



Reclaiming our **TURF**

soil scientists seek to grow the
profession and bolster its image

By Madeline Fisher

A film about soil might seem like a doubtful draw for viewers. But in 2009, the documentary, *Dirt! The Movie*, debuted at none other than Robert Redford's

independent film showcase, the Sundance Film Festival. Narrated by the actress Jamie Lee Curtis and promoted by other celebrities, *Dirt!* later aired nationwide on PBS, propelled by reviews that called it thought-provoking, invigorating, and fun.

Not bad for a movie whose sole aim was to take audiences inside the "wonders of the soil." Yet even for such a film, "soil" itself was something of a dirty word, as Certified Professional Soil Scientist and Classifier Larry Baldwin discovered when he got a chance to talk with one of the filmmakers.

"I asked him, 'Why did you call it *Dirt! The Movie*? Why not *Soils! The Movie*?' " recalls Baldwin, who is vice president of the North Carolina environmental consulting firm Land Management Group, Inc. and an SSSA member. "And he said, 'Because the word 'soils' has no marketing to it.' "

So it has gone with soils of late; the subject seems to hold scant appeal with the public. Students have been turning away from soil science in droves, leaving academic departments scrambling to reinvent themselves in order to survive. During the 1990s, membership in SSSA dropped significantly, although the numbers have since rebounded. Meanwhile, consultants like Baldwin have seen engineers, geologists, and other professionals muscling in on the rightful work of soil scientists.

All of this has led to a "groundswell of concern about where this profession is going," says SSSA member Nick Balster, an associate soil science professor at the University of Wisconsin–Madison who studies soil science education. It has also led to action by SSSA. A group

of Society leaders has been teleconferencing monthly to discuss the issues, Baldwin says. In the meantime, an Advocacy/Education Task Force, convened in 2007 to study education and employment trends, published its results and conclusions in the September–October 2010 issue of the *Soil Science Society of America Journal* (74:1429–1432). And last July, Dawn Ferris joined the Society as Soil Science Program Coordinator. Her charge: To improve relations between SSSA and state soil science societies, expand certification and licensing programs, and increase continuing education opportunities for professionals.

The steps are all extremely positive. Still, if soil science is going to bolster its image and gain the recognition it deserves, it will take not only a groundswell of concern, but also of thought and action. Ferris recommends that everyone read the task force's paper on trends in soil science education and employment as well as the article, "Growing the Soil Science Profession through Investment, Vestment, and Validation," published in the March–April 2010 issue of the *Soil Science Society of America Journal* (74:453–460). She encourages members and certification holders to contact the Society with their questions, comments, and ideas.

"I really encourage people to talk with us," Ferris says. "That's how things are going to happen."

Ferris herself has been involved in the SSSA for nearly two decades. A native of Wisconsin, she earned a B.S. and M.S. in soils and a Ph.D. in forest hydrology before embarking on a career that has included positions in consulting, government, and academia. In 1993, she began volunteering with SSSA, helping

to develop a set of performance objectives for professionals that unambiguously defined the practice of soil science. A few years later, she was involved in bringing a licensing requirement for soil scientists into Minnesota, where she worked at the time. She also became a charter member of the Council of Soil Science Examiners (CSSE), which writes the national exams used for licensing and certifying soil scientists. She has served on the council ever since, including six years as chair.

Enhancing Certification, Licensing

During much of this time, Ferris was also talking with Luther Smith, the Societies' director of certification programs, about ways to enhance certification and licensing in soil science. When he offered her a job early in 2010 to do just that, Ferris was an assistant professor at Ohio State University and well on her way to tenure. In the end, however, she couldn't let the opportunity pass.

"It occurred to me that I could do more for the profession of soil science being on staff at SSSA," she says, "than I could ever hope to do as a professor at OSU."

