

### **DMS Training Program Continues**

During Q1 of PY3, the MEL team provided extensive DMS training—classroom and practical sessions—to 32 ARIA researchers (3 women). The training participants were trained on the recent DMS changes and the new DMS features. The training was conducted in Kabul, Nangarhar, Balkh, and Herat. Participants first received assignments to simulate experiment data collection; then, they engaged in data collection exercises using DMS on the tablets. In addition to the extensive training provided to ARIA and GRAIN researchers, the MEL team will introduce the basic use and functions of the DMS apps to interns, Mentors, and Mentees in the next quarter. These introductory presentations aim to encourage the researchers to use and find more access to innovative technology in their research work.



*Left to Right: GRAIN DMS specialist providing practical session to ARIA researchers in Herat and Nangarhar provinces* 5

### **Data Management System (DMS) Learning Workshop**

In addition to the training programs conducted by MEL team related to DMS use, ongoing consultation meetings were held with ARIA's lead researchers in Kabul and regional offices to gather their feedback in order to understand what is working well and what features may need to be improved for the future. From this feedback, changes were made to the system in PY2Q4 and early PY3Q1 and incorporated for roll-out for PY3 ARIA wheat trials. New features added to the DMS include the ability to manually input or correct plot layouts and further disaggregation of plant stand parameters (Fall Plant Stand %, Spring Plant Stand %).

The major lessons learned and points of discussion during the workshop include:

- Experimental trials should be designed in DMS before planting in the field, thus reducing discrepancies between the trial protocol and the actual layout in the field.
- Regional M&E Officers, as field DMS focal point, should hold regular on-the-job training for ARIA staff across all regions to ensure ARIA has full technical support and that questions or challenges are quickly resolved.
- Researchers appreciate that the data are collected through the tablet with proper GPS stamped and time, using field-based data collection on the tablet.
- A member of Wheat Research Team should have access in DMS dashboard and regularly check the collected data from the field in close coordination with ARIA lead researcher. This will integrate the DMS into ARIA and GRAIN's research management system, allowing lead researchers to monitor frequency of data collection in the field.

### ***1.C.3 Support the Sustainable Operations of Current or New ARIA Research Lab and Field Facilities***

#### **Facilities: Connecting ARIA to Digital Research Resources (Digital Libraries)**

During this reporting period, GRAIN formally launched three Research Resource Centers (RRCs) at Kabul, Nangarhar, and Balkh ARIA Research Stations. RRCs are equipped with computers, a printer, and internet which enables visitors to search a platform with 30 open access sources of credible research data and publications. This platform was developed through the support of MSU's Agricultural Science Library Resource Officer. RRCs are also equipped with a print library with 31 titles on a wide range of subjects recommended by CIMMYT and informed by researchers' feedback on the Digital Library Survey. RRC facilities enable ARIA/MAIL and partner universities' researchers and students to join the international research communities in their fields of study and have access to and use of relevant, recent, and scientifically refereed literature and communities of practice.

Prior to the launching, digital library familiarization trainings were provided through the engagement of a PhD-level local consultant at each digital library in Kabul, Nangarhar, and Balkh provinces. In total 98 participants (seven women) from ARIA, KU, Agriculture and Veterinary Institute (AVI), CAAI, and GRAIN attended a two-day training. Disaggregated geographically, this includes 48 participants (five women) from Kabul on 27-28 October, 24

participants (0 women) from Nangarhar on 30-31 October, and 26 participants (two women) from Balkh on 27-28 November respectively.

Moving forward, the RRCs will be staffed by interns who will maintain the functionality of the centers, monitor use, and assist users with technical difficulties. The RRC interns were recruited through a competitive process, with an emphasis on skills and education in information technology systems (IT), English-language skills, and online research experience. Interns will receive initial training in Q2, focused on online research techniques in agriculture, familiarity with the resources provided in the Digital Library, and GRAIN guidance on facility maintenance and reporting. Following initial training, RRC Interns will have ongoing support from GRAIN's technical teams and receive refresher training at least quarterly.



