



## Annua Report 2020 2022

**Endowment Fund Secretariat** 

University of Agriculture, Faisalabad



## FOREWORD

The Government of Pakistan and United States of America signed a US\$ 12.4 million Food for Progress Agreement on September 15, 2003. Under this Agreement, the Syndicate under Section 25(2)(i) of the University of Agriculture Faisalabad Act, 1973 approved to establish Endowment Fund at UAF. The Ministry of Finance transferred Rs. 650.00 million through HEC to UAF in 2006. The Endowment Fund, UAF has an independent board which possesses all of the powers necessary to carry out its activities.

The income generated from investment of this fund is allocated for different activities which focus on food security, poverty alleviation and sustainable agriculture. Agricultural technology has a key role to play for sustainable development and requires investment in human and social capital because they are more knowledge-intensive. According to FAO, one of the major constraints to realizing the potential for increased productivity in Pakistan is the woeful lack of a mechanism to transfer existing technology from government research institutions to farmers. Endowment Fund provides an opportunity for the scientists to get financial support for transfer of technologies to the stakeholders.

Research Commercialization is the process that converts ideas, research, or prototypes into viable products that retain the desired functionality. To provide an ecosystem for startups, Endowment Fund Secretariat established "Business Incubation Center" in 2009, with the joint support of Competitive Support Fund (CSF) and Higher Education Commission (HEC), Islamabad. For display/demonstration of developed and tested innovative technologies, a state of the Art Exhibition Centre has been constructed.



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### Vision

To innovate the agriculture in becoming competitive and profitable for sustainable growth and commercialization.

#### Mission

- 1. To support UAF faculty, the national scientific community, and agricultural industry working for the cause of agricultural and rural development.
- 2. To promote competitiveness in agriculture through adaptive Research & Development initiatives.
- 3. To explore ways and means for strengthening of Endowment Fund for Research & Product Development.



### 1. Introduction

#### 1.1 Establishment of Endowment Fund at UAF

Endowment Fund was established with the assistance of USDA with seed money of Rs. 650.00 million. The Syndicate under Section 25(2)(i) of the University of Agriculture Faisalabad Act, 1973 approved the MOU to establish Endowment Fund at UAF. The major objectives of funds are:

- a) To support UAF programmes for advanced training in biotechnology, agricultural sciences research, technology transfer and product commercialization.
- b) To strengthen faculty and support R&D activities of UAF.
- c) To support similar programmes with other institutions of higher learning, private sector, not-for profit organizations, and domestic as international organizations.
- d) To encourage increased cooperation among scientists conducting agriculture-related research at universities in Pakistan and the United States of America.

#### 1.2 Management of the Fund

The Board of Directors (BoD) is the governing body of this Fund and is responsible for Fund's program, its financial and managerial policies. Following is the composition of Board:

•	Vice Chancellor, UAF (Chairman)	Ex-off
•	Vice Chancellor, Agriculture University Peshawar, KPK	Ex-off
•	USDA Agri. Attache in Pakistan or his nominee	Ex-off
•	Agri. Specialist, USDA, US Embassy in Pakistan	Ex-off
•	Eminent Scientists (Two)	For 3-years
•	Progressive Farmer (One)	For 3-years
•	Executive Director, ALP (PARC), Islamabad	Ex-off
•	Registrar, UAF	Ex-off
•	Treasurer, UAF	EX-off
•	Executive Director, EFS, UAF (member/Secretary)	Ex-off

#### 1.3 Endowment Fund Secretariat

Endowment Fund Secretariat is responsible for the operation of the Fund which consists mainly of the selection, processing, approval, monitoring, evaluation and coordination of projects supported in whole or in part by it. All the activities are planned, approved and coordinated through Endowment Fund Secretariat (EFS) under the supervision of Executive Director. The Endowment Fund Secretariat staff is as under

- 1. Executive Director, Professor nominated by Vice Chancellor, UAF
- 2. Additional Director, Regular (One)
- 3. Deputy Director, Regular (One)
- 4. Lecturer, Regular (One)
- 5. Administration/Supporting Staff

#### 1.4 Programs

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With the approval of Board, the following programs are being sponsored by EFS, UAF

- 1. Faculty Development
- 2. Technology Transfer
- 3. Product Commercialization
- 4. Research & Development

#### 1.5 Achievements since its inception

The Endowment Fund was established in 2006 at the University of Agriculture, Faisalabad with the assistance of USDA under "Food for Progress" agreement with an amount of Rs. 650.00 million through the Government of Pakistan and Higher Education Commission, Pakistan. The principal amount was invested in banks and the profit generated was allocated for different activities approved by the Board of Directors. Endowment Fund supports the whole value chain of Agriculture including human resource development, sponsoring Research & Development, dissemination of knowledge intensive technologies and promoting University Industry linkages for commercialization of research output.

Since its inception in 2006, EFS has been able to support diverse activities in the university and national level. Its salient achievements are summarized as under.

Endowment Fund Secretariat (EFS) has granted 175 projects with an expenditure of Rs. 658.572 million, 203 travel grants and 290 seminars/workshops with total expenditures of Rs. 101.598 million. Endowment Fund has provided technical assistance to all segments of the rural community through Faculty Outreach Program started in 2011 with the focus on skill development and gender mainstreaming. Up till now, EFS has supported 128 outreach activities conducted by UAF faculty at the door step of farmers worth Rs. 11.606 million.

During 2021-22, EFS has initiated a University Retreat Program where faculty members are given an opportunity to step away from their day-to-day responsibilities and engage in activities that foster professional growth, team-building, and contemplation. EFS has also initiated a Small Grant program to process short proposals of emergent needs.

In addition to this, Endowment Fund has supported the University in developing physical infrastructure like Business Incubation Centre, Farm Market (Rs. 5.91 million), Bio-Safety Lab (Rs 37.31), Exhibition Centre (Rs186.720 million), FM Radio and Integrated Farming Model. Some of the major technology transfer projects sponsored by EFS include projects in Crop Production, Plant Protection, Horticultural Fruits Production, Horticultural Germs Plasm Collection, Vegetable Production, Agro Forestry, Animal Production, Animal Health, Integrated Model Farming, Agri. Mechanization, Water Resource Management, Waste Water Treatment, Alternative Energy Program, Use of ICT in Agriculture, Exhibition & Showcasing, Diagnostic Services, Conservation of Agricultural Heritage, etc.

#### 1.6 Geographical distribution of EFS funded projects

Endowment Fund Secretariat (EFS) provided widespread financial support throughout Pakistan. EFS regularly publishes call for project proposals in the domains of Technology Transfer, Research & Development and Product Commercialization throughout Pakistan via different print media and also issues individual invitation letters to different organizations. EFS had awarded projects to following institutions since its inception.

SN	Year	Institution	No. of projects
1.	2007-08	University of Arid Agriculture, Rawalpindi	01
2.	2008-09	Lesbela University of Agriculture, Water and Marine Sciences, Uthel, Balochistan	01
3.	2008-09	Soil Salinity Research Institute, Pindi Bhattian	01
4.	2011-12	University of Arid Agriculture, Rawalpindi	04
5.	2011-12	Forman C College, LHR	01
6.	2013-14	Ayoub Agricultural Research Institute, Faisalabad	01
7.	2013-14	Ayoub Agricultural Research Institute, Faisalabad	01
8.	2014-15	Ayoub Agricultural Research Institute, Faisalabad	01
9.	2014-15	Nuclear Institute of Biotechnology & Genetic Engineering, Faisalabad	01
10.	2014-15	Islamia University Bahawalpur, Bahawalpur	01
11.	2015-16	UAF Sub Campus, Burewala, Vehari	02
12.	2016-17	UAF Sub Campus, Burewala, Vehari	01
13.	2016-17	UAF Sub Campus, Toba Tek Singh	01
14.	2016-17	University of Veterinary and Animal Sciences, Lahore	02

SN	Year	Institution	No. of projects
15.	2016-17	Islamia University Bahawalpur, Bahawalpur	01
16.	2019-20	UAF Sub Campus, Burewala, Vehari	01
17.	2020-21	University of Veterinary and Animal Sciences, Lahore	04
18.	2020-21	Muhammad Nawaz Sharif University of Agriculture, Multan	01
19.	2020-21	UAF Sub Campus, Toba Tek Singh	01
20.	2021-22	Muhammad Nawaz Sharif University of Agriculture, Multan	02
21.	2021-22	UAF Sub Campus, Toba Tek Singh	01
22.	2021-22	University of Poonch, Azad Jammu & Kashmir	01

#### **Evaluation of the Project Proposals**

The project proposals are processed in accordance with the procedures approved by the BoD as under:

- Invitation of proposals in the National Press.
- Initial evaluation by Endowment Fund Secretariat.
- Review of proposals by three national referees (Nominated by the Chairman BoD/Vice Chancellor).
- Revision of proposals as per recommendation of referees.
- Submission of revised proposals to TAC along with recommendations of referees for evaluation.
- Rationalization of the recommended proposals by the Committee constituted by the Chairman BoD.
- Final selection/approval by the Board of Directors (BoD).
- Signing of Implementation Agreement between the executor/PI and UAF.
- Issuance of Administrative approval of the projects.



## FACULTY DEVELOPMENT

### 2. Faculty Development

The Technological Innovations require Investment in human and social capital because they are more knowledge-intensive. Capacity-building in agriculture and allied disciplines has been the prime focus of Endowment Fund, UAF. Further, interaction with the international community and exposure to the developed systems are the additional benefit of this program. A Faculty Development Committee comprising senior teachers evaluates and recommends such applications to the Chairman BoD for approval.

#### 2.1 Achievements during the reporting period

During 2020-21 & 2021-22, following are the achievements under Faculty Development:

1.	Short Trainings (abroad)	00
2.	Travel Grants for Presenting Papers (Abroad)	02
3.	Short Visit for Institutional Collaboration (Abroad)	02
4.	Seminars/Workshops/Conferences organized at UAF	35

#### 2.2 Short Term Trainings abroad

This program has been designed with the objective to accelerate the quantum of research and development in Agricultural Universities through short term trainings that are catalytic to the technological and socio-economic development of the country. Under this program, teachers, scientific and technical staff and researchers of the University of Agriculture Faisalabad can avail the grant for short term local as well as foreign training of their own choice but related to their current field of specialization. Due to COVID-19 pandemic, International stay and travel was restricted. Therefore, no activity could be funded under this segment.

#### 2.3 Travel Grants for Presenting Paper abroad

Endowment Fund Secretariat encourages faculty members to have international exposure by presenting their research findings at various international seminars, conferences, workshops, etc. Following travel grants were provided to faculty members for presenting papers at international events:

SN	Name & Address of the Grantee	Title/organizer/Country
1.	Dr. Khalid Hussain, Assistant Professor, Department of Agronomy, UAF	Sustainable Cropping Options for Small Land Holding Farmers (ONLINE) in the 4th Jeddah International Conference on Multidisciplinary Issues (ICMI-2021) Organized by Saud Royal Society for Research in Multidisciplinary Issues (SRSRMI) February 22 to 25, 2021 in Jeddah, Saudi Arabia
2.	Dr. Abdul Mateen, Assistant Professor, Department of Zoology, Wildlife and Fisheries, UAF	Immune Competency and Growth response Variability of Oreochromis niloticus under Dietary Supplementation of Black Seed (Nigella Sativa)" in the Aquaculture America-2022 organized by World Aquaculture Society & California Aquaculture Association February 28 to March 04, 2022 in San Diego, California, USA

#### **2.4 Short Visits for Institutional Collaboration**

Travel grants for short visits abroad are provided for strengthening international collaboration and participation in events after nomination by the Vice Chancellor/Chairman BoD to represent UAF. Following faculty member was awarded grant under short visits program:

SN	Name /Department	Title/Country
1.	Mr. Umar Saeed, Treasurer/ member BoD EFS, UAF	<ul> <li>i. 3rd UN World Data Forum October 03-06, 2021 (Switzerland)</li> <li>ii. UNECE Ministerial meeting on Urban Development October 06-08, 2021 (Switzerland)</li> <li>iii. Vita Foods Europe October 05-07, 2021 (Switzerland)</li> <li>iv. BCF Career Event October 06, 2021 (Netherlands)</li> <li>v. Work Space Expo October 05-07, 2021 (France)</li> </ul>
2.	Prof. Dr. Iqrar Ahmad Khan, Vice Chancellor/ Chairman BoD, UAF	To attend an IOFS High Level Forum on Food Security in Islamic Organization for Food Security and Kazakh National Agrarian Research University Almaty, Kazakhstan June 07-10, 2022 in Kazakhstan

#### 2.5 Seminars/Conferences/Workshops/Trainings organized at UAF

Endowment Fund provides financial support to UAF faculty members to organize seminars/ conferences/workshops at the campus. During the year 2021-22, EFS sponsored following events::

