DEPARTMENT OF AGRICULTURAL STATISTICS
AND
COMPUTER CENTRE
N. M. COLLEGE OF AGRICULTURE
NAVSARI AGRICULTURAL UNIVERSITY, NAVSARI

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विद्या सर्वत्र गौरव

Future Plan

Major Thrust Area:

The department is actively engaged in applications of statistical techniques in agricultural research activities. Therefore it is require to be up-to-date in several areas of agricultural statistics. In order to meet the challenges of the rapid evolutions in research, technology and the diversity of emerging career opportunities, the department has identified these thrust areas:

1. Statistical models and forecasting/forewarning

The outcome of any experiment depends on several variables and such dependence involves some randomness which can be characterized by a statistical model. Different types of models including the econometric models, e.g., multiple regression models, quantile regression analysis, restricted regression models, time series models, measurement error models, etc. are employed in such situations. So the need of development of new statistical tools arises for the detection of problem, analysis of such non-standard data in different models and to find the relationship among different variables under agricultural research problems. The major applicability of models (tools) listed hereunder:

 a. Agricultural and horticultural crop yield forecast modelling using weather parameters, biometrical characters, agricultural inputs and farmers' appraisal
 b. Development of models for forewarning important insects, pests and diseases of different crops
 c. Agriculture/horticulture/forestry crop acreage estimation through application of remote sensing and Geographical Information System

2. Time series analysis

Time Series Analysis is used to determine a good model that can be used to forecast agriculture data metrics such as commodity prices, sales, area, production, weather data, pollution and more. It allows management to understand timely patterns in data and analyze trends in data metrics. By tracking past data, the statistician hopes to get a better than average view of the future. Time Series Analysis is a popular forecasting method because it is inexpensive. The department is dealing with such huge time series data thus the major applicability of time series tools listed hereunder:

 a. Time series analysis on weather variables helps to understand the patterns of the up-downs or increasing /decreasing of different weather parameters since 100 years
 b. Time series modelling to forecast commodity prices, sales, area, production for various crops

c. Advance time series analysis techniques to be adopted for precise forecasting viz. ARIMA with errors, ANN, fuzzy time series, hybrid forecasting etc.

3. Design of experiment

The department is engage in developing statistical designs and methodologies for analysis of data relating to field and laboratory experimentation in agriculture, animal, agro-forestry and fisheries research. The design of experiment play crucial role in most of all field of study for validation of output and interpretation. In the university number of students are increasing and simultaneously number of agricultural research experiment goes on increasing which may face problems of availability of experimental area (plot)/materials. Therefore advanced design need to be formulated and adopted which are hereunder;

a. BIBD, Partial BIBD
b. Cross over design, augmented design, response surface design, experiments with mixtures etc.
c. Diagnostics and remedial measures in designed field experiments. Effect of data transformation on interpretation of the data
d. Designs for bioassays; microarray experiments

4. Sample survey

The subject of sampling techniques helps in providing the methodology for obtaining precise estimates of parameters of interest. The various areas which requires suitable sample survey techniques for estimation of various parameters of interest relating to crops, livestock, fishery, forestry and allied fields. The following core thrust areas need to be explore;

a. Small area estimation
b. Area & production estimation through crop cutting experiment
c. Cost of production studies
d. Harvest and post-harvest losses

5. Statistical genetics

The department provide advisory services on theory and application of statistical genetics with special emphasis on agriculture. To meet this, it is needs new theoretical developments for application in plant and animal breeding and related areas. Some of the thrust areas are listed hereunder:

a. Developed procedures for estimation of genetic parameters
b. Construction of selection indices
c. Studying $G \times E$ interactions for multi locations trials
d. Focusing on advanced statistical techniques in Biometrics and provide platform for such computational analysis
e. The divergence and stability of various genotype and suggest cultivar for a specific region