***ARIA Researchers attending posttest of the digital library familiarization training***

Use of the facilitates will be monitored in order for GRAIN to track the usability and frequency of use of the center, determine which resources are most frequented or deemed most useful by researchers, and to quickly troubleshoot any issues. Additionally, GRAIN will host monthly informal learning opportunities at these RRC's, creating a forum much like a "brown bag" or "coffee break" approach, inviting ARIA researchers, CIMMYT and GRAIN technical staff, and guests to share interesting articles, present their own research results, or extend key points from training they have attended to other researchers and peers. In this way, GRAIN aims to establish the RRCs as a hub for scholarly discussion and discovery.

**Intermediate Result 2:** Improved capacity of MAIL/ARIA to conduct wheat research (research design, implementation, data collection and analysis) that identifies technologies and practices with the potential to improve productivity in the wheat sector.

***Sub-IR 2.A: Improved knowledge and skills of wheat research to develop conclusions from research findings and to disseminate results that informs future research.***

### ***2.A.1. Facilitation of Research Conferences and Workshops***

#### **Afghan Researchers Join Scientists from 20 Countries at International Conference**

Agriculture, the biggest driver of the Afghan economy, presents major opportunities for job creation, poverty reduction, and economic growth ([CDCS](#), p.18). Through investment in programs to strengthen the country's agricultural and research innovation systems, USAID and its Government of Afghanistan (GoA) partners aim to improve rural livelihoods as farmers adopt technologies to improve agricultural production and respond to real challenges facing the agriculture sector.

As one such effort on 6-8 November, 11 researchers from Afghanistan joined 600 presenters from 20 countries at HAU's Golden Jubilee International Conference on 'New Millennium Agriculture—Novel Trends and Futures Scenarios' in Hisar, India. These researchers were supported financially and technically through a collaborative effort between GRAIN and CAAL.

The Dean of the Faculty of Agriculture of Nangarhar University expressed his appreciation for USAID for funding his research and travel to the international conference, emphasizing the importance of establishing international partnerships between Afghan universities and international universities for joint research and development collaborations. The Dean presented results of his collaborative research with ARIA, related to affordable technologies for the conservation of water in wheat production systems, which was funded through GRAIN's Small Grants Program. Water conservation is critical considering that one driver of "slow development progress is [are] low crop yields due to drought conditions and a shortage of irrigated land caused by a lack of water for agriculture." (Afghanistan CDCS, p.18). GRAIN Research Advisor from Balkh Province shared results from a preliminary study evaluating the quality characteristics of certified improved wheat varieties grown in Afghanistan, a study that provided valuable information for wheat breeders and agronomists. This is a necessary effort in order for Afghan-grown wheat to compete with imported wheat in terms of quality, nutritional composition, and consumer preference. Additionally, GRAIN Chief of Party (CoP) delivered a presentation of collaborative research between KU and MSU focused on identifying gender roles and power dynamics in the wheat value chain.

### ***2.A.2 Short-Term Training on Presenting and Publishing Research Results***

One of the most critical components of research is analyzing the data and translating it into usable recommendations for the intended beneficiaries. As a continuation of a program launched in PY2, GRAIN is continuing engagement with a cohort of training participants in a medium-term training program implemented through a series of short-courses, independent study and practice, and sustained engagement.

GRAIN's Director of Breeding and Training led the second training of GRAIN's short-term training is the Scientific Communications training, designed to enhance the capacity of ARIA researchers and university professors to prepare research abstracts, compose effective CVs, and develop academic poster presentations in Balkh, Herat, Nangarhar, and KU on 12- 13 November, 17-18 November, 1-2 November and 3-4 November, respectively. In total, 77 researchers, educators, and students (18 women) joined the training across four provinces, including 21 participants (eight women) at Balkh University, 19 participants (four women) at Herat University, 25 participants (four women) at Nangarhar University, and 12 participants (two women) at KU.



***Left to Right: Scientific Communication Training underway in Nangarhar, and practical session on presentation development in Herat***



Content included instruction and practical exercises related to abstract development and effective poster design and presentation. Training such as this, paired with ongoing technical support and practice, assist researchers to build knowledge and skills to share research results internationally and engage in the broader international community. Participants were pleased and favorably commented on the quality of the training. The Balkh Agriculture Faculty Dean in his opening speech said to the training participants, “This is a very important opportunity for all of us to improve our academic performance in sharing research results to a wider audience in the international community.”

