Department of Agricultural Statistics
College of Agriculture
Junagadh Agricultural University, Junagadh

Recommendations for scientific community :

2015-16
Title:Effective number of replications for field experiment on wheat crop. (Triticum aestivum L.)
Principal investigators & associates: 1. Prof. C. M. Naliyadara, Assistant Professor, Dept. of Agril. Statistics 2. Dr. S. M. Upadhyay, Professor & Head, Dept. of Agril. Statistics 3. Dr. D. V. Patel Associate Professor, Dept. of Agril. Statistics 4. Dr. K. H. Dabhi, Research Scientist, Wheat Research Station
Recommendation for Scientific community:
For effective control soil variation an experiment plot having 12 basic units each of 0.90 m2 with size 4.0 × 2.7 mt. (4×3 Units) were found optimum with minimum 2 replications are recommended to scientific community to conduct wheat experiment.

2016-17
Title: Path coefficient analysis tools for selection of genotype in wheat.
Principal investigators & associates: 1. Dr. D. V. Patel, Assoc. Professor, Deptt. of Agril. Statistics 2. Dr. S. M. Upadhyay, Prof. & Head, Deptt. of Agril. Statistics 3. Prof. C. M. Naliyadara, Asstt. Professor, Deptt. of Agril. Statistics 4. Dr. L. G. Vanaparia, Asstt. Res. Scientist, Wheat Research Station 5. Dr. M.S.Shitap, Asstt. Professor, P.G.I.A.B.M.
Scientific Recommendation:
It is advised to scientific community, that the productive tillers per 3 meter, grain weight per spike and days to anthesis are the important biometric characters for selecting genotype for improving grain yield of timely shown wheat under South Saurastra Agro climatic conditions.

2017-18
Title:Weather based forecasting of wheat productivity in Junagadh district
Principal investigators & associates: 1. Dr. M. S. Shitap, Assistant Professor, Dept. of Agril. Statistics 2. Dr. D.V. Patel, Associate Professor, Dept. of Agril. Statistics 3. Prof. H. Y. Maheta, Assistant Professor, PGIABM 4. Prof. Kalpesh Kumar, Assistant Professor, PGIABM 5. Dr. S. M. Upadhyay, Professor & Head, Dept. of Agril. Statistics
Scientific Recommendation:
It is advised that to forecast wheat productivity in the Junagadh district before 6 weeks of harvest, the model based on week wise approach using original weather variables can be used with 12 weeks and 23 years data to have 93.00% accuracy. The variables affecting the productivity are X1W48, X1W49, X1W5 (Maximum Temperature) of 48th week, 49th week and 5th week, respectively, X2W49 (Minimum Temperature) of 49th week, X5W50,X5W52, X5W3 (Bright Sun Shine Hours) of 50th week, 52nd week and 3rd week. Recommended model is: Model with 12 weeks and 23 years data Y = 12800.97 – 104.92 X1W48 – 84.98 X1W49 – 104.94 X1W5 + 53.92 X2W49 + 361.10 X5W50 +139.47 X5W52 – 547.67 X5W3 (R^2= 0.93)

2018-19

Title: Comparison of various methods of stability analysis to identify stable genotypes in Sesame

Principal investigators & associates:
1. Dr. D. V. Patel, Associate Professor
2. Dr. M. S. Shitap, Assistant Professor
3. Prof. G. K. Sapara, Assistant Professor, Cotton Research Station, JAU, Junagadh
4. Dr. S. M. Upadhyay, Professor & Head
5. Dr. N. J. Rankja, Assistant Professor

Scientific Recommendation:

The desirability index (Di) of parametric method and mean of absolute rank difference of genotype over environments (Si(3)), variance among ranks of genotype over environments (Si(6)) of non-parametric methods found useful for stability analysis of genotypes in sesame. These non-parametric methods need not required to fulfil strong assumptions as in case of Eberhurt & Russel.

