Comments

Tree Planters' Notes
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Cover: Hardening the seedlings at the old Wind River Nursery, Gifford Pinchot National Forest, Washington; photograph by Rebecca Nisley, USDA Forest Service, Hamden, CT).

Computer Applications in the Nursery

Small, personal computers, compared with mainframe computers, first began entering the workplace roughly two decades ago. With this introduction came many predictions of the computers' impacts on work life. Predictions included computers replacing workers, generating shorter work weeks for those who still had jobs, and making employees more productive. In most cases in the nursery industry, only the last prognostication came to reality. I do not know anyone who is currently working less than before getting a computer. The loss of jobs, which may or may not have occurred, has likely been due to increased competition among nurseries and advances in mechanization. Most would agree that the introduction of the computer into our working lives has indeed increased both personal and nursery productivity (defined as the number of tasks per unit time).

In the early to mid-1980's, nurseries began using computers in their operations. Usually the computer was relegated to the office for administrative functions (letter writing and some accounting activities). However, over the past 10 to 15 years, computers have become integrated throughout many nurseries. Computers and computer-assisted equipment are being used to control environments in greenhouses, irrigate crops, run coolers and freezers, grade seedlings, advertise, and market—in addition to their traditional roles in administration. Nurseries vary as to their incorporation of these technologies in their operations. Failure to adopt computers and computer-driven technology in nurseries has been attributed to several factors, including lack of knowledge of the technology, failure to understand the need, and cost. The latter reason seems to be the predominate one in most nurseries. However, most nurseries do not recognize that there is a cost of not adopting these technologies.

Computers have two attributes that make them instrumental in most nurseries. First, computers can process, sort, and retrieve information quickly. The ability to process data quickly allows them to make short work of repetitive, long-drawn-out calculations, usually with fewer errors. Two examples of this type of computer application are determining fertilizer applications and sowing rates in container nurseries. Using computers to assist with these decisions allows a grower to explore the pro's and con's of various options quickly. Information generated from the computer allows the grower to compare the proposed options and, using this knowledge, to determine the ideal solution, without the distraction of having to conduct all the calculations by hand, to obtain the information. The ultimate decision of how many seeds to sow or fertilizer application rates still fall on the shoulders of the grower. The computer simply provides information to help in the decision making process.

Computers can also be programmed to execute decisions depending on the input information. This process is often called computer automation. Two examples of this in the nursery industry are the developing optic grading technology and climate control computers used in greenhouses. Both applications have been programmed to respond to certain input information by controlling some mechanical function. In climate control computers, if the

temperature from the thermal sensor is too high, the computer activates a cooling system. If the temperature input is too low, the computer activates a heating system. However, the grower is still responsible for setting the temperatures at which the computer sends the signals to the mechanical devices.

The second attribute computers have is the ability to gain rapid access to information previously difficult to obtain. This ability has only been developed recently, with the advent of electronic communication, specifically the Internet and electronic mail. These abilities allow nurseries and growers access to a seemingly infinite supply of information. A person only has to look at the number of traditional format journals, electronic journals, web sites, conference proceedings, and news groups to see that the volume of information being generated is expanding at an increasing rate. However, few people in the nursery industry have taken advantage of these resources. Many of those who have are involved in research or are people who see the potential to use this technology to improve marketing.

Most nurseries I have the opportunity to work with have been "reorganizing" (for lack of a better term!) due to changes in market demands or changes in operation constraints (costs). Most of these nurseries have been asked to produce more species using the same facilities. Needless to say, the same production system used last year may not suffice this year. For example, at the New Mexico State University—Mora Research Nursery, the number of species being produced has increased over the past 4 years from 9 species of native and introduced conifers to 45 species of woody trees and shrubs, each with its own distinct cultural requirements. This, in conjunction with a doubling of the total number of seedlings produced, has resulted in many logistic challenges. Such challenges include where to find seed, propagation requirements for species, introducing new pest problems, cropping schedules, etc. However, none of these problems was insurmountable when the information necessary to make wise decisions was obtained. Using various sites on the Internet, such as university and federal libraries, we were able to obtain the appropriate information quickly.

As new information, technologies. and demands are applied to nurseries, it will become necessary for nurseries to assimilate and process this information, if they are to remain viable enterprises. The cost of personal computers capable of these activities is now less than $2,000, so cost should not be a limitation in adopting computers in the nursery. In closing, computers are just tools, it still will be up to the grower to interpret the information and make decisions, the first of which may be who to hire next.

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