***Sub-IR 2.B: Improved knowledge and skills of researchers and extension personnel to develop research-based best practice recommendations for farmers and others in the wheat value chain.***

### ***2.B.2 Training on Translation of Research into Extension and Outreach***

This training program is expected to resume in Q2.

### ***2.B.3 Development of Zone-Specific Packages of Best Practice Recommendations***

A major concern for MAIL is the low productivity of wheat production in Afghanistan. There are many reasons for low production, but a major limitation is the lack of research-based information that is appropriately developed for farmer comprehension. In PY2Q4, GRAIN and its partners at ARIA and CIMMYT designed and released poster-based extension and farmer education tools for four wheat growing zones of Afghanistan. The posters, developed from five years of research data provided by ARIA and CIMMYT, communicate best practices for sowing date, seed spacing, irrigation timing, soil fertility, and pest management.

Furthering this effort in this reporting period, the GRAIN research team worked to draft content to expand the posters into booklet-based products, which provide additional details and are well designed for use among agricultural extension agents. Finalization of the pocket-sized booklets will be completed with ARIA in Q2, including graph-based production information on one side of the opened booklet and written text in local language on the other. Prior to release, the booklets will be reviewed by MAIL’s new Research and Extension Coordination Committee (being formed with GRAIN advice and likely to launch in Q2) for technical accuracy, usability of the content and format, and for advice on distribution methods and areas. Following MAIL approval, GRAIN will fund printing of the booklets and coordinate distribution to major wheat-producing districts and provinces through MAIL’s Director of Provincial Affairs and local DAIL Directors.

**Intermediate Result 3: Improved capacity of MAIL/ARIA to identify research priorities in response to key constraints in the wheat sector.**

***Sub-IR 3.A: Strengthen collaboration between MAIL research units, public extension systems and private sector stakeholders along with the wheat value chain.***

### ***3.A.1 Facilitation of Work Groups between ARIA, Extension, Universities and Private Sector***

Reportable progress towards this activity is anticipated in Q2.

### **3.A.2 Participation in and Facilitation of Stakeholder Conferences and Workshops**

#### **Attendance at Partner Project CAAI in the Young Innovators in Agricultural Competition**

GRAIN representatives participated in the National Competition of the Young Innovators in Agriculture, in the field of Tackling Post-Harvest Losses in High-Value Crops organized by USAID's Afghanistan Value Chains-High Value Crops (AVC-HVC) and CAAI in Kabul on 29 October. In this competition, the young students of Agriculture from five regions shared their innovation for reducing post-harvest losses in high-value crops. Their innovation was assessed by a panel and the top innovators were awarded prizes.

#### **Participation in the USAID Agricultural Implementing Partners Meeting**

Similarly, the GRAIN Deputy Chief of Party and Wheat Breeding and Training Director participated in USAID's Office of Agriculture (OAG) Implementing Partners (IP) Meeting at the US Embassy on 05 November 5. The purpose of the meeting was to review OAG accomplishments over the past year, identify priorities for 2020, discuss strategic issues, and identify opportunities for further collaboration among IPs involved in similar projects or operating in the same geographic areas. Each IP presented its project activities and progress to the participants through panel sessions. There were three-panel sessions including Value Chains and Agricultural Market Promotion, Natural Resource Management, and Research and Capacity Building.

#### **Key Contributors in National Conference on Agricultural Development**

GRAIN actively participated in the National Conference on Agricultural Development organized by MAIL on 24-26 November. This conference was held to bring all stakeholders involved in the agriculture sector together, including DAIL directors, university professors, scientists, producers, traders, relevant Afghan Government entities, technical experts and lead farmers across the country for a national dialog to develop a roadmap for the development of agriculture in the country. Attended by more than 300 participants, this conference aimed to find solutions/improve four particular areas in the agriculture sector: identifying substitutes for import; encouraging private sector investment; maximum use of natural resources; and moving from traditional/conventional to modern agriculture.