SN	Organizer	Title of Seminar/workshop/conference
1.	Dr. Sultan Habibullah Khan, Focal Person/Associate Professor, CAS-AFS, UAF	Workshop and Launching of National Center for Genome Editing (NCGE). August 6-7, 2021
2.	Ms. Binish Sarwar Khan, Lecturer, Institute of Home Sciences, UAF	Seminar on Protect Breastfeeding: A shared Responsibility. August 31, 2021
3.	Prof. Dr. Anas Sarwar Qureshi, Dean, Faculty of Veterinary Sciences, UAF.	3rd National One Health Symposium. September 8, 2021
4.	Dr. Rashad Waseem Khan Qadri, Associate Professor, Institute of Horticultural Sciences, UAF	International CATAS-UAF Workshop on Tropical Agricultural S&T Cooperation. September 23, 2021
5.	Prof. Dr. Anas Sarwar Qureshi, Dean, Faculty of Veterinary Sciences, UAF	Symposium on Rabies. September 28, 2021
6.	Prof. Dr. M. Jalal Arif, Principal Officer, PRP, UAF.	Workshop on Agriculture Sector of Pakistan, SWOT Analysis. October 02, 2021
7.	Dr. Summar A. Naqvi, Assistant Professor, Institute of Horticultural Sciences, UAF	First National Date Palm Stakeholders Workshop and Date Festival. October 14-15, 2021
8.	Dr. Babar Shahbaz, Associate Professor/Director Academics, UAF	Professional Development Workshop for Young Faculty. During October/November, 2021
9.	Dr. M. Shahid, Associate Professor, Department of Biochemistry, UAF.	2nd Two-day National Training Workshop on Bioassays for Exploration of Bioactives. October 25-26, 2021
10.	Prof. Dr. Hammad Ahmad Khan, Department of Zoology wildlife & Fisheries, UAF.	Seminar on Wildlife in Pakistan: Challenges and Conservation Strategies. November 04, 2021
11.	Dr. Anjum Munir, Chairman, Department of Energy Systems Engineering, UAF	Seminar on Pakistan Current Energy Scenario & Future Prospects. October 15, 2021

SN	Organizer	Title of Seminar/workshop/conference
12.	Prof. Dr. Anas Sarwar Qureshi, Dean, Faculty of Veterinary Sciences, UAF	World One Health Day. November 03, 2021
13.	Dr. Tahira Sadaf, Assistant Professor, Institute of Agricultural and Resource Economics, UAF	Awareness workshop on Banking on Equality- Women Empowerment with State Bank of Pakistan, Faisalabad. November 11, 2021
14.	Dr. Babar Shahbaz, Associate Professor/Director Academics, UAF	Workshop on Capacity Building and Professional Development. November 15 to 19, 2021
15.	Dr. Abdul Rehman, Associate Professor, Department of Pathology, UAF	7th International Conference of Pakistan Phytopathological Society. November 21 to 23, 2021
16.	Prof. Dr. Anas Sarwar Qureshi, Dean, Faculty of Veterinary Sciences, UAF	International Symposium on Antimicrobial Resistance: A Silent Pandemic. December 07, 2021
17.	Prof. Dr. Sajjad-ur-Rahman, Director, Institute of Microbiology, UAF	Workshop on Laboratory Scale Screening of Multidrug Resistant Pathogens. December 20, 2021
18.	Prof. Dr. M. Jafar Jaskani, Institute of Horticultural Sciences, UAF	Citrus Exhibition Workshop. December 13 to 14, 2021
19.	Prof. Dr. M. Jalal Arif, Principal Officer, PRP, UAF	A Seminar on Standardization of Agricultural Implements January 06, 2022
20.	Dr. Babar Shahbaz, Associate Professor/Director Academics	Induction Training Workshop for Newly Appointed Faculty. During March, 2022
21.	Prof. Dr. Abdul Khaliq, Chairman, Department of Agronomy, UAF	Agri-Connect: A Workshop for Strengthening Stakeholder Linkages. March 15, 2022
22.	Dr. Beenish Israr, Lecturer, Institute of Home Sciences, UAF	International Women's Day Celebration. March 08, 2022
23.	Dr. Raheel Anwar, Assistant Professor, Institute of Horticultural Sciences, UAF	National Workshop on Postharvest Management of Fresh Horticultural Produce for Academics. March 17-18, 2022
24.	Dr. M. Zafar Iqbal, Assistant Professor, Department of Mathematics and Statistics, UAF	19th International Conference on Statistical Sciences. March 17-19 2022

SN	Organizer	Title of Seminar/workshop/conference
25.	Dr. Irfan Ahmad, Associate Professor, Department of Forestry and Range Management, UAF	Seminar on Forests and Sustainable Production and Consumption. March 21, 2022
26.	Dr. Iftikhar Ahmad, Associate Professor, Institute of Horticultural Sciences, UAF	2nd International Workshop on Diversification, Value Addition and Supply Chain Management of Floriculture. March 24-25, 2022
27.	Prof. Dr. Anas Sarwar Qureshi, Dean, Faculty of Veterinary Sciences, UAF	Seminar on The Pirbright Institute's Knowledge Exchange. April 06, 2022
28.	Dr. M. Aslam, Associate Professor, Department of PBG, UAF	3rd International Colloquium Challenges and Opportunities of Maize Production. May 18-20, 2022
29.	Prof. (Rtd.) Dr. Ashfaq Ahmad Mann, Subject Expert/Consultant, Department of Rural Sociology, UAF	Seminar on Crime and Prison Scene in Pakistan. May 25, 2022
30.	Mrs. Sadaf Iqbal Khan, Lecturer, Institute of Home Sciences, UAF	Sustainable Textiles & Fashion. May 25, 2022
31.	Dr. M. Sohail Sajid, Associate Professor, Department of Epidemiology & Public Health, UAF	Workshop on "Study Designs and Analysis in Biomedical Research". June 2-3, 2022
32.	Prof. Dr. Ghulam Murtaza, Director, Institute of Soil & Environmental Sciences, UAF	World Environment Day June 06, 2022
33.	Dr. Syed Ashar Mahfooz, Assistant Professor, Department of Clinical Medicine & Surgery, UAF	Internees-Stakeholders Interactive Workshop on the Development of Training Modules. June 10, 2022
34.	Prof. Dr. M. Sarwar Khan, CABB, UAF	2nd Hands on Training Workshop on Biotechnology, Biochemistry and Bioinformatics. June 14 to 15, 2022
35.	Mr. Umar Saeed, Treasurer, UAF	Seminar entitled Dressing Etiquettes for academia and Staff. June 22, 2022

#### **Highlights of Some Events**

Title of the Event:Workshop and Launching of National Center for GenomeEditing (NCGE)August 6-7, 2022Name of Organizer:Dr. Sultan Habibullah Khan, CAS-AFS, UAF

#### **Objectives**

- launching and showcasing new initiative, the National Center for Genome Editing for crop improvement and human health
- Showcasing of CAS research being conducted in the thematic laboratories by lab supervisors.

#### **Proceedings**

Punjab Agriculture Minister Syed Hussain Jahania Gardezi along with Chairman, PCSIR, Dr Hussain Abdi inaugurated Center for Genome Editing for Nutrition and Health at the Center for Advanced Studies in Agriculture and Food Security (CAS-AFS), University of Agriculture Faisalabad (UAF).

After recitation of few verses of the Holy Quran, Dr Sultan Habibullah invited the Vice Chancellor (UAF) for an introductory address. The Vice Chancellor (UAF) briefed the audience about the functions and achievements of the university and CAS. He lauded the measures being taken on the part of the government to uplift the sector which is the backbone of our economy. He said that the UAF developed 14 agrological zones of the province that will tangibly results. The Focal Person Dr. Sultan Habib Ullah, CAS-AFS informed about the NCGE project and its objectives. He said that Genome Center will work on crops, vegetables, fruits, and human health. He said that the Center is set up with the total funding of Rs 1799 million. Collective funding comprises from Pakistan Council of Scientific and Industrial Research (worth Rs 1298.63 million) and UAF (worth



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Rs 500.960 million). He said that application of Genome editing includes medicine, biology, and biotechnology. Dr. Imran Arshad, Dr. Rizwana Maqbool, Dr. Zaheer Ahmad and Dr. Iqrar Rana also spoke on their respective domains i.e. Health, Crop, Vegetable & Fruits etc.

PCSIR Chairman Syed Hussain Abidi said that the government was paying special attention to promote the research culture and ensure the betterment in the sector. He urged the agricultural scientists to work with dedication for the development of agriculture sector. The Vice Chancellor MNS University of Agriculture Multan, Prof. Dr. Asif Ali called for creating the awareness among the farming community about the latest trends. He said that with improved learning ecology, we can bring the change. The Vice Chancellor PMAS Arid Agriculture University, Dr Qamar uz Zaman said that we have to make the collaborated efforts for combating the agricultural challenges. He said that they had been running a joint degree program with Dalhousie University Canada and such program will help fight the challenges with knowledge exchange. Progressive farmer Afaq Ahmad Tawana said that poverty alleviation was directly linked to the agriculture sector which is the backbone of our economy. DG Ayub Research Dr. Zafar Iqbal Qureshi said that all out efforts were being made for tangible research work and new varieties.

After comments by the guests, Punjab Agriculture Minister Syed Hussain Jahania Gardezi officially launched NCGE. The workshop ended with a vote of thanks by the Vice Chancellor.

#### Outcome

Out of this workshop, the partner institutes were able to frame out tangible targets and a collaborative action plan to achieve them in a timely manner. The workshop was a great opportunity for the researchers and academicians to interact with sister organizations and the policy makers.

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Title of the Event:	Semina	r on	Protect	t Breasfe	eding:	Α	Shared
	Respon	sibility.					
	August	31, 2021					
Name of Organizer:	Binish Science	Sarwar s, UAF	Khan,	Lecturer,	Institute	of	Home

#### **Objectives**

- To promote exclusive breastfeeding.
- To create awareness about the benefits of breastfeeding in addressing malnutrition.
- To sensitize young females for breastfeeding

#### **Proceedings**

- All participants were gathered in front of Igbal auditorium for awareness walk.
- Vice Chancellor UAF, Prof. Dr. Igrar Ahmad Khan and Dean FFN&HS, Prof. Dr Masood Butt joined the walk.
- All known media channels interviewed guests and students.
- After walk, seminar was formally conducted in New Senate Hall, UAF.



- Dr. Ayesha Riaz, Director/In-charge IHS welcomed all the participants, guests and speakers. Prof. Dr Igrar Ahamed, VC UAF shared his views about trends and history of breastfeeding and its link to Pakistan's economy. Dr Igra from National Hospital, gave detailed insight about physiology, safe ways, impact on child health regarding breastfeeding. Ms. Surriya Ikhtiar highlighted the excellent nutritional value of breastfeeding in comparison to formula milk.
- Dean FFN&HS Prof Dr Masood Butt pays thanks to all the guests and participants.



## Title of the Event:3rd National One Health Symposium.September 08, 2021

### Name of Organizer: Prof. Dr. Anas Sarwar Qureshi, Dean, Faculty of Veterinary Sciences, UAF

#### **Objectives**

- Identification and prioritization of research gap in the fields of zoonoses, emerging infectious diseases, ecological and environmental factors which impact on other diseases
- Create synergies and facilitate the sharing of data between the researchers and research groups in order to mend and prioritize research gap
- Disseminate the results and insights of existing and new research projects on One Health
- Enhance awareness of the value of the One Health Approach through communication, facilitation of interaction between stakeholder groups, education and training

#### **Proceedings**

The symposium was composed of the following activities.

- Introduction to the One Health Symposium by Prof. Dr. Iqrar Ahmad Khan (T.I.), Vice Chancellor University of Agriculture, Faisalabad.
- Appraisal of One Health app at humananimal-environment interface: core competencies to action plan by Dr. Imran Arshad, Assistant Professor, Institute of Microbiology, UAF.



- Parasitic diseases in One Health scenario: a SWOT analysis by Dr. M. Sohail Sajid, Associate Professor, Department of Parasitology, UAF.
- Mycotoxin contamination of foods and feed: a global One Health issue by Dr. M. Kashif Saleemi, Associate Professor, Department of Veterinary Pathology, UAF and Dr. Aisha Khatoon, Lecturer, Department of Veterinary Pathology, UAF.
- Dengue a serious health concern: a success story and a national contribution By Prof. Dr. Waseem Akram, Department of Entomology, UAF. Drug residues and One Health perspectives by Dr. Faqir Muhammad, Associate Professor, Institute of Physiology and Pharmacology. Nutrition: a significant component of One Health by Dr. Allah Rakha, Associate Professor, NIFSAT, UAF and Dr. Beenish Israr, Lecturer, Institute of Home Sciences, UAF.

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 Concluding remarks by Chief Guest, Lt. General (Rtd.) Syed Muhammad Imran Majeed H.I. (M)

#### Poster session included

- 1. Isolation of lytic phages against multidrug resistant Staphylococcus aureus and Pseudomonas aeruginosa from burn patients wound and determination of lytic spectrum by Dr. Muhammad Aamir Aslam.
- 2. Transmission dynamics of Toxoplasma gondii in Pakistan: One health prospect by Dr. Muhammad Kasib Khan.
- Multi-species Investigations Reveal Endemic Status of Cystic Echinococcosis in Pakistan – An Update in One Health Perspective by Dr. Mughees Aizaz Alvi.
- 4. Epidemiology and Public Health: At a Glance by Namrah Rehman and Faisal Rasheed Anjum, Visiting Faculty at the Department of Epidemiology and Public Health.
- 5. Detoxification of bacterial endotoxins by biomimetic and synthetically modified nanoparticles by Bushra Akhtar.





6. Brucellosis as an emerging zoonosis: Future perspectives in terms of One health Concept (OHC) by Shafia Tehseen.

#### Outcomes

- Better understanding of One Health triad to prevent the zoonotic health problem.
- Fulfilled technological gap.
- Collaborative research linkages among academia, human and veterinarians and personnel dealing with environment.
- Professional cooperation and linkages developed between the UAF, NUMS and FMU.

## Title of the Event:InternationalCATAS-UAFWorkshoponTropicalAgricultural S&T Cooperation.September 23, 2021

Name of Organizer: Dr. Rashad Waseem Khan Qadri, Associate Professor, IHS, UAF

The workshop was chaired by Prof. Dr. Iqrar Ahmad Kha, Vice Chancellor, UAF. Lectures were delivered regarding intercropping and production technology of king grass by the keynote speakers. Emphasis was given to expand the cultivation of king grass across the country

#### Outcome

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Progressive growers, scientists and students were briefed about the production technology of king grass and management practices. This activity enhances basic understanding of the growers and farmers about the fodder shortage during the summer. This activity motivated the growers and farmers regarding king grass cultivation. During discussion, King Grass production technology was shared among the participants for complete understanding about its nutritional value and multi cut advantages. General objective of this workshop was to provide a solution to famers for the shortage of fodder especially during summer season.





