GROWERTALKS

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Rakers: Plugged In

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In this except from the upcoming 17th edition of the *Ball RedBook,* Paul Karlovich, head of information systems for plug and cutting producer C. Raker & Sons, describes how Rakers uses the latest computer technology to track and maintain their plug and cutting inventory.

I've grown up with the personal computer. I can remember being one of the first students to use a PC to type my Master's thesis back in 1983. In those days, we thought it was wonderful to do what we did, and we never imagined where the personal computer would take us.

Today's PCs are so powerful that they outstrip the computer power of mainframe computers of just a few years ago. This power and flexibility, combined with relatively low cost, is now used throughout the greenhouse industry, allowing us to maintain unprecedented systems control, inventory control and accuracy. This information allows us to make better business decisions and to serve our customers in new and better ways.

There are two equally important components to Raker's system. The first is the technology itself. This is the hardware and software necessary to do what needs to be done in the computer. This capability is available now and no doubt will be substantially improved by the time you read this article. Technology includes computers, scanners, bar codes, RFID (Radio Frequency Identification) chips, antennae and cabling hardware.

The second component is how we manage the system. This includes maintaining and upgrading the technology, monitoring the data accuracy, entering data into the system in a timely and consistent manner, retrieving and presenting data in a useful manner, and matching the technology system to the work process systems of the organization.

Barcodes, beginning to end

At Raker's, we barcode every tray that's started in the system. We deal almost exclusively with flats, and our system lends itself well to putting a barcode on each one. The Vericell Vision software we use (Plantware Inc., Batavia, Illinois) generates unique barcodes. Since every barcode is a different number we can attach all kinds of information to that number. Some of the information we track is seed lot, sow date, tray status (dumped, in inventory, shipped), ship date, customer and greenhouse tray location. We can track any information we want with this type of system.

Barcodes are very valuable because they can be scanned mechanically and immediately at the time the work is done, and the data is recorded at once. Scanning is important because it eliminates human entry errors. For this reason we use scans to enter data in the computer as much as possible. In many cases, the ability to scan replaces human work. On the Raker sowing lines, an in-line serial scanner reads the barcode at the end of the

sowing process. As the barcode is scanned, the computer is updated with the information related to that activity. At sowing, the number of trays started is updated and the seed inventory is reduced at every scan. This information is immediately available to the rest of the company. In the good old days a human would have done this on paper, and it would most likely not have been done as accurately or in as timely a manner as is possible with a computer. Does this sound familiar: How many trays did we *really* start last week? How much seed is left?

Barcodes are integral to our technology system. Once we have the tray barcoded we can place that barcode in the greenhouse in a location. Raker's uses moveable benches, each of which has its own unique barcode, so we "place" tray barcodes on the bench by scanning a bench barcode. The work done by the scan is always in context to the activity being done, so the same barcode is scanned to "move" trays to benches. We also use bench tags that are coded both by number and by ship week color to help the growers keep things organized visually in the greenhouse.

So now we have a tray with a barcode, and we have information about when it was sown and the bench number it's on. The next step is to know where it is in the greenhouse. As we've expanded, it has become increasingly important to know where product is in the greenhouse. We employ an RFID (radio frequency identification) system to track the movement of our benches through the greenhouse. Each bench has a permanently attached RFID button. These buttons can take many shapes, but ours are the size and thickness of a credit card. We place these cards in a high-density polyethylene block and attach the block to the underside of each bench. An RFID button is like our barcode in that every one is unique. When these buttons pass over an antenna, the antenna reads the information on the card, and that information is sent back to the computer. Antennae are placed at all entry and exit points for benches into and out of our system. Like the barcodes and RFID buttons, each antenna has a unique position. Therefore, when a bench crosses an antenna, the computer can identify exactly where the bench is in the greenhouse.

With access to the information from the tray barcode and the bench location, we're in a position to provide accurate and timely information as well as find the tray easily in a very large facility. We accomplish two important goals. We have information that anyone at Raker's with access to a computer can view, and we can find the trays quickly and efficiently. This is the huge advantage of computers: information stored electronically can be widely and instantaneously accessible. This is a key point, because in my experience, when information is kept solely on paper, it's rarely widely available or timely.

The human element

Having a computer system isn't enough. A very common mistake is to view the computer as the end of the system, when in reality it's only the beginning. A computer is a tool, and like any tool it's only useful if it's used effectively. Careful consideration and emphasis must be placed on the management of the system. At Raker's, almost every employee is expected to use the computer. We've built systems that allow even novice computer users to be proficient very quickly. One of our goals is to make it as easy as possible for those doing the work to do it in the manner we expect. This means having enough computers, in convenient locations. This means making sure that when the technology breaks, someone is responsible for getting it fixed. This means investing in new technology continuously so the equipment doesn't become outdated.

Raker's has several key philosophies in regards to people and technology. First, workers must be able to use the equipment easily in the day-to-day work they're expected to accomplish. Work systems and computer systems must align. If the systems are grossly mismatched, it's likely that one or the other will be mismanaged at the most critical time: when we're the most busy and the information is most important.

Second, the more workers who can accurately do the computer work we require, the more information we can collect and use. We expect everyone to use the computer, and it's built into the work process. Implementing

technology is rarely perfect, so we work to listen to employees when they tell us why it's hard to use the computer. We eliminate as many issues as we can, and as a result we collect an amazing amount of information. This requires proper training, tools and computer accessibility. This requires that the tools work and are repaired quickly when they break. With a functional system, we're then able to use the information in many ways to provide information internally and externally to assist in decision-making.

A third critical management area is data validation. As part of the work process we build in steps to check the integrity of our data. We check continuously; this is essential. Without this we don't know if the information is accurate ... and we all know about Murphy's Law.

Key places we check the data are at any starting point for a tray, any time the product moves, and any time the inventory changes (dumped, shipped, transplanted). To do this effectively, employees are expected to check the data, and they're given the tools and computer access to do it easily and quickly.

The final critical management consideration is support and investment. To maintain technology requires continuous maintenance and upgrade. This should be viewed as an investment--part of the cost of doing business. Raker's is frequently asked what this investment is. We answer that it should probably be 3 to 5% of your gross dollars on an annual basis. These dollars cover all costs, from information technology support staff to hardware and software maintenance.

A smarter future

The system just described is cool, but what's just around the corner is even better. There's technology such as "smart labels" that have computer chips embedded in them. These will give us a whole new way to store and move information. These labels are available now, but their cost of $0.50 to $1.00 each make them prohibitively expenses for most of our applications, but we expect them to become more affordable.

We also envision putting an RFID button on every tray. This is currently expensive, but once it becomes feasible it will open new ways of collecting data.

RF handheld technology is currently good enough to be used in the greenhouse. RF handhelds allow you to carry the computer with you. You can update your computer database while you work, from anywhere. All of this will require new investment to initiate.

What's the point?

Why bother with all this work? The answer is that it makes good business sense. You'll be more profitable. The investment will pay for itself in increased customer satisfaction and employee efficiency. But building technology into a greenhouse requires a strategy and commitment. And a key component of any technology system is a strong commitment to the people management issues. The marriage of technology and people is critical to making the system functional and profitable. Another part of the strategy is to continually upgrade as the technology improves. At first it can seem like a huge mountain to climb, but if you take one step at a time you can reach the top.

Gerry Raker, of C. Raker & Sons, Litchfield, Michigan, will be speaking about "The Human Side of Cutting-Edge Technology: People and Systems" at the 2002 International Plug & Cutting Conference, September 29 to October 2 in Orlando, Florida. For details, go online (www.ballpublishing.com/conferences/) or call (888) 888-0013.