Ten working groups were formed to identify opportunities, challenges, value chain processes, and recommended solutions to the problems associated with each of the concerned agricultural commodities. GRAIN's Wheat Breeding and Trainings Director led the Cereal Crop Group which included the Dean of the Faculty of Agriculture from Nangarhar University, the Director of Cereal Crops from MAIL, the Director of Adaptive Research from ARIA, FAO staff, a senior advisor of ICARDA, the Director of Mechanization from MAIL, a lead farmer, and faculty member from Kabul and Bamyan Universities. The findings of ten working groups will be used by an assigned committee to develop a roadmap for the next ten years.

***Sub-IR 3.B: Strengthened collaboration between MAIL and University researchers to respond to priorities in the wheat sector.***

#### **3.B.1 Implementation of Small Grants Research Program (SGP) for Collaborative Research**

##### **Implementation of Field and Lab Research Funded by SGP Round #1 Funding**

In PY2, ten proposals were awarded for collaborative research between MAIL and Universities; two are implemented within laboratory environment and eight as field-based experiments. Unfortunately, USAID eliminated this program in May 2019, calling for the cancellation of any new Requests for Proposals and asking that current grants be closed at the end of their current research years. As such, this quarter, Principal Investigators (PI) and Co-PIs dedicated significant time to analyzing data and submitting their research result to GRAIN. All reports were thoroughly reviewed by a committee comprised of GRAIN's Research Team, Operations Team, and the Capacity Building Team to evaluate the results and activity achieved compared their proposed research plan. Suggested revisions and comments by the evaluation committee were shared with PIs and Co-PIs and the reports were revised accordingly. Stipends to the PIs and Co-PIs are pending CoP review and approval of the final reports.

### **Field-Based Learning**

To better prepare youth for careers in the agriculture sector and to fill a gap in university curricula which generally lacks field-based learning for students, engaging them in the field-based learning is critically important. Through the SGP program this quarter, 25 student research assistants (SRA) were trained by GRAIN, ARIA, and SGP researchers. Their practical engagement with PIs and Co-PIs this quarter was particularly focused on analyzing data and assisting their supervisors in preparing data for their final reports. Additionally, SRAs were involved in sample preparation for test, pathogenicity test of the pathogens on the collected samples and related data collection for the lab-based research. Furthermore, PIs, and Co-PIs were provided scientific communications training in all four provinces, please refer to activity 2.A.2 for additional details.

***Sub-IR 3.C: Improved knowledge and skills of wheat researchers and extension staff to recognize gender roles in the wheat value chain and develop research priorities that are gender responsive.***

#### ***3.C.1 Gender Mapping in the Wheat Value Chain***

Creating an enabling environment for women to be successful in the private sector – including in their roles along the agricultural value chain – is essential to sustainable development in Afghanistan. The ability to design and implement social science research, such as gender-responsive value chain mapping, will enable universities and MAIL researchers to better target research and extension efforts to audiences in each community, based on current gender roles.

Throughout Q1 of PY3, GRAIN continued implementation of the Central Region Gender Mapping in the Wheat Value Chain Study, initiated in PY2 as a collaborative research program between GRAIN, MAIL, and the KU Faculty of Agriculture. This activity aims to:

- Map gender roles along the full wheat value chain in Central Afghanistan, including identification of actors, links between actors, and each actor's control in decision making.
- Identify constraints and opportunities for women to participate in the value chain as well as an analysis of differences in power (positions) in value chain governance.
- Identify barriers to technology adaptation and improved practices that may exist and how these barriers differ and are compounded by gender-specific factors.

The collaborative study is also intended as a capacity-building opportunity, with GRAIN social scientists working alongside ARIA researchers and university faculty members in designing the

study, and training 37 university students (20 women) in note-taking, data collection, and basic descriptive data analysis. The study commenced in PY2, with three data collection activities taking the form of Gender Mapping Focus Groups conducted by the KU students. These were completed last program year, with GRAIN teams gathering Focus Group Discussions (FGD) data for the purpose of report compilation and analyzing information collected from 120 male and female respondents (12 groups of ten participants), from four wheat-producing districts of Kabul province: Surobi, Bagrami, Charasiab, and Dehsabz.

