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An Inexpensive, Microcomputer-based Bulletin Board System for Extension Programs

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Abstract. **A microcomputer-based bulletin board using the FIDO software package was established at the Univ. of Massachusetts for the distribution of information in the cooperative extension programs of home horticulture, fruits, vegetables, cranberries, and integrated pest management. System establishment costs were under $3000, and costs for the first year were about $200 for the maintenance of a telephone line. The system logged 4595 calls from university personnel, county extension staff, state agencies, and farmers during the first year of operation (July 1986 to June 1987). A total of 307 individual information files were uploaded to the system by both university and county extension staff, while 387 downloads occurred from the system.**

The use of computers to aid in the dissemination of horticultural and agricultural information is not a new concept (1). The earliest applications used computers to give market information (2–4, 6, 7). However, a number of these systems involved expensive computer facilities and dealt with more than information transfer, i.e., they allowed the actual trading of commodities through the computer. In a cost analysis of a potential system for the trading of fresh fruits and vegetables in the southeastern United States (2), the establishment costs were estimated to be $60,000 for software alone. A system (FLORALMART) developed in Indiana for the marketing of floricultural crops (3) is composed of a network of microcomputers based at county extension offices and connected to a mainframe computer at Purdue Univ., West Lafayette. This type of system would be very expensive to establish and would be well beyond the budget of many extension programs.

In this paper, we detail an inexpensive system that uses a microcomputer-based bulletin board to facilitate interaction among university personnel, county extension staff, state agencies, and farmers. The Univ. of Massachusetts system (INFONET) was created initially as a means of transferring the most current horticultural and pest management information to regional extension agents in Massachusetts. However, many more uses have developed since its inception. Additionally, the system serves as a repository for current home horticulture fact sheets, making these available to home horticulture extension agents and others. INFONET allows newly developed and revised information to be available to the county extension offices as soon as it is assembled at the university and transferred to the bulletin board. This system has the additional advantage of transferring information directly to farmers. This feature is of particular importance for pest alert messages and similar timely information.

The primary benefit of the microcomputer-based system, compared to many of the large computer-based systems, is the cost. INFONET is maintained on a single microcomputer equipped with 640 kb of memory, a 20-mb hard disk drive, a 360-kb floppy disk drive, a serial port, and a 1200 baud modem. The hardware cost about $1900. Additional costs included telephone installation ($50) and maintenance ($200 for the first year). Obviously, the users of INFONET accrued costs associated with long-distance telephone charges, which were directly related to the amount of use and the distance from the system location. With a relatively small input, similar systems can be developed to provide price, market, pest management, or horticultural information on any crop.

INFONET uses the FIDO Bulletin Board Software Package (5). This system (which can be contained on one 360-kb floppy disk) and some assistance on the use of FIDO are freely available from many of the over 1500 FIDO-based bulletin board systems across the country. It is classified as shareware, meaning that it does not cost anything to obtain the software, but a donation to its author is appreciated. We chose to hire a local FIDO bulletin board operator as a consultant at a cost of $1000 to aid with the structuring of the system. The FIDO software is flexible, allowing the establishment of several areas within a single bulletin board for the transfer of personal messages among users, as well as several different areas for the storing of software and text files. INFONET includes six message areas, including one area for the posting of general messages, both public and private, and a second area for messages that can be sent to any other FIDO system in the

Table 1. File areas available on INFONET, the bulletin board system at the Univ. of Massachusetts.

File areas
General Information about INFONET
Software to use with FIDO files
Home horticulture: Fruits and vegetables
Home horticulture: Ornamental and interior plants
Home horticulture: Turf
Home horticulture; Interior pests/rodents
Home horticulture: Master Gardener information
Home horticulture: Publication list
Home horticulture: Resource and slide inventory
Home horticulture: Program calendar
Home horticulture: Garden clippings/horticulture notes
Home horticulture: Public service announcements
Home horticulture: Lead information
Public domain software for IBM-compatible microcomputers
Public domain software for Digital Rainbow microcomputers
Farm financial management issues
Fruit news
Small fruit news
Vegetable news
Pesticide bulletins
Pesticide bureau newsletter
Soil test log
Disease diagnosis log
IPM: Miscellaneous