2019-20

Title: A Comparative Study on Groundnut Yield Forecasting Models for Junagadh District

Principal investigators & associates:
1. Dr. M. S. Shitap, Assistant Professor, PGIABM
2. Dr. D.V. Patel, Associate Professor, Dept. of Agril. Statistics
3. Prof. H. Y. Maheta, Assistant Professor, PGIABM
4. Prof. Kalpesh Kumar, Assistant Professor, PGIABM
5. Dr. S. M. Upadhyay, Professor & Head, Dept. of Agril. Statistics
6. Dr. N. J. Rankja, Associate Professor, Dept. of Agril. Statistics

Scientific Recommendation:

The groundnut productivity can be forecasted at the 10th week after sowing and use multiple linear regression models having generated weather variables with correlation coefficient between groundnut productivity and weather variables as weight and original weather variables using week wise approach with higher predictability and lower deviations between forecasted and observed productivity.

2022-23

Title: Forecasting area, production and productivity of cotton and groundnut in Gujarat

Principal investigators & associates:
1. Dr. D.V. Patel, Associate Professor, Dept. of Agril. Statistics
2. Dr. M. S. Shitap, Assistant Professor, Dept. of Agril. Statistics
3. Prof. H. Y. Maheta, Assistant Professor, PGIABM
4. Prof. Kalpesh Kumar, Assistant Professor, PGIABM

Scientific Recommendation:

The area, production and productivity of cotton and groundnut can be precisely predicted using the hybrid model in comparison to ARIMA and TDNN for Gujarat state.

2023-24

Title: Hectareage Prediction Models for Major Oilseed Crops of Gujarat: An Empirical Investigation

Principal investigators & associates:
1. Dr. M. S. Shitap, Assistant Professor, Dept. of Agril. Statistics
2. Dr. D.V. Patel, Associate Professor, Dept. of Agril. Statistics
3. Prof. H. Y. Maheta, Assistant Professor, PGIABM
4. Prof. Kalpesh Kumar, Assistant Professor, PGIABM

Scientific Recommendation:

It is recommended to the scientific community that area under selected crops can be precisely predicted using the single equation models rather than simultaneous equation models as single equation model gives maximum R^2 and $\bar{R}^2$ with low values of MAPE, RMSE and MAE.

2024-25

Title: Time series forecasting of area and production of vegetable crops in Gujarat

Principal investigators & associates:

1. Dr. M. S. Shitap, Assistant Professor, Dept. of Agril. Statistics
2. Dr. D.V. Patel, Associate Professor, Dept. of Agril. Statistics
3. Prof. H. Y. Maheta, Assistant Professor, PGIABM
4. Prof. Kalpesh Kumar, Assistant Professor, PGIABM
5. Prof. A. P. Prajapati, Assistant Professor, Dept. of Agril. Statistics

Scientific Recommendation:

It is recommended to the scientific community that area and production of the selected vegetable crops viz., okra, tomato, potato, brinjal and onion can be precisely predicted using the following models with reasonable RMSE, MAE and MAPE

Title: Strengthening Statistical Analysis Programmes using Python Machine Learning and Data Visualization

Principal investigators & associates:

Prof. A. P. Prajapati, Assistant Professor, Dept. of Agril. Statistics, CoA, JAU, Junagadh (PI)
Dr. D. V. Patel, Associate Professor, Dept. of Agril. Statistics, CoA, JAU, Junagadh (Co PI)
Dr. M. S. Shitap, Assistant Professor, Dept. of Agril. Statistics, CoA, JAU, Junagadh (Co PI)

Scientific Recommendation:

The scientists/researchers of SAUs are recommended to use new computer programs developed by the Junagadh Agricultural University using the Python Machine Learning and Data Visualization techniques for the data analysis of three types of experiments conducted in Latin Square Design (LSD), Split Plot Design and Strip Plot Design which are requirement specific, unique, user friendly with the important features of descriptive auto conclusion and auto data visualization.