During this reporting period, RSI technical teams worked jointly with four KU professors to analyze data output from eight FGD's, while RSI analyzed the remaining four. There were regular meetings this quarter between the GRAIN/RSI team and KU Research Team to coordinate the gender mapping activity to ensure data analysis methodology alignment and procedural consistency.

GRAIN will support KU in the publishing and disseminating results, through international peer-reviewed journals and research conferences, as well as distribution to other provinces through ARIA and university channels. As an example, results from the concluding report were incorporated into a PowerPoint presentation that formed part of GRAIN's presentation at the Golden Jubilee International Research Conference in India.

### ***3.C.2 Assessing Research for Gender-Responsiveness***

Reportable progress under this activity is expected to be made in Q2 as GRAIN designs a survey among ARIA and University partners to gauge the level of gender-responsiveness within Afghan agricultural research programs, drawing from advice from MSU's Center for Gender in a Global Context (GenCen) and other international literature that measures socially inclusive research ranging from gender-blind to gender-transformative. The results of the study will inform future training programs under activity 3.C.3.

### ***3.C.3 Training on Gender-Responsive Research Design and Implementation***

GRAIN launched the first Women in Agricultural Innovation international speaker series webinar on 19 November with presenters from MSU's Center for Gender in a Global Context (GenCen) introducing the concept of gender-transformative research. Groups of researchers, faculty, students, and other invited guests joined via Zoom software from four provinces. A total of 63 people (25 women) participated: 27 in Kabul (14 women), 15 in Balkh (5 women), 11 in Nangarhar (two women), and 10 in Herat (four women). This activity aims to



***Participants engage with MSU specialists during the first Women in Agricultural Innovation webinar, Kabul***

connect Mentees and other female project beneficiaries to women from around the world who are leading research, extension, production, and innovation in various value chains, specifically

highlighting wheat innovations. This event created an opportunity for Mentees, Researchers and Students to discuss Gender Transformative Research with MSU's GenGen Experts.

### 3. Project Management

#### 3.1 Monitoring, Evaluation, and Learning

The MEL team monitored GRAIN-supported events as well as field trials. A total of 86 visits were made in four provinces (Kabul, Balkh, Herat, and Nangarhar). The monitoring team used tailored checklists for all monitoring visits in the areas of technical implementation, environmental compliance, financial compliance, and sustainability. Program participant feedback was also sought. Findings were reviewed by program management. Regular bi-weekly coordination meetings conducted between MEL and program teams and based on findings, changes were incorporated into programming as required for program improvement.

**Table 4. Field Monitoring Visits**

The full-time MEL team carried out routine data collection for GRAIN's indicators, including

Province	Training/Event	Field Research	Grand Total
Balkh	5	13	18
Herat	3	19	22
Kabul	10	18	28
Nangarhar	3	15	18
<b>Grand Total</b>	<b>21</b>	<b>65</b>	<b>86</b>

signing participants in and out during training, administering self-efficacy, and knowledge-based pre- and post-tests, and collecting backup documentation and final completion reports of indicators related to the SGP during PY3Q1.

#### 3.2 Learning and Adaptation

This quarter, the MEL team in conjunction with program management, undertook routine monitoring work, studies, and workshops to explore program successes and areas for improvement. These activities enabled the GRAIN team to document its lessons learned as well as incorporate such lessons into work planning and new rounds of activities. The summaries of these activities are outlined below.

##### Student Engagement Survey: Lessons Learned

This activity was carried out in October, which allowed the MEL team to conduct the Student Program Outcomes Survey with participants who had participated in various GRAIN programs over the past two years including the Women's Mentorship Program, the ARIA Research Internship Program, and the SGP SRAs in all GRAIN coverage areas. The top three recommendations included making some minor changes in the terms of reference for practical works, extending the duration of the internship program, and providing increased/expanded training opportunities.