## Title of the Event:First National Date Palm Stakeholders Workshop and<br/>Date Festival<br/>October 14-15, 2021

Name of Organizer: Dr. Summar A. Naqvi, Assistant Professor, IHS, UAF

The workshop was organized

- To review and discuss recent trends and challenges in date palm production and marketing in Pakistan.
- For creating awareness about most promising fruit tree
- For the promotion of indigenous date palm fruits and products

#### Seminar

The First National Date Palm Stakeholders Meeting and Date Festival was also organized in Institute of Horticultural Sciences, UAF. About 13 speakers presented their experiences on different topics with the date palm stakeholders, faculty, researchers and students.



#### Date palm stakeholder meeting

First national date palm stakeholders meeting was organized in Syndicate Room, About 30 date palm stakeholders i.e. growers, exporters, importers, traders, faculty, researchers and students attended the meeting physically and virtually (online) as well.

#### **First National Date Festival**



First national date festival was organized in Exhibition Center. About 20 stalls of dates and date products representing four provinces of the country were displayed. Chairman, Faisalabad Chamber of Commerce and Industry (FCCI) and his team visited the expo and appreciated the activities. Chairman WAPDA, Lieutenant General Muzammil Hussain (Retd.) also graced the event and appreciated the activities. Growers, Traders, Retailers, Teachers and Students visited expo and showed interest in collecting date palm industry related information.

#### **Outcomes of the Event**

- The event provided a platform for importers, exporters, stakeholders and farmers.
- Speeches of different researchers and faculty members provided much knowledge about date palm varieties, diseases, SWOT analysis and other activities.
- Provided a source of bridging among date palm stakeholders.
- Providing opportunity to the entrepreneurs.
- Establishment of date palm growers and industry association.
- Agreement of exporters with traders of Balochistan.



## Title of the Event:2nd Two-day National Training Workshop on Bioassaysfor Exploration of Bioactives.October 25-26, 2021

### Name of Organizer: Dr. M. Shahid, Associate Professor, Department of Biochemistry, UAF

This two-day training workshop was planned under the theme "Bioassay for the exploitation of lead moieties from natural sources". The workshop has bridged biochemists, medical and health professionals, chemists, genetic engineers, agriculturists, environmentalists, and eminent scientists with multi-disciplinary professional background on a common platform where they have barter over their thoughts to discuss the role of bioassays in research and related to discovery of lead molecules of biologically importance. The activity was focused in addressing the global challenges such as drug discovery and bioassay, food contamination and toxicology. It was also discussed how this knowledge can be effectively assimilated in industry, agriculture, education, health, and other fields. This event has generated enthusiasm in young scientists especially from the college and universities to optimize these assays in their institutes. A special emphasis was put on future trends in bioassay practices and drug discoveries through scientific research.



This event provided a platform to the senior experts to disseminate the updated knowledge and latest methods to young faculty and students.

## Title of the Event:A seminar titled Wildlife in Pakistan: Challenges and<br/>Conservation strategies.<br/>November 04, 2021

Name of Organizer: Prof. Dr. Hammad Ahmad Khan, Department of Zoology Wildlife & Fisheries, UAF

The seminar was aimed to:

- Provide regular links between academia, wildlife experts and students for learning, training, and developing sustainability of wildlife conservation.
- Undertake thread-bearing discussion on different aspects of wildlife, its causes of decline and strategies to enhance it in the agro-ecosystems of Pakistan.
- Establish academic and research-based podium to exchange information among the concerned quarters for its usefulness implement.



#### Outcome

The gathering of wildlife experts and environmentalists in this seminar provided concrete measures to infuse the awareness, motivation and spirit in the public regarding the conservation of wildlife and to impart respect to all wildlife species as these were the friends of environment.

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## Title of the Event:Pakistan Current Energy Scenario & Future ProspectsOctober 15, 2021

#### Name of Organizer: Dr. Anjum Munir, Associate Professor, Department Energy Systems Engineering, UAF

#### **Objectives**

- Dissemination of knowledge to the stakeholders (students, researchers, end-users etc.) about Pakistan energy situation from various resources of hydro-power and role of WAPDA in mitigating energy gaps.
- Capacity building of students, trainers and entrepreneurs.

#### **Proceedings**

This capacity building seminar provided an overview to participants that how Pakistan can improve energy production from hydal, oil and other alternative sources. It enlighten the importance to implement greenhouse gas mitigation technologies and consider alternative energy sources especially renewable energy resources. The event also provided a platform



to showcase the infrastructure developed by the Department of Energy Systems Engineering, UAF to advocate its case for the induction of graduates (Energy Engineers) in WAPDA. The seminar was followed by visits to Expo Centre, EFS, Solar Park and Labs; Department of Energy Systems Engineering, UAF.



www.efsuaf.org

## Title of the Event:Professional Development Workshop for young FacultyNovember 23-25, 2021

#### Name of Organizer: Dr. Babar Shahbaz, Associate Professor/Director Academics, UAF

#### **Objectives**

The objective of this activity was to impart the skill to young teachers to build professional careers on strong basis using modern concepts of using information technology in teaching and class assessment, time management and stress management, quality assessment and evaluation. Furthermore, it provided knowledge of ethics at work place improving their skills in developing healthy interaction with the students in class room.

#### Major Components of the workshop were:

1. Curriculum and its Components Effective Teaching Skills by Dr. Syeda Samina Tahira Chairperson Education, GCWU, Faisalabad



- 2. Domains of Learning and Lesson Planning by Dr. Asif Igbal, Associate Professor, University of Education.
- 3. Assessment/Examination by Dr. Asif Igbal, Associate Professor, University of Education.
- 4. Interpersonal Communication Skills by Dr. Asim Aqeel, Assistant Professor, Department of Humanities & Linguistics, UAF
- 5. Research Proposal, Research Grant by Dr. Abdul Rashid, Associate Professor, ORIC, UAF
- 6. Online/Remote Education, LMS by Mr. Ahsan Raza Sattar, Principal Officer, ITRCDB, UAF
- 7. Educational Ethics by Prof. Dr. Aman Ullah Malik, Dean, Faculty of Agriculture, UAF
- 8. Hybrid Courses and Use of Instructional Videos by Dr. Ayesha Kiran, Assistant Professor, Department of Botany, UAF
- 9. UAF Rules and Regulations by Dr. Faisal Saeed Awan, Director, Graduate Studies, UAF
- 10. Basic of Finance and Budgeting by Mr. Rana Khalid Mehmood, Deputy Treasurer, UAF
- 11. Time Management and Stress Management by Dr. Nadeem Tariq, CEO, Microbial Biotechnologies (Pvt.) Ltd
- 12. Effective Mentoring and Counselling by Dr. Nadeem Tariq, CEO, Microbial Biotechnologies (Pvt.) Ltd

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## Title of the Event:Citrus Exhibition Workshop.December 13-14, 2021

#### Name of Organizer: **Prof. Dr. M. Jafar Jaskani, Institute of Horticultural** Sciences, UAF

This two-day Citrus Exhibition workshop provided opportunity to the researchers, students, scientists, growers, processors, exporters and all other stakeholders to visit the citrus exhibition which contains more than 100 citrus cultivars for their awareness and promotion of new citrus cultivars. The workshop also provided an opportunity to share their research and ideas for food safety and security issues in horticulture production.

#### Outcome

All the participants were briefed about the importance of citrus in the world and in Pakistan as well. Citrus is ranked top first in the Pakistan regarding area of cultivation and production. However, Kinnow is mostly cultivated on more than 90% area in Pakistan. Pakistan is blessed with diverse range of climate conditions; therefore, it is suggested to motivate our farmers to grow different citrus cultivars for gaining higher profit from their land. This activity enhances basic understanding of the farmers about the citrus cultivation. Overall, this activity increased awareness in farmers about different citrus cultivars and they appreciated different citrus cultivars on the basis of color and taste. Farmers showed interest to grow Daizy mandarin, Salustiana sweet orange and some new grapefruit cultivars for commercial cultivation at their farms. In general, objective of this workshop was to introduce all available citrus cultivars to farmers, researchers and students for identification, awareness and commercialization of high-quality citrus cultivars for achieving higher returns.



# Title of the Event:Workshop on Laboratory Scale Screening of Multidrug<br/>Resistant Pathogens.<br/>December 20, 2021Name of Organizer:Prof. Dr. Sajjad Ur Rehman, Institute of Microbiology,

UAF

#### **Objectives**

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- Identification of critically important bacteria using antibiotic supplemented media.
- Biochemical identification of bacteria using API-20E.
- Evaluation of antibiotic susceptibility testing using standard technique.
- Demonstration of Minimum Inhibitory Concentration (MIC) determination.
- Polymerase chain reaction for detection of genes encoding drug resistance.

#### Outcome

The workshop provided the platform for microbiologists, scientists, students of microbiology, medical lab technology, biochemistry, and clinical sciences to gain hands on training on diagnosis of AMR. It also provided a platform for scholars and other participants to understand and learn the basic techniques for laboratory scale screening of multidrug resistant pathogens. The workshop helped to develop trained human resource for AMR diagnostic, surveillance, and laboratory management protocols. The event also highlighted the current work being carried out on AMR at Institute of Microbiology, UAF and will open future possibilities of collaboration with other national organizations.



#### Title of the Event: A seminar on Standardization of Agricultural Implements. January 06, 2022

Name of Organizer: Prof. Dr. M. Jalal Arif, Principal Officer, PRP, UAF

The event was a consultative meeting of all stakeholders to discuss the issue of combine harvester losses which hamper the yield up to 15% per acre due to import of substandard combine harvesters in scrap, and lack of timely replacement of cutter bars, sieves, etc. The organizers were successful to sensitize the stakeholders including that of the government about the existing loss to wheat crop due to combine harvesters and its technical issues. The event will go a long way to formulate a policy document for the government to arrest this loss.





#### Title of the Event: Agri-Connect: A Workshop for Strengthening Stakeholder Linkages March 15, 2022

Name of Organizer: Prof. Dr. Abdul Khaliq, Department of Agronomy, UAF

The workshop was arranged in the Faculty of Agriculture. The prime objective of the workshop was to provide an interactive platform to the stakeholders to seek their opinion and feedback on the quality of agricultural graduates and various degree programs offered in the Faculty of Agriculture. More than 100 representatives from public sector (academia, research and extension) and private sector (fertilizer, seed, pesticides and other agri. business) attended the workshop. Prof. Dr. Aman Ullah Malik, Dean, Faculty of Agriculture chaired the workshop session moderated by Prof. Dr. Abdul Khaliq, Chairman, Department of Agronomy. The Chair emphasized to discuss about the services already present in the sectors of Seed, Fertilizer, Pesticide, Research and Extension Centers and Other private agri-business companies.

To proceed, the following panelists discussed various issues covering these sectors of agri. business.

- a) Mr. Salman Mehmood Khan
- b) Mr. Abid Ilyas Dar
- c) Mr. Tauseef ul Haq
- d) Mr. Mehboob Elahi
- e) Mr. Wajeehudin
- f) Dr. Abdul Hameed

(President, Seed Association of Pakistan) (Head of Hybrid Seed Business, Engro Fertilizer) (Head Business Sustainability, Syngenta Pakistan) (Agri. Manager, Nestle Pakistan Pvt. Ltd.) (Divisional Forest Officer, Faisalabad) (Director Extension, Faisalabad)

A day-long session was held discussing the issues related to input of stakeholders about their expectation/demand about knowledge base and skill-set of agri-graduates, and streamlining their internship program to develop specific skills, and opportunities for paid/unpaid internship to the agri-graduates.



Endowment Fund Secretariat

Title of the Event:	National Workshop on Postharvest Management of
	Fresh Horticultural Produce for Academics.
	March 17-18, 2022

Name of Organizer: Dr. Raheel Anwar, Assistant Professor, Institute of Horticultural Sciences, UAF

#### **Objectives**

- Capacity building of academic working at different universities on postharvest and value chain management of horticultural crops.
- Strengthening postharvest horticulture curriculum and R&D work by integrating and sharing resources at national level (Postharvest academic archive initiative).
- Strengthening linkages among institutions and faculty for supporting industry in country.

#### **Proceedings**

The workshop was organized mainly for faculty members in Pakistani universities engaged in teaching and/or research on postharvest horticulture. Faculty members engaged in postharvest horticulture teaching and research were identified and invited to the workshop. After having presentations on teaching and research activities by each participants, a "Pakistan Postharvest Horticulture Working Group" was developed where participants committed to develop joint research projects on fruits and vegetables value chains. Participants also agreed to share scientific writings and lab resource to strengthen collaborative efforts in teaching and research. Secondly, it was proposed to organize the workshop annualy on Postharvest Horticulture in one of the participating institutes where postharvest subject experts may discuss collaborative projects.



## Title of the Event:19th International Conference on Statistical Sciences.March 17-19, 2022

### Name of Organizer: Dr. M. Zafar Iqbal, Assistant Professor, Department of Mathematics and Statistics, UAF

Statistical sciences provide a vital bridge to all the stakeholders such as researchers, policy makers and implementers. The international conference on statistical sciences wishes to

bring the think-tanks of academia and the researchers therein to highlight the problems being faced by the public and the government and to come up with some solid scientific suggestions and recommendations. Almost everywhere there is a keen focus to Sustainable Development Goals (SDGs) and keeping this in mind the intended conference brought scientists from cross-disciplinary fields including statistics, mathematics, humanities, sciences, etc. from across the globe and Pakistan, for providing expertise



and strategies to assist the government in attaining the following five goals:

- SDG1-End poverty in all its forms everywhere
- SDG2-End hunger, achieve food security and improved nutrition and promote sustainable agriculture
- SDG6-Ensure availability and sustainable management of water and sanitation for all
- SDG8-Promote sustained, inclusive, and sustainable economic growth, full and productive employment and decent work for all
- SDG9-Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

#### Objective

The objective of the conference was:

• To plan the implications needed for research-based and data-driven approaches.