Much of Ferris's passion to uphold her profession stems from the 14 years she spent as an environmental consultant. Like Baldwin, she was dismayed to see licensed engineers, geologists, and others doing the work of soil scientists. She also saw that soil scientists would never enjoy the same stature as these licensed professionals unless they became licensed themselves.

Licensure, she explains, is a legal requirement dictated by state law that aims to protect the health, safety, and welfare of the public. But licensure also protects soil science professionals because only those



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people who meet state standards for education, experience, and performance on exams are allowed to work as soil scientists in licensing states.

In granting licenses, however, states tend to be all over the map. North Carolina, Minnesota, Texas, and Wisconsin, for example, all require professionals to pass both CSSE exams: the fundamentals exam and the professional practice exam. Several more states use one of these exams; others, like Tennessee and South Carolina are deciding what their licensing rules will be. And many more states don't yet license soil scientists, Ferris says.

The reason it's important for states to require both CSSE exams, she stresses, is that this provides national consistency, or comity, in licensing. A soil scientist licensed in Wisconsin could immediately apply for a license to practice in North Carolina, for example, whereas this wouldn't be true in a state that doesn't share Wisconsin's licensing requirements. Thus, Ferris spent much of her time this summer and fall meeting with officials in various states and encouraging them to adopt similar licensing rules so that soil scientists can easily cross state lines.

In the meantime, there is also certification. Although certification through SSSA (see www.soils.org/certifications/cpsc) is voluntary and doesn't carry the legal status of licensing, it does convey to the public that a qualified person is carrying out the work, Ferris says. Importantly, many states' laws also dictate that a certified soil scientist perform certain kinds of work; for example, the design and installation of septic systems. But this requirement is often left out of state law, as well, which is why professionals need to keep a close eye on legislation to make certain soil scientists are being named as rules are updated.

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Baldwin agrees, adding that any profession—whether medicine, engineering, law, or soil science—has the same three legs. Professionals must acquire a specialized body of knowledge. They must then apply that knowledge responsibly in their work. But in between is the public call for the knowledge, which arises largely through laws, regulations, and policies. Without this public recognition and demand, a profession isn't truly a profession, he says. "It's just a body of knowledge."

Finding opportunities to protect and enhance the profession was also the goal of the Advocacy/Education Task Force—a group of dedicated SSSA members, including Ferris and Balster, who had all heard stories for years about soil science's decline. But when the members convened for the first time in 2007 under the leadership of SSSA and ASA member John Havlin at North Carolina State University, they realized that stories alone weren't enough; they needed solid data. So in 2008, the task force commissioned a survey of soil science students, academic departments, and employers, which queried them on matters such as student enrollment trends, future career prospects, the downsizing (or growth) of academic programs, and the preparedness of soil science graduates.

Soil Science's Image

The survey yielded a trove of information about these topics, Ferris says, which can be read about both in the SSSAJ paper and in a longer, companion report. But perhaps the most interesting findings centered on something the task force hadn't asked about explicitly: soil science's image.

For one, students, employers, and departments all agreed that in

the minds of many, soil science is still linked exclusively to production agriculture, when in fact the profession is much broader. When asked where they saw themselves employed in the future, student respondents—81% of which were graduate students, Balster notes—overwhelming chose the environmental sciences (agronomy ranked third, while soil science came in ninth). Similarly, many departments indicated that interest in the environment, land use, and sustainability seemed to be attracting more students to soils today. And when asked where future job growth would be, employers, too, said environmental science.

The results therefore suggest that soil science could sell itself better to students and the public by tying itself more closely to the environment. Similarly, job market trends indicate that departments may want to train students more broadly in environmental science—as indeed many of them are doing already. However, this also creates a dilemma for educators, Balster says. Broad, interdisciplinary education has well-known benefits. But in delivering it, departments may struggle to maintain the depth of training they've traditionally offered in subjects such as soil chemistry, soil physics, and classification. As a result, a "full-service" education in soil science may become less common, and graduating students may be less capable of passing soil scientist certification exams at the end.

