A Beacon for Applied Plant Pathology: The Origins of *Plant Disease*

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This year marks a full century since the founding of the journal *Plant Disease*. The story of how the journal developed, from its origins as a service publication of the USDA in 1917 to the leading applied journal in the field today, reflects on major historical themes in plant pathology. Central to this narrative is the delicate balancing act in plant pathology between fundamental and applied science. During the 1960s and 1970s, substantial numbers of plant pathologists in the U.S. expressed concerns through the American Phytopathological Society (APS) over what they viewed as an alarming and increasing scarcity of applied papers in the flagship journal, *Phytopathology*. These concerns led increasingly to calls for a second APS journal devoted to applied research. After a period of uncertainty and indecision, the dissolution of the USDA *Plant Disease Reporter* (PDR) in 1979 offered APS leadership an unusual opportunity to assume publication of a journal with a 63-year legacy of publishing practical plant pathology. In a bold move, APS Council, with the decision in 1979 to take on the publication of PDR under the new title, *Plant Disease*, provided plant pathologists and the larger agricultural science community with an innovative vehicle to communicate applied plant pathology.

Introduction

Never one to mince words, the legendary plant pathologist James G. Horsfall asked his colleagues in 1969, “Are we smart outside?” (Fig. 1). Horsfall was responding to forecasts for dramatic budget cuts in federal funding, the critical source of funding for advancing research in plant pathology. The threat of budget cuts was also tied to doubts from Congress over the practical value of allocating research dollars to plant pathology. Horsfall, one of applied plant pathology’s most ardent champions, questioned whether plant pathologists had brought this situation on themselves by placing too much emphasis on being “smart in the scientific world” while giving short shrift to being “smart in the real world outside” (Horsfall 1969). Horsfall concluded that plant pathologists had chased increased federal dollars for basic research while letting their service component slip precariously. In other words, he asked, had “we become irrelevant in the real world” by sacrificing service to society?

Part of Horsfall’s argument centered on how plant pathology published the results of practical research. In the 1960s, the APS journal *Phytopathology* was the sole source of peer-reviewed plant pathology research in the United States. According to Horsfall, however,

the percentage of papers in *Phytopathology* “with even a small component of field research had fallen from 65 to 18% in 20 years” (Horsfall 1980). Horsfall acknowledged that practical information on plant diseases was published in the USDA’s *Plant Disease Reporter* at the time. Yet Horsfall did not see PDR as an answer to the relevancy dilemma. Sadly, in his view, its lack of peer review meant that contributions offered “no credit toward advancement” for faculty. Horsfall found this “an astonishing example of the flight from reality. It refuses credit for the research that ‘pays the piper.’ No wonder the tax-paying piper is calling a different tune in Congress,” he bemoaned (Horsfall 1969).

Behind the scenes of his editorial, Horsfall was also referring to a larger, ongoing discussion among APS members during the 1960s about the need for a second journal devoted to applied research. At the time, there were widespread complaints that *Phytopathology* had largely abandoned publishing the results of practical research. Highlighting these criticisms in “The President’s Column” published in 1965, APS President William J. Zaumeyer admitted, “I often wonder how many authors of good applied research papers fail to submit them to our Journal lest their work be rejected on grounds that it is not sufficiently ‘basic’ and therefore inferior” (Zaumeyer 1965). The following year, APS President George A. Zentmyer returned to this issue by stating that, “As far as publication in *Phytopathology* is concerned, certainly we need a balance here” (Zentmyer 1966).

APS quickly responded to the growing controversy. In 1967, a special projects committee appointed by President Arthur Kelman strongly recommended a second journal for applied research. The idea of a second journal continued to gain momentum over the next several years. In 1975, APS President James Tammen appointed a committee to study the feasibility of publishing another journal through the society.

