Using the HP71 Hand-Held Computer for Seedling Inventory[1]

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The J. H. Stone Nursery has used a Hewlett-Packard hand held computer since 1985 for data collection during seedling inventory. The use of the HP71B has resulted in improved inventory accuracy, better information handling, and cost savings.

INTRODUCTION

Each nursery has its own method for seedling inventory, but all nurseries have the same need to collect this data for evaluation and reporting. Until 1985 the J. H. Stone Nursery recorded inventory data on paper forms and then transferred the information manually into our computer system. This method was time consuming, allowed for entry errors, was costly, and did not provide timely access to the inventory data. From the beginning of operations at Stone Nursery, we identified the need for a field data recorder to assist the inventory process. In 1984, nursery personnel with assistance from Randy Lunceford of the Deschutes National Forest tested and evaluated the Hewlett-Packard HP71 Hand Held Computer. We found this computer satisfactorily met the requirements for seedling inventory; we embarked upon a process to develop an inventory program and operating procedures for the HP71.

EQUIPMENT

HP71 Hand Held Computer - This is a powerful computer/calculator that is programmable in BASIC language. The standard memory for this computer is a 64K

ROM and a 17.5K RAM. Both the ROM and RAM are expandable. The nursery is uses an expanded RAM of 32K. The cost of the HP71 is $350 (GSA contract). The expanded memory module costs $395.

HP-IL Interface Module - The HP Interface Loop allows the HP71 computer to operate with a variety of peripheral devices, such as, printer, cassette recorder, and other computer systems through an RS-232 Interface. The cost of the module is $53 (GSA contract).

HP-IL RS-232 Interface - This device allows the HP71 to "talk" with other computer systems. This permits the transfer of data from the handheld computer to a main computer system for storage and additional processing. The cost is $210 (GSA contract).

Digital Cassette Drive - The cassette drive is a very necessary peripheral device. The mini-cassettes can be used for storing data and programs. The programs can be loaded from the cassette into the HP71. This makes loading of different programs very easy. The cost is $320 (GSA contract).

Thinkjet Printer - We have used the printer primarily for listing and troubleshooting programs. The HP71 has TRACE FLOW and TRACE VARIABLE commands that aid in analyzing program troubles by printing out the program steps or variables. The cost is $350 (GSA contract).

The minimum equipment required to successfully use the HP71 for data collection would be the HP71, the HP-IL

Interface Module, and the RS-232
Interface. The expanded memory may be
necessary depending on the amount of data to
be collected and the proximity of the
collection area to a main computer for data
transfer. The cassette drive and printer are
very helpful tools, but not essential for field
data collection

PROGRAM DEVELOPMENT

Each nursery conducts its inventory
differently, as was mentioned above; therefore,
there is not A need to discuss the "mechanics"
of the inventory program (formulas, statistics,
sampling requirements). Great consideration
must be given to the abilities of the
individuals doing the work. A program that
relies on specialized knowledge of the
equipment may present problems to the person who
hasn't any experience with computers.
Designing a program which is inter-active in
format can overcome "computer induced trauma".
By querying the operator for input, by
presenting clear cut choices on the display,
by requiring operator confirmation of data
input, and by building error traps and escapes
into the program, the chance for operator error
is reduced.

Once a program is successfully completed and
debugged, the inventory crew must be trained in
the operation of the computer. A program flow
chart is one of the best tools that can be used
in any training session. Practice with the
equipment under the guidance of accomplished
operators is also mandatory. It is much easier
to answer questions and to look at operator

problems in a classroom setting than in the
field with the crew scattered out over ten or
twenty acres. During our training sessions
"sample inventories" are entered into the
computer. The samples are designed to produce
specific results which give operators the
opportunity to correct errors, escape from
mistakes, and see "correct" machine responses.
A well designed training program will help
insure that the operators perform the inventory
quickly and with few errors.

CONCLUSION

The Stone Nursery's experience in using the
HP71 for seedling inventory has been a
positive one. The following advantages
were evident:
  1. Paperwork was reduced.
  2. Errors were reduced
  3. Cost of inventory was reduced
  4. The inventory figures were available on
  a timely basis.
  5. The flexibility afforded by the HP
  71 allowed modifications to the
  program during the inventory.

The high cost of the equipment and alterations
to previously established procedures were the
only perceived disadvantages to using the HP
71. Since this equipment has only been used for
two years we can not assess its durability.
There are many types of hand held computers on
the market, and regardless of which brand is
chosen, a hand held computer can improve the

seedling inventory process.