#### Outcome

This conference has provided an opportunity to the researchers and protagonists of change, including the youth to gain knowledge from the international participants as well as indigenous ones, which will not only allow an insight into ground realities along with fact and gap findings but also help them in identifying the best practices being followed around the world.

Endowment Fund Secretariat

Title of the Event:	Seminar on Forests and Sustainable Production and
	Consumption.
	March 21, 2022
Name of Organizer:	Dr. Irfan Ahmad, Associate Professor, Department of
	Forestry and Range Management, UAF

#### **Objectives**

- To celebrate 21st March as International Day of Forests in UAF.
- To familiarize the participants with sustainable forest production.
- To create awareness at mass level.

#### **Proceedings**

The event was organized to enhance the awareness level of farmers, students and general public. The speakers were able to disseminate knowledge about the production and utilization of multipurpose tree species. Participants realized the importance of trees in the reclamation of problematic soils and especially farmers got knowledge about the importance of agroforestry. To have a productive feedback, a comprehensive questionnaire was circulated among the participants. The resource persons shared their practical knowledge and experiences regarding tree plantation especially about Ten Billion Tree Tsunami Program launched by the Federal Government. Participants suggested that such seminars should be organized on regular basis.



## Title of the Event:2nd International Workshop on Diversification, ValueAddition and Supply Chain Management of Floriculture.March 24-25, 2022

Name of Organizer: Dr. Iftikhar Ahmad, Associate Professor, Institute of Horticultural Sciences, UAF

#### **Objective**

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 To disseminate the knowledge about different new trends in floriculture production, introduce new crops and varieties and explore possibilities to reduce postharvest losses through proper postharvest handling, value addition and supply chain management.

#### **Proceedings**

Workshop provided so many learning opportunities for the local growers, stakeholders, floriculture researchers, and students for future research and business development. As an outcome, the organizer was able to develop baseline for commercialization of newly developed soilless substrate, **UAF-Gro**, which is first patent of the institute. Future collaborative programs were discussed with invited Resource persons from Netherlands and Greece. Other opportunities were also discussed for future collaborative efforts to boost local floriculture. Moreover, a collaborative project was discussed with Director Agriculture Gilgit Baltistan for future collaboration, which has been submited to GB cabinet for approval. New ideas for diversification and value addition were shared with researchers, growers and students. A separate meeting was also arranged for growers where they asked their floriculture problems and invited International resource persons provided their solutions. Moreover, the workshop highlighted the issues and suggested way forward to promote our local floriculture industry by diversification, value addition and supply



chain management. Overall, this workshop provided an excellent opportunity for all who attended the technical sessions and industry trip to learn more for improving their floriculture business or their research endeavors. Overall, the workshop had high impact on all participants including academia, researchers, students, growers and stakeholders. Workshop had different technical sessions, discussion sessions, visit of university commercial floriculture research farm and industry tour to flower farms and commercial ornamental nurseries. Moreover, future collaborative opportunities were also explored, which marked high impact of the workshop.
# Title of the Event:3rd International Colloquium on Challenges andOpportunities of Maize Production.May 18-20, 2022

## Name of Organizer: Dr. M. Aslam, Associate Professor, Department of PBG, UAF

## **Objectives**

- To enhance the capability of maize researchers by teaching with latest field oriented techniques used for improvement in maize.
- To strengthening the collaboration with all the stakeholders involved in maize seed business.
- To increase know how about latest techniques to strengthen diverse maize germplasm.
- Promotion of collaborative research for sharing of innovative achievements in the field of maize research.
- Planning for the enrichment of maize germplasm in the department of Plant Breeding and Genetics by importing maize nurseries from CIMMYT and other maize research institutes.



#### Outcome

- Maize researchers/stakeholders from public and private sector (both national and international level) share the knowledge and experiences with the participants. These participants were from seed industry and public sector maize research organizations. Latest techniques were discussed in these three days virtually, physically and in maize fields will contribute in the betterment of maize production. All the participants were benefitted from the experiences and sharing of stakeholders.
- Mutual discussion is the fastest and impactful way to communicate. Stakeholders working as Member Maize Working Group at national level, always introduce new techniques and methodology to boost the maize production. These members work in collaboration with each other to benefit the others by sharing new achievements.
- Sharing of different latest techniques by different resource persons like, DH technology, Fall army worm control, Biological control of aflatoxin, genome editing techniques, etc. These sharings further increase the trust of the maize researchers and owners of the seed companies to establish advanced setup in their own R&D.
- During interactive session, different maize research organizations made commitments to support students of maize research with field oriented problems.
- International organization participating in this colloquium, made promise to share their high value maize germplasm on no-profit no loss basis.

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Title of the Event:	Workshop on Study Designs and Analysis in Biomedical	
	Research	
	June 2-3, 2022	
Name of Organizer:	Dr. M. Sohail Sajid, Associate Professor, Department of	
	Epidemiology & Public Health, UAF	

## **Objectives**

- Identifying the lacunae in planning and executing the community-oriented biomedical research.
- To update the tools for successful surveillance and field investigations
- To understand the nature of data, variables and application of various statistical tests.
- Hands-on practice on the analysis and interpretation of Biomedical Research Data using Minitab or R software.

## Proceedings

The workshop was composed of the following activities.

- Importance of Study Designs and Analysis in Biomedical Research.
- Key note Address Dr. Sumera Badar Ehsan, Head (Health Professions



- Day 1 Technical Session 1: Presentation 1: Introduction of Minitab Software and its Uses in Biomedical Research by Dr. Amjad Islam Aqib. Presentation 2: Qualitative Data Analysis in Biomedical Research by Dr. Muhammad Imran Khan
- Day 1 Technical Session 2: Quantitative Data Analysis in Biomedical Research by Dr. Muhammad Kashif.
- Day 2 Technical Session 1: Epidemiology & Surveillance in Biomedical Research by Dr. Usman Zaheer.
- Day 2 Technical Session 2: Introduction of R Software & Data Analysis in Biomedical Research.
- Concluding remarks and vote of thanks by Dr Muhammad Sohail Sajid Incharge, Department of Epidemiology & Public Health, University of Agriculture Faisalabad.

#### Outcome

- Better understanding of study designs analysis problems in biomedical research.
- Fulfilled technological gap.
- Collaborative research linkages among medical professionals and veterinarians.
- Professional cooperation and linkages developed between the University of Agriculture and Faisalabad Medical University.

Endowment Fund Secretariat



# Title of the Event:Internees-Stakeholders Interactive Workshop on theDevelopment of Training Modules.June 10, 2022

Name of Organizer: Dr. Syed Ashar Mahfooz, Assistant Professor, Department of CMS, UAF

## **Objectives**

- Professional training of outgoing graduates.
- To identify job opportunities for graduates in the industry.
- To strengthen the linkage with industry stakeholders

#### **Proceedings**

Dr. Rana Sajjad Arshid, CEO NS poultry/ Chairman, Pakistan Poultry Association was the chief guest on this occasion. He appreciated the commendable efforts of the Faculty Internship working group and Dean Faculty of Veterinary Science for organizing this learning workshop. He also encouraged the internees to get



benefit from this opportunity. The private and public stakeholders from all over the Punjab participated in the workshop. The workshop achieved its objectives in term of training of DVM students as capacity building as well as the interest of stakeholders to the progress of country. All the participated stakeholders acknowledged the effort of Internship Working Group and assured that they will provide good training from their trained persons. The stakeholder were introduced and invited for their requirements and their suggestion were discussed.

#### Outcome

The internees were accommodated in well reputed organizations and stakeholders provided them conducive learning environment. The objectives of internship program were discussed in detail with stakeholders and internees. The suggestions of stakeholders were also taken and included in the program. The stakeholders were requested to accomodate internees from the department. It is hoped that this year internees will get better training as compared with previous years. Title of the Event:2nd Hands on Training Workshop on Biotechnology,<br/>Biochemistry and Bioinformatics.<br/>June 14-15, 2022

Name of Organizer: Prof. Dr. M. Sarwar Khan, Director, CABB, UAF

## **Objectives**

- Thorough understanding of cutting-edge techniques and advancements in Biotechnology, Bioinformatics and Biochemistry
- Hand-on-training of faculty members and young researchers on DNA isolation, PCR, gene cloning, plants transformation using gene gun, agrobacterium, and proteomics.
- To promoting PhD students to interact with national and international faculty
- To practical demonstration of Bioinformatics tools with their possible application in designing research.
- To prepare the participants to apply biotechnology in their respective fields of research.

## **Proceedings**

The workshop was designed for young faculty members and researchers to provide them with hands-on-training in advanced techniques used in Biotechnology, Bioinformatics and Biochemistry. The workshop was comprised of lectures, demonstrations and hands-on training on techniques and protocols by eminent national and international Faculty.

#### Outcome

Through this workshop young faculty members and researchers were trained. Faculty members and researchers from UAF, GC Women University Faisalabad, GC University Lahore actively participated and got practical knowledge about recent techniques in these disciplines. Moreover, there was a poster competition among all the participants. It helped them to present their knowledge in scientific events.





## **TECHNOLOGY TRANSFER**

## 3. Technology Transfer

This component provides an opportunity for the scientists to get financial support for transfer of technologies to the stakeholders. Endowment Fund Secretariat accepts proposals for technology transfer from all public entities which demonstrate needed research and development capabilities and financial responsibilities. The portfolio under this component consists of outreach projects, demonstration on campus, organizing Farmers' Fairs and Exhibitions.

The technologies disseminated through Technology Transfer projects during the period under report relate to Animal Nutrition Strategies, Disease Control, Fruit Germplasm Collection, Soil Reclamation Strategies, Propagation of Floriculture, Ornamental Plant Production, Precision Agriculture, Seed Production Technologies, IoT & Blockchain Technology, Vegetable Grafting, Home Gardening, Date Palm growing, etc.

## 3.1 Project Initiated during 2020-21

SN	Title of the Project	Name of the PI	Duration	Budget (Million)
1.	AgroChain - An Intelligent System to Track Down Counterfeit Agricultural Inputs using IoT & Blockchain Technology	Dr. Saqib Ali, Assistant Professor, Department of Computer Science, UAF	2 Years 01.11.20 to 30.10.22	1.335

#### 3.2 Ongoing Projects during 2020-21

SN	Title of the Project	Name of the Pl	Duration	Budget (Million)
1.	Targeting Actions to Improve the Ornamental Plant Production System for Strengthening Floriculture Industry	Dr. Adnan Younis, Assistant Professor, I.H.S, UAF	3-years 30.09.19 to 31.08.22	2.754
2.	Establishment of Grapes Germplasm Unit (GPU) for Technology Transfer	Prof. Dr. Muhammad Jaffar Jaskani, I.H.S, UAF	3-years 01.09.19 to 31.08.22	4.409

SN	Title of the Project	Name of the PI	Duration	Budget (Million)
3. Auger Hole Technology: An Pr Economical Technique for M the Reclamation of Dense So Saline-Sodic Soils So		Prof. Dr. Ghulam Murtaza, Institute of Soil & Environmental Sciences, University of Agriculture, Faisalabad	01.05.020 to 30.04.23	3.542
4.	Establishment of Community Oriented Plant Disease Diagnostic Clinic at UAF Sub-Campus Burewala	Dr. Sohail Akhtar, Assistant Professor, UAF Sub-Campus Burewala	3-years 01.12.19 to 30.11.22	1.849
<ul> <li>UAF Sub-Campus Burewala</li> <li>5. Uplifting Monetary Conditions of Chilli Growers by Creating Awareness about Disease Problems and Their Management</li> </ul>		Dr. Nasir Ahmed, Assistant Professor, Department of Plant Pathology, University of Agriculture, Faisalabad	3 Years 01.07.20 to 30.06.23	1.476

## 3.3 Project Completed during 2020-21

SN	Title of the Project	Name of the PI	Duration	Budget (Million)
1.	Vegetable Grafting of Capsicum spp. and Watermelon	Dr. Khuram Ziaf, Assistant Professor, I.H.S, UAF	2-years 15.04.19 to 14.04.21	2.304

## 3.4 Projects Initiated during 2021-22

SN	Title of the Project	Name of the PI	Duration	Budget (Million)
1.	Feeding Scavenging Chicken For Deficient Nutrients- Proven Strategy to Improve Growth and Production in Rural Chicken	Dr. Umar Farooq, Assistant Professor, UAF Sub Campus Toba Tek Singh	2 Years 01.10.21 to 30.09.23	1.417

SN	Title of the Project	Name of the PI	Duration	Budget (Million)
2.	Popularization of home gardening in urban and peri urban areas of Punjab	Project Manager: Prof. Dr. Muhammad Jalal Arif, ZONE-1: Dr. Muhammad Muzammil Jahangir, ZONE-2: Dr. Rashad Waseem Khan Qadri, ZONE-3: Dr. Muhammad Atiq, ZONE-4: Dr. Muhammad Dildar Gogi	3 Years 01.11.21 to 30.10.24	8.035

