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HEALTHY CROPS, PLANTS, AND FORESTS

Gary Bergstrom describes how members of the American Phytopathological Society are working to combat plant diseases worldwide

Published on 11 November 2003. Downloaded by Michigan State University on 19/01/2016 23:10:34.

Lessons from the Irish Potato Famine

The Irish Famine of 1846–1850 (the result of potato late blight disease) took as many as one million lives, changed the social and cultural structure of Ireland, and created a wave of immigration that altered the history of the United States and Britain.

While our understanding of plant diseases and the organisms that cause them has advanced significantly since then, potential loss and devastation from diseases is still a significant problem. From 1991 to 1997 alone, American farmers lost 470 million bushels of wheat, worth $2.6 billion, because of a plant disease called Fusarium head blight or scab. So severe are the losses and the potential future losses of this important food source, that the "US Wheat and Barley Scab Initiative," a consortium of scientists and agribusiness leaders, has been formed to try to reduce the damage caused by this disease.

A growing world population, changing climate, and the environmental complications of many agricultural practices challenge our efforts to combat plant diseases and find efficient food production practices that will not jeopardize human health or the environment. The growth in international trade and travel has also meant the introduction of new pests and diseases into countries poorly equipped to handle them. Even now, emerging diseases are creating havoc in various parts of the world, leaving scientists scrambling with how to deal with them.

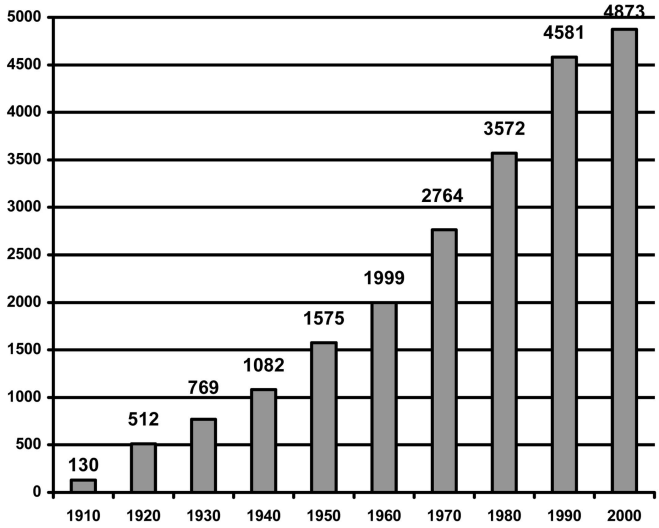

Figure 1. **APS Membership Growth from 1910-2000. The American Phytopathological Society was founded in 1908 and has grown from 130 charter members to nearly 5000 plant pathologists and scientists worldwide.**`

"Like all sciences, we gain ground on some levels and lose ground on others," says Gary Bergstrom, president of The American Phytopathological Society (APS), the world's largest organization of plant health scientists (Figure 1). "One way that those of us working in the plant health field stay on top of developments and connect with colleagues is through APS."

Diversity breeds innovation

As Bergstrom explains, the study of plant pathology (or plant diseases) is an interdisciplinary science, utilizing knowledge from many disciplines including botany, microbiology, crop science, soil science, ecology, genetics, mycology, biochemistry, molecular biology and physiology. Such diversity means that the nearly 5,000 APS members come from a variety of backgrounds and work in a variety of positions in academia, state and federal government agencies, industry, international institutes and privately as consultants. Their activities range from basic and applied research and teaching to new product development, plant inspection, and crop advising.

"One of the strengths of APS is the fact that our members represent a broad spectrum of the agricultural and plant science community from throughout the world," says Bergstrom. "APS integrates a variety of views and perspectives on the science. There's opportunity for discussion, debate, and assimilation of ideas."

While many organizations would strain under the demands of serving such a diverse membership, APS is thriving. Its publishing arm, APS PRESS continues to grow and expand, and its outreach efforts have captured the interest of the public and policy makers alike. Most importantly, APS members view the organization as a critical source of valuable information on the latest research developments, emerging diseases, and applied plant health science; and as a source of support for their professional development.

Making progress by staying informed

The saying, "nothing ever happens in a vacuum" aptly describes APS's publishing philosophy. "Scientific inquiry is not a solo activity," says Bergstrom. "Science is built upon

DOI: 10.1039/b311464n

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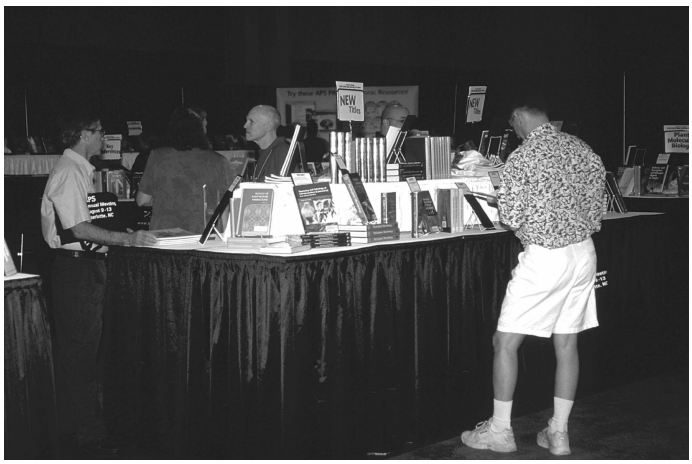

Figure 2. **APS's publishing program has grown to include several highly respected journals, an online Plant Management Network, and close to 200 book titles along with slides, clothing, and multimedia products.**

the discoveries of the past, from the past century to the past month. We need a way to archive developments and report on current ones, a way to keep everyone informed and involved. Without this kind of compilation, you have a dead science."