As this committee’s work proceeded, however, a surprising announcement from the USDA in early 1978 altered the course of events. Due to federal budget cuts, the publication of PDR was on the chopping block. Initially, the APS official response, through then President Durward Bateman, was a hope that the USDA would find some means to save the publication. According to R. James Cook, however, this initial response rapidly transformed into the idea that APS find a way to assume publication of PDR if it indeed vanished (Cook 2008). The loss for the USDA now gave APS an opportunity to have its second journal for applied research. Taking over PDR provided the society and the profession with nearly 60 years of an impressive publishing history in practical plant pathology.

The USDA Plant Disease Survey and the Origins of the *Plant Disease Reporter*

The origins of the *Plant Disease Reporter* extend back to the creation of the USDA Plant Disease Survey in 1917. The survey was a

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novel federal program designed to collect information on plant diseases throughout the United States. Aspects such as prevalence, geographical distribution, and severity would be the primary focus. Once the disease information was collected and organized, it would be made available as published information to plant pathologists and others concerned with disease control (Anonymous 1917a).

In 1917, America had entered World War I. The Plant Disease Survey was, in large measure, a response to concerns over safeguarding national food production in wartime. The survey also represented a deeper commitment to national efforts toward plant disease control. The rationale behind the survey was a lack of sufficient field data on the occurrence and severity of plant diseases nationwide, particularly those of regional and national importance. As a prime example, USDA officials cited the limited amount of information available on the scope and scale of the massive stem rust epidemic of 1916, which caused a disastrous wheat crop failure that year (Campbell et al. 1998, 1999; Peterson 2001). USDA officials promoting the survey successfully argued that “the distribution and importance of even some of the most common diseases was known only incompletely, and knowledge about plant disease occurrence in general was inadequate” (Miller 1950c).

American plant pathologists at the time were largely focused on local disease problems. This related directly to the decentralized development of American agricultural science along state lines at colleges, universities, and agricultural experiment stations in the late 19th century. After 1900, the USDA took a leading role in coordinating and consolidating American agricultural science on a national basis, plant pathology included (Campbell et al. 1999). One of the first, but large steps in this direction was the principal role of USDA scientists in the formation of the American Phytopathological Society in 1908 (Peterson and Scholthof 2010).

With the creation of the Plant Disease Survey, USDA officials wanted American plant pathologists to broaden their scope beyond “purely local conditions” to regional and national problems of priority. Wartime concerns over food shortages were on the top of their minds in 1917, but the issue of local versus national information about plant diseases had been building for at least a decade. By the first decade of the 20th century, staggering regional disease problems resulting in large-scale crop losses, like stem rust of wheat and late blight of potato, appeared to require a broader approach. In addition, the sudden appearance of chestnut blight in 1907 brought home the threat of exotic pathogens entering the United States. The chaotic response to chestnut blight that followed over the next several years and the visible failure to thwart the spread of the disease with ill-planned eradication efforts demonstrated the consequences of inadequate information on the distribution of disease (Campbell et al. 1999). USDA officials intended for the Plant Disease Survey

to fill this informational gap, “thus clarifying the disease situation in each state, and delimiting the pressing problems” (Lyman 1918). It would be a systematic collection and distribution of authoritative and timely information “to serve all parts of the country, to benefit all pathologists, and to assist all pathological work” (Lyman 1918).

Implicit in their actions to create the Plant Disease Survey was a confidence among USDA officials that American plant pathologists could do something useful with the disease information once gathered, assembled, and published in the *Plant Disease Bulletin*. There was justification for this confidence, however. In just a few decades since the late 1800s, American plant pathologists had acquired an understanding of the nature of diseases caused by fungi and could diagnose and then control diseases with fungicides that had emerged through experimental practice. Beyond fungi, American plant pathologists had established the field of plant bacteriology in this era and were beginning to investigate diseases caused by viruses and nematodes. Although the scientific union of genetics with plant breeding was in the future, plant pathologists were already identifying plants with resistance to diseases of economic importance. These practical successes led to rising numbers of plant pathologists hired by American colleges and universities, state agricultural experiment stations, and the USDA (Campbell et al. 1999). G. R. Lyman (Fig. 1), the first director of the Plant Disease Survey, characterized it as a logical extension of these developments. In 1918, he told fellow APS colleagues, “We have schools and professors for teaching pathology; we have laboratories, equipment and trained investigators for research. Extension work is rapidly developing and the Plant Disease Survey is now perfecting an intelligence service which shall supplement and complete other pathological work” (Lyman 1918).

