# COMPUTERS — WHERE ARE YOU?

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As you probably realized, this title really asks two questions: (1) What is the state of art? What is out there today? and (2) Where are each of you today and where are you headed in relation to computers? This article discusses the 1st question and gives some guidelines to use as you may attempt to answer the 2nd question.

I would like, first of all, to share with you where our firm is today in relation to computers — where we are headed and why — as an example of another nursery to whom you can relate.

Studebaker Nurseries has had a *Basic Four Model 600* for about 7 years. (We upgraded from a *Model 400* and increased capacity during that period.) It has 48 KB of memory and 20 MB on-line disc storage and currently operates 4 terminals. It has served us well, but:

1. Technology in computers has greatly improved over this period of time.
2. The older hardware and dust in our environment causes too much downtime.
3. We need to expand our capacity for on-line storage and for processing time, and we need to increase the numberof terminals from 4 to 8.
4. We have used a band-aid approach to program changes and add-ons over the years, and our programs need to be restructured.

Therefore, we are about to upgrade probably to a *Basic Four Model 8010* with 1.5 MB main memory (1.5 million bytes compared to our current 48 thousand bytes), 144 MB on-line disc storage (compared to 20 MB currently) and 8 terminals. We will be able to take advantage of the state of the art operating system and add the following: *IDOL DBM* software, *Spread Sheet Software, Integrated Word Processing, A Security Sytem, Virtual Memory* (computer automatically utilizes disc space if it runs out), *Dynamic Disc Allocation* (computer controls placement of data files and keeps track of their location which is more efficient when designing programs and eliminates errors in program runs due to insufficient memory.)

Currently, our computer is not used a lot strictly for propagation. That department does get the budget vs. actual reports for each expense item that they control and they get their labor reports (hourly and salaried hours and dollars projected vs. actual by work code or function). We do propagate 420,000 evergreen cuttings in the winter, root 230,000 summer softwood cuttings under mist, bud 6,500 trees, and graft 1,200 evergreens — but, propagation takes a backseat to the rest of the company when it comes to number crunching.

For example, our propagation department has a maximum of 1 million items on inventory at a given time during the year while there are 2 million on inventory in the finished production areas. Propagation deals with about 150 combinations of cultivars and sizes, while the rest of the company deals with 4,500. Finally, propagation labor hours are only 3% of those of the rest of the company, thus there are fewer people to process through payroll and costing. We would have done more for propagation on the computer, but we have had limited resources with our present configuration primarily: programming time, available memory, and user terminal time available.

When we upgrade, we will develop more propagation programs. Some examples would be in the areas of: (1) Historical and current records of rooting percentage by cultivar, by category, with various analyses and trends. (2) Projections of numbers going into and coming out of each propagation phase. (3) Costing. (4) Space requirement. (5) Timing and scheduling.

Enough on introductions — we will now consider computer *systems integrators*. In a *Business Week* article this past summer, and in an article in the August, 1983, issue of *Computer Decisions*, the concept of *systems integrators* was discussed. This is being forecast as the newest need in business/computer personnel — someone to make sure that all the different systems and subsystems from all the different vendors work together efficiently. It involves integrating micros, minis, and main frames and different levels of programming languages (those of you with micros that have purchased different boards and computers and software from different vendors know about compatibility problems). I will try to fill the role of integrator a little as we consider briefly the uses and concepts in hardware and software and of sources of help, information, and experience sharing.

The most important thing in choosing hardware is to find a good reliable local vendor that services the hardware he sells (unless that brand is serviced by a local outlet of a good service organization) and provides software support. This combination is not easy to find in a vendor.

A hardware concept you should be familiar with is *micro computer* vs. *mini computer*. When a dealer is discussing a piece of hardware, it is very important that you know which it is (just ask him). Many times the size of the main memory is the same or larger on a micro as compared to a mini, but:

1. The micro cannot access or process all that memory at one time like the mini can.
2. The micro disc access time is much slower than the mini.
3. In general, disc storage is much smaller, or it takes more drives, to get the same amount of storage on a micro as compared to a mini.
4. The micro's operating systems uses much more of the memory than does the minis.

The net effect is that the micro cannot hold as much data, its programs cannot be as long and complex, and it takes much longer to process or run each program as compared to the mini. However, micros are much cheaper (approximately $10,000 to $20,000 vs. $25,000 to $100,000).

Another term or concept with which to be familiar with is *Data Base Management (DBM)*. This is either *firmware* (on a chip) or *software*. This feature allows easier report generation with limited programming. You can get your data out in many different combinations very easily without having stored the data in that form.

We will consider briefly four types of software: 1. canned or off the shelf, 2. custom designed, 3. spread sheets, 4. word processing.

With *canned programs*, you adjust to it. You conform your operating practices to match the steps and the order of the software package. These are cheaper than customed designed and for the most part have been debugged. They are quite useful for functions that are standardized across different industries. Usually payroll, accounts payable, accounts receivable, and general ledger canned programs are quite useful.

