Information System for Arid Fruit Crops

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ABSTRACT

At present days the conventional extension system has been facing several challenges in delivering information to farmers as farmers need is much more diversified and more knowledge driven to address them is beyond the level of grass root extension functionariesIt is possible to deliver information timely by computer based technologies and Information Communication Technologies (ICT), which are interlink among extension, research, marketing network and farm communities to provide information at the arid region, Information System for Arid Fruit Crops was developed at Central Institute for Arid Horticulture, Bikaner. The software was developed using MS-Access as back-end and asp pages and html pages,java script as front-end to provide easy interaction with database is developed. This System integrates the accumulated expertise of various disciplines into a frame work that best addresses the specific problems and on-site needs of the farmers. It combines experimental and conventional knowledge with reasoning skills of specialists to help farmers in making best decisions for raising a successful crop. The fruit crops chosen for the Information System are Aonla, Ber, Bael, Pomegranate and Date palm. The Information System has 5 modules, one each for each fruit crop. Each module further divided into 3 sections, such as 1. Production Management; 2. Statistics of the fruit crop.3.Post Harvest Management. Further these modules are subdivided into sub modules covering different parameters of fruit crops information. It has also provision to update the information of fruit crops. The Information System is useful for Agricultural Extension Agents farmers, and other stake holders involved in Arid Horticulture to realise higher productivity and production of fruit crops through improved knowledge and skill sets.

Key words: *Information communication technologies (ICT); Cyber extension; Information system; Arid horticulture;*

With the success of green revolution in India, agriculture has evolved from subsistence farming into a complex and profit oriented business, which requires accumulation and integration of knowledge and information from diverse sources. An increasing population coupled with mining of natural resources requires application of new technologies to maintain a sustainable food and water supply without environmental degradation. Horticultural crops are input intensive enterprise. Presently the costs of the planting material/ seeds, nutrients, pesticides, water, power and labour are increasing enormously; where as increase in crop productivity is at low pace. Farmers are more concerned about the choice of crops that are appropriate for the changing environmental conditions and more conscious about location-specific crop management, so that the input costs are minimal and less risk prone.

It is essential to optimize the various inputs under different edapho-climatic and cropping system. Farmers need different calculated feasible, viable and economical practices to follow for better output and income. But existing extension is unable to provide timely demand based information to the farmers. The extension personnel of the Department of Agriculture disseminated the technological messages to the farmers manually. This approach has not been able to reach majority of the farmers who are spread across the whole country. This gap remains a challenge for the Extension system even today. Farmers' needs are much more diversified and the knowledge required to address them is beyond the capacity of the grass root level extension functionaries. Quick dissemination of technological information from the Agricultural Research System to the Farmers and reporting of farmers' feedback to the

research system is required in transfer of Agricultural Technology. The limitations in existing extension are-

1. Traditional Extension is expensive.
2. Traditional Extension is more time and energy consuming processes.
3. Poor communication capacity of existing extension systems.
4. In traditional extension system the quantum of modification and missing in message is high.
5. The area /client coverage capacity of the traditional extension system is very limited.
6. Lack of extension personnel/experts in general and non qualified and educated personnel in specific.
7. There is lack of timely incorporation of new vision and ideas in existing extension system. (*Arulraj, 2006*).

The 'Task Force on India as Knowledge Superpower' (*GOI, 2001*) emphasized the necessity of developing the capacity to generate, absorb, disseminate and protect knowledge and exploit it as a powerful tool to derive societal transformation. Information and Communication Technology (ICT) can play a significant role in achieving such a transformation as it consists of three main technologies. They are: Computer Technology, Communication Technology and Information Management Technology. These technologies are applied for processing, exchanging and managing data, information and knowledge. Recent developments in information and communications technology (ICT) offer a great opportunity to facilitate the flow of information and technology services delivery especially to the farmers (*Maningas, 2006*). So Today the above limitations in traditional extension system can be removed by using the potential use of Information and Communication technologies (ICT) to meet the location specific information needs of the farmers, because Information Technology has opened up new challenges as well as opportunities to fulfill increasing needs for up-to-date and precise information (*Sailaja,2004*). The extensive use of modern information technology needs to be promoted for communication between researchers, extension workers and farmers to transfer technologies and information in a cost effective manner. Multimedia Learning Systems and computer based training systems improve information access to the Farmers, Extension Workers, and Research Scientists and Extension Managers (*Sharma, 2003*). Keeping in view of justified incorporation of information technology to help extension personals and farmers, Information System for Arid Fruit Crops of Aonla, Ber, Bael, Pomegranate and Date Palm was developed. The main advantage of this system is not only the easy access to expert solution but also to enhance the performance of average worker to the level of an expert.

METHODOLOGY

The selected fruit crops for the information system are Aonla, Ber, Bael, pomegranate and Date palm. The Information system was developed with 5 modules. Each modules represent for each selected fruit crop. Each fruit crop module contains 3 sections- vis. Production Management, Statistics of the fruit crop and Post Harvest Management. Production Management section contains 12 sub modules. The sub modules are General Information of Fruit crop, Introduction of crop, Genetic Resources, Varietals status, Genetic improvement, Plant Propagation, Nursery Management, Orchard establishment, Orchard management, Inset-Pest Management, Disease management and Crop harvest and grading.

Statistics section of each selected fruit crop contains 7 sub modules. The sub modules are World wide distribution of crop. Share in Production, Distribution in India, Domestic prices, World major Producers, World major Importers, and India Exports. Post Harvest Management of each selected fruit crop contains 3 sub modules. The sub modules are Handling and storage, Processing of crop and Microbiology of crop.