The Bulletin and Reporter

The Plant Disease Survey, under the auspices of the USDA Bureau of Plant Industry, issued its first publication, originally titled the *Plant Disease Bulletin*, on August 15, 1917 (Fig. 2). To collect, collate, and publish data on plant disease locations, severity, and prevalence throughout the U.S., two plant pathologists from each state, primarily from the agricultural experiment stations, were assigned as USDA survey “collaborators.” It was to be an ambitious effort, with the *Bulletin* assembled every 2 weeks for nationwide distribution. This schedule was intended to provide “real-time” reporting about plant disease outbreaks affecting agricultural production nationwide.

The first issues of the *Bulletin* in 1917 set the stage for future content. The crop focus ran the gamut from potatoes, beans, winter wheat, rye, barley, and corn to cotton, sweet potato, flax, oats, grape, alfalfa, and sugarcane. The early reports were brief. For example, a

Fig. 1. Seminal figures in the history of *Plant Disease*. **A**, G. R. Lyman, a plant pathologist at the USDA from 1914 to 1923, was a leading figure in the creation of the USDA Plant Disease Survey and was its pathologist in charge from 1917 to 1923 during the initiation of the *Plant Disease Bulletin*. Lyman served as president of APS in 1923. **B**, James G. Horsfall was associated with the Connecticut Agricultural Experiment Station for much of his career. Horsfall was an ardent supporter of applied plant pathology and an early champion of a second APS journal in the 1960s and 1970s. He served as APS president in 1951. **C**, Edgar L. Kendrick was APS treasurer (1978 to 1983) and a USDA administrator. Kendrick played a vital role in helping to secure crucial startup funds from the USDA during the first years of *Plant Disease*.

collaborator from New Jersey wrote on bean anthracnose (*Colletotrichum lindemuthianum*), describing “less complaint than usual from growers.” Conversely, another collaborator reported that bean anthracnose in New Mexico was “more prevalent than last year” (Anonymous 1917b). Over time, the number of crops and diseases reported on would increase significantly as would the amount of data and information contributed.

A distinctive feature that began with the *Bulletin* was the publication of special supplements, beginning in 1917-1918. The supplements were designed to provide additional detail on key diseases of important crops. At the end of the growing season, for example, collaborators were asked to complete forms on key diseases of small grains (wheat, barley, rye, and corn), selected vegetables (potatoes, beans, tomatoes, onions, and sweet potatoes), apple and pear, and cotton. The information provided would make its way into these annual publications. Eventually, the supplements were expanded to include occasional special topic reports of importance to U.S. agriculture, such as cereal rust epidemiology and diseases in foreign countries.

In 1923, the *Bulletin* was renamed *Plant Disease Reporter* to avoid confusion with other regularly published USDA bulletins (Fig. 2). PDR continued to function as the publishing arm of the federal Plant Disease Survey to provide a rapid and accurate assessment of known and new disease problems. In 1926, an annual “Check List of Plant Diseases in the United States” was produced, followed by an “Index of Plant Diseases” recorded in the U.S. In terms of reporting on new diseases, PDR coverage of the sudden outbreak of Dutch Elm Disease in 1930 is a classic example, as was the subsequent reporting on the identification of the causal agent and the range of the epidemic in the U.S.

