The Plant Patent Act of 1930: A Sociological History of its Creation

Cary Fowler, Ph.D.[1]

INTRODUCTION

The first intellectual property rights law in the United States to cover biological materials explicitly was the Plant Patent Act of 1930.[2] This Act provided patent protection for asexually reproduced varieties of domesticated plants (for example, apple, pear, rose, etc.).[3] Since that time, patent or patent-like protection has been expanded through legislation and court decisions to include: sexually reproduced plant varieties,[4] micro-organisms,[5] genes and gene complexes,[6] characteristics[7] and products.[8] Trade secrets, contracts, and use of the tort theory of conversion have also been used for the protection of plant germplasm.[9]

Given the development of scientific plant breeding in the early twentieth century following the rediscovery of Mendel's laws of heredity, it might be assumed that the Plant Patent Act (PPA) was the product of certain interests attempting to gain legal control over the plant varieties created through employment of Mendel's insights. Indeed, proponents of the PPA argued at the time that the Act was warranted because changes in technology had made inventors out of plant breeders.

1 Cary Fowler is Associate Professor, Norwegian Center for International Environment and Development Studies, Agricultural University of Norway, Aas, Norway; and Senior Advisor to the Director General, International Plant Genetic Resources Institute, Rome, Italy.

2 Townsend-Parnell Plant Patent Act of 23 May 1930, Pub. L. No. 245 (71st Congress).

3 These are species which are multiplied asexually for the commercial market, by grafting or other "cloning" techniques. The Act, however, excludes potato and other such tuber crops.

4 Plant Variety Protection Act of 24 December 1970, 84 Stat. 1542, 7 U.S.C. 2321 et seq., as well as through *Ex Parte Hibberd, 227 U.S.P.Q. 443* (Bd. Pat. App. & Int. 1985).

5 *Diamond, Commr. Pats. v. Chakrabarty,* 447 U.S. 303, 308–9 (1980).

6 *227 U.S.P.Q. 443.*

7 The Federal Circuit (*Imazio Nursery v. Dania Greenhouses,* 69 F.3rd 1560, 36 USPQ2d 1672 (Fed. Cir. 1995)) limited the rights of holders of plant patents under the 1930 law to excluding only those who have derived their material directly from the patent holder's stock. Independent creation is thus an ample defense in an infringement action. Breeders fashioning a new variety with a unique trait—in this case a heather variety which bloomed in different months than other varieties—must now seek protection under utility patent statutes for such a characteristic. *See* Kjeldgaard and Marsh, *Recent United States Developments in Plant Patents,* Molecular Breeding Vol. 2 (1996).

8 *227 U.S.P.Q. 443.*

9 Ihnen and Jondle, *Protecting Plant Germplasm: Alternatives to Patent and Plant Variety Protection,* Intellectual Property Rights Associated with Plants (American Society of Agronomy 1989).

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The rediscovery of Mendel's laws of heredity in 1900 unquestionably provided the scientific basis for deliberate and knowledgeable innovation with domesticated plants.[10] But, while this event was an important part of the context around the Plant Patent Act (PPA), the passage of the Act cannot be explained by referring solely to advances in plant breeding technologies and resulting "needs" for changes in law. Intellectual property rights, like other categories of rights or law, are historically situated.[11] They are conceived, constructed and interpreted "in context." The origin of the PPA, is not, therefore, to be found in the simple unfolding of legal logic, an inevitable response to a major scientific advance. Nor can it be easily understood as the institutionalization of custom or as a simple expression of public opinion.[12]

This article examines the even richer and more complex story of how the Plant Patent Act came to be within the social, economic, scientific, and legal context of its time. Among other topics, it examines the interests and intentions of the actors involved in its creation, and how it happened that the legislation was drafted to apply to crops undergoing scant directed improvement (such as apples) while omitting crops (such as corn) that were the object of intense innovation through breeding.

Commercialization of Agriculture: the Context for Legislation

At the beginning of the 19th century, westward expansion in the U.S. was well underway. In fewer than sixty years, and by the time of the Civil War, the total land area of the country more than tripled.[13] For the most part settlers brought their agriculture with them in the form of seeds. They were soon aided, however, by supplies of seeds assembled and distributed, first through the Patent Office, and later through the Department of Agriculture (which was created during the Lincoln presidency).[14] Few major agricultural crops, it should be noted, are indigenous to the U.S.[15] Intra-specific genetic diversity in the form of myriad

10 Mayr, *The Growth of Biological Thought: Diversity, Evolution, and Inheritance* (Harvard University Press 1982).

11 Granovetter, *Economic Action and Social Structure,* American Journal of Sociology, Vol. 50 (1985).

12 Chambliss, *Law, Order and Power* at 63, 140 (2nd. Ed. Addison-Wesley 1982).

13 U.S. Department of Commerce, Bureau of the Census. *Historical Statistics of the United States: Colonial Times to 1970, Part 2,* at 38–9 (U.S. Government Printing Office 1975).

14 True, *A History of Agricultural Experimentation and Research in the United States, 1607–1925,* Miscellaneous Publication No. 251, U.S. Department of Agriculture, Government Printing Office at 23–4 (1937). Klose, *America's Crop Heritage: The History of Foreign Plant Introduction by the Federal Government* at 33 (1950).

15 Zeven and Zhukovsky, *Dictionary of Cultivated Plants and Their Centres of Diversity* (Centre for Agricultural Publishing and Documentation 1975).