## Mentorship Learning Activity

GRAIN conducted a mentorship program final evaluation survey in October in the four regional partner universities where GRAIN works to understand perceptions of the program, to measure changes in knowledge and areas of self-efficacy among participants, and to explore changes in perceptions related to their career aspirations. The overall results show significant learning outcomes among participants in the mentorship program. Refer to Activity 1.B.1 for further details.

## Short-Term Training

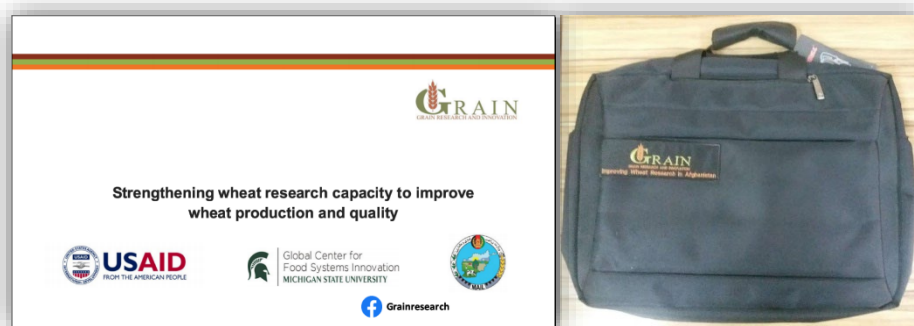
Dialogue between ARIA and University leadership continues on a regular basis at central and provincial levels, ensuring training modules are meaningful and beneficial for ARIA training participants, and that curricula deliver the most relevant and up to date information. Course implementation will also be planned around peak field trials implementation and data collection periods, so as to ensure maximum participant attendance.

### 3.3 Communications and Outreach

During this reporting period, the Strategic Communications Plan and Branding and Marking (B&M) Plan were updated to reflect PY3 Work Plan revisions, which increases the roles of CIMMYT in program implementation.

The Bi-Weekly Snapshot and Monthly Highlights remain important outputs, with the Communications Team coordinating closely with partners and GRAIN departments to continue profiling activity achievements during PY3, distributing the Highlights monthly to an email list of over 60 recipients from MAIL, ARIA, Afghan Universities, USAID, MSU, CAAI, CIMMYT, GRAIN, and other partners. GRAIN's Facebook page remains a popular and valuable partner/stakeholder outreach tool to further communicate GRAIN activity accomplishments. This quarter, six new posts were released with the page now exceeding 1120 "likes" since its launch in 2018.

The B&M Plan notes that, at times, GRAIN may need to omit USAID and MSU branding on selected items, if such branding threatens the safety of program partner or beneficiaries. In planning PY3 project product needs (shirts, laptop bags,



**Left to Right: USB Card design, New laptop bags distributed to the short-term training participants containing training materials, and a computer bag for GRAIN MSc scholars at Kabul University.**

notebooks, etc.), the GRAIN Communications Team flagged to the CoP items that may require branding exclusion. For example, MAIL raised potential security concerns related to USAID branding be included in field site markers and similarly, GRAIN team members and KU partners agreed that laptop bags issued to Scholars should exclude branding as it is not advisable for

students to carry USAID-branded bags in Kabul City. A written notification of these exceptions was provided to USAID on 04 September.

In addition to Teamwork online access where department managers and partners (including RSI and CIMMYT) directly upload weekly reports, Google Drive has been introduced to further enhance current team communications. This will be beneficial in streamlining tasks like collaborative report editing and finalizing items such as PowerPoint training materials that involve multiple approval and/or input. A second 'Safe Use of Pesticides' poster promoting responsible storage and handling methods (the first highlighting the use of protective clothing while spraying pesticides), is being finalized and due for release next quarter, pending approval by MAIL and ARIA leadership.