By the 1930s, PDR was well established, with an expanding reputation. In editor Jesse I. Wood’s estimation in 1937, the *Reporter* was becoming ever more popular, based on requests for subscriptions, the use of its data in textbooks and abstracting services, and its international distribution. Woods proudly remarked that after only two decades, this “informal publication ... has a recognized standing in its field” due largely to “regular and timely dissemination” of plant disease information in the U.S. (Wood 1937).

Over the course of the next several decades, the type of content in PDR would continue to reflect this service component of disease reporting, but the nature of the publication would be altered to address changing “interests, theories, and knowledge” in plant pathology more generally (Miller 1950c). Part of the reason for these changes had to do with expanded participation in the survey

nationally. Whereas two plant pathologists from each state had been assigned to the survey in 1917, by the 1940s, the organization could count on the participation of the plant pathology community in general as well as growers, county agents, extension specialists, and other USDA employees.

By the mid-1940s, the impact of this expanded participation showed up in PDR content. A perfect example is the “Warning Service” that was created in 1946 in response to an epidemic of tomato late blight (*Phytophthora infestans*). By 1950, this tomato late blight forecasting project had been extended to include efforts at providing forecasts of other emerging epidemics, such as late blight of potato (*P. infestans*), blue mold of tobacco (*Peronospora tabacina*), and cucurbit downy mildew (*Pseudoperonospora cubensis*). Another prime example of how PDR content changed to respond to different needs in plant pathology was reflected in 1950 by the inclusion of papers from APS annual meeting sessions on “The Teaching of Plant Pathology” (Miller 1950a, b).

By the late 1940s and 1950s, PDR content had become distinct from content in the earlier decades. As USDA scientist and PDR editor Paul R. Miller recalled, by this time, “pathologists began to use the REPORTER as a place for presentation of preliminary results and tentative conclusions, as well as for the speculative comment on topics of interest for various reasons” (Miller 1956). There also had been a noticeable shift “toward more extensive and complete articles.” This was accompanied by editorial changes, beginning in 1950, which required authors to submit manuscripts with an abstract, introduction or history, methods, results, conclusions, and citations.

In addition to content, PDR design and format also changed during this era, reflecting its expanded status in plant pathology. Originally, the *Bulletin* and early *Reporter* were rather simple, mimeographed publications. In January 1950, however, PDR publication changed to multilith printing, allowing for a new font, redesigned tables, and quality black and white photographs as well as drawings that were embedded in the text. Miller insisted that the “new form of publication will add greatly to the usefulness of the *Reporter*, besides making it much more attractive in appearance.” Still, Miller felt obliged to add that even with the design upgrades “... it is content that is really important” (Miller 1949).

Miller was correct that these changes would increase the value of the journal. Combined with expanded content and quick publication turnaround times, the design upgrades also brought increased submissions. Miller noted that its “prestige had already increased greatly in the last few years because of the type of contents and the promptness of publication, and since our recent change to the new method of

Fig. 2. First issue front covers of *Plant Disease Bulletin* (1917), *Plant Disease Reporter* (1923), and *Plant Disease* (1980).

reproduction its popularity among plant pathologists has increased by leaps and bounds” (Miller 1951). These effects were clear by the mid-1950s. In 1955, more than 1,000 pages, including the index, were published, increasing to more than 1,300 pages in 1958 and 1959, but decreasing again in the 1960s because of increased publication costs.

Perhaps the most monumental change to PDR, however, occurred during the mid-1970s with the establishment of an editorial board and the introduction of peer-reviewed manuscripts. Much of the responsibility for these changes rested with Hilde M. McGrath, who became editor of the revamped journal in 1975. McGrath, who worked for the USDA in Beltsville, Maryland, had been associated with the production of PDR for 30 years. From her position, she had witnessed many of the seminal changes to the publication. As APS Council would later remark, “During its 63 years as a USDA publication, PDR expanded from a simple, interagency, mimeographed publication to a major, international, peer-reviewed journal” (APS Council, undated).