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varieties of individual crops was collected by oversees American embassies, hired plant collectors, and even the military, and then distributed to farmers through the mails in order to encourage experimentation, crop adaptation and the spread of settlement and agriculture. By the time that Henry Ellsworth, Commissioner of Patents under the Department of Treasury, left office in 1849, some 60,000 seed packets were being distributed annually. The figure increased rapidly to its high point, a yearly average of more than ten million packages during the period 1890–1897.[16]

At the beginning of the 19th century, the main regions of the U.S. were each agriculturally self-sufficient. It was the "heyday of domestic manufacture."[17] As late as 1820 in the rural North, the most developed region in the U.S., only a quarter of farm production was entering the marketplace. Not surprisingly, the seed and nursery industry was tiny, and economically insignificant. The demand for new seeds and planting materials was quite real and substantial, but there was little demand for (or capacity to produce and market) particular fixed varieties of agricultural crops. In such an economic and scientific context, patent legislation applying to plant varieties would have served little purpose.

The situation was not static, of course. The growth of cities, the expansion of railroads (and the refrigerated rail car capable of carrying farm produce[18]), as well as the rapidly increasing mechanization of farms and industry, all gave impetus to the commercialization of agriculture. Markets were opened. Processors increasingly desired uniformity and predictability in their supplies. Farmers employed more and more machinery (tractors, seeders, harvesters) over expanding acreage, mitigating against seed selection and saving.[19] Seldom given their due in this process are the agricultural societies (supported by the Patent Office), that sponsored state and county agricultural fairs.[20] In 1868, there were 1,367 agricultural societies sponsoring fairs. By 1913, the number had doubled.[21] The fairs promoted "standards," offered premiums to winning farmers, and generally heightened interest in crop improvement

16 Klose, *supra* note 14, at 57, 98.

17 Henretta, *Families and Farms: Mentalité in Pre-Industrial America,* 35 William and Mary Quarterly 17, 30 (January 1978).

18 Taylor, *The Influence of Refrigeration on the Fruit Industry,* Yearbook of Agriculture, 1900, at 577 (U.S. Government Printing Office/USDA 1901).

19 For a more detailed account of the rise of commercial agriculture in the U.S., *see* Fowler, *Unnatural Selection: Technology, Politics and Plant Evolution* (Gordon and Breach 1994).

20 Brown, *The United States Patent Office and the Promotion of Southern Agriculture, 1850–1860,* M.A. thesis, Florida State University, at 54 (1957).

21 Marti, *Historical Directory of American Agricultural Fairs,* at 7 (Greenwood Press 1986).

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and in improved varieties. In the words of sociologist Wayne Neely, the fairs were intended to promote "modernization," through the "direct visual demonstration of the standards which the market more or less compels him (the farmer) to meet."[22]

As the 20th century got underway, the shift from self-sufficiency to production for the market was well established and gaining speed. Between 1918–21 and 1932–36, acreage devoted to 15 major vegetable crops for the market rose 80 percent.[23] There were now over 300 companies offering mail-order seeds, and distributing 35 million catalogs annually.[24] Though there were few scientifically-bred varieties available, the commercial trade now accounted for 60 percent of all vegetable seed used, and was actively discouraging home seed-saving.[25]

Differentiated crop varieties were now rather commonplace. An early 20th century government survey documents some 7,000 named varieties of apples cited in publications between 1804 and 1904.[26] By 1925, when *The Small Fruits of New York* was published, Hedrick was able to describe 1,362 varieties of strawberries.[27]

Despite the proliferation and growing importance of specific crop varieties (resulting chiefly from farmer-experimentation, simple mass selection, and discovery), formal plant breeding was slow to take hold, even in the years following the rediscovery of Mendel's laws of heredity. Mendel's theories were neither easily nor quickly accepted. Scientists debated whether they applied to all species and whether Mendel's explanation of inheritance, even if correct, was an explanation of one of several or many mechanisms. The first decade of the 1900s was, according to Mayr, "preoccupied with evolutionary controversies and with doubts as to the universal validity of Mendelian inheritance."[28] There was an enabling commerical context for the production and marketing of differentiated seed and nursery varieties by the 1920s. But, practical and widespread use of Mendelian theory—the cornerstone of the scientific plant breeding—lagged.

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22 Neely, *The Agricultural Fair,* at 21 (Columbia University Press 1935).

23 Hopkins, *Changing Technology and Employment in Agriculture* (U.S. Government Printing Office/ USDA Bureau of Agricultural Economics 1941).

24 Anonymous, *Pleasing the Mail Order Customer,* 5 Seed World 118 (February 5, 1919).

25 Anonymous. "Discourage Home Seed Saving," 5 Seed World 422 (April 4, 1919).

26 Ragan, *Nomenclature of the Apple: A Catalog of Known Varieties Referred to in American Publications from 1804 to 1904,* Bureau of Plant Industry, Bulletin No. 56. (U.S. Government Printing Office 1926).

27 Hedrick, *The Small Fruits of New York: Report of the New York State Agricultural Experiment Station for the Year Ending June 30, 1925* (J.B. Lyon Company).

28 Mayr, *supra* note 10, at 721.

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This situation was rapidly changing with seed corn and to a lesser extent with other crops. Use of scientific approaches to formal, commercial breeding of nursery crops, however, was hardly even on the horizon, even though strong markets existed for particular fruit and ornamental varieties. The rise of commercialized agriculture had created a concomitant need for control and predictability of elements of production (such as knowledge of and control of what varieties were being planted, and their characteristics), as well as for product differentiation—a situation which tended to enhance the value of and interest in specific, identifiable varieties of crops.

