

ANNUAL REPORT

OF

**STATISTICAL SECTION
AYUB AGRICULTURAL RESEARCH INSTITUTE
FAISALABAD**

**FOR THE YEAR
2019-20**

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INTRODUCTION

Statistics is the backbone of Agricultural Research. It provides a strong basis to draw valid and reliable inferences on the basis of data obtained through agricultural research experiments. Research experiments are laid out at Ayub Agricultural Research Institute, Faisalabad and other Research Stations attached to it in all over the Punjab. Statistical Section, by critically examining the data of research experiments conducted by various disciplines of AARI, is playing an important role under the supervision of the Statistician. Application of suitable experimental design increases the precision of the results by minimizing experimental error and analysis of experimental data by applying appropriate statistical technique helps in proper interpretation of conclusion drawn from results. Suitable designs are suggested to the agricultural scientists of AARI, keeping in view the objective of the experiment, number of factors to be studied, area & experimental material available with them and other constraints in conducting experiments.

Research experimental data received from various Research Institutes/Sections are critically examined/evaluated by applying statistical techniques and then analyzed statistically. The inferences drawn there-from, are communicated to the respective Institutes/Sections.

Various research disciplines are evolving crop varieties and introducing new technologies and this section is equally contributing to these developments by providing them statistical services. Training of Research Scientists of Ayub Agricultural Research Institute on data analysis and interpretation of results is also being conducted.

I. OBJECTIVES IN BRIEF:

Statistical Section, in collaboration with agriculture scientists, aims to achieve the highest standards in agricultural research that is being conducted under different institutes of Ayub Agricultural Research Institutes, Faisalabad.

The main objectives of the section can be classified as under:-

- a) Designing the layout of field and laboratory experiments conducted at Ayub Agricultural Research Institute, Faisalabad and Research Stations attached to it in all over the Punjab.
- b) Vetting of Annual Research Program of work of all the Research Institutes under aegis of Ayub Agricultural Research Institute.
- c) Evaluation / Identification of Problem Data.
- d) Statistical analysis of data of research experiments and interpretation of results.
- e) Physical verification of layout of experiments conducted at Ayub Agricultural Research Institute, Faisalabad and other Research Stations attached to it in the Punjab.
- f) Maintenance of the data regarding area, production and yield of different crops.
- g) Training of Research Scientists of Ayub Agricultural Research Institute on data analysis and interpretation of results.

RESEARCH WORK:

a) Advisory Services for Designing and Layout of Research Experiments.

There are number of factors which contribute a lot in minimizing experimental error but the choice of suitable design is the important one. For this purpose, advisory services were provided to 238 research scientists for designing their research experiments. Guidance was also provided to researchers in collection of data, interpretation / presentation of results and for writing research papers, articles etc.

b) Evaluation / Identification of Problem Data.

To ensure the validity of the research data collected by Agri. Scientists, the data of research experiments received from various Institutes were examined, evaluated with statistical standards and problem data were identified.

c) Statistical Analysis of Data and Interpretation of Results.

The staff remained busy throughout the year due to the pouring of a large number of data sets for statistical analysis. A total of 808 tables / parameters of experiments conducted by different institutes, under the umbrella of Ayub Agricultural Research Institutes were analyzed.

All the data of 808 tables / parameters of research experiments received in this section during the last year under report were timely and efficiently examined, evaluated, discussed with the specialist concerned and analyzed statistically keeping in view the objective of the experiments. Behavior of individual factors and their interaction was also studied. Design wise detail of these data sets, processed statistically, during the year 2019-20 is as under:-

Sr. No	Name of Experimental Design/Statistical Procedure	No. of parameters /tables processed statistically
1	RCBD	339
2	CRD	26
3	Factorial Experiments	7
4	Split Plot Design	35
5	Path Analysis	2
6	Principal Component Analysis	3
7	Cluster Analysis	3
8	Multiple Comparison Test	348
9	Pooled ANOVA	45
	Total	808

d) Physical Verification of Layout of Field Experiments.