From PDR to *Plant Disease*

Prior to PDR editorial transition to peer review, calls for a second APS journal devoted to applied plant pathology had been developing steadily among society members since the early 1960s. Much of the impetus for these demands appears to have been significant dissatisfaction with the perceived small number of applied science papers versus basic science papers published in *Phytopathology* during the time. APS President-Elect Don Ellis wrote in 1968 that “many of our members feel that our journal, *Phytopathology*, has in recent years become prone to carrying, almost exclusively, papers dealing with excellent and valuable basic research, but to such an extent that it does not have wide appeal to people interested in the problem of plant disease control” (Ellis 1968). One *Phytopathology* editor mentioned that “...loud voices are being heard in the Society which seriously question journal policy and content” (Aycok 1969). Another APS officer acknowledged that “the belief that *Phytopathology* is biased against applied papers is strongly held by many members of the Society” (Bruehl 1969). An additional factor that may have also played a role in this discontent were rumors that the publication of PDR was in “jeopardy” (Dimock 1969).

The heightened level of dissatisfaction among society members led directly to the appointment of a subcommittee of the general APS Publications Committee by APS Council in 1969 to investigate these charges against *Phytopathology* and the need for a second APS journal. One of the subcommittee’s primary efforts involved sending a questionnaire to members asking them “to express their opinion” on the society’s publication of applied papers. Based on the results from this questionnaire, the subcommittee found that “a significant portion of our actively publishing membership felt that the journal was ‘biased in favor of basic papers’ and was not adequately serving present needs” (Baker 1970).

In its annual report to APS Council in 1969, known as the “Petersen Report” after its chair, Donald Petersen of Pennsylvania State University, the subcommittee recommended that APS examine more closely the possibility of a second journal (Petersen 1969). The Petersen Report recommendations in 1969 were followed up the next year with the appointment of a subcommittee of the editorial board for *Phytopathology*. Although there was strong push back on the charge of content bias from the editorial board, author guidelines and requirements were altered (Aycok 1970). Yet even with these modifications, the issue of a second APS journal dedicated to applied plant pathology did not go away in the early 1970s.

Continued pressure for action among members led to the appointment of a “second journal” special committee in 1975 by President James Tammen with the approval of APS Council. Kenneth Hickey of Pennsylvania State University was selected to serve as chair. Writing to committee members soon after its formation, Tammen stated that “Council considers this Committee to be one of the most important that it has appointed in recent times” (Tammen 1975). Indeed, the committee of 12 active and four ex-officio members was quite busy over the next two years.

To determine the feasibility of a second journal, the committee polled department of plant pathology faculty from 10 major land

grant colleges. The responses were mixed. The committee reported that, “In general, persons involved in ‘basic’ research or teaching saw little need for a ‘second journal’ while those in Cooperative Extension or adaptive research expressed concern that something more than *Phytopathology* is needed by the society” (Hickey 1976).

Based on the results from this survey, the committee as a group “decided that there was a definite need for some type of publication that would publish applied research results ... for Extension use.” Beyond this broad description, however, the committee members were uncertain as to what any future publication might look like or exactly what audience would be targeted. Committee members were adamant, however, that any second journal not compete with PDR or *Phytopathology* (Hickey 1975).

The committee’s next step involved the formation of a subcommittee to assemble a prototype journal tentatively entitled “Journal of Plant Health.” Under the leadership of Thor Kommedahl from the University of Minnesota, the subcommittee gathered examples of the type of papers that the second journal might eventually publish. Many of the papers “submitted” were of an applied nature and had already been published in various trade journals. Although the details are unclear, members of the full committee generally seemed to have been dissatisfied with how the prototype turned out (Hickey 1977b).