The Nursery Industry and the Roots of the Plant Patent Act

Nursery firms and seed companies in the United States share a roughly parallel history. Both arose early and tenuously, gaining in prominence as American agriculture became more rationalized and commercialized. Because of the possibility of "cloning" fruit trees and many woody ornamentals, nurseries had an advantage in offering distinct, stable varieties. Once identified, a superior variety could be multiplied in unlimited quantity. Thus, nurseries could establish a business based on the reputation and the proven performance of uniform, stable varieties. Stark Brothers, for example, could purchase the rights to the original Delicious apple tree for a few thousand dollars in 1893,[29] and over the course of the next century sell over 15,000,000 "copies" of it.[30]

Most of the larger eastern cities had two or three small nurseries specializing in fruits and flowers on their outskirts by the early nineteenth century, but is estimated that the nurseries occupied not more than 500 acres collectively in 1840.[31] Nurserymen had to battle prevailing practices to create a market. "'Every man his own nurseryman' was a slogan against which the pioneer professional had to contend . . ."[32] But nursery companies proliferated, competition intensified, and prices fell.[33]

Nurserymen were faced with opportunities and obstacles that were different than the early seed companies—different to a large extent because of the type of plant materials they handled. Unique fruits produced by a single tree could be more easily identified than a unique wheat or

29 Terry, *The Stark Story: Stark Nurseries 150th Anniversary,* at 40 (Missouri Historical Society 1966).

30 http://www.starkbros.com/who_we_are.cfm July 11, 2000.

31 Wickson, *California Nurserymen and the Plant Industry: 1850–1910,* The California Association of Nurserymen, at 18 (1921).

32 Id. at 21.

33 Olmo, *California, History of Fruit Growing and Handling in United States of America and Canada* (W.H. Upshall, ed. American Pomological Society 1976).

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corn plant. Once identified, scion wood (twigs or shoots) could be clipped off the tree and grafted onto rootstock. In this way thousands of genetically identical plants could be reproduced. This quality of woody plants such as fruit trees and rose bushes, together with the simple technique of grafting, gave great predictability to and control over commercial reproduction of these plants. But, as illustrated by the case of nurseries in California described above, it also meant that competitors could quickly flood the market either with exact copies of the varieties, or complete forgeries. Because fruits take some years to bear, the forgeries would be undetectable at the time of sale.

An apple must be pollinated by a different variety in order to produce a fruit. Bees carrying pollen on their legs from one tree unintentionally leave some on flowers of the next tree, pollinating the blossoms, and in the process performing countless "breeding experiments." Seeds from an apple, if planted, produce a tree that is a cross between the tree that bore the apple and the tree that supplied the pollen. This crossing can also be easily accomplished by people. But breeding of fruits such as apples, because it did not utilize stable inbred lines, did not produce particularly predictable or replicable results. The breeding product still appeared to be a matter of chance given state of scientific knowledge at the time. More involved breeding—again, due to the nature of most fruit crops—would have involved the expenditure of long periods of time.

Writing in 1921, Folger and Thomson state that:

> Seed selection and hybridization have been responsible for the improvement of many cultivated plants and for the discovery of many new varieties, but not so for the cultivated fruits. Practically all varieties of fruit are the result of chance discovery of seedlings.[34]

Little "scientific" breeding was taking place. With so many varieties being produced naturally, why would commercial enterprises go to the expense of encouraging even more when the result was so unpredictable? Significantly, however, farmers were well situated to notice nature's own breeding experiments (the chance seedlings and naturally-occurring bud mutations). The normal commercial activities of nurseries brought them into contact with new varieties originating on people's farms. The techniques of deliberately crossing varieties and of reproducing varieties by grafting were within reach of everyone. However, once a significant variety was discovered, certain commercial advantages flowed to the nursery which could multiply, advertise and market the variety.

34 Folger and Thomson, *The Commercial Apple Industry of North America,* at 389 (Mamillan 1921).

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Farmers wanting to grow the best or latest variety could buy one tree, wait for it to reach a sufficient size to begin taking scion wood from it (several years), graft that material, and then wait for the young "whips" to reach profitable bearing age (at least another 6 years). Or for the cost of buying a young tree from a nursery (between .50 and $1.50 for trees from reputable dealers in 1930), some 3-6 years plus labor and upkeep expenses could be eliminated. Purchased stock was clearly cost-effective. (A tree could yield as much as $12 worth of apples in a season,[35] so reducing the amount of time until a tree started bearing by purchasing commercial stock could easily pay for the cost of the tree.)

Thus, while many nursery species were easy for farmers to "breed" and multiply, nursery companies expanded because they could provide a unique, visibly differentiated, standardized product at a cost which actually saved the farmer money over a 5-year period. Unlike the seedsman, the nurseryman's biggest competition came not from the farmer, but from the competing nurseryman who could legally buy superior or unique stock and set up a large-scale operation to multiply and sell it. Nurseries with unique varieties could only enjoy control—monopoly—for a limited time before others invaded the market with genetically identical plants. This situation discouraged expenditures for plant breeding and put a premium on rapid multiplication and marketing.

Since fruit trees remain productive for decades, a lost sale was an opportunity lost for a long time. L.H. Bailey's list of plants introduced in 1893 gives some evidence of the trouble certain nurserymen were beginning to have. Each of the corn varieties introduced that year was offered by a single company, whereas most of the rose varieties were offered by a multiple "dealers."[36]

A number of trade associations were founded as conflicts arose among commercial interests. The American Association of Nurserymen, founded in the 1870s, worked to standardize nomenclature, lower freight rates, rid the industry of dishonest operations and educate its members about the latest horticultural and business techniques. The American Pomological Society was a similar organization that heard lectures on a wide range of fruit, fruit-growing, and business topics at its convention in 1889. Similar too was the American Seed Trade Association, organized in 1883, to bring order to marketing, lobby against the govern-

35 This figure may be overstated somewhat as the data involved comes from claims made about yields and prices from "Golden Delicious" apples trees as related in the 1930 Stark Brothers Nursery Yearbook (catalog)at 11.