## 3.5 Ongoing Projects during 2021-22

SN	Title of the Project	Name of the PI	Duration	Budget (Million)
1.	Targeting Actions to Improve the Ornamental Plant Production System for Strengthening Floriculture Industry	Dr. Adnan Younis, Assistant Professor, I.H.S, UAF	3-years 30.09.19 to 31.08.22	2.754
2. Auger Hole Technology: An Economical Technique for the Reclamation of Dense Saline-Sodic Soils		Prof. Dr. Ghulam Murtaza, Institute of Soil & Environmental Sciences, University of Agriculture, Faisalabad	3 Years 01.05.020 to 30.04.23	3.542
3.	Establishment of Grapes Germplasm Unit (GPU) for Technology Transfer	Prof. Dr. Muhammad Jaffar Jaskani, I.H.S, UAF	3-years 15.04.19 to 14.04.022	4.409
4. Establishment of Community Oriented Plant Disease Diagnostic Clinic at UAF Sub-Campus Burewala		Dr. Sohail Akhtar, Assistant Professor, UAF Sub-Campus Burewala	3-years 15.04.19 to 14.04.022	1.849
5.	Uplifting Monetary Conditions of Chilli Growers by Creating Awareness about Disease Problems and Their Management	Dr. Nasir Ahmed, Assistant Professor, Department of Plant Pathology, University of Agriculture, Faisalabad	3 Years 01.07.20 to 30.06.23	1.476

SN	Title of the Project	Name of the PI	Duration	Budget (Million)
6.	AgroChain - An Intelligent System to Track Down Counterfeit Agricultural Inputs using IoT & Blockchain Technology	Dr. Saqib Ali, Assistant Professor, Department of Computer Science, UAF	2 Years 01.11.20 to 30.10.22	1.335

## 3.6 Project Completed during 2021-22

SN	Title of the Project	Name of the PI	Duration	Budget (Million)
1.	Capacity Building and Entrepreneurship Linkage Development- a Package for Date Palm Growers of Punjab	Dr. Summar A. Naqvi, Assistant Professor	2 Years 15.04.19 to 14.04.21 & Ext.31.10.21	2.544

#### **PROGRESS AND ACHIEVEMENTS FROM SOME SIGNIFICANT PROJECTS**

FEEDING SCAVENGING CHICKEN FOR DEFICIENT NUTRIENTS- PROVEN STRATEGY TO IMPROVE GROWTH AND PRODUCTION OF RURAL CHICKEN (ongoing in 2021-22)

### Dr. Umar Farooq

Pakistan is facing crisis in terms of malnutrition that is worst of its kind. Malnutrition has long lasting consequences on rural households and several initiatives including chicken distribution for meat and egg production has long been remained part of the strategy to counter this problem.

Rural/scavenging poultry largely rely on "fibrous food" (i.e. crop residues, kitchen waste, and low quality pastures) that is generally deficient in energy, protein, minerals, and vitamins. For proper growth and egg production a chicken needs around 90-100gms of completely balanced diet on daily basis. Scavenging chickens do not get the required nutrients from pastures and the situation become even worst during dry and cold weathers. Feeding continuously on nutrient deficient diets result in development of weak chicken hence the production remained much lower than expected, so the tendency of the rural households (who rely on chicken for supply of meat and eggs) to go nutritionally insecure remain high.

If chickens are fed to fulfill their nutrient needs, high growth and egg production can be achieved hence the target of food security can be accomplished. This project provides base for estimation of the quantity and quality of the nutrients available to the rural/scavenging chicken in different seasons. The project is in progress and after estimation of deficient nutrients nutrient-rich capsules/ pellets will be prepared to fulfill energy, protein, minerals and vitamins gap. This strategy will help in improving chicken production and cou ntering food security issues.



## AGROCHAIN - AN INTELLIGENT SYSTEM TO TRACK DOWN COUNTERFEIT AGRICULTURAL INPUTS USING IOT & BLOCKCHAIN TECHNOLOGY (ongoing in 2021-22) Dr. Saqib Ali

The growth of counterfeiting represents a serious challenge to several industries. Any one of us may inadvertently purchase fake products in clothing stores, at jewelry store and even at a pharmacy. The problem is not alien to the agricultural industry.



Fake fertilizers, hybrid seeds and agricultural chemicals are among the main reasons for low yields being recorded by farmers. Using counterfeit agrochemicals have severe and direct impacts on crop, production quality, output and consequently on farmers' revenue. Therefore, an intelligent system has been developed to track down counterfeit agricultural inputs (like hybrid seeds, fertilizer, herbicide, pesticides, and other agrochemicals) using NFC Tags\ QRtags and Hyperledger Fabric blockchain technology which makes the efforts of counterfeiters to clone genuine tags redundant since they cannot prove the possession of products on this system. Hence, the developed project ensured great sustainable agriculture in terms of application and quality assurance of high value agricultural inputs particularly for low-income farmers. Furthermore, the developed project helps to ensure high crop productivity and food security in a low-cost manner particularly for small farmers having constrained resources. This also facilitates the Manufacturers, Distributors, Suppliers and Retails of high value agricultural inputs by ensuring the quality, availability, and price of the inputs. The venture is helping to develop an extreme amount of trust among the multi stockholders of the agricultural ecosystem. Especially, the developed project ensures that no counterfeits inputs are applied to agriculture crops which can be verified at any time and place with extreme resistance against tempering. This leads to high value of the agricultural products in specially in international market. Moreover, the development provides support to the government agencies to track, monitor and analyze the application of high value agricultural inputs.

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## VEGETABLE GRAFTING OF CAPSICUM SPP. AND WATERMELON (completed in 2020-21)

Dr. Khuram Ziaf

Grafting technique was optimized for hot and bell peppers and watermelon. For grafting of watermelon, bottle gourd was found to be the best rootstock. Nursery of bottle gourd as rootstock should be sown 18-20 days before sowing of hybrid watermelon variety. Sow hybrid watermelon (scion) when first true leaf of rootstock has emerged. Scion will take about 8-9 days to reach grafting stage. Remove true leaf of rootstock and make hole between cotyledons using tooth pick. This hole should be slightly slanting. Cut scion hypocotyl and make a slanting cut on it. Insert scion in to rootstock. Place grafted plants in complete darkness at 24 °C with 85-95% relative humidity for two days. On 3rd day, expose grafted seedlings to difused light for 20-30 minutes. Increase light exposure duration daily for 9-12 days. Shift plants in tunnel with partial light for 2-3 days for acclimation before transplanting in field. Bottle gourd as rootstock gave highest fruit yield and showed more resistant to drought compared to other rootstocks.

Nursery of rootstock for grafting of hot pepper hybrids should be raised about 30-35 days before sowing of hybrid (scion) for grafting. While, for grafting of bell pepper, rootstock nursery should be sown 50-55 days before sowing of bell pepper scion variety. After performing cleft grafting method, grafted plants of both hot and bell peppers, should be kept in complete darkness, at 22-24 °C with 85-95% relative humidity, for healing of wounds. Avoid water drops falling on grafted plants during healing process. After seven days of keeping grafted plants in complete darkness, expose them to difused light for 20-30 minutes by removing black polythene sheet and moist gunny bags (that should be used to keep darkness and high humidity). Increase interval daily for upto 14 days. Transfer these grafted plants in tunnel for acclimatization for 3-5 days. These last acclimatization days are not required if plants need to be transplanted in tunnel. Parafilm was found best wrapping material to hold graft



union compared with grafting clips, bandage tape and other materials. For hot and bell pepper, local land races Kashmiri and Lodhran performed better than all other tested genotypes. These genotypes showed best result regarding disease resistance.

Technology transfer activities included farmers' training workshops organized at two different places in Gujranwala (hub of watermelon production) and in Mamu Kanjan. Field officers of Syngenta company also participated in Mamu Kanjan. Training session was also conducted at UAF for farmers, students, personnel of seed companies and internees of project "Enhancing productivity in 10 low producing tehsils through deployment of fresh Agri Scientist at Farm level" in which hands on training was given. Forty five internees (mostly from farming background), students, personnel of Spurt International Seed company and three faculty members participated in this training. Field staff involved in grafting of fruit plants were also trained in vegetable grafting. Agricultural Scientists from Sindh province were also demonstrated grafting techniques in both crops. Technology awareness was also created through Social media, i.e. different groups on WhatsApp and Facebook. Two groups of Horticulture, i.e. Horticulture Extension and Vegetables Punjab, which included a large number of extension officers, progressive farmers and academician, were used for this purpose. One day seminar was also organized in which academician, farmers, technical officers vegetable seeds of Syngenta vegetable seeds and Certus seeds Multan, and students participated. Dr. Hafiz Nazar Farid, Assistant Professor, Muhammad Nawaz Sharif University of Agriculture (MNSUA) Multan, who is also



team member in this project (involved to evaluate performance of grafted plants in Multan) got training and now producing grafted cucumber, watermelon and tomato plants at MNSUA Multan under a project funded by HEC (NRPU). A booklet was published in which detailed procedure of grafting of both crops has been elaborated with pictorial illustrations for farmers. Booklet has been distributed among farmers so that they perform grafting themselves.

## COMMUNITY ORIENTED PLANT DISEASE DIAGNOSTIC CLINIC AT UAF SUB-CAMPUS BUREWALA (ongoing in 2020-21) Dr. Sohail Akhtar

Plant diseases are the main concern for sustainable agriculture. In Pakistan, severe economic losses are attributed due to the inability of farmers to diagnose the disease at an early stage. Pesticide companies take benefit of the farmers' simplicity and sell nonperforming and sometimes irrelevant products to farming community. In addition to the financial loss to farmers, use of unwanted products cause serious threat to the ecosystem. In this scenario, it was planned to establish a plant disease diagnostic clinic (PDDC) at UAF Sub-Campus Burewala; with main responsibilities of disseminating the importance of disease diagnosis to the farmers; testing the diseased plant samples for proper disease diagnosis and hence recommending the suitable control measures. The project activities were started in April 2019 with the first program arranged in the form of students training. Volunteer trained students helped in creating awareness regarding importance of disease diagnosis in the farming community. For the accomplishment of said purpose, farmer days were also conducted in nearby villages, in which, subject experts from different disciplines also accompanied the PI. Five villages were targeted in the 1st year, while in the 2nd year, the activities were expanded to eleven (11) villages in the vicinity of the campus. Attempts were made to develop "Test, Dont guess" attitude in the farmers. Resultantly, now farmers started contacting telephonically for their field problems and by bringing their diseased plant samples to our lab. Their samples are being tested for disease diagnosis using standard lab protocols, and recommendations are provided for the better control of the field problems.



## UPLIFTING MONETARY CONDITIONS OF CHILLI GROWERS BY CREATING AWARENESS ABOUT DISEASE PROBLEMS AND THEIR MANAGEMENT (ongoing in 2020-21) Dr. Nasir Ahmed

It was estimated that 40-50% chilliproduction was lost every year in Pakistan due to fungal diseases. It has been observed through experiments that proper drying, packaging, and transportation of chili can half the post-harvest losses in chili. In the current scenario, awareness among farmers about important disease problems in chilli under field conditions and management practices, is the best solution. The project entitled "Uplifting monetary conditions of chilli growers by

awareness about creating disease problems and their management" was started on 01-01-2020 and the tasks mentioned in the plan of work have been accomplished successfully. The selection of different done location was for choosing the chilli farmers for transplanting disease



free nursery of chilli and for training sessions regarding identification of chilli diseases and their management practices was done. Small holding farmers were identified and their selection was done with the help of Agriculture officers from Faisalabad and Chiniot. Project team visited from both districts; Gardhana, Maita, Thikriwala, Pansara, Gojra road sites, (Chak bandi, Jewan Shah, Kiran Zarai Farm, Bhutto Colony, Chambay Wala, Thatta Thakar, Pubber Wala, Haweli Bana, Wahid Shah Wala, Bhalo, Chak No. 195, Moza Bonga, Chak No. 129/JB) for the execution of project activities. Collaboration was developed with the Agriculture Extension department of the concerned areas from Faisalabad and Chiniot. Current project can largely helped chilli farmers in the identification of chilli diseases and establish of disease-free nursery. Farmer's meetings were organized in the selected areas of both Districts (Gardhana, Maita, Thikriwala, Pansara, Gojra road site, Chak bandi, Jewan Shah, Kiran Zarai Farm, Bhutto Colony, Chambay Wala, Thatta Thakar, Pubber Wala, Haweli Bana, Wahid Shah Wala, Bhalo, Chak No. 195, Moza Bonga, Chak No. 129/JB). Contacted farmers were highly willing to grow the disease-free nursery of chilli on their farmlands. Similarly, training sessions were organized at these sites with the cooperation of Agriculture Officer (Agri-Extension) of the concerned area. There are many social as well as economic problems facing by chilli production including, illiterate farming community, high cost of inputs, small landholdings, less adoptability of innovations by the farmers, lack of guidance to farmers, high cost of production and insecurity in the market but the cost of production being the most important one.

## TARGETING ACTIONS TO IMPROVE THEORNAMENTAL PLANT PRODUCTION SYSTEM FOR STRENGTHENING FLORICULTURE INDUSTRY (ongoing in 2020-21)

#### **Dr. Adnan Younis**

Ornamental plant nursery is an important area in horticultural industry, and it has increasing demand these days due to massive landscaping environmentally friendly and plantation worldwide. In ornamental nursery production, many factors involved in improving the efficacy of plant production such as growth media, plant germplasm, fertilizer selection, irrigation management, location of plant production area etc. Therefore, germplasm was collected in the first year. Ornamental mother plants are distributed into house plants, palms, shrubs, and trees.

According to germplasm collection scheme for three years, thirteen house plant species including 4 dracaena species were collected. In palm categories, nine palm species were collected as germplasm (Table 1). Five Ficus species and eleven ornamental shrubs were purchased to propagate as ornamental plant production system. Four plant species utilized as border and ground cover plants were collected as mother plants. Seeds of two tree species and nine palms were collected to sow for plant production system. All the above germplasm was placed in at Gardening Wing Nursery, University of Agriculture, Faisalabad.