But the implications could also go much deeper, Balster says. "It could easily change our knowledge base as a society because we might lose the contributions of specialized scientists and specialized students who really understand the soil system," he says. "When I think about my role in society, these are the trade-offs that concern me as an educator."



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Backdrop image courtesy of David Weindorf.

As an employer of new soil science graduates, Baldwin is already seeing evidence of this shift in the resumes that cross his desk. Increasing numbers of applicants hold degrees in interdisciplinary programs, such as environmental management, rather than in core disciplines, such as soils, geology, or forestry. But Baldwin's company needs people with core knowledge and skills, which means these students need to be retrained before they're able to contribute, Baldwin says.

At the same time, he agrees that soil science needs to start marketing itself in line with the times. "I think sometimes we're our own worst enemy. As soon as you say the word 'soils', half your audience has gone to sleep," he says. "We have to hammer land use, land development, and land policy issues. Soils are integral to all of that."

The trick will be finding the balance between breadth and depth, but some departments already seem to be getting the hang of it. At Baldwin's alma mater, North Carolina State University, for example, undergraduates can choose between two rigorous soils majors: one with a more traditional focus, called Plant and Soil Science, and another with a contemporary name and emphasis: Natural Resources. Similarly, the University of Minnesota's Department of Soil, Water, and Climate offers a broad major in Environmental Sciences, Policy, and Management. But students who choose to minor in soil science will also receive enough specialized training to meet the course requirements for Minnesota's soil science licensure program, the department says.

Better Communication

The above discussion points to another major finding of the survey: Students, departments, and employers need to be talking with one another more.

"What struck me was how many times the same complaint [about communication] came up in the responses of all three groups," Ferris says. "Somewhere communication has to be better facilitated."

For example, when asked how they got hooked on soil science, survey respondents cited a host of reasons, but one of the most common was completing an internship in soils work. Yet students also complained they had trouble finding both internships and jobs, noting that their departments seemed ill equipped to provide such help. Employers, on the other hand, said they had lots of internships and jobs available. Their problem was finding qualified people to fill them. In fact, when asked about finding trained soil scientists in the future, 37% of employers thought it would be harder in the coming years, while only 7% thought it would be easier.

The findings indicate that there's "an apparent disconnect occurring between soil science departments and employers of our students," Balster says, and it could be adding to soil science's woes. Students may not be choosing soil science because they aren't aware of the jobs they could get upon graduation. Departments may be inadvertently cutting courses that employers need students to complete, such as soil classification. And without information from employers about these needs, departments have a harder time justifying themselves to university administrators and fending off cuts. "So I think more research is warranted to understand this disconnect and how it can be fixed so that we re-establish the conduit for our students into the profession," Balster says.

Educating the Public

A better connection needs to be established between two other groups, as well: soil scientists and

the public. Despite an increasing awareness of environmental issues, U.S. citizens still seem mostly oblivious to the centrality of soils in problems such as food insecurity, water quality, erosion, and climate change. Instead, most people in the United States still think of soils merely as dirt—as the makers of *Dirt! The Movie* shrewdly recognized.

"That tells you right there that we don't understand that the essence of soils is life," Balster says. "In my opinion, there's a critical societal change that needs to happen in how we appreciate the soil and view its role in the sustainability of this planet."

The task force had several recommendations for SSSA on this front, as well:

- Promote the soil science profession and its connection to the environment at earlier stages of education, including high school.
- Integrate the subject more fully into K-12 curricula by building on the Society's already established program in soil science education.
- Experiment with hiring a marketer, whose job would be to tell the public why soils are so vital to our existence and can't be taken for granted.

If any one group can make progress on these issues, it's SSSA, Baldwin says, with its national reputation, resources, and large membership base. Speaking of those members, however, Ferris hopes they recognize that, in the end, no better champions for soil science exist than soil scientists themselves.

"We need to put ourselves out there and reclaim our turf, no pun intended," she says. "That's what I want to help people do."

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