At APS, plant health science is alive and well, not only in its three highly respected journals, but also in APS-produced and APS-supported online publications. Introduced more than 90 years ago and considered vital today, APS journals continue to inform an information-hungry audience (Figure 2). APS's research journal, *Phytopathology,* is considered the premier international journal on fundamental research on plant diseases. *Plant Disease* is the leading international journal for rapid reporting of research on new diseases, epidemics and methods of disease control. And *Molecular Plant-Microbe Interactions® (MPMI)* remains a groundbreaking journal on molecular biology and molecular genetics.

APS has also been heavily involved in publishing journals on the Internet. Together with several partner scientific societies and universities it has developed the newly created *Plant Management Network,* www.plantmanagementnetwork.org, a multidisciplinary Internet site offering three peer-reviewed, applied plant science journals: *Plant Health Progress*, *Crop Management*, and *Forage and Grazinglands*. The network also offers a wealth of other applied plant science information and resources, all developed and produced by scientists from several disciplines including agronomy, entomology, horticulture, and weed science.

Other offerings through APS PRESS include more than 170 books on various plant science topics as well as disease image collections, and multimedia products for teaching and research. New titles are released regularly making APS PRESS popular among members and nonmembers alike. "Our library of available titles is large and broad enough to draw interest from outside APS and plant pathology," says Bergstrom. "Our *Compendium of Turfgrass Diseases*, for example, is on the office shelves of a good share of golf course greens keepers, and you'll likely find APS's publication, *Soybean Diseases of the North Central Region*, in the hands of growers and extension agents." The APS PRESS maintains an online bookstore at www.shopaps-press.org.

Taking plant health science personally

APS's emphasis on keeping its members informed and involved extends beyond the printed page. Bringing members together for one-on-one exchanges, personal dialogues and mutual discovery is a top priority. The APS Annual Meeting routinely draws more than 1500 scientists from around the world (Figure 3). Bergstrom calls this "the connecting effect." "Meetings are important because they can become one giant brainstorming session. It's a different way to take in and process information. At a typical APS meeting, you're likely to find a government scientist from a regulatory agency sitting down with a scientist from an agrochemical company for a lengthy discussion."

The "connecting effect" Bergstrom speaks of is fostered in other ways as well. The Society has six divisions: Caribbean, North Central, Northeastern, Pacific, Potomac and Southern. These divisions sponsor events and meetings that bring members together. Special subject-matter committees focusing on specific areas within the plant health sciences also nurture shared interests and personal connections.

For those members with travel limitations, online meetings and "events" provide another opportunity to interact. Important disease topics such as Karnal bunt, Potato Late Blight, Exotic Forest Pests, and Sudden Oak Death have been organized into presentations and discussion sessions hosted on the Internet and attended, at no charge, by members of APS along with others in the scientific and professional community. These events continue to be archived online as a valuable resource for continuing education and reference.

Spreading the word

While serving the needs of its members and helping to advance the science of plant pathology are the two main

Figure 3. **The APS Annual Meeting routinely draws more than 1,500 scientists from around the world to discuss the latest developments in plant health science.**

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forces driving APS, the Society also feels a responsibility to share its knowledge with a broader audience. "We have an obligation to inform and offer our advice and opinion when appropriate," says Bergstrom. "It's not our desire to isolate ourselves in a cocoon of membership, but to extend our reach both inside and outside the organization."

Several Boards and Offices of APS reach within the organization and outside to promote and advance the study of plant pathology. The APS Office of Industry Relations helps optimize the ongoing relationship between APS members in research and applied fields and those more closely aligned with industry.

The APS Office of Public Affairs and Education (OPAE) is an outreach program with a mission to educate the public about plant health. OPAE routinely issues press releases and works to generate media interest and reporting of plant health issues.

The Society's online Education Center offers free resources for instructors, including lesson plans and lab experiments to assist in teaching plant pathology.

The APS Public Policy Board works with other scientific societies, coalitions and agencies to provide scientific input into the national policy-making process (Figure 4).

The Office of Electronic Communications sponsors the Society's website, known as APS*net,* www.apsnet.org. Here, all of APS's activities are reflected – its journals, publications, electronic resources, education center, meetings, member services, and information about the society itself. APS*net* is among the web favorites of everyone interested in plant health.

On the international level, the Office of International Programs works to promote greater worldwide interaction among scientists and practitioners of plant pathology. "More and more, representatives in Washington, and other policy-making organizations and associations, are calling on us to provide input into issues related to agriculture and plant health," says Bergstrom. "This didn't happen by chance, we have made a concerted effort to get involved and those efforts are paying off."

Figure 4. **In February 2002, APS members briefed U.S. Congressional staffers on the Society's efforts to protect the world's food supply against possible terrorist attack.**

Making plans for the future

It's been more than one hundred and fifty years since the Irish Potato Famine and ninety-five years since APS was founded. "We've come a long way yet we have a long way to go," says Bergstrom when asked about the future of plant pathology. "Experts in plant disease are as valuable, if not more so, than they've ever been. The key is to make sure that funding and support for the study of plant diseases continues. We also need to support our students and young scientists. After all, they are the future." Bergstrom is quick to add that in five years APS will celebrate its 100-year anniversary. "We're an old and wise organization," says Bergstrom, "but we're also youthful and full of possibilities."