

**Report on the session on Statistical Computing held during the 45th Annual Conference of the Indian Society of Agricultural Statistics on 29th November, 1991 at National Dairy Research Institute, Karnal.**

1. With the wide spread introduction and use of computers in statistical work, many people are interested in computer applications in Statistics, not all of whom are familiar with the disciplines of Statistics, Computer Science, and Mathematics. Therefore, people from related disciplines will have to be familiarised with the diversity of statistical computer applications through well designed training programs in Statistical Computing. As this is a current issue, it was decided that the topic 'Training in Statistical Computing' be chosen for discussion at this Session this year.

2. The Session had as

*Chairman:* Prof. R.K. Bose, Calcutta University  
*Convenor:* Shri R. Gopalan, IASRI, New Delhi  
*Speakers:* Dr. S.D. Sharma  
Rajendra Agricultural University, Pusa.

Dr. A. Dey  
Indian Statistical Institute, New Delhi.

Shri R. Gopalan  
IASRI, New Delhi.

Dr. D.K. Jain  
National Dairy Research Institute, Karnal.

*Participants:* All the delegates.

3. The Session started with the Chairman's remarks. He drew the attention of the participants to the following:
  - (i) The efforts made by Prof. P.C. Mahalanobis, Indian Statistical Institute, Calcutta to develop a computer in collaboration with Jadhavpur University, Calcutta thirty years ago and now the wide spread introduction of computers in statistical work.
  - (ii) The growth of the Indian Society of Agricultural Statistics

during the past 45 years, the importance of the state-of-the-art in Statistical Computing, and the decision of the Society to hold in 1992 an International Conference of the International Association of Statistical Computing.

- (iii) Holding of session on Statistical Computing during the previous two and present Conference on the last day of the program and the need to promote the session to the beginning of the Conference.
- (iv) Thereafter, the Chairman invited the speakers to present their papers. Dr. V. Arunachalam, Indian Agricultural Research Institute, New Delhi was not able to participate personally in the discussion and present his paper.
- (v) Dr. S.D. Sharma spoke about Statistical Computing in Agricultural Universities with specific reference to Rajendra Agricultural University, Pusa. He identified certain broad area for computer training programs. The suggested topics include historical development of computers, components of computer systems, operating systems, computer algorithms, BASIC, and computer softwares.
- (vi) Dr. A.Dey spoke about training in Statistical Computing for working statisticians. He discussed a structure of training program for working statisticians having some basic knowledge of computers and statistical computing who wish to update their knowledge in the subject and also to know additional new things about statistical computing to which they have no ready access. He felt that the working statisticians should know programming language(s), know computer softwares, receive instruction in numerical analysis, and data bases. This training can be provided through a 2-week training program (50 hours of work). Such training programs can be arranged at institutes having adequate infrastructure at their disposal, like IASRI.
- (vii) Shri R. Gopalan spoke about training in Statistical Computing for agricultural research workers. He was of the opinion that the objective of such training programs should be to expose the research workers to the concepts of statistical computing and familiarising with mathematics, statistics, and computer. The course

should deal with topics like computer oriented numerical methods, errors in computer arithmetic, computer algorithms and programming languages, computerised data bases, simulation and modelling with computer, computer softwares, computer graphics, and computer intensive methods. In principle, any one who is interested in computer application in statistics should be eligible to attend and spare about two weeks for such learning. Courses may have to be offered on a continuous basis at the initial stages.

- (viii) Dr. D.K. Jain spoke about training in statistical computing for dairy research workers. He and Dr. K.N.S. Sharma were of the opinion that the training program in professional courses should invariably include a curriculum on use of computers in their respective fields of specialisation at undergraduate and post-graduate levels. The basic objectives of organising training program on computers should be to teach computer literacy, to familiarise in computer operation, to acquaint with software packages, and to train in developing need based applications programs. The course content should include introduction to computers, BASIC, FORTRAN, C, data base management system, and software packages. The eligibility criteria will depend upon the level at which the training is to be imparted, but, research workers attending should have undergone a course in Statistics with adequate knowledge of Mathematics. The duration of the training program should depend upon the level at which the training is to be imparted and range from one week to one month duration. The periodicity of such training programs may be once or twice in a year.
- (ix) Some of the participants attending the session joined in the discussion and the points made included the following.
- Better numerical methods are needed.
  - Additional algorithms need to be developed.
  - CBT programs can be used to supplement the class room lectures.
  - NIC can make contribution to disseminating information on computer software by organising

certain training programs.

- Development of packages like SPAR 1 should in interpretive system as part of the general interactive capability in time sharing systems.
  - Information technology/informatics has a particular reference to Agricultural Research and the need of the hour is establishment of an Agricultural Research Information System - KRISHINET.
  - The course will have to be conducted by a faculty with specialised experience in related fields.
- (x) The chairman concluded the session with the following remarks:
- Considerable efforts had to be made by universities and institutes to procure a computer in early 70's and in less than twenty years, we have the wide spread introduction of PCs everywhere.
  - The Indian Society of Agricultural Statistics, as a scientific society, aims at promoting the study of and research in Statistical Theory in the widest sense of the term. As such the Society must evolve well designed training programs in Statistical Computing and strengthen the necessary infrastructure in the form of Personal Computer.
  - The computer has many an application and not all users know all, especially Indian Agricultural Statisticians working in the Eastern and North-Eastern regions. Therefore, training programs in Statistical Computing must be organised not only at Delhi, but also at other remote places (in say, East and North East India) like Manipur.
  - The Executive Council of the Society may set up a committee to evolve well designed training programs in Statistical Computing as well as arrange for a number of Personal Computers for this purpose. This work may be completed in an year's time and the committee may have members from Agricultural University like Rajendra Agricultural University, Indian Statistical Institute, Indian Agricultural Statistical Research Institute and ICAR Institute like National Dairy Research Institute.