Improvisation of plant propagation by cutting method utilizing rooting hormones To check the plant growth regulators efficacy, three commercial synthetic rooting hormones, viz. Indole butyric acid (IBA), 1-Naphthaleneacetic acid (NAA) and Salicylic acid (SA) were purchased. Improvement in seed germination characteristics of Cassia fistula seeds by plant growth regulators



Seeds of Cassia fistula tree were collected from University of Agriculture Faisalabad from

different planting locations. Seeds were cleaned from dust, washed normally, and stored in room conditions until experimental use. Germination experiment was performed in small pots in greenhouse area. For seed treatment, aqueous solutions with each 47 concentration of Indole butyric acid (50 mgL-1, 100 mgL-1, 200 mgL-1) and Naphthalene acetic acid (NAA) (50 mg L-1, 100 mg L-1, 200 mg L-1) were formulated separately. Control was also maintained in parallel with treated material. Using soaking method, 30 seeds were soaked for 2-3 hours at 30-35 °C in each treatment before sowing in pots. After that, seeds were soaked in germination media (60% peatmoss: 20% silt: 20 % leaf manure). Regular watering of all pots was performed until final germination occurred.



## **3.7 UNIVERSITY OUTREACH PROGRAM**

The University outreach activities initiated as a project during 2010-11 was converted into a program with recurring budget under Technology Transfer Component. Under this program, faculty members submit as proposal for an activity ranging from one day to one week. Under outreach program, proposals may cover hands-on trainings, demonstrations, farmers/ gathering, exhibitions and lectures/seminars for the awareness/sensitization of the community.

These programs have received enormous response and have been highly admired. The outreach activities conducted during the year 2020-21 & 2021-22 are as under.

SN	Title of the Project	Name of the PI
1.	Dr. Adnan Younas, Officer In-charge, Gardening Wing, UAF	Hands of Training: 3 D Landscape design and Management at UAF August 10-13, 2021
2.	Prof. Dr. M. Qamar Bilal, Institute of Animal & Dairy Sciences, UAF	Tagging and Coding of Plant Species at UAF During October 2021
3.	Dr. Haroon Zaman Khan, Director, Directorate of Farm, UAF	Dissemination of Sustainable Wheat Production Technology and Wheat Sowing Campaign at UAF Sub Campuses (TT Singh, Burewala and Okara) November 09, 11 & 13, 2021
4.	Dr. Nisar Ahmad, Principal, UAF Sub-Campus TT Singh.	Dissemination of Sustainable Wheat Production Technology and Wheat Sowing Campaign at TT Singh Campus November 09, 2021
5.	Dr. Sajid Mehmood Nadeem, Principal, UAF Sub-Campus Burewala/Vehari	Dissemination of Sustainable Wheat Production Technology and Wheat Sowing Campaign at Burewala Campus November 11, 2021
6.	Dr. Tariq Aziz, Principal, UAF Sub-Campus Depalpur/Okara.	Dissemination of Sustainable Wheat Production Technology and Wheat Sowing Campaign at Okara Campus November 11, 2021
7.	Dr. Muhammad Azam, Assistant Professor, Institute of Horticultural Sciences, UAF	Harvesting and Packaging Management in Guava at Chak No. 1 Sargodha Road and Pensara, Fsd December 15, 2021
8.	Prof. Dr. M. Jafar Jaskani, Institute of Horticultural Sciences, UAF	Citrus & Date Palm Field Visit and Technology Transfer at DG Khan January 07, 2022

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SN	Title of the Project	Name of the PI
9.	Prof. Dr. M. Qamar Bilal, Institute of Animal & Dairy Sciences, UAF	Workshop on Capacity Building of Gardening Wing at UAF January 14, 2022
10.	Prof. Dr. M. Qamar Bilal, Institute of Animal & Dairy Sciences, UAF	Capacity Building of Security Wing at UAF February 10, 2022
11.	Dr. Haroon Zaman Khan, Director, Directorate of Farm, UAF	Promotion of Maize Soybean Cultivation/ intercropping and Wheat Productivity Enhancement Campaign of UAF in Kot Fateh Khan Farmers Festival at Attock District February 18 to 20, 2022
12.	Ms. Hira Iftikhar, Institute of Home Sciences, UAF	Assessment of Nutritional Status and Cognitive Development (through WISC-R Test) of School Going Children Before and After Provision of Micronutrient Fortified Snacks at Sunny Public Ideal School, Chak No. 64/JB, Fsd February 28, March 15, April 05, April 19, & May 05, 2022
13.	Dr. Nadeem Akbar, Director, WMRC, UAF	Wheat Production and Harvesting Technologies at W.M. Farm Chak No. 221/ RB, 15-Rasala, Fsd March 05, 2022
14.	Dr. Adnan Younas, Officer In-charge, Gardening Wing, UAF	Importance of Floriculture and Landscape for Stakeholders and Community with Demonstration at UAF March 14 to 16, 2022
15.	Dr. Shoaib Ur Rehman, Lecturer, UAF Sub-Campus Depalpur, Okara	National Potato Festival- 2022 at Okara Campus March 21 to 23, 2022
16.	Dr. Naveed Farah, Department of Rural Sociology, UAF	Community Awareness for Water Conservation at UAF March 22, 2022
17.	Dr. M. Saif-ur-Rehman, Associate Professor, Institute of Animal and Dairy Sciences, UAF	Sheep and Goats Show/Competition at UAF March 24, 2022
18.	Dr. M. Anjum Zia, Principal, UAF Community College, PARS	Awareness Campaign for Tree Plantation to Save Environment at PARS-Community College, UAF March 24, 2022

SN	Title of the Project	Name of the PI
19.	Dr. Haroon Zaman Khan, Director Directorate of Farms, UAF	Knowledge dissemination among farmers through different festivities and interactive session with UAF Scientists at UAF March 24 to 26, 2022
20.	Dr. Sikander Ali, Department of Irrigation & Drainage, UAF	Citrus & Date Palm Field Visit and Technology Transfer at DG Khan May 19-20, 2022

## **HIGHLIGHTS OF SOME SIGNIFICANT OUTREACHER ACTIVITIES**

Event	:	Importance of Floriculture and Landscape for
		Stakeholders and Community with Demonstration
Team Leader	:	Dr. Adnan Younas, Associate Professor, Institute of
		Horticulture, Science, UAF
Date	:	March 14-16, 2022
Venue	:	Expo Centre, UAF

## **Details of Activities**

This activity was the part of Spring Festival that was held on 14th -16th of March 2022. It was organized by Gardening Wing Estate Department, University of Agriculture Faisalabad. The Vice Chancellor Prof. Dr. Igrar Ahmad Khan (SI) inaugurated the event. He visited different stalls and technologies displayed by various organizations in Expo center and appreciated the efforts of organizers and participants. This activity imparted awareness among researchers, general public, farmers, civil society and students about the importance of flowers and plants in human life. This event helped to introduce modern concepts about landscape designing, recent advances in flower production technology and postharvest handling of flowers and also enabled the participants to collaborate with other organizations concerned with Floriculture and Landscape. Latest and advanced technologies for growing indoor plant and other annual flowers to growers were



practically demonstrated. Recent advancements in packing and value addition of floricultural products were also disseminated as well as demonstrated which were developed by various research organizations. The festival encouraged students, farmers, growers and nurserymen to present their talent and provide an opportunity to look for new products, developments and technical background information in relevant field.

•	Promotion of Maize Soybean Cultivation/Intercropping		
	and Wheat Productivity Enhancement Campaign of		
	UAF in Kot Fateh Khan Farmer's Festival		
:	Dr. Haroon zaman Khan, Director Farms, UAF		
:	February 18-20, 2022		
:	District Attock (Kot Fateh Khan, Maoza Fateh Jang,		
	Awan Pur)		
	:		

#### **Detail of activities**

A progressive farmer of the area, Nawab Arslan Khan had arranged a Farmers' festival in which different farmer based games were organized. A large number of farmers gathered for entertainment. Keeping in view the opportunity for interactive session with the farmers, an outreach activity was conducted. UAF also participated in the event UAF Tentpegging Team. Dr. Haroon Zaman Khan welcomed the farmers, and gave a brief note on Importance of Soybean for Pakistan and said that more than one billion US dollars are being invested for import of soybean for making oil to fulfill the need of poultry industry in Pakistan.

He further elaborated the Possible Strategies to adjust soybean in present cropping systems of Pakistan like intercropping of Maize-Soybean or as sole soybean cultivation particularly in this area.

Dr. Muhammad Aslam addressed the farmers and gave a brief note on Maize crop. He gave the Sustainable Maize Production Technology for District Attock. He added the sowing time, seed bed preparation, seed rate, irrigation and fertilizer requirement, insect/pest and disease management, proper timing for harvesting and controlling post-harvest losses and storage of the produce for Maize Crop. He further discussed about the Wheat productivity enhancement campaign by UAF.

Mr. Amir Saeed Rana, Assistant Professor University of Agriculture Faisalabad, gave a detail on Economics of Soybean cultivation & its importance to strengthen the small farmers especially in District Attock.







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He added that, Soybean is an enriched plant having 38-42 percent protein contents and 18-22 percent oil contents along with essential amino-acids, minerals and Vitamins. He also described the sowing time, seed bed preparation, seed rate, irrigation and fertilizer requirement, insect/ pest and disease management, proper timing for harvesting and controlling post-harvest losses and storage of the produce for Soybean Crop.

Participation of UAF created a soft image of University of Agriculture, Faisalabad in the farmers.



At the end of farmers gathering meeting, questions were made by the farmers about their ongoing wheat crop issues, which here addressed by university experts. Vote of thanks was given by progressive farmer of the area, Nawab Arslan Khan. Besides this, discussion was made to get the above mentioned objectives in small farmer group gatherings during whole day event of Tent pegging.

Event	:	Assessment of Nutritional Status and Cognitive
		Development (through WISC R Test) of School Going
		Children before and after Provision OF Micronutrient
		Fortified Snacks.
Team Leader	:	Hira Iftikhar, Institute of Home Sciences, UAF
Date	:	February -May 2022
Venue	:	Sunny Public Ideal School, Chak No. 64/JB, Fsd

Main objectives of this outreach activity involved.

- Identify nutritional and cognitive status of school going children via initial screening Dietary, developmental and hygiene habits modification via visual aids and guidance.
- Focus to improve nutritional status and cognitive development of children via provision of micronutrient fortified snacks.
- Different activities were planned in order to fulfill project objects.

These activities were conducted according to needs of growing children. During 1st visit (28-02-2022), initial screening of children was done and study groups were formulated. However,

nutrition guidelines through learning materials and micronutrient fortified snacks were provided to all participants. During 2nd visit (16-03-2022), dietary record of study groups was recorded as well as general awareness talk on healthy eating habits was delivered to enrolled participants. Outreach project's 3rd visit (07-04-2022), mainly focused on giving awareness on self-care. Screening of children, who were given micronutrient fortified snacks, was done and were guided for regular follow up. Home-based approaches in order to provide nutritionally adequate products from available food sources was main objective of 4th visit (17-05-2022). In this visit students were given awareness on healthy eating habits, selection of healthy snacks etc. Nutritional benefits were described to study subjects. However, last nutritional and cognitive followingup examinations were conducted during 5th visit (24-05-2022).

Thus, improvement in nutritional status and to better develop their learning abilities in growing children through healthy and micronutrient focused snacks was main.



Improvement in dietary behaviors were observed via results from dietary record as well as nutritional screening. Fortification improved specific cognitive abilities in these children including working memory. It plays a crucial role in attention, memory status, learning behavior, motor control, and emotional effect modulation.

#### Conclusion

The fortification of foods like chickpeas, breads, and other cereal grains is an economical and easy way to provide essential nutrients like iron, zinc and vitamin A to the targeted population like young children. Chickpeas enhances the iron absorption in the body making it more bioavailable. These micronutrients are



crucial for the brain development and cognition of the children and fortification of these key nutrients makes them available for targeted population. It can be concluded at the end that fortification of our daily dietary components with micronutrients is an economical and healthy approach in combating learning difficulties and cognitive problems in school going children.

#### **Recommendations**

- The implementation of food fortification techniques should be encouraged in the local system to overcome micronutrient deficiencies.
- The use of economical food vehicles such as chickpeas, wheat, rice, should be implemented to make it available for all the vulnerable groups including children.
- The cognitive disabilities and learning problems should give attention to be treated by the intake of essential micronutrients.



Event	:	Sheep & Goat Show/Competition
Team Leader	:	Dr. Muhammad Saif-ur-Rehman, Associate Professor,
		Institute of Animal and Dairy Sciences, UAF
Date	:	March 24, 2022
Venue	:	Agriculture Heritage Museum, UAF

#### **Sheep and Goat Beauty competitions:**

The registered animals were evaluated/judged for their beauty in each category. For this purpose a separate beauty ring was arranged by the organizers. Sheep or Goats, upon entering the ring, were evaluated as per breed standards by a panel of judges comprising of four member. The categories were Beetal Faisalabadi Male, Beetal Faisalabadi Female, Beetal Faisalabadi Flock, Beetal Nagri Male, Beetal Nagri Female, Beetal Nagri Flock, Teddy Goat Flock, Nachi Goat Flock, Lohi Sheep and Mundri Sheep.



Upon agreement among the panel of judges, the judges declared the first, second and third positions for each category. The animals were also decorated with different colors of ribbon (Red for First, Yellow for Second and Green for Third).