36 Bailey, *Annals of Horticulture in North America for the Year 1893,* at 127 (Orange Judd Co. 1894).

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ment's free seed program and work for commercial seed interests. The Society of American Florists, which at its fifth annual convention in 1889, heard a committee report on "exaggerations in illustrated catalogs," acted to establish a system of certificates for approved catalogs.[37] The Florists' Protective Association was established for "protection of its members from the designs of dishonest persons." The National League of Commission Merchants was open only to "houses of known reputation" interested in divesting the business "of abuses that are said to arise and creep into it . . ."

A number of associations focusing on specific flowers or fruits were organized, such as the American Rose Society and the National Chrysanthemum Society. Such groups typically sought to bring rationality and order to the naming of varieties, a problem reputable nurseries experienced when dishonest dealers flooded the market with misnamed varieties, as discussed above. Many, including the Chrysanthemum Society, established formal registries of variety names.[38] Regional organizations to deal with the nomenclature problem were also convened. The Peninsula Horticultural Society (Delaware and Chesapeake peninsula) empowered a committee to suggest a plan for registration. The committee reported that "respectable nurserymen" were upset that old varieties were being sold under new names. "Originators," it said, "seek protection similar to that afforded by patents."[39]

The Move Towards Legislation

Stark Brothers Nurseries had become the largest of all U.S. nursery companies in the early part of the twentieth century.[40] A very brief look at this nursery is appropriate both because it illustrates some of the problems faced by the larger, established nurseries, and because it took the lead in efforts to solve these problems.

Stark Brothers Nurseries was founded in 1816 and incorporated in Missouri in 1889. The nursery began advertising in newspapers in 1887,

37 Bailey, *Annals of Horticulture in North America for the Year 1889* at 88 (Rural Publishing Co. 1890).

38 Information is sparse on the precise work and tactics of the associations, though Constitutions and conference agendas can sometimes be found. Most information is of a general reporting nature and can be found in books such as L.H. Bailey's *Annals of Horticulture* during the 1880s and 1890s.

39 Committee on Registration of the Peninsula Horticultural Society, *Registration of New Fruits,* 12 The American Garden 338 (1891).

40 It was four times larger than any other nursery in capitalization according to information made public in a congressional hearing on HR 13570, "Authorizing the Registration of the Names of Horticultural Products and to Protect the Same." Hearings, U.S. House Committee on Patents. 59th Congress, March 28, 1906, at 15 (Government Printing Office 1906).

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produced its first catalog in 1894, and brought out a color edition of its catalog in 1896. The Stark family had large landholdings, business relationships with railroads, and very powerful political contacts on the state and national levels.[41]

Although it was the country's leading nursery, Stark Brothers was not significantly involved in actual plant breeding. According to Terry, a sympathetic historian of the company, "chance seedlings and bud sports have been the main sources of Stark's famous varieties of apples and other fruits . . ."[42] Clay Stark Logan, president of Stark Brothers stated in a 1992 interview that the company had "never" done any breeding work.[43]

An examination of the Stark Brothers' catalog for 1930 illustrates this point. The cover features the "Starking Double-Red Delicious" apple, which was discovered as a bud mutation on a Delicious apple tree growing in New Jersey. Stark purchased the tree for $6000 and promptly erected a tall fence around it to prevent others from obtaining grafting wood. According to the catalog, it was "the greatest red apple of all time." (The "original" Delicious apple was a chance seedling discovered by Jesse Hiatt on his Iowa farm in 1868. Hiatt named it "Hawkeye."[44] Stark Brothers bought it and changed the name to "Stark Red Delicious.") The second apple featured was the "Staymared Stark Double-Red Stayman Winesap." Two pages are devoted to this bud sport discovered in Virginia and again purchased by Stark Brothers. "Stark's Golden Delicious" receives 8 pages of attention. It was discovered in Virginia and purchased for $5000. Of the eight apples prominently displayed in the catalog, only one possibly appears to have been the result of intentional breeding, the "Stark King David"—a simple cross between two well-known apples, Jonathan and Winesap.[45] Interestingly, unlike

41 Terry, *supra* note 29. For example, Speaker of the U.S. House of Representatives Champ Clark was a friend of the Starks and an early teacher of Lloyd Stark's. (Clark had been city attorney in Louisiana, Missouri, hometown of Stark's Nurseries.) Clark engineered a visit of President Teddy Roosevelt to the Nursery and appointed Lloyd Stark to Annapolis. Lloyd would later become Governor of Missouri (1937–41), and challenge Harry Truman for the Democratic nomination for Senate in a particularly bitter (and, according to a letter from Truman to his wife, a particularly dirty) campaign in 1940, with the support of Clark's son, Bennett Champ Clark, who was then Truman's colleague in the U.S. Senate. *See Early Handwritten Letters from Harry Truman Made Available for Research* (November 3, 1998 Press Release from the Truman Library, at http://www.trumanlibrary.or/news/letters.htm). *See also Barone, Truman and Pendergast,* 5 The Weekly Standard. No. 6 (October 25, 1999). http://www.weeklystandard.com/magazine/mag_5_6_99/barone_bkar_5_6_99.html

42 Terry, *supra* note 29 at 71.

43 Interview with Clay Logan, President, Stark Brothers Nurseries, by telephone, April 24, 1992.

44 Nichols, *Iowa, History of Fruit Growing and Handling in United States of America* at 55 (Upshall ed., The American Pomological Society 1976).

