

Christopher Columbus set sail in 1492, in part, to prove wrong those who said the world was flat. His discovery of the New World should have accomplished that goal. But even today, members of the Flat-Earth Society facetiously dispute Columbus' (and subsequent scientific) findings. They belong to a group of people that prefer flat objects to round ones.

In 2001, another intrepid explorer has entered the round vs. flat debate — but this time it concerns the changing world of turfgrass photography. Jim Moore's work with flatbed scanners will bridge the gap between those who revel in flatness and those who live in a 3-D world.

Moore, director of construction and education at the USGA, uses his flatbed scanner to capture 3-D images for diagnostic purposes. He says scanners work well as a dissecting microscope, a tool he craved as a superintendent.

"Unfortunately, dissecting microscopes cost between \$700 and \$800," Moore says. "Somehow, I could never convince my green chairman it was a good investment."

His curiosity about scanners evolved from his long-standing fascination with photography. Moore describes himself as an avid photographer who has collected between 2,000 and 3,000 pictures in the course of his multiple careers as a father, a superintendent and a USGA staff member. He sheepishly admits that he has more photographs than he could ever adequately store.

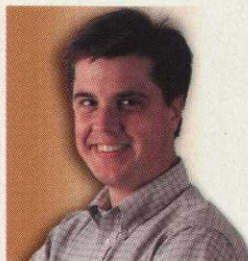
"I kept telling myself I would go back and eliminate the more outdated photos," Moore says. "But it's such a time-consuming job that



Moore says he discovered that *poa annua*, scanned at 1,200 dots per inch, reveals more color than most people realize the plant possesses.

Flatbed Scanners Round Out Images

BY FRANK H. ANDORKA JR.



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So when Moore discovered flatbed scanners, he was thrilled. He could finally combine his passion for photography with his passion for computers — and clean out his closet of some old boxes of photos. Moore's research revealed that a \$150 scanner would meet his needs. He scanned his flat photographs as quickly as possible.

But Moore still wasn't completely satisfied. Flat photographs, no matter how sophisticated, could never allow a 3-D view that would help Moore understand what was *really* going on in turf. There had to be a way, with the technology at his disposal, to give his photos depth.

Moore experienced an epiphany as he flipped one of the many PC magazines he reads each month. An article on scanning 3-D objects caught his eye, and it struck him that the same techniques could apply to turf.

"The article showed pictures of objects that most people wouldn't consider scanning because they're not flat," Moore says. "But the detail in the pictures intrigued me. I was sure there would be an application in my work with golf courses."

Moore's first 3-D scan involved (what else?) a golf ball. He was amazed by the depth of field and the clarity he achieved. Then he scanned turf leaves and turf plugs with dazzling results.

"I was finally able to do what I had always wanted to do," Moore says. "I could go below the surface to see problems with sufficient magnification. I could finally see subterranean problems graphically in a way that I couldn't before."

Moore urges superintendents to use their scanners as inexpensive dissecting microscopes. They can scan turf leaves or insects ("Insects are great," Moore says) on a simple flatbed scanner. New scanning software allows users to adjust the resolution for clarity, and it will help them

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understand more clearly what's going on below the surface.

But that's not all. Superintendents can e-mail scanned images to extension specialists. With the additional magnification available in the scans, it creates a depth that allows specialists to diagnose problems far more accurately. Be-

sides, images don't depend on the U.S. Postal Service to deliver a fragile turf sample in one piece.

Using 3-D images also helps superintendents communicate more effectively with their members. Pictures always tell the story more effectively than words, no matter how eloquently the superintendent speaks.



JIM MOORE

Scan only the parts of the turf you need to see in high detail.

"It's one thing to describe the effects of foot traffic on your greens to members in the newsletter," Moore says. "It's another thing to include an image which clearly shows compaction problems underneath the green. You can't put a price on the effect that stark visuals will have on your membership."

The amount of image manipulation depends on what the superintendent wants to use it for. Moore recommends superintendents save images at a minimum resolution of 300 dots per inch. (For comparison, *Golfdom* only uses electronic images with that minimum resolution.) The higher the dots per inch, the higher the resolution. But don't go overboard: Higher resolution images take up more space on your computer. If you have too many large images saved, you can actually inhibit the effectiveness of your computer.

Once superintendents experiment with the potential uses of scanners, they will discover applications they hadn't even considered, Moore says.

"You don't need a \$1,000 machine to do this," Moore says. "It's an inexpensive way to increase your effectiveness."

With his use of flatbed scanners, Moore has written a new chapter in the age-old flat vs. round debate. The creative use of flatbed scanners can help both sides live in harmony.

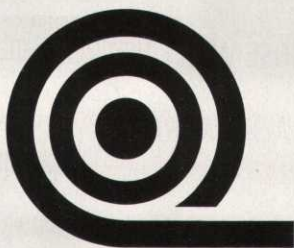
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