Animal Shows have long been in vogue as a tool for networking opportunities for educationists, researchers, extension workers and industry people. University of agriculture, Faisalabad has a tradition of organizing such shows as a teaching tool for training young people. At University of Agriculture, Faisalabad Animal shows are a permanent feature and people wait for the occasions throughout the year. The sheep and goat show provided an opportunity for goat lovers at public level to show their breeds and compete for beauty. Availability of good breeding animals was another outcome for public who want to start sheep and goat farming.

Actually, Goats in Pakistan are the fastest growing animal species. There are 25 breeds of goat with a total population of 60 million. Preference for goat meat is the major reason for its faster growth in the country. The Beetals are the most popular breed. Appreciable diversity

among and within goat breeds exists in morphological, growth, fertility and other traits. Sheep and Goat raising is generally a low input activity, however, raising of sacrificial animals is specialized in certain areas of the country and production system may be quite intensive. Within-breed, selection is a preferred strategy for improvement of traits of economic importance. The conduct of interactive session with breeders helped in their capacity building and it is expected that indigenous sheep and goat resources can be better utilized on sustainable basis if farmers get organized to augment breed development efforts.



## Outcomes

- Awareness among livestock keepers and general public about unique genetic potentials and beauty attributes of sheep and goats
- Training of farmers regarding recommended techniques for enhanced productivity
- Awareness for raising of good sheep and goats as pets, and sacrificial animals or for commercial purposes
- Helped in teaching and practical demonstration of indigenous breeds of sheep and goats.



Event	:	<b>Community Awareness for Water Conservation</b>
Team Leader	:	Dr. Naveed Farah, Lecturer, Rural Sociology, UAF
Date	:	22 March, 2022 at UAF Main Campus &
		25 March, 2022 at Schools in District Chiniot
Venue	:	UAF Main Campus
		Govt. Boys High School, Chak No. 152 JB, Tehsil &
		District Chiniot &
		Govt. Non-Formal Basic Education School, Ratta Pur,
		Chiniot.

The activity was arranged to raise the awareness about water conservation and a large number of people got awareness about the importance of water saving. The message was also disseminated to larger society through print and electronic



media coverage. An awareness walk was arranged from Admin Block to Clock Tower, UAF. The Vice Chancellor Dr. Iqrar Ahmad Khan, lead the walk. The participants of the walk emphasized the importance of water conservation through different messages and motivational slogans.

In order to mobilize the community about adopting water saving techniques pamphlets, in both Urdu and English languages, were distributed among the people at University. The pamphlets were designed to graphically show the different tips and techniques to save water.

An awareness session about the importance of water and water conservation was also conducted at Govt.



Boys High School, Chak No. 152 JB, Tehsil and District Chiniot. The district Literacy Mobilizer, Chiniot M. Imran Khan, who is also a student of M.Phil. in department of Rural Sociology, gave a brief lecture to the students and teachers of high school about the water conservation and shared some important but easy water saving techniques to save water at household and workplace. To educate the children about water conservation, an awareness session was conducted at Govt. Non-Formal Basic Education School, Ratta Pur, Tehsil and District Chiniot. The District Literacy Mobilizer discussed with young school children and their mothers that how they can save water during their household activities.

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## **RESEARCH & DEVELOPMENT**

## 4. RESEARCH & DEVELOPMENT

As a response to the Dengue outbreak in the country, the activities under this component were initiated in 2011. This involved the commencement of projects which were entirely centered on research and development regarding Dengue. These projects have been concluded, and the activities under this component have been broadened. Nevertheless, the funding available is limited and exclusively allocated to significant projects involving applied research.

## 4.1 Ongoing Projects during 2020-21

SN	Title of the Project	Name of the PI	Duration	Budget (Million)
1.	Development of Innovative Jujube, Peach and Guava Products and Capacity Building Under Public Private Partnership Mode	Dr. Muhammad Inam- ur-Raheem, Assistant Professor, National Institute of Food Science and Technology, UAF	2 Years 01.01.020 to 31.12.021	2.022
2.	Study of Cellular Cannibalism (Entosis) in Tumors of Animal Origin	Dr. Syed Qasim Raza, Assistant Professor, University of Veterinary and Animal Sciences, Lahore	2 Years 01.01.020 to 31.12.021	1.323
3.	Effect of B-Galacto- oligosaccharides on Muscle, Bone and Gut Development of Physiologically Stressed Broilers	Dr. Hafsa Zaneb, Department of Anatomy & Histology, UVAS, Lahore	1 Year 01.01.20 to 31.12.20	1.44
4.	Exposure Assessment of Infants to Aflatoxin M1 Through Consumption of Breast Milk and Its Association with Nutritional and Socioeconomic Status of Lactating Mothers	Dr. Azmat Ullah, Assistant Professor, Department of Food Science & Human Nutrition, University of Veterinary and Animal Sciences, Lahore	18 Months 01.01.020 to 30.06.021	1.146
5.	Utilization of Vegetable Waste to Produce Antioxidants Enriched Poultry Meat and Eggs	Dr. Jibran Hussain, Assistant Professor, Department of Poultry Production, University of Veterinary & Animal Sciences, Lahore, Ravi Campus, Pattoki	2 Years 01.01.020 to 31.12.021	1.179

SN	Title of the Project	Name of the PI	Duration	Budget (Million)
6.	Local Development of Micro Plot Seeder for Improving Efficiency of Agricultural Experiments	Dr. Umair Sultan, Associate Professor, Muhammad Nawaz Shareef University of Agriculture, Multan	2 Years 01.01020 to 31.12.021	2.302
7.	Development and Dissemination of Meat Type Japanese Quail Breed to Counter Malnutrition among Rural Women and Children	Dr. Umar Farooq, Assistant Professor, UAF Sub Campus Toba Tek Singh	2 Years 01.01.020 to 31.12.021	1.385
8.	Molecular Detection, Pathobiology and Immunoprophylaxis of Fowl Typhoid in Commercial Poultry (broiler & breeder flock)	Dr. Farzana Rizvi, Associate Professor, Dept. of Pathology, University of Agriculture, Faisalabad	2 Years 01.01.020 to 31.12.021	1.89

## 4.2 Project Completed during 2020-21

SN	Title of the Project	Name of the PI	Duration	Budget (Million)
1.	Detection of novel coronavirus (nCoV-19) by real-time RT-PCR	Dr. Mashkoor Mohsin Gilani, Assistant Professor, Inst. of Microbiology, UAF	6 Months 15.05.20 to 14.11.20	1.974

## 4.3 Project Initiated during 2021-22

SN	Title of the Project	Name of the PI	Duration	Budget (Million)
1.	Domestication of wildly grown black raspberries for exploiting their nutritional and commercial potential under climatic conditions of Rawalakot, Azad Jammu and Kashmir	Dr. Mehdi Maqbool, Assistant Professor, Department of Horticulture, University of Poonch, Rawalakot, Azad Jammu and Kashmir	3 Years 01.10.21 to 30.09.24	2.199

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## 4.4 Ongoing Projects during 2021-22

SN	Title of the Project	Name of the PI	Duration	Budget (Million)
1.	Green Nano-Pesticides: A Novel Approach for Pest Control	Dr. Nazish Jahan, Assistant Professor Department of Chemistry, UAF	3-years 15.04.19 to 14.04.022	1.981
2.	Study of Cellular Cannibalism (Entosis) in Tumors of Animal Origin	Dr. Syed Qasim Raza, Assistant Professor, University of Veterinary and Animal Sciences, Lahore	2 Years 01.10.20 to 30.09.22	1.323
3.	Utilization of Vegetable Waste to Produce Antioxidants Enriched Poultry Meat and Eggs	Dr. Jibran Hussain, Assistant Professor, Department of Poultry Production, University of Veterinary & Animal Sciences, Lahore, Ravi Campus, Pattoki	2 Years 01.10.20 to 30.09.22 (Ex)	1.179
4.	Domestication of wildly grown black raspberries for exploiting their nutritional and commercial potential under climatic conditions of Rawalakot, Azad Jammu and Kashmir	Dr. Mehdi Maqbool, Assistant Professor, Department of Horticulture, University of Poonch, Rawalakot, Azad Jammu and Kashmir	3 Years 01.10.21 to 30.09.24	2.199

## 4.5 Projects Completed during 2021-22

SN	Title of the Project	Name of the PI	Duration	Budget (Million)
1.	Development of Innovative Jujube, Peach and Guava Products and Capacity Building Under Public Private Partnership Mode	Dr. Muhammad Inam- ur-Raheem, Assistant Professor, National Institute of Food Science and Technology, UAF	2 Years 01.01.020 to 31.12.021	2.022

SN	Title of the Project	Name of the PI	Duration	Budget (Million)
2.	Effect of B-Galacto- oligosaccharides on Muscle, Bone and Gut Development of Physiologically Stressed Broilers	Dr. Hafsa Zaneb, Department of Anatomy & Histology, UVAS, Lahore	1 Year 01.01.20 to 31.12.20	1.44
3.	Exposure Assessment of Infants to Aflatoxin M1 Through Consumption of Breast Milk and Its Association with Nutritional and Socioeconomic Status of Lactating Mothers	Dr. Azmat Ullah, Assistant Professor, Department of Food Science & Human Nutrition, University of Veterinary and Animal Sciences, Lahore	18 Months 01.01.020 to 30.06.021	1.146
4.	Local Development of Micro Plot Seeder for Improving Efficiency of Agricultural Experiments	Dr. Umair Sultan, Associate Professor, Muhammad Nawaz Shareef University of Agriculture, Multan	2 Years 01.01020 to 31.12.021	2.302
5.	Development and Dissemination of Meat Type Japanese Quail Breed to Counter Malnutrition among Rural Women and Children	Dr. Umar Farooq, Assistant Professor, UAF Sub Campus Toba Tek Singh	2 Years 01.01.020 to 31.12.021	1.385
6.	Molecular Detection, Pathobiology and Immunoprophylaxis of Fowl Typhoid in Commercial Poultry (broiler & breeder flock)	Dr. Farzana Rizvi, Associate Professor, Dept. of Pathology, University of Agriculture, Faisalabad	2 Years 01.01.020 to 31.12.021	1.89

## PROGRESS AND ACHIEVEMENTS FROM SOME SIGNIFICANT PROJECTS

## DETECTION OF NOVEL CORONAVIRUS (NCOV-19) BY REAL-TIME RT-PCR (completed in 2020-21)

## Dr. Mashkoor Mohsin Gilani

In this project, a Biosafety Level II lab has been developed for coronavirus testing having a capacity to detect the virus from human, animal and environmental samples. The facility has been tested and certified by Punjab Healthcare Commission, Government of Punjab. Real-time PCR techniques were used to detect coronavirus. This method is currently considered as gold standard for coronavirus detection. This facility has been further extended to institutional capacity and trained human resource for coronavirus testing in Pakistan. In this regard, hands on training workshops were conducted to trained human resource from different institutes of Punjab and KPK



فصل آباد: زرگا بو نیورش کے انسٹیوٹ آف آئیرد با کیاوج کی 6 روزہ پہلی شکل ورکشاپ کی افتتا می آخر یب یہ ڈینی یکلی سائنٹر پر وفسر ڈاکنز طفر اقبال قریش، ایکر یکٹوڈائر یکٹرڈ می ادارہ محت میٹر جزل (ر) ڈاکٹر عام اکر امار اور ڈاکر یکٹر پر وفسر ڈاکٹر سواد ارض چیف آرکنا تراز کالم مقلومی کیلانی خطاب کررے ہیں



## DOMESTICATION OF WILDLY GROWN BLACK RASPBERRIES FOR EXPLOITING THEIR NUTRITIONAL AND COMMERCIAL POTENTIAL UNDER CLIMATIC CONDITIONS OF RAWALAKOT, AZAD JAMMU AND KASHMIR (ongoing in 2021-22)

#### Dr. Mehdi Maqbool

In this project, wildly gorwn black raspberry plants were domesticated at Research Farm of University of Poonch Rawalakot, AJK. For this purpose, land was prepared at Chotta Galla Farm, and clean and healthy balck raspberry plants were transferred. Land was prepared using standard management practices and for soil analysis, samples were taken and analysed to check the fertility status of soil at project site. After transferring black raspberry plants to the field, some of the plants died and some struggled to establish their roots which were replaced with other plants. However, so far the growth of black raspberry plants is guite satisfactory and they are performing very well under the local coditions. At the time of transplanting, FYM was mixed with the soil in a ratio of 1:1 and immediately after transplating, the plants were provided water. As the winter season finished, the sprouting of new leaves started. Moroever, the whole project area has been fenced using green net sheet and iron wire to protect it from the animals. To



perform all the research activities, a PhD student has been appointed who is involved in all the project activities.



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## UTILIZATION OF VEGETABLE WASTE TO PRODUCE ANTIOXIDANTS ENRICHED POULTRY MEAT AND EGGS (ongoing in 2021-22)

### **Dr. Jibran Hussain**

Soon after the release of funds, project activates were started. Tender process for purchase of feed was started immediately. It was anticipated that hatching of Naked neck chicks would be completed within two months. however due to Covid-19 lockdown situation, the process of chick hatching delayed, hence, extension was requested in order to properly execute the project activities.