45 Stark Brothers Nursery, *Stark Yearbook, 1930* at 21 (Stark Brothers Nursery 1930).

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the variety names of the hybrid corns emerging during this period, Stark's fruit varieties, appropriately, do not bear names touting a scientific plant breeding origin. Instead, the names remained very "traditional."

Stark Brothers also marketed some varieties produced by Luther Burbank. Burbank, who died in 1926, was known as the "plant wizard" and "had tremendous influence on fruit improvement and popularized plant breeding worldwide."[46] It is unclear however, just how much Burbank's varieties were the result of intentional breeding. One of his first plums, the "Burbank plum," for example, was actually one he imported from Japan in 1885 and renamed after himself.[47] Stark Brothers paid Burbank for the rights to market his varieties and in turn Burbank endorsed Stark varieties and bequeathed his "treasure box" of seeds to Stark when he died.

Stark's business was based on varieties, not breeding. It depended on the ability to purchase new, desirable varieties as they arose, and to mass-market them. It did not depend on Stark's breeding new varieties—varieties it could not legally or practically keep out of the hands of eager and often unscrupulous competitors.

Stark enjoyed economies of scale and a reputation for selling quality stock and varieties that were true-to-name. But, Stark's fruit varieties, like most nursery species, were particularly vulnerable to others taking, multiplying and selling them. Stark's attempts to gain exclusive control over the marketing of its varieties by having its customers sign contracts (printed on the catalog order form) saying they would not propagate and offer Stark varieties for sale, were not successful.[48] Once a variety "escaped" from a single customer, it could be propagated legally and with impunity by others with whom Stark had no contractual relationship. If, Stark Brothers could obtain and enforce exclusive control over its varieties and prevent others from selling them, it could dramatically expand its sales.[49]

Not surprisingly, some of the earliest suggestions of patent or trademark protection for plant varieties (1870s) came from the nursery indus-

46 Olmo, *supra* note 33, at 19.

47 Id. at 19.

48 Barbee, *Bill Before Hoover Grants Plant Patents,* Washington Post, May 25, 1930: p. 1. (Barbee addressed the specific failure of Stark Brothers' contracts.)

Robb, *Plant Patents,* 15 Journal of the Patent Office Society 762 (1933). Harry Robb addressed the conditions in the industry as a whole, stating that without patents the threat of "piracy" amounted to a "100% certainty."

49 It might also provide an incentive for research and the breeding of new varieties. However, in the case of Stark Brothers, the securing of patent rights over varieties did not lead to in-house varietal development post-1930.

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try.[50] For decades there was no consensus on what form protection should take, however. Prominent horticulturalists such as Luther Burbank and Liberty Hyde Bailey found a number of the early proposals to be deficient. Though the idea of protection was regularly discussed at nursery association meetings (in contrast to seed association meetings), little action was taken.

In 1905, at the first meeting of the American Breeders' Association (ABA), Assistant Secretary of Agriculture, W. M. Hays,[51] remarked that "Possibly laws or business practices can be devised which will give private individuals, animal breeders, seed firms and nursery firms practically a patent right or a royalty on new blood lines."[52] But Hays had not mobilized political support either within the Administration or Congress, and the ABA hardly a potent political force. Its membership was small and diverse, including intellectuals, scientists and farmers. It was concerned mainly with developing Mendelian genetics, and was diffused by various interests, including plant breeding and eugenics. It had no full time staff. And, finances were tenuous. It struggled just to publish its journal.[53] Hays himself was busy with his job at the USDA and with trying to keep the ABA afloat while promoting the "Country Life" movement.

Stark's difficulties in controlling its varieties and the desire for some sort of protection, combined with the support of groups such as the ABA, led to the 1906 tabling of "A Bill to amend the laws of the United States relating to patents in the interest of the originators of horticultural products." The bill was introduced by Congressman Champ Clark, who represented Stark Nurseries' district and was a friend and political ally of the Stark family. It provided for the registration of the name of a new variety as a trademark. Some congressmen, however, were worried that the bill would regulate state as well as interstate commerce. And, one congressman noted that "Protests have reached the committee from great nurserymen against the passage of the bill." The split in nurserymen ranks occurred between companies such as Stark Brothers, which located and acquired new, improved varieties, and companies that "pi-

50 White, *A Century of Service: A History of the Nursery Industry Associations of the United States,* at 128 (American Association of Nurserymen 1975).

51 Hays was a key organizer and promoter of the ABA.

52 Hays, *Distributing Valuable New Varieties and Breeds,* Proceedings of the First Meeting of the American Breeders' Association held in St. Louis, Mo., at 62 (American Breeders' Association (ABA) 1905).

53 Kimmelman, Op. cit. p. 181. Interestingly, Hays sought financing from large commercial agriculture concerns, including fruit growers. These were the basis of financing the ABA's *American Breeders' Magazine.*

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rated" and sold the same varieties.[54] No serious lobbying effort was mounted. The bill died in committee. More bills were introduced in 1907, 1908 and 1910. None were passed. In Europe similar measures were being proposed, especially vociferously in France among fruit growers, but none were successful.[55]

The failure to pass patenting legislation covering plant varieties can be explained by a number of factors. First, it is unclear how active seed companies were, individually or collectively, in attempts to pass such legislation. Nurseries, with the possible exception of Stark Brothers, were not particularly active either and were unorganized for the effort. The record seems to indicate that these bills were not actively promoted. It must be remembered that seed companies faced bigger problems than securing their exclusive rights over particular varieties. First and foremost was the struggle simply to commoditize seeds. The fight to eliminate government competition from the "free seed program" did not come to an end until 1924. Furthermore, seed companies had to contend with state seed laws, the first of which was passed in 1897. These laws were primarily aimed at protecting farmers by regulating germination standards, weed seed content, labeling, and nomenclature practices. In general these laws were ultimately helpful to large, established seed businesses, but the immediate effects on and reception by the seed trade were neither uniformly positive, nor popular.

