
Computer and Biometrics Services Unit

Introduction

The mission of the Computer and Biometric Services Unit (CBSU) is to provide support for ICARDA's research and management information storage, processing and biometrics to satisfy the requirements of its users through the implementation of computerized applications, hardware and software support, networking, and assistance in experimental design and analysis. CBSU facilitates information sharing with stakeholders and provides training and consulting support to NARS.

Achievements

Network Infrastructure and Connectivity

- A major project was completed in 2002 and resulted in the installation of a new high speed LAN giving users 100 Mbit/sec network speed at their desktops; wireless network facilities were also installed.
- Servers, desktop and notebook computers, printers and other peripherals, network and communication devices, as well as operating systems and software were continually upgraded, replaced and maintained; the Internet connectivity is 2 Mbit/sec now with a backup satellite installed.
- Firewalls were installed to enhance network security, a new live anti-virus PC distribution system was set up, critical data were moved from users PCs to the network File Servers, and a SAN system was installed.

Scientific Computing

- Databases were developed and maintained for seed information management (SeedMan) in seed production and for the RALF project, Water Benchmark for MP1, and Water Inventory in West Asia for the UN Convention for Combating Desertification (UNCCD).
- Web-based Meteorological, Soil, and Meta Databases were initiated using Oracle 9i DBMS, with some completed.
- CBSU developed Virtual Resources Center questionnaire as a web application, prepared mailing lists, and analyzed data for the CGIAR ICT-KM projects. CBSU also led a CGIAR project on "Utilization of Intelligent Systems for Plant Protection" involving the development of an expert system for barley and capture of knowledge bases for wheat and chickpea.
- Participated with NRMP on an on-going modelling study of the groundwater resource use in Syria, developed a system requirements study document for a Plant

Participatory Breeding Database, software for a bar code reader for the Gene Bank accessions, and a program for economic assessment of on-farm water use efficiency.

Biometrics

- During 2000-2005, biometrics consultancies were provided on experimental design, statistical data analysis, and interpretation of results and presentation. More than 500 individual sessions with researchers and support on statistical software and data management were provided. Experimental designs and statistical analyses were carried out for numerous experiments. Some examples include evaluation of core collection, evaluation of improved lines of wheat, barley, and legumes for drought stresses, diversity and pathogen distribution on a number of barley hosts, crop-loss assessment in cereals, effect of seed-storage factors on seed germination, water catchments on barley and vetch in rotation, and supplemental and deficit irrigation of wheat, maize, and cotton.
- Biometric methodologies were developed to address specific aspects in the areas including temporal-spatial covariance structures of plot errors in crop rotation systems, repeatability of genotype x location interaction, sampling for estimating gene diversity in wild wheat populations using AFLP markers, and estimation of threshold values for gene expression.
- CBSU established an *Online BioComputing facility* using GENSTAT, developed and operational since September 2003 (<http://icardaintranet/biometrics/index.htm>). With currently 37 modules, the facility was used in over 200 occasions during the last three years.

Management Information Systems and Knowledge Management

- The most important achievement during 2005 was the implementation, with the support of a consultant, of the web-based version of the Oracle Applications (11i) covering financial, administrative and human resources areas, to meet new reporting requirements and overcome deficiencies in the previous system. Many functional processes were re-engineered, new reports developed, users trained, and access improved. Prior to 2005, the old version of the application was supported and maintained.
- It was decided to adopt the CIAT Project Manager system. The database has been installed and the data preparation and loading has been largely completed.
- The ICARDA Intranet site design was revamped in co-operation with CODIS, a Training Information Database and a Travel Schedule Database developed.
- Online forms for International Employee Applications as well as a website registry of potential experts useful in Iraq reconstruction efforts were developed. The registry is hosted at ESCWA website.
- During 2002-2004, considerable effort was made in protecting the institutional memory and explicit knowledge. CBSU actively led a project aimed at developing a knowledge management strategy to gather and protect ICARDA's knowledge base.

Training

CBSU trained more than 500 NARS scientists on the use of biometric tools and applications in agricultural research through a series of 18 courses organized by CBSU, 15 courses organized by other programs, and over 20 individual trainings. We also organized 37 internal courses for 366 ICARDA staff on both computer and biometrics aspects.

Current Activities

These include (1) the completion and full deployment of the Oracle Applications to outreach offices, (2) further upgrading of the LAN and facilities including the voice network, (3) development of the Virtual Spatial Data Center, (4) improvement of the network security and disaster recovery planning, and (5) development of the bioinformatics capability and new biometrics methodologies.

Future Plans

Future plans include continuous development of the IT infrastructure and facilities and various databases, improvement of the MIS and activities on the biometrics and bioinformatics such as exploitation of genotype x environment interactions using international nursery data, selection of genotypes for drought tolerance and input responsiveness, exploitation of molecular, sequence and expression data, modeling crop response to irrigation, time-trend in long-term wheat rotations, more biocomputing modules, enhanced bioinformatics facility, and sharing in the training in applied biometrics and bioinformatics methods and tools. As an IT service provider, CBSU activities are tightly integrated with all MegaProjects, as well as GISU, HRDU and CODIS.