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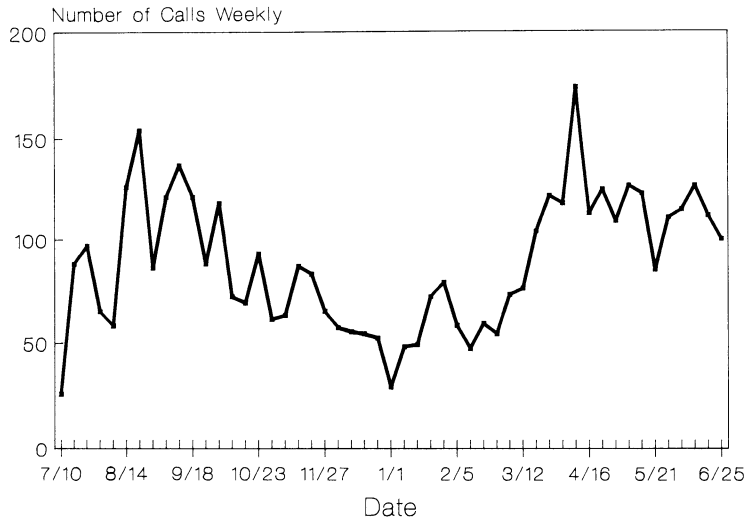

Fig. 1. The number of calls logged per week during the first year of operation of INFONET.

world. Extensive use of the latter area can greatly increase the cost of operating a bulletin board system because of long distance telephone charges, but it can be a useful aid in communicating with colleagues at other universities worldwide. Four message areas use a feature referred to as Echomail, in which messages are placed in these areas by INFONET users and then are shared with other bulletin board systems daily during the early morning hours when the telephone rates are low. The Echomail areas include one that is shared only with a bulletin board at the Univ. of Massachusetts Suburban Experiment Station (Waltham). One area is shared nationally and deals with technical subjects about computers. The other two areas share messages of interest to bulletin board operators in the New England region. As more agricultural bulletin boards are developed, echomail areas that deal with agricultural subjects will be included.

INFONET has several file areas categorized by subject, including microcomputer software, information on home horticulture subjects, information to aid with the use of INFONET, information on fruit and vegetable culture, current integrated pest management messages, apple maturity alerts, and pesticide information. Table 1 lists the available file areas. We hope to include an area that presents the current apple wholesale market prices. Files within these areas can be read directly by users on the screen of the terminal or microcomputer with which they are accessing INFONET, or they may be transferred by the user from INFONET to their microcomputer (downloading). Also, files may be transferred by users from their microcomputers to INFONET (uploading). This system provides a means whereby text can be generated at the university, transferred to INFONET, downloaded by county personnel, and used directly with their word processing software to develop newsletters or alerts in an efficient manner. Data and software files can also be transferred simply.

Users access INFONET via the telephone from their own terminal or microcomputer, emulating a terminal. INFONET is used regularly by several people at the Univ. of Massachusetts in the Depts. of Plant and Soil Sciences, Plant Pathology, and Entomology. The fruit, cranberry, vegetable, home horticulture, and integrated pest management extension programs use INFONET to exchange information among the personnel involved in each program. Additionally, all of the 14 counties in Massachusetts, the Massachusetts Dept. of Food and Agriculture, the Massachusetts Pesticide Bureau, the Univ. of Massachusetts Suburban Experiment Station (Waltham), and the Univ. of Massachusetts Cranberry Experiment Station (East Wareham) interact regularly with INFONET.

The FIDO software records all bulletin board activity, so we were able to quantify the amount and type of use that INFONET received during the first year of operation. Over a 12-month period, INFONET logged 4595 calls. Fig. 1 shows the distribution of those calls throughout the year. An average of 88 calls were received each week, with an average of 116 calls per week from April through June. Calls were logged at the average rate of 16 per day (Monday through Friday). However, as many as 62 calls were received on some days. Some problems have occurred with excessive use during certain hours, and this situation may necessitate the addition of more telephone lines or the development of additional bulletin boards for specific subject areas.

File transfers occur on a regular basis during the operation of INFONET. During the first year, 307 files were uploaded to INFONET, 54 by county staff and 253 by university personnel. Also, 387 downloads occurred by users: 203 by county staff, 90 by university personnel, and 94 by farmers. We are trying to encourage more use of INFONET by fruit and vegetable farmers so that they can obtain pest alert and other important messages as soon as they are available. The value of this feature should exceed the cost necessary to allow connection with INFONET.

The reliability of the software and hardware used to maintain INFONET exceeded our expectations. We had only occasional modem problems and no computer failures. Only minor software problems occurred, all related to operator error. All problems resulted in INFONET being unavailable for less than 1% of the total time in use.

After 1 year of operation, we are pleased by the acceptance and level of use of INFONET. It provides an effective means of message transfer that is much quicker than the postal service and a means that is often more efficient than the telephone (since people often are not available for telephone calls). INFONET also improved the level of interaction among university departments, extension offices, and state agencies. A microcomputer-based bulletin board system using the FIDO software package is inexpensive and relatively simple to establish. Before starting such a system, it would be advisable to contact a local FIDO bulletin board operator to determine what hardware is suitable for use with FIDO.

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