The long years of competing with farmer seed-saving and free government seed, coupled with lack of scientific knowledge necessary to engage in effective formal breeding, had produced its share of dishonest practices and dishonest seedsmen and had weakened the entire industry.[56] Adulterated and mislabeled seed was common, as were exaggerated claims. These created a public relations and political problem. In the words of an official of the Association of Official Seed Analysts at an ASTA convention, the situation in the seed business was "caveat emptor with a vengeance . . ."[57] The USDA even published lists of seedsmen

54 U.S. House of Representatives Committee on Patents, 59th Congress, Hearings on HR 13570 "Authorizing the Registration of the Names of Horticultural Products and to Protect the Same, at 15 (Government Printing Office 1906)

55 Heitz, *History of the UPOV Convention and the Rationale for Plant Breeders' Rights,* Proceedings, UPOV Seminar on the Nature of and Rationale for the Protection of Plant Varieties under the UPOV Convention, at 2 (UPOV 1990).

56 The nursery industry was not as weakened by government distribution of nursery stocks. By the 1920s, the government was mostly distributing reforesting and erosion-control species. This affected businesses such as Stark's only marginally.

57 American Seed Trade Association, Proceedings of the American Seed Trade Association, 1909, at 58 (Hartford Press 1909).

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known to sell adulterated seed.[58] But this did not seem to solve the problem. State seed laws were often a response to this situation. As the President of the Association of Official Seed Analysts put it in 1930:

> If neither his regard for the prosperity of the farmer, or the permanence of his own business could induce such a dealer to cease his undesirable selling practices, it was apparent that pressure from outside must be brought and this pressure must be of a type to be effective. Efforts were made by the better class of seedsmen to eliminate this menace to their own interests, but without avail. Apparently, the only alternative was a resort to law. For a time this seemed like "jumping from the frying pan into the fire," for much of the legislation enacted was extremely undesirable in character.[59]

Consequently, such laws were often viewed by industry officials as "ill considered and unenforceable." Ten states passed state seed laws in the 1920s. But by the late twenties, states were beginning to reconsider their legislation—a potentially threatening situation—prompting various seed trade organizations to turn their attention to drafting and promoting uniform state laws and federal seed legislation.[60]

It would appear that seed industry groups were distracted by concerns of more immediate importance to their members than that of legal protection of varieties. Furthermore, many seed companies could not point to genuinely new varieties needing or deserving patent protection. And those that could—or were about to—were often involved in producing hybrids (such as hybrid corn) that offered a form of biological protection which made patents redundant.[61] Absent significant numbers of distinct new varieties being produced by seed companies, variety protection through something like a patent law would hardly have been considered a business necessity. The American Seed Trade Association was, after all, an association of seed *traders* as its name implies. Members typically referred to themselves either as "traders" or "growers" of seed, rarely if ever calling themselves "breeders." Significantly, the pages of the seed trade journals in this period are filled with articles about many problems—shipping rates, the inadequacy of the postal system, dishonest seedsmen, the free seed program, exports, merchandizing difficulties, etc.—but the issue of variety protection is missing.

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58 Brown, *How Seed Testing Helps the Farmer,* Yearbook of Agriculture, 1915, at 315 (Government Printing Office 1916).

59 Stone, *20 Years of State Seed Laws,* 27 Seed World 28 (March 1930).

60 Id. at 28. *See also* Smith, *Seed Legislation,* 5 Seed World 24 (June 1919).

61 Fitzgerald, *The Business of Breeding: Hybrid Corn in Illinois, 1890–1940.* (Cornell University Press 1990).

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Finally, seed companies faced mounting financial problems after 1925. In the next 9 years, the annual volume of seed sales fell by 50% reflecting farmers' attempts to economize (through seed-saving) in the face of the Depression.[62]

Despite their previous legislative impotence, nursery companies, Hays, and others had begun to introduce the notion that the plant breeder was like the industrial inventor and as such was deserving of similar incentives and rewards.[63] David Fairchild, a prominent scientist took up this point in the pages of the *Journal of Heredity.*[64] And in the pages of the Stark Brothers Catalog, photos of Burbank—the great plant inventor—were shown with those of the other great inventors of the day, Thomas Edison and Henry Ford, despite the fact that Stark's own offerings were primarily discoveries.[65]

The American Association of Nurserymen (AAN) turned to the issue of varietal protection in earnest in 1923, appointing a committee (which included Lloyd Stark,[66] President of Stark Brothers) to work on the problem. Soon thereafter, Paul Stark of Stark Brothers Nurseries was named chair of the committee. He arranged for the committee to meet with high-ranking USDA officials (including some, such as David Fairchild, who were sympathetic to their concerns). Meetings with allied associations such as ASTA and the Society of American Florists were held in 1926.[67] Discussions did not immediately center on patenting as a solution to the nurserymen's problems—the alternative of varietal registration was also discussed, but eventually rejected. Several sources credit a Washington patent attorney, Harry C. Robb, Sr., with first having the idea of introducing a patent bill.[68] It is obvious from the short history al-

62 Kloppenburg, *First the Seed: The Political Economy of Plant Biotechnology,* 1492–2000, at 81–2 (Cambridge University Press 1988).