At this point, after two years of deliberating, the Tammen Committee members appeared to have agreed broadly on the need for some type of second publication but were at an impasse as to exactly what this publication should be or who it should serve. Some committee members suggested that any second publication provide more exposure for plant pathology and APS than a narrowly academic research journal like *Phytopathology*. Other committee members argued the need for a “type of publication containing articles that could be understood and applied by agriculturists outside of plant pathology” (Hickey 1977b). Although financial considerations do not appear to have occupied as much attention as the prototype publication, cost concerns were very much present. Kenneth Hickey summed up the situation in April 1977 when he wrote, “It’s obvious that many APS members feel that some additional type of publication is needed but most are not sure what it should be and very few are willing to pay much for it” (Hickey 1977a).

This was how the situation stood when APS received word from the USDA in early 1978 that PDR would likely be discontinued due to federal budget cuts. As mentioned previously, the initial official response from APS was a hope that the publication might be saved from cancellation. APS President Durwood Bateman expressed this sentiment in a memo to APS committee chairmen on January 26:

“It has come to my attention that the budget for the Plant Disease Reporter has been deleted from the USDA budget for the coming fiscal year. This journal of long-standing is of major importance to all scientists concerned with increased agricultural productivity. The elimination of the Plant Disease Reporter would constitute a disaster of major proportions to the crop protection disciplines, particularly plant pathology and nematology. Every possible effort should be made to get the budget for the Plant Disease Reporter restored” (Bateman 1978a).

Although attempts to preserve PDR appear to have continued for some time (Bateman 1978b), it looked increasingly unlikely that PDR would survive the federal budget axe. According to Raymond Tarleton, APS executive vice-president at the time, high-level USDA officials told APS that PDR had little chance of survival (Cook 2008). With this realization, APS began discussions with USDA officials about the possibility of the society assuming the publishing role of PDR (Nielson 1978). The momentum began to favor a second journal. Cook wrote to APS President Bateman, “There is strong support within APS for a second journal. A major argument against a second journal has been the existence of PDR. Perhaps this is a time to reconsider the issue. Perhaps this is an opportunity for the American Phytopathological Society to bring under its control both of the major journals in the U.S. dealing with plant disease research” (Cook 1978a).

During the APS annual meeting in Tucson, Arizona, in November of 1978, APS Council under President John Schafer named a special committee to prepare a publication plan for consideration. With the reality of PDR's termination looming, the APS special committee had little time to act before the normal PDR publication schedule and journal numbering system would be interrupted. Under the leadership of Cook as chair, a portion of the committee met in Tucson where they "identified the full scope" of the task and "established specific objectives" (Plant Disease Reporter Committee and Cook 1979). The full committee met at APS Headquarters in St. Paul on January 4 and 5, 1979, where they drafted a plan for APS Council consideration that would become the basis for publication of PDR as a second journal of APS.

The ambitious plan envisioned the "new, yet ongoing" journal to be international in scope with an emphasis on "the practical aspects of maintaining and improving plant health." It would invite and accept contributions on a worldwide basis. Not only would the applied core of PDR be continued but the new publication would be expanded to include original research, reports on new diseases or epidemics, feature articles, editorials, and news. The committee plan also called for a "hot-line" section to summarize new and significant research results and to communicate up-to-date information on disease outbreaks, regulatory decisions, research needs, and other urgent items. Another addition was to be the inclusion of targeted advertisements, considered to be a vital source of revenue for the long-term survivability of the publication. The content would be designed for practitioners in plant science, extension specialists, pest management specialists, consultants, and county agents (Plant Disease Reporter Committee and Cook 1979).

In addition to content, other major issues before the committee involved decisions on the journal name and finances. According to the historical records, a lively debate surrounded whether to retain PDR or invent a new title. In the end, the committee unanimously proposed the title *Plant Disease*, to better reflect the planned increased content and other changes. Concerns over costs and sources of revenue from subscriptions, advertising, sponsorships, and memberships also captured the attention of the committee. In assuming publication of PDR, APS would have to market a journal that, as Cook correctly pointed out, "would no longer be free." Cook warned his committee members, "The big question is whether or not APS can ultimately survive the economic burden of PDR once the support from USDA (assuming we get support) runs out. Whether or not we can handle this financially will obviously depend on the number of subscribers as well as number of ads, etc. The number of subscribers and advertisers, in turn, will depend on the kind of job we (the committee) do to make the journal attractive and thus desired. We have a big job" (Cook 1978b).