*Custom designed programs* are more flexible and are conformed to the way you presently operate. You do not have to change procedures. The software is bent to your specific needs. However, this is more costly. It is usually necessary, however, to get good inventory, order processing, sales analysis and costing software.

*Spread sheets* (like Super Calc, Visi-Calc) require no programming knowledge to be able to customize reports and financial analysis. It is especially useful for budgets, production

records and projections, propagation records and projections, and financial planning. This is a very important management tool.

*Word processing* is something that most of you would want as a software addition to your computer rather than as a stand alone system. It is a real time saver when used to update catalogs and manuals, to personalize mailing lists and multiple correspondence, and to prepare charts and reports.

*Networking*, another current computer buzzword, simply means linking together several micros to a mini. Each has its own data base which can be shared with each other or with a larger mini. This could be an interim step between a micro and a mini if your firm is not rapidly expanding, or does not need the capacity of a mini, but needs several work stations that can share data. However, a network uses a lot of throughput time if users are interacting a lot and this does not lend itself well to practical expansion.

The final concept to discuss is *time sharing*, which is basically renting time from a larger machine of another company. This is done over a phone line. This might be the most inexpensive alternative if you had large data bases and did not need frequent interaction, although security of data could be a problem. I know of at least one large nursery firm that is renting time to other users. One added advantage with this arrangement within the industry is that many of the programs could be pertinent to your own operation.

I will close by discussing sources and resources for further information. I have found magazines to be the best information source if you can take the time to read them. It is like reading the *American Nurseryman*, their ads are as informative as their articles. Following are several magazines with which I am personally familiar:

1. *Personal Computing* — one of the best for micros.
2. *Personal Software* — discusses pros and cons of available software for games, home and business use for micros.
3. *Byte* — has reader service cards you can send in for information about particular ads.
4. *Computer Decisions* — Administrative and office oriented.
5. User Group Publications:
   (a) *Association of Computer Users* — excellent for micros.

(b) *Data Stream International* — pick operating systems on minis

(c) *Pragma* — pick operating systems on minis.

(d) *PC* — IBM's micro user group.

6. *Software Center* — software catalog from a supply house.
7. *Technology Network* — used equipment dealer publication.

Other nurseries are a good source of information. The American Association of Nurseryman has a listing of nurseries available by state showing the type of nursery, type of computer and programs they have, and if they are willing to share information. It is 2 years old now, but still very helpful.

Computer "consultants" are available. I put *consultants* in quotes because they all have a vested interest (like insurance "consultants"). Even when they can 'get you any product', their recommendations will be biased by commission rates, the ease they have in dealing with the manufacturer, how the hardware relates to software they may want to sell, etc. They can be of use, you just have to weigh their input and you have to make the final decision.

Two excellent books that I would recommend if you own a micro or are considering buying one are "How to Select Your Small Computer — Without Frustration," and "How to Manage Your Small Computer — Without Frustration". Both are available from the Association of Computer Users in Boulder, Colorado.

Finally, if you are looking for software you can use software catalogs (which I mentioned earlier). They are the cheapest way but get out of date quickly. Or you can use personal search services. Several companies are available which do this now. They are expensive, but good if you are looking for something very unique or specific.

We have touched briefly on some of the current computer concepts and their relationship to a nursery or propagation business and on some of the sources of information on hardware and software. I would be happy to share any additional information that I have if you just contact me.

BILL SCHWARTZ: One comment. You did not talk about reliability at all. Every so often one of the machines drops dead and it needs to be fixed. This is very important and it should tell you which one to buy.

WILLIAM STUDEBAKER: That is a good point. You also need to backup every day because some day you are going to have your data wiped out.

CAMERON SMITH: One thing that I have seen many small businesses get in trouble with is the lack of fully documented software. Anyone considering custom software, no matter how minor the change from stock, should be well documented. See a good CPA firm.

WILLIAM STUDEBAKER: That is a very good point. It is very difficult to get that from a programmer.

PETER VERMEULEN: For a multifaceted use, such as office procedure, propagation, etc, would we be better to go with a mini or several micro computers?

WILLIAM STUDEBAKER: I am not sure if I can answer that question right off. It depends on if you have a large data base and a lot of interaction going on in your business. If a lot of your people will use the same data all the time then you need a mini. If you have stand alone functions then micros will work.

RALPH SHUGERT: I would just like to echo a comment you made on sharing. Zelenka Nursery is involved in sharing and feels very comfortable with that format.

## WATER QUALITY IN PLANT PROPAGATION

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Most propagators, I believe, do not really think about water except that they have a sufficient amount to do the job. The most important factors seem to be an adequate supply and that it is sufficiently clean to prevent clogging of nozzles in the greenhouse.

Also, in the past, I believe that life was simpler, most nurseries were off by themselves, or they were on city water and most water supplies were naturally clean. Many often used cisterns to collect rainwater which was, in those days, considered to be as clean as you could get. However, today with urbanization, industrialization, extensive use of herbicides, shortages of water in some areas, and increased costs of city water, propagators need alternate sources such as ponds