### **3.4 Partner and Stakeholder Collaboration**

Cognizant of the value of close coordination and communications, GRAIN leadership dedicated significant time this quarter to maintain current relations and broaden outreach to build new linkages among and between its counterparts at MAIL and provincial DAIL offices. At minimum, bi-weekly meetings were convened with ARIA DG to provide program updates and canvass administrative and technical feedback to facilitate smooth implementation of activities related to GRAIN program support. Additionally, weekly forums for ARIA researchers and scientists were arranged to coordinate and monitor program technical implementation. Similar meetings were held in Nangarhar, Balkh, and Herat provinces by GRAIN Regional Managers, to keep MAIL staff involved and updated with regard to program activities. As a highlight this quarter, on 12 November, the GRAIN DCoP and Wheat Research Director met with the Acting Deputy Minister of Agriculture and Livestock to provide updates on recent activities, particularly regarding progress made in program planning during the GRAIN leadership workshop held in Dubai on 25-27 October. This was followed by a meeting held in Dubai on 5-6 December with the Deputy Minister of Agriculture and Livestock and the ARIA DG to discuss future program planning and mechanisms for effective communications between MAIL, ARIA, GRAIN, CIMMYT, and other partners. In this meeting, it was agreed that moving forward starting in Q2, regular monthly meetings will be held among ARIA, GRAIN, CIMMYT, and RSI to ensure everyone is kept informed.

#### **GRAIN All-Directors Meeting, Dubai 25-27 October**

The transition of international staff out of country and the resulting management and implementation changes, necessitated a workshop for all GRAIN senior leaders and partners from RSI, PIRM, and CIMMYT, held in Dubai on 25-27 October. The purpose of the three-day workshop was for GRAIN program leadership and implementing partners to further program planning for PY3, discuss and develop solutions to challenges anticipated based on the new GRAIN program implementation and management planning, reflect on lessons learned from PY1-2, and further strengthen team cohesion and morale. The workshop agenda was set to allow ample time for small group work, resulting in detailed weekly planning for Q1-2 implementation and draft revisions to guiding GRAIN internal policies. In total, the workshop included 11 attendees (three women).

#### **GRAIN Senior Partners Meeting, Dubai 05-06 December**

While it was hoped that MAIL representatives would join the meeting in October, scheduling conflicts required a separate meeting in Dubai. On 05-06 December, GRAIN CoP chaired a

workshop with attendees included Acting Deputy Minister of Agriculture and Livestock, ARIA DG, an ARIA Senior Researcher, GRAIN PI, GRAIN's incoming PI, GRAIN DCoP, GRAIN Program Manager, and GRAIN's Senior Advisor (consultant). Additionally, CIMMYT's Afghanistan Country Director joined by webinar for several sessions. The first workshop day focused on introductions between all participants, review of collaborative achievement since 2017, detailed discussion of MSU's expanded collaboration with CIMMYT, walkthrough of each GRAIN activity and plans for implementation PY3 forward, and open discussion regarding continued coordination and communication between all GRAIN partners. Upon a detailed review of the revised programmatic and management plans, the Deputy Minister shared his appreciation to MSU and USAID for continuation of the program in a way that responds to the priorities discussed with MAIL leadership immediately following the evacuation of international staff in September. The Deputy Minister commented, "The Minister will be very pleased, and even surprised, with the revised work plan."

The second day, led by GRAIN's Senior Advisor consulting on policy and planning, was utilized as an opportunity to finalize ARIA's Strategic Action Plan (SAP) for wheat research and to make significant progress in the development of ARIA's Balanced Scorecard (BSC) for performance measurement. It is anticipated that the SAP will be signed by the Minister in January, with the BSC finalized and baseline data collected shortly after.

[Security report redacted]

### ***3.6 Environmental Compliance***

In addition to a series of Environmental Compliance training that is already developed, in December GRAIN developed a new package of lab and field safety training. These materials are intended for initial training of new research interns, ensuring their understanding of the practical aspects of environmental protection, importance of proper personal safety and protection, and other best practices for safe field and laboratory working conditions. USAID approval of GRAIN's submitted Environmental Review Reports, Pesticide Procurement Requests, and Restricted Commodity Request for all relevant PY3 activities was officially approved on 21 November.