In early January 1979, President Schafer wrote to APS Council asking for their immediate response to the special committee plan for the new publication. Schafer also notified them that negotiations were underway with USDA officials for possible financial support to underwrite the APS continuation of PDR. Yet, Schafer made no promises (Schafer 1979).

Under these circumstances, in a bold move, APS Council voted to take on the challenge of publishing the *Plant Disease Reporter* under its new title, *Plant Disease*. APS Council also chose to follow the Cook Committee's general recommendations. In making this decision, APS leadership recognized that the membership had, for years, pushed for a vehicle to publish more applied science and, in so doing, better communicate the importance of the science of plant pathology to a broader audience. APS leaders also were pleased with the recent success of the first compendia series of books as well as headquarters' proficiency in publishing skills. Now, suddenly, there was an opportunity to assume publication of *Plant Disease*, a journal whose predecessor had provided significant value to APS membership. There also was the hope for a USDA grant to fund start-up costs and the plan of adding additional content that could transition the publication to financial self-sufficiency (S. C. Nelson, personal communication).

With the approval of Council and an alarmingly small window of time before PDR's normal publication schedule would be broken, the special committee and APS Headquarters' staff went into high gear to produce the first issue of the new journal. In fact, a decision was made to publish the premiere issue by June 15, 1979, six months in advance of the official first publication date of January 1980. This step was considered necessary to allow additional time for promotion to attract potential subscribers and advertisers. It would also allow current institutional subscribers like libraries to make the necessary accounting changes to purchase the journal from APS (Kommedahl 1979).

Immediately, calls went out to potential authors for research and feature articles. APS Headquarters staff created marketing materials to describe the new journal for potential individual and library subscribers, offering them a free first issue. Marketing materials were also created to reach advertising agencies and potential sponsors. For this, 50,000 brochures advertising the new journal were mailed to potential subscribers outside the APS membership and the current mailing list of PDR. To keep all members abreast of progress, updates were published in *Phytopathology News* (Cook, undated).

On the editorial side, a temporary arrangement was created to handle the premiere issue. Kommedahl would serve as acting editor-in-chief, while members of the Cook Committee agreed to serve as interim senior editors. For subsequent issues, however, a new editorial board was appointed under Malcolm Shurtleff as editor-in-chief. At their midyear meeting in April 1979, APS Council also appointed an advisory board for *Plant Disease* to identify prospective authors and subjects for features and editorials. In March of 1979, Cook reported to APS Council that the production of *Plant Disease* was on schedule. In fact, as to the call for research and feature articles, he delightedly told the council that the response from members "cannot be described by any term short of overwhelming." Cook ended his report by adding, "In short, the day of the second journal in APS is very near" (Cook 1979).

Cook was indeed correct. According to plan, the first issue of *Plant Disease* arrived off the press in July of 1979 (Fig. 2), six months ahead of the official publication date (Volume 64, January 1980) and only seven months after the decision by Council to assume publication of PDR. PDR continued publication through the December issue, 1979, which completed volume 63 of the journal series. Twenty-thousand copies of the first issue of *Plant Disease* were mailed in July to members, libraries, and other potential subscribers to promote the revamped journal. During the annual meeting that year, *Plant Disease* was approved by APS members as an official journal of the society.

APS Council had taken quite an audacious step in early 1979, but the move had been rewarded with an impressive first issue on schedule. Still, APS officers realized that it would be a struggle for the new journal to build the various revenue streams needed for any long-term financial stability. Arguably, the most important development for the fledgling journal during this initial period may have been securing the USDA financial support to underwrite a major portion of the startup costs. Through the efforts of APS Treasurer Edgar Kendrick (Fig. 1), a USDA-ARS administrator, the USDA awarded a grant of \$236,000 to APS in 1980. The following year, Kendrick was successful in going back to the USDA for an additional \$80,000 grant to help *Plant Disease* attain financial break-even status (S. C. Nelson, personal communication).