63 Hays, supra note 52 at 58 ("Inventors who create new values, and creative breeders who add to the transmitting efficiency of plants and animals, are alike in that they too often do not secure for themselves reasonable remuneration. It is to the interest of the manufacturer, the grower of pedigreed seeds or pedigreed animals, and the general public that a liberal share of the new values go to the inventor and to the creative breeder.")

64 Fairchild, *The Fascination of Making a Plant Hybrid,* 18 Journal of Heredity 62 (Feb. 1927).

65 It should be noted here that the Patent Act of 1790 itemized eligible subject matter. As amended in 1793, it covered "any art, machine, manufacture, or composition of matter, or any new and useful improvement." Before 1930, it was assumed that a "product of nature" could not fit into the patentable categories. *See* Beier and Straus, *Patents in a Time of Rapid Scientific and Technological Change: Inventions in Biotechnolog,* Biotechnology and Patent Protection, at 25 (Organisation for Economic Cooperation and Development 1985). Seeds and seed-grown plants are also statutory subject matter under 35 U.S.C. 101. *Pioneer Hi-Bred International Inc. v. J.E.M. AG Supply Inc.,* 53 USPQ2d 1440 (Fed. Cir. 2000)

66 Stark served two terms as president of the AAN.

67 White, *supra* note 50, at 131.

68 Kneen, *Patent Plants Enrich Our World,* National Geographic Magazine, at 364 (March 1948).

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ready given that the idea had circulated for some time. But it is likely that Stark and his committee used Robb to draft the legislation.[69] Robb's initial interest had been piqued when he unsuccessfully tried to obtain a trademark on a new plum variety some years earlier.

In order to sidestep expected opposition to plant patenting, Paul Stark's bill omitted coverage for sexually (seed) reproducing plants such as grains and vegetables. Stark had convinced ASTA to "drop their efforts" earlier in 1930.[70] According to ASTA records, Stark observed:

> It seemed to be the wise thing to get established the principle that Congress recognized the rights of the plant breeder and originator. Then, in the light of experience, effort could be made to get protection also for seed propagated plants which would be much easier after this fundamental principle was established.[71]

Practically, the bill would cover only fruits and some flowers, like roses. Potatoes and Jerusalem artichokes were omitted. The Report from the Committee on Patents to the House of Representatives explained the omission this way: "This exception is made because this group alone, among asexually reproduced plants, is propagated by the same part of the plant that is sold as food."[72] It could also have been said that farmers used this part as planting material. The omission would ease the concerns of those who would be troubled that the bill would deprive farmers of the assumed right to use the products of their fields as they saw fit.

The bill was formally introduced by Senator John Townsend of Delaware and Representative Fred Purnell of Indiana. Townsend, it may be noted, owned thousands of acres of apple and peach orchards.[73] He

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69 Regarding the origin of the bill, it should be noted that Rep. Fred Purnell, the chief sponsor in the House, acknowledged in the Hearings that he had "not had a great deal to do with the preparation of it . . ." In a telephone interview with Frank B. Robb, Harry Robb's nephew and himself a partner in the law firm of Robb and Robb (which was founded by Harry Robb and Frank Robb's father, John, Frank Robb stated that Robb and Stark worked together on the bill. He believes Harry Robb drafted the bill utilizing Stark's knowledge of plants. Harry Robb was an admirer of Burbank, according to Frank Robb, and perhaps was "encouraged" in part by a desire to see his work rewarded. Frank Robb could not say with certainty whether Harry Robb was formally employed by Stark Brothers or the AAN while he was working on the plant patent bill, however, it is known that the AAN incurred "legal expenses" during the effort to pass the legislation. (On this point, see Richard White, cited earlier.) After passage of the Act, Harry Robb handled most of Stark Brothers patent applications and Robb and Robb became the chief firm in the country handling plant patent applications according to both Frank Robb and Clay Stark Logan, president of Stark Brothers and a member of the Stark family. Interview conducted with Frank B. Robb, Willoughby, Ohio, April 28, 1992.

70 Kloppenburg, *supra* note 62, at 261.

71 American Seed Trade Association, *supra* note 57, at 66.

72 U.S. House of Representatives Committee on Patents, Report to Accompany H.R. 11372. Report No. 1129. April 30, 1930: p. 6.

73 Doyle, *Altered Harvest: Agriculture, Genetics and the Fate of the World's Food Supply,* at 51 (Viking 1985).

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owned several canning and processing companies. For a time he operated a string of 23 strawberry processing plants stretching from Tennessee to Delaware, possibly including operations involved in strawberry breeding or propagation.[74] He was involved in diversified large-scale farming operations, had banking and timber interests and business relationships with the railroad industry.[75]

Stark and his committee spent "six months' steady activity in Washington" soliciting support.[76] They obtained the predictable endorsement of several industry groups. More importantly, they garnered official support from the Commissioner of Patents,[77] the Secretaries of Commerce and Agriculture, the Grange (which had close government ties and had supported the government's plan to end the free-seed program) and the Farm Bureau (with its historic ties to the Country Life movement, "scientific agriculture" and commercial interests).

Proponents saw in the bill their best opportunity in years to acquire patent rights for plants. Reeling from the crash of 1929, the Administration was eager to "do something" for agriculture.