Information needed for development of Information System was collected from concerned fruit crop scientists, reviewing journals and manuals of selected fruit crops. To develop the software we followed the software development cycle and created requirement analysis of the system. The Information system contains front end and backend. The front end was developed using java script, Vb Script, asp pages and backend was developed using Microsoft Access. To provide interaction with database Graphical user interface (GUI) was developed. Photo viewer was added to each page for displaying photos related to each crop.

For designing the user interface first analyzed the collected data. Based on data tables designs are created for each parameter. The starting page of Information system is called Home page. Login Page was designed to enter user name and password and tested for authorized users. Designed the screens for each

modules and sub modules for each selected fruit crops. The collected data is stored in the concerned modules for each fruit crop. The modules for each fruit crop are developed independently. To communicate to each module link is required. For that each module is integrated by linking all sub modules. After linking the modules evaluated the designed interfaces. All main modules and sub modules for each crop are tested independently. Corrected the errors in all the modules and linked together. An interface for each module of each selected crops was developed to retrieve the information. The interface contains list of drop down boxes. When the user clicks the required component of the module the request goes to the database and information is retrieved and results are sending to the user.

RESULTS AND DISCUSSION

The starting page of Information system is called Home page (Fig 1.) When the user successfully login, he can view the main page of the fruit crops. The main page of fruit crop was designed with list of radio buttons to select any one of the crops by the user.

When the user selects any one fruit crop he will get the page which contains 3 sub modules vis. Production Management, Statistics of the fruit crop and Post Harvest Management. When the user selects Production Management he will be transferred to the Production management module page (Fig 2).

This module contains 12 sub modules. The user can interface with production management module by using drop down boxes. The user can select any one option from the drop down box. When the user selects any one of Production management option he will be transferred to concerned sub module and the data will be retrieved and displays on the page. When the user selects pest sub module in the production management module he will gets the pest management information related to fruit crop with photos related to the pest of the crop.

On selecting the Disease management sub module by the user in Production management, user gets the disease management main module. This page was designed to display the list of diseases of the selected crop. When the user selects the disease of the crop he will get the page which contains 3 sub modules namely 1- Photo gallery of the disease. 2- Details of the disease. 3- Disease management. On selecting the photo gallery of disease option user gets the photos of the selected disease of the crop. The selected photos can be enlarging to examine the disease clearly. The system provides detail information of the disease of selected crop by selecting the details of disease sub module. When the user selects the disease management option he will get the information about control measures of the selected disease for selected fruit crop. Similar to production management user can select the any one option of the sub modules of Statistics of fruit crop and

Fig 1. Home Page of Information System for Arid Fruit Crops

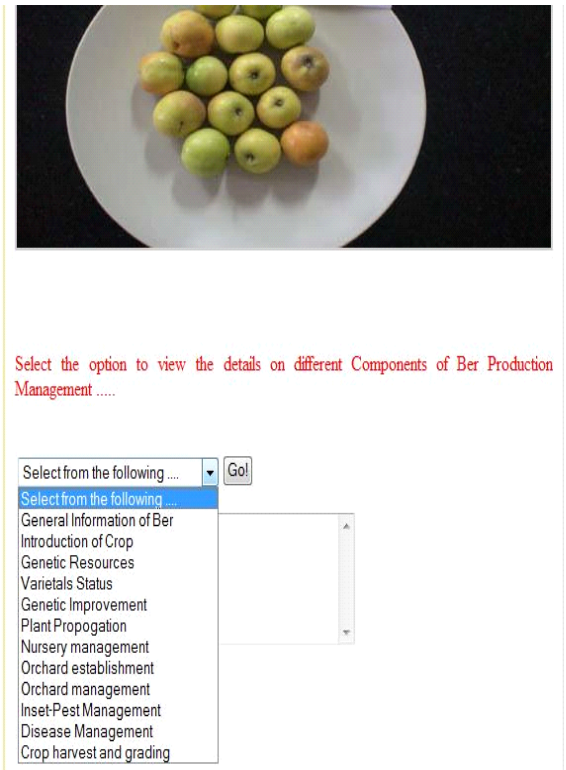

Fig 2. Main Module of Production Management of Ber

Post Harvest Management with designed user interface to view the required data. Provision is given to update each module in the developed system with the new information. User can select any of 5 selected fruit crops and view the output

Agricultural officers, Extension Officers will be trained on this package. Technologies developed for the selected fruit crops can be transferred to farmers and .can get good improvement in yield by following recommended control measures. Information System was developed with user friendly interfaces. User can easily operate the system and can move from one module to other module easily to view the required data. When the user selects any one of option, he will be transferred to concerned module and the data will be retrieved and displays on the page. Extension Officers and Agricultural Officers can educate farmers in nursery management, identifying different pests and diseases and advice them the recommended control measures by executing the package.

CONCLUSION

This paper brings out the scope for utilizing Information Technology for the spread of new agricultural technology. The use of ICT in agriculture in particular remains restricted in India. Effective utilization of ICT has the potential to make the rural communities in India .For ICT initiatives to be successful and sustainable in the long run, collaborative efforts are indispensable. Constraints in use of ICT are 1.Lack of content in local language. 2. Lack of skilled persons for disseminating agricultural information. 3. Technical constraints. 4. Economic constraints. 5. Insufficient basic Infrastructure. 6. Irregular internet connectivity. 7. Lack of clear policies. The process of Cyber Extension in India needs to have a clear vision at national level, state level and more importantly at State Agricultural University level.

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