[Staffing report redacted]

### ***3.8 Sub-Awards and Other Major Service Providers/Partners***

In the quarter, CIMMYT focused on deliverables for the second scope of work (SOW2) that runs through September, completing the Roadmap for a Comprehensive National Wheat Improvement program, ongoing technical support from CIMMYT's Afghanistan Country Director, who also serves as a Senior Advisor to GRAIN, and delivering the Beginner/Intermediate Data Analysis and Statistics Training for ARIA regional researchers; CIMMYT is still working on finalizing the Data Collection Manual. CIMMYT also began activities for the SOW3 modification, including sending ARIA researchers to CIMMYT Academy in India. As a result of the attack on Green Village in September and the evacuation of GRAIN international staff, however, GRAIN worked with CIMMYT during the quarter on a modification to increase their SOW to include additional in-country implementation, such as support for ARIA's breeding program. The modification is expected to be finalized in early PY20Q2.



The purchase order with RSI is unchanged; they will provide MEL services through 2022. As a result of the attack on Green Village, however, GRAIN worked with RSI during the quarter to amend their contract in order to expand their activities, including implementation of socio-economic studies and training for ARIA on the DMS. The amendment is expected to be finalized in early PY20Q2.

Throughout the quarter, GRAIN amended the existing PIRM contract to allow them to invoice for lodging the expat Risk Manager at their Villa, a necessary change after the attack on Green Village. While that contract end date was in October, it renews month-to-month in the absence of termination or a new contract. In the meantime, GRAIN worked with PIRM to revise the SOW for the new contract, which is expected to be finalized in early PY20Q2.

In late Q1, the initial draft of the Scope of Work and proposal review criteria for a new partnership with a local non-government organization for the implementation for the Women in Agriculture Mentorship Program (Activity 1.B.1) was drafted, with the aim of releasing the Request for Proposals publicly in January of Q2 for an open, competitive selection process.

Also in Q1, MSU released a Request for Proposals (RFP) for a new India-based partner with services to include provision of temporary office and meeting space for GRAIN staff and events and event planning and facilitation support for the planned India-based training and workshop events. The RFP was released to five possible vendors in India by MSU on 31 October; the deadline for submission was 11:59 pm on 17 November. On 19 November, the RFP submission deadline was extended to 11:59 pm on 24 November—the five vendors were notified. As of 24 November, four submissions were received. Of the five bids received, only three bids were complete.

On 26 November, a 5-person bid review committee met and evaluated all five bids; the review team discussed the incomplete bid and decided the information provided was too incomplete for consideration and disqualified the bid. The top scorer was selected, based on the following criteria: completeness of proposal; overall professionalism of proposal; quality of background & expertise related to the SOW; quality of office space; reasonableness of cost for services. MSU anticipates signing an expanded service contract with the selected organization, beginning in Q2.

At the request of USAID/Afghanistan, on 19 December MSU submitted an email explaining the competitive solicitation and selection process as well as the need for these expanded regional partners services. The email was acknowledged as received, with no further questions by USAID/Afghanistan or GRAIN's AOR.

### **3.9 Formal Project Submissions**

With the evacuation of GRAIN's CoP, DCoP, and Director of Operations from Kabul in September, and MSU's subsequent changes to the management approach for the project, significant effort in Q1 was committed to internal meetings and strategic planning discussions with the GRAIN Agreement Officer's Representative and USAID/Afghanistan regarding the restructuring of the project. On 18 October, GRAIN submitted revisions to the PY3 Work Plan, with comments received from USAID on 07 November; GRAIN addressed all comments via a shared Google Doc on 22 November; USAID sent additional comments on 05 December, and the final revision was submitted on 23 December. Additionally, MSU submitted revisions to the Life of Project Work Plan, Buy-In Agreement, and budget on 15 November and received

USAID's feedback on 09 December; final revisions to these documents will be made once the PY3 Work Plan is approved.

After these initial re-submissions, further discussions at MSU and a realization that expat travel to Afghanistan is uncertain going forward, GRAIN presented a concept for a further revised staffing structure and management approach. This plan, which includes transition of the Chief of Party position to an Afghan local national employee along with key Operations functions being transitioned to a local national team and new home office support, was shared on a call with USAID around 17 December. Formal resubmission of the PY3 Work Plan, version 3, was completed on 23 December, as stated above.

[Summary of budget table is redacted]