In the time-honored fashion of Washington, the claims made for the bill were not always modest. The Patent Committee's Report to the House spoke of the history of men who had developed new plants of "inestimable value to humanity and have died in poverty." It implied that the bill would help researchers develop cold-hardy apples, substitutes for rubber and new classes of plants and that it would be "of incalculable value in maintaining public health and prosperity, and in promoting public safety and the national defense. Finally plant patents will mean better agricultural products that will give the public more actual value for its dollar."[78]

More realistically, proponents saw the plant patenting bill as an opportunity to gain legal control over varieties *as varieties* and to begin to move the government out of the breeding business and to secure that activity for private interests. "To-day," the Committee on Patents' Report stated, "plant breeding and research is dependent, in large part, upon

74 An article in Business Week, August 26, 1931, entitled *Patenting of Plants Promises Big Profits—and Big Problems*, notes at page 29 the possible interest of E.W. Townsend & Son of Salisbury, Maryland, in using the Plant Patent Act to protect strawberry varieties. Senator Townsend is thought to have had strawberry companies operating in Maryland, though it cannot be determined for certain that there is a connection.

75 *The National Cyclopedia of American Biography*, at 213–13 (James T. White & Co. 1982)

76 Terry, *supra* note 29, at 85.

77 This support came after a compromise (discussed below) involving what types of materials would be covered.

78 U.S. House of Representatives Committee on Patents, supra note 72, at 3.

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Government funds to Government experiment stations, or the limited endeavours of the amateur breeder. It is hoped that the bill will afford a sound basis for investing capital in plant breeding and consequently stimulate plant development through private funds."[79]

The assistance of Thomas Edison, the most famous inventor of the day, was solicited by Stark. Stark and Burbank had business ties and Edison and Burbank had certain ties (noted below), thus Stark had at least one avenue through which to approach Edison. Edison was trying to breed goldenrod to produce a rubber substitute and thus almost surely approached the subject with sympathy. He sent a telegram to Congress saying, in part: "Nothing that Congress could do to help farming would be of greater value and permanence than to give to the plant breeder the same status as the mechanical and chemical inventors now have through the patent law. There are but few plant breeders. This will, I feel sure, give us many Burbanks."[80]

Luther Burbank, who had died four years earlier, had become the country's most famous horticulturalist and plant breeder. His was a household name.[81] Burbank was also a promoter. His Luther Burbank Society included among its life members, his friend Thomas Edison, and Phoebe Hearst, John Muir and Hugo de Vries.[82] Burbank had worked for Stark Brothers from 1893 to the 1920s. Paul Stark's father, Clarence, had journeyed to Burbank's California plant-breeding station in 1893 and cemented a business relationship with him that would result in Stark's marketing many of the varieties developed by Burbank. Burbank was unquestionably prolific, developing, discovering or improving some 800 varieties of trees, vegetables, fruits and flowers. Ironically, his most successful "invention" was the Burbank potato, developed in 1872, a crop which would not have been covered by the bill in question.

Burbank had early on voiced his opposition to patents. In a pamphlet entitled, *How to Judge Novelties,* published in 1911, he stated:

> No patent can be obtained on any improvement of plants, and for one I am glad that it is so. The reward is in the joy of having done good work, and the impotent envy and jealousy of those who know nothing of the labor and sacrifices necessary, and who are by nature and cultivation, kickers rather than lifters.

79 Id. at 2.

80 Id. at 3.

81 Dreyer, *A Gardener Touched with Genius* (Coward, McCarn & Geoghegan 1975).

82 Edison was a famous inventor; Hearst was the wife of a U.S. Senator and mother of media magnate, William Randolph Hearst; Muir was a celebrated conservationist (and inventor), and DeVries was one of three rediscoverers of Mendel's work.

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Happening however to be endowed with a fair business capacity I have so far never been stranded as have most others who have attempted similar work, even on an almost infinitely smaller scale."[83]

Furthermore, Burbank's standing in the scientific community had deteriorated by the time of his death in 1926. (He persisted in believing in the inheritance of acquired characteristics, though he was well acquainted with Mendel's work.) Biographer Peter Dreyer recounts that Burbank's friend (and a life member of Burbank's Burbank Society), John Burroughs "had, like most scientists, come to associate the name of Burbank with the worst kind of horticultural quackery."[84] As Orland White, Professor of Agricultural Biology and director of the University of Virginia's Blandy Experimental Farm put it:

> Because of his notoriety or fame it has been possible to secure a favorable and special consideration for many scientific projects that otherwise would have had a deaf ear turned toward them because of ignorance in regard to the possibilities of what they might attain. . . . He aroused the imagination of many unimaginative and ignorant people so that they became interested in a subject that otherwise they probably never would have heard of.
>
> When I explain to people that I am a geneticist, it means nothing to most of them outside of a very small scientific group. If I tell them I am a follower of Mendel, the group is only slightly increased. But if I explain to them that I am crossing plants such as Burbank did, their faces light up, and many of them begin to feel quite at home and in a position to talk intelligently about a world that they know very little concerning."[85]

Neither his initial opposition to plant patenting nor the tarnishing of his scientific reputation dulled his usefulness to patent proponents in the political setting. Burbank's final statement on patenting had been in support of the concept. It was used most effectively.

Various accounts (Terry,[86] Doyle[87]) have incorrectly credited Burbank's statement with immediately changing the tide of the debate and virtually forcing the patent opposition to concede.

According to these accounts, on May 5, 1930, Congressman Fiorello LaGuardia (the future mayor of New York) stood in the well of the U.S. House of Representatives and railed against the plant patenting bill. Co-sponsor, Congressman Purnell asked LaGuardia what he thought

83 Quoted in Dreyer, *supra* note 81, at 237.

84 Id. at 280.

85 Id. at 280-281.

86 Terry, *supra* note 29.

87 Doyle, *Altered Harvest: Agriculture, Genetics, and the Fate of the World's Food Supply* (Viking 1985).

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of Burbank, to which LaGuardia replied, "I think he is one of the greatest Americans that ever lived." Purnell then