Proximate composition and Selenium analysis of cabbage, spinach, lucerne and commercial feed have been completed Selenium contents analysis of soil samples has also been completed. Chicks have been placed in the experimental sheds. Weekly body weight and other related parameters including growth, morphometric traits, and physiological traits are being recorded. Chicks were reared and their and immune response were assessed. After the maturation stage, the naked neck chicken were slaughtered. After slaughtering the bird,



Carcass was weighed as hot eviscerated carcass weight and its re was calculated with respect to live weight to calculate dressing percentage. The carcass was eut in different cut-up parts such as thigh, drumstick, breast, wings, ribs, back and their % were calculated relative to the live bird weight. The pH of the breast meat was measured using a pH meter. For meat color, the breast samples were evaluated for lightness, redness and yellowness. Breast meat samples were weighed and covered with plastic bags followed by hanging at 40 °C for 24 hours. Drip loss was measured as a percentage of weight lost during 24 h of refrigerated storage. Shear force was measured by using warner-bratzler shear force texture analyzer. Immune assessment status of the experimental birds alongwith the weight of thymus, bursa and spleen were evaluated.
# DEVELOPMENT AND DISSEMINATION OF MEAT TYPE JAPANESE QUAIL BREED TO COUNTER MALNUTRITION AMONG RURAL WOMEN AND CHILDREN (completed in 2021-22)

# **Dr. Umar Farooq**

Poultry species provide excellent protein in terms of meat and eggs. In Pakistan, rural households mainly rely on local chicken for supply of meat and eggs. However, it is very unfortunate that poor-rural households seldom consume chicken meat as food because killing one chicken to get meat causes a significant loss of asset in terms of birds. On the other hand local chicken grow slowly and takes almost 7 to 8 months to reach mature weight so, it offers little to meet nutritional needs of the rural households. This project offered improved breed of Japanese quail for this purpose.

The Japanese quail is grown all over the world. Quail meat and eggs are rich in nutrients, minerals and vitamins and make very good food for children, young ones, adults, pregnant women and elderly. Quails attain market weight within four to five weeks. Quail farming also has certain advantages over other poultry species like chicken. It occupies small space and consumes less feed and matures within very short period of time (7-8 weeks). It can be sold at reasonable price in market and restaurants, and good profit can be obtained. Households adopting this enterprise produce quail on continuous basis and earn their livelihood.

Wild quails in Pakistan produce only 70-80 gram of body weight within five week's period; however, improved exotic breeds grow better. A fair number of quails are grown on commercial scale and also at household level in Pakistan yet slow growth and less meat yield makes it less attractive for farming or production at household level. In order to promote farming of this wonder bird at commercial scale and disseminate its benefits to malnutrioned



poor households, this project worked to improve quail production through selection of high quality parents until five generations and produce offspring with high growth rate, better final body weight gain, feed to gain ratio and survivability. The new breed grows faster and has almost doubled the body weight with twenty percent less feed consumption than the wild quails present in Pakistan. The improved breed **(Uni-GAINT)** of quail is available at UAF Sub Campus Toba Tek Singh for dissemination to rural households

# EFFECT OF ß-GALACTO-OLIGOSACCHARIDES ON MUSCLE, BONE AND GUT DEVELOPMENT OF PHYSIOLOGICALLY STRESSED BROILERS (completed in 2021-22)

# **Prof Dr Hafsa Zaneb**

The poultry industry has a great impact on the economy of our country. Broiler meat is considered a cheaper source of protein than red meat or any other source of animal protein (beef and mutton). The poultry industry has a significant contribution to GDP (1.4%) and it also contributes 35% of the total meat production in the country. The poultry industry is facing many challenges for sustainability and meat production. One of them is stress. Broilers are exposed to different types of stressors including transportation stress, thermal stress, poor handling, high stocking density, and infectious diseases. These stressors have diverse impacts on broiler production. Stress induces the activity of the hypothalamic-pituitary-adrenal (HPA) axis. Antibiotics were previously used as antibiotic growth promoters to cope with various stress factors in broiler production. Antibiotics residue in broiler meat have adverse effects on human due to the transference of antimicrobial resistance. Therefore, the researchers have focused on the search for alternatives such as probiotics, phytogenic substances, and plant extractions (aromatic), amino acids, essential oils, synbiotics, organic substances and prebiotics. The ß-galacto-oligosaccharide (ß-GOS) is used as a prebiotic It is a short-cham carbohydrate of galactose oligomer which contains some units of galactose, lactose and glucose. It has ß-(I+6) galactosyl-linked residues and terminating linkage of 13-(1+4) of the glucose The ß-GOS is fermented by bacteria of the colon, which forms the basis of their mechanism of action. Fermentation of GOS increases the production of short-chain fatty acids and is a source of energy for enterocytes. The present study demonstrates the positive effects of various dietary concentrations of B-GOS on muscle bone and gut development during physiological stress in broilers. Results demonstrated



that dexamethasone negatively influenced the growth traits, weights of viscera, intestinal architecture, components of the gut barrier and selected meat quality parameters in broilers. Supplementation of 0.5% ß-GOS improved live body weight, growth performance, weight of heart, gizzard and small intestine, villus surface area of duodenum and ileum diaphyseal diameter, robusticity index and medullary canal diameter of tibia bone. Hence, we concluded that supplementation of 13-GOS can improve the growth performance, muscle, bone and gut development in broiler.

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# UTILIZATION OF VEGETABLE WASTE TO PRODUCE ANTIOXIDANTS ENRICHED LOCAL DEVELOPMENT OF MICRO PLOT SEEDER FOR IMPROVING EFFICIENCY OF AGRICULTURAL EXPERIMENTS (completed in 2021-22)

### **Engr. Dr. Umair Sultan**

High crop production with limited energy resources is always the priority area of developing countries. Manual and conventional methods for agricultural experiments are time consuming,

challenging, laborious, and energy-intensive. Various experimental studies have been carried out for advancement in agriculture technologies. This project was mainly focused on the design and development of the innovative low till high-efficiency seed drill (Micro Plot Seeder). This machine has a special seed dividing head and seed distributor triggered with a mechanical timer. The mechanical timer is responsible to deliver seed to the seed distributor as per fixed plotting intervals. Seed distribution unit distributes the seeds uniformly in all furrows as per pre-decided seed rate aided with centrifugal glider connected through tractor supply. Moreover, the machine has 9X9 low till s-type spring tines for seed and fertilizer, which are mainly designed for better soil pulverization and airation with significant energy conservation as per conventional alternatives. Overall, the results from different field tests verified the uniform seed dispersal. The machine has customized unique features for experiments and energy-efficient precision agriculture to conserve seed wastage and energy with low tillage practices.

Following are the major benefits of this local manufactured machine:

- Seed cum fertilizer multi-crop seed drill
- 9 rows with adjustable row to row distance
- Versatility in seed rate
- Adjustable seed placement (depth)
- S-type spring tines to alleviate soil compaction and better crop stand
- Auto plot spacing for field experiments
- Uniform seed distribution to all rows
- Reduced calibration efforts, single point seed control
- Less load on tractor hydraulic due to unique linkage system
- Comparatively low power requirements



# MOLECULAR DETECTION, PATHOBIOLOGY AND IMMUNOPROPHYLAXIS OF FOWL TYPHOID IN COMMERCIAL POULTRY (BROILER AND BREEDER FLOCK). (completed in 2021-22)

# Prof. Dr. Farzana Rizvi

Poultry industry has a significant importance in terms of its major share in livestock sector and national GDP of Pakistan. The national poultry industry is however facing numerous problems and infectious diseases is an important factor among them. Fowl typhoid is a major infectious disease of poultry which occurs in the form of outbreaks and causes major economical losses. The current project was aimed to access the current disease status of FowlTyphoid in commercial broiler and breeder flocks along with development of a killed vaccine based on local isolates



to determine its efficacy in disease prevention. The local isolates of Salmonella gallinarum, causative agent of Fowl Typhoid infection, were obtained from field samples and confirmed through culturing, biochemical tests and Polymerase chain reaction (PCR). The PCR confirmed-bacterial isolates were subjected to Formalin treatment for development of Formalin-killed bacterin which was further evaluated through sterility and safety tests. Experimental birds (broiler and breeders) were employed for determination of the efficacy of bacterin in prophylaxis of Fowl Typhoid infection. The bacterin was found efficacious as its inoculation in experimental broilers and breeders provided protection against S. gallinarum challenge. The vaccinated

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groups of the birds were healthy and have significantly higher weight gain as compared to nonvaccinated group. Furthermore, the clinical signs and gross lesions were either absent or very mild in vaccinated birds. There was no hepatomegaly and splenomegaly in vaccinated groups post-challenge and the absolute and relative weights of visceral organs were non-significantly different from control negative group. The morbidity and mortality rates were significantly lower in vaccinated groups as compared to control positive group. Immunological parameters such as lymphoproliferative response, Phagocytic index and IgG antibody titers indicated higher protection status in vaccinated birds as compared to non-vaccinated birds.







# **PRODUCT COMMERCIALIZATION**

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#### **5. PRODUCT COMMERCIALIZATION**

EFS offers funding for researchers and scientists to commercialize innovative products or technologies that have been developed at UAF. Investors or entrepreneurs who are interested may partner with EFS to invest and establish companies focused on the commercialization of university products. Additionally, EFS has successfully accomplished significant projects under this component, such as the construction of a state-of-the-art Exhibition Centre worth Rs.16.04 million on the campus, and a Farm Market valued at Rs. 5.911 million. EFS is also supporting projects under this component aimed at commercialization of products.

### 5.1 Project Completed during 2021-22

# SOLAR POWERED ELECTROCOAGULATION-BASED SYSTEM FOR PROVIDING PURIFIED WATER (completed in 2021-22) duration 01-01-2020 to 31-12-2021

#### Dr. Muhammad Asif Hanif

Assistant Professor, Department of Chemistry, UAF

Drinking of contaminated water is biggest cause of diseases spread in Pakistan. The economic loss due to water diseases to Pakistan is 1.3 billion dollars every year. In addition to it, almost 250,000 children under the age of 5 years die every year in Pakistan due to water borne diseases. Budget allocation for water supply and sanitation amounts to less than 0.2% of GDP. The major diseases responsible for death includes Hepatitis A & E, Typhoid, Cholera, and Diarrhea are widespread in the country. Polluted water contains a diverse nature of pollutant starting from heavy metals in elemental form to very complex organic and inorganic compounds. Many of persistent organic pollutants such as aldrin, dieldrin, DDT, chlordane, endrin, heptachlor, toxaphene, mirex, PCBs, HCB, dibenzofurans are also



found abundantly in ground water. Natural ground water has undergone preliminary screen treatment to remove unwanted particles after addition of natural coagulants Moringa oleifera. The primary filters have been used to remove all types of dust particles, smaller stones, sludges to reduce total suspended solids significantly. After removal of suspended solids, the ground water was passed through magnetic stabilizers for separation of magnetically charged particles. Solar hybrid electrocoagulation was installed and tested using cost efficient re-changeable electrodes that are known to have enough potential to remove all types of odours compounds and smelling agents. Secondary filtration was performed using filters having ability to remove smaller sized particles. Aeration was also done in secondary treatment setup. Ultraviolet radiation was used to kill all types of microorganisms.

Endowment Fund Secretariat



# FINANCIAL REPORT

# 6.1 Investment of Fund's

The Principal amount is invested in approved banks. A portion of its profit is retained for adding in the principal amount @ 15% of the profit to counter the impact of inflation/devaluation of Rupee. The volume of principal amount invested during 2020-21 was Rs. 1045.00 million and 2021-22 was Rs. 1111.00 million.

Investment and profit 2020-21		(Rupees in Million)
Description	Amount	Profit
Investments in Banks	1045.000	93.142
Total:	1045.000	93.142
Investment and profit 2021-22		(Rupees in Million)
Description	Amount	Profit
Investments in Banks	1111.000	105.089
Total:	1111.000	105.089



# 6.2 Expenditure for the financial year 2020-21

The financial year 2020-21 closed with savings of Rs. 41.182 million. The Actuals of Receipts and Expenditure for the year, 2020-21 are shown in Table-I. The detail of other receipts and component wise expenditure is given in Table-II.

#### TABLE-I

	(Rupees in Million)
RECEIPTS	Actual
Opening Balance 1st July, 2020	0.861
Income from Investment 2020-21	93.142
Other Receipts *	1.478
Total Receipts	95.481
Transfer to Principal Amount (15% of the Income from investment)	15.000
Available for Allocations	80.481

\*Income from ongoing projects and savings from completed projects.

# TABLE-IIComponent wise Expenditure during the year 2020-21

	(Rupees in Million)
ALLOCATION / EXPENDITURE	Actual Expenditure
Faculty Development	0.123
Technology Transfer	5.151
Product Commercialization	0.000
Research & Development	1.395
Operation EFS	2.630
TOTAL EXPENDITURE/CASH OUTLAY	9.299
SURPLUS / SAVINGS	71.182
TRANSFER TO P.A	45.000*
Closing Balance	41.182

\*Rs. 30.00 million form savings and Rs. 15.00 million (15% of income) will be made part of principal amount after June, 2021.

# 6.3 Expenditure for the financial year 2021-22

The financial year 2021-22 closed with savings of Rs. 41.00 million. The Actuals of Receipts and Expenditure for the year, 2021-22 are shown in Table-I. The detail of other receipts and component wise expenditure is given in Table-II.

#### Table-II

	(Rupees in Million)
RECEIPTS	Actual
Opening Balance 1st July, 2021	41.182
Income from Investment 2021-22	105.089
Other Receipts *	0.032
Total Receipts	146.303
Transfer to Principal Amount (15% of the Income from investment)	16.000
Available for Allocations	130.303

\*Income from ongoing projects and savings from completed projects.

#### TABLE-II

#### Component wise Expenditure during the year 2021-22

	(Rupees in Million)
ALLOCATION / EXPENDITURE	Actual Expondituro
	Expenditure
Faculty Development	10.000
Technology Transfer	11.000
Product Commercialization	3.000
Research & Development	7.000
Operation EFS	8.303
TOTAL EXPENDITURE/CASH OUTLAY	39.303
SURPLUS / SAVINGS	91.000
TRANSFER TO P.A	66.000*
Closing Balance	41.000

\*Rs. 50.00 million form savings and Rs. 16.00 million (15% of income) will be made part of principal amount after June, 2022.