The layout of field experiments was physically checked / verified according to the vetted Annual Programme of Research Work by paying visits to the experimental areas of different Directorates/Sections at Ayub Agricultural Research Institute, Faisalabad. The difficulties faced by the researchers were discussed in detail and suitable solutions were suggested at the spot. Various points of mutual interest pertaining to the number of replications, shape and size of plot were also discussed. Technical staff were also suggested to send their layout plan to the Statistician for approval / vetting before sowing. The discipline wise detail of visited experiments is as under.

Sr. No	Name of Institution/Section	No of Experiments
1	Maize Research Station Faisalabad	8
2	Soil Chemistry Section	13
3	Pulses Research Institute, Faisalabad	17
4	Vegetable Research Institute, Faisalabad	11
5	Oilseed Research Institute, Faisalabad	10
Note:	In last two quarters field experiments could not be visited to verify layouts due to the professional training of technical staff & COVID-19.	



e) Vetting of Annual Program of Research Work.

Annual Program of Research Work of Rabi and Kharif 2019-20 of various disciplines of Ayub Agricultural Research Institute, Faisalabad were vetted, and improvements / modifications were suggested where deemed necessary.

f) **Assignments**

Various assignments regarding different aspects (House Allotment List, Crop Situation Report and Cotton Arrival Report etc.), were prepared and provided to Director General Agri. (Research).

IV). **Training of Research Scientists**

One of the thrust areas of this section is to develop trained scientists in AARI in the disciplines of Agricultural Statistics for meeting the challenges of Agricultural Research. Trainings were conducted on monthly basis for agri. researchers to enhance the statistical aptitude and necessary understanding of design of experiments and interpretation of results to make them able to cope with the practical difficulties faced during experimentation. The course covers the fields of Design of Experiments, Regression Analysis, Multivariate Techniques etc. and lays more emphasis on statistical computation using different statistical Software. Discipline wise distribution of 35 trained scientists under this program during 2019-20 is as under:-

Month	Institute/Directorate	No. of Scientists
July, 2019	Entomological Research Institute, Faisalabad	4
August, 2019	MMRI, Yousafwala (Sahiwal)	5
September, 2019	Rapid Soil Fertility Survey & Soil Testing Lahore	6
October, 2019	Plant Pathology Research Institute, Faisalabad	5
November, 2019	Pulses Research Institute, Faisalabad	7
December, 2019	Horticulture Research Institute, Faisalabad	5
January, 2020	Rice Research Institute, Kala Shah Kaku.	3
Note:	In compliance of Govt. instruction & following the SOP regarding COVID-19, & shortage of staff, training was not conducted from February- 2020 to Jun- 2020.	



A group photo with scientists after training.



A photo during training session.

Technical staff comprising Assistant Statisticians & Statistical Officer of this section completed the professional training regarding “Finance, Administrative Management and E-Government” conducted by U.A.F. w.e.f 20-01-2020 to 14-02-2020 & w.e.f 17-02-2020 to 13-03-2020 respectively.

V) List of Publications.

This section provides technical / statistical services to agri. scientists in designing the layout of their research experiments and analysis of data obtained through these experiments. Area and production figures of various crops are also provided for writing research papers, articles etc. However following publication are published/accepted as co-author by the technical staff of this section.

- Optimized subsurface irrigation system (opsis). The future of sugarcane irrigation.
- Genetic studies for yield and related traits in micro and macrosperma exotic lentil genotypes.
- Assessment of sesbania aculeate as green manure in rice-wheat cropping system.

List of Technical Staff:

S. No.	Name	Qualification	Designation
1.	Mr. Muhammad Tariq	M.Sc. (Statistics)	Statistician
2.	Mr. Jafar Salim	M.Sc. (Statistics)	Assistant Statistician
3.	Mr. Khalid Mehmood Mughal	M.Sc. (Statistics)	Assistant Statistician
4.	Mr. Amir Hameed	M.Phil. (Statistics)	Statistical Officer

STATISTICIAN
AYUB AGRICULTURAL RESEARCH INSTITUTE
FAISALABAD