Putting some Byte into Aquaculture

by Wm. Pennell, S. Combs and T. Septav

Though there are some new software packages tailor-made for the aquaculture industry, most fish and shellfish farmers will find computer technology best suited to traditional tasks such as filing, accounting and general bookkeeping. Many off-the-shelf programs can be modified to suit fish farm management.

Computerizing the latter day fish farm presents an appealing image: fanciful accounts of computers on the farm often portray something akin to NASA control centers with a plethora of crucial data simultaneously collected, analyzed and acted upon with little effort on the part of the site manager.

At the other extreme, real-life micro-computers costing from $3,000 to $15,000 sit unused, gathering dust in fish farmers' offices. The owners of these expensive paper weights have not had time to master the complex "user friendly" software packages, several hundred pages of instruction, tutorial disks and other paraphernalia. And if using the computer has not been a problem, the manager may not have enough time to enter his data into the machine. Instead he continues to use familiar tools such as the calculator and pencil, adopting the traditional approach to life on the farm.

The Middle Ground

Somewhere in between lies an area where the micro-computer can indeed reduce the risks associated with aquaculture as well as ease the farmer's planning burden. However, successful incorporation of a computer into farm management must be preceded by a clear understanding that the computer is a tool that demands daily use. Moreover, the work of the computer must first be clarified, then appropriate software identified and, finally, the hardware which operates the software purchased.

The commitment to use the system on a daily basis is crucial. Entering farm data into the computer takes just as much time as writing it in a ledger, and designing site-specific data management systems for the computer is also very time-consuming. The pay-off comes later when the farmer wishes to manipulate the data to attain new insights and achieve better management control of the farm and its profits. These manipulations, done in minutes on a computer would normally take hours or days by traditional methods.

Electronic filing systems

Data base programs are essentially electronic filing systems which allow the farmer to store data for sorting or searching by category or group of categories. One interesting capability of this type of software is in the analyses of data to establish emerging patterns. For instance, the quality of water in tanks or pens can be related to patterns of growth or mortality, thus providing information on possible relationships between the two.

Accounting programs

Though general accounting programs do not save greatly over traditional methods in data entry time, they do handle the various required calculations quickly and accurately. Using them, the farmer can keep track of the farm's financial position on a weekly rather than a quarterly basis. This could be important when one wants to know one's exact tax position or cash flow without waiting for an accountant's office to review the books. Packaged programs to do this type of work should be of Canadian design, at least with respect to aspects of taxation.

Commercially-available software for most of the above tasks allows programs to be designed by the user to meet specific farm needs - e.g., the type of farm, financial situation, etc. Many of the newer software packages also permit graphic portrayal of farm data. This is not only easier to interpret than straight numbers, but useful in the production of reports and proposals. Bear in mind too, that spreadsheet, data base, word processing and graphics programs may now be purchased together in integrated programs which make jumping back and forth between one and another much easier — and faster.

It is possible to hire a consultant to design farm-specific computer programs; however, these are often expensive, rigid and generally no better than the commercially available programs described above. Moreover, they tend to become extraneous as farm plans change or new techniques become
There is a place for the consultant though, and this is in helping farmers to utilize the microcomputer as a management tool. Indeed, it may be extremely cost effective to engage an expert to determine the uses to which a computer can be put, choose the software, hardware and then instruct the farmer in its use. Costly and time-consuming errors may be avoided. Examples of such errors include falling prey to zealous salesmen and "over buying" (paying for computer capacities that will never be used) or, at the other extreme, buying a machine without enough memory to operate modern spreadsheet programs. The consultant may also pay house calls when the new operator gets "stuck" during the operation of the new software. This not only saves time, but probably some millimetres of stomach lining.

**Special programs**

Recently, some special programs have been developed specifically for aquaculture applications. The Salmonid Enhancement Program (S.E.P.) of Federal Fisheries and Oceans has developed a series of fish hatchery ("Utilities") programs which allow the technician to calculate water flow and oxygen levels, predict growth and feeding rates, design aeration systems and do other work in the hatchery. These programs have been written for the Apple computer and are modified regularly to keep pace with hatchery research. The B.C. Ministry of Agriculture and Food is completing a business management program for salmon and trout farmers. This will be compatible with both Apple (Macintosh) and IBM-type computers and may be available to farmers. No doubt other programs will emerge in the future.

**Common sense warnings**

Finally, a few common sense warnings should be heeded. Basically, the computer is mindless but accurate; the normal errors of arithmetic which plague most bookkeeping will not occur in a computer program. However, any error in the data entered by the farmer may cause enormous errors in the projections produced by the computer. Small errors of data entry such as typos and decimal point placements can also be significant.

The farmer should start using his new computer in tandem with the paper system currently in use, overlapping the two systems until confidence in the software is justified. There are many classic tales of lost data owing to misuse of computers.

**The costs**

The costs of computers vary. IBM clones sell for as little as $2,000 complete with drives and printer. However, some of these may have dubious servicing arrangements and may or may not be able to utilize a wide range of software as some of the recognized models. The versatility and servicing arrangements are more important in the long run than a saving of a few hundred dollars. The final cost will most likely vary from $3,000 to $15,000 depending on make and capabilities.

Obsolescence is a fact of life with computers; the system on sale today is already obsolete with new models and lower prices always imminent. Therefore, one should carefully assess the most probable uses to which the computer will be put, make the purchase, and use it.

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