On August 31, 1979, Derald Slack, APS Secretary, sent a letter to Cook on behalf of APS Council informing him that the *Plant Disease Reporter* Committee, formed less than a year earlier, was officially disbanded. Slack wrote that the committee "performed beyond all expectations and provided a base for the new APS journal *Plant Disease*" (Slack 1979).

The tradition of excellent, timely disease reporting that was started with the *Plant Disease Bulletin* in 1917, and later with PDR in 1923, was continued with *Plant Disease*. Added to this tradition in 1980 was original research; the rapid reporting of new diseases and epidemics; and reviews of needs, approaches, and accomplishments in the field, but all with a continued emphasis on the practical aspects

of maintaining and improving plant health that had begun in 1917. These new features only served to broaden the usefulness and appeal of this valuable resource. They also served to cement the legacy of this journal as a major force in helping unite research, teaching, and extension in plant pathology and nematology.

In his report to APS Council in March 1979, Cook predicted that “PD will become the center of attention in the Society. It will tell our success stories – what we are.” James Horsfall echoed these sentiments when he wrote, “this is a journal that will show what is useful about our science” (Cook 1979).

Epilogue

In their enthusiasm for providing a second journal for applied plant pathology, APS Council and headquarters’ staff underestimated the risk involved and the scale of the task before them. In a couple of years, with the USDA startup funds exhausted, covering the cost of continued publication would require building new streams of revenue from subscriptions, advertising, sponsorships, and members. None of this was a sure thing when the decision was made in 1979 to publish the new journal. Indeed, while the first issue was produced on time, building the revenue streams that eventually made *Plant Disease* financially successful took much longer than expected.

The minutes of the APS Council in the early 1980s tell the story of the difficulties associated with bringing financial stability to the new journal. Council worried about whether sufficient revenue could be secured and maintained in time to sustain publication beyond 1981. Substantial discussion occurred on the question of whether the initial design would attract subscribers and advertisers. It is clear from the records that Council, the Plant Disease Advisory Board, and headquarters’ staff spent many hours brainstorming over ideas.

In the end, however, *Plant Disease* survived this period of uncertainty. Some elements of the new journal were found to work, while others proved to be difficult to sustain. Changes were made to the initial design, while at the same time efficiencies were found to save production costs. For example, the task of gathering extensive reports and updates for every issue required more volunteer help to write these as well as staff editing and printing costs than were practical. Instead of asking industry experts to provide monthly articles on news in industry, Thor Kommedahl created a monthly update that consolidated industry news. *Plant Disease* concentrated on publishing two or three feature articles each month that were meant to appeal to a broad audience with color photographs and practical information. Thus, *Plant Disease* feature material was a bit shorter and less expensive to produce and this helped balance the additional time and expense of handling the growing number of scientific papers that the journal was attracting. Another issue was that authors wanted faster review and publication times. To provide speed of publication, some emphasis was shifted from the special editorial features to the practical matter of faster review, editing, production, and printing.

Subscriptions grew, but advertising proved difficult to sell and largely ineffective. Some authors were not fond of having advertising near their articles in the journal. Advertising was limited to covers and the front pages of the journal. Eventually, authors would be asked to pay higher page charges, while members would agree to pay additional dues for a *Plant Disease* subscription.

After several years of fine-tuning, the journal finally achieved the status of financial breakeven in 1983. The risk and enormity of the task had brought together APS leadership, staff, and hundreds of member volunteers in an unprecedented working relationship to make *Plant Disease* a success. Over the years, the journal has grown to be a major financial contributor to APS, while it also has continued to be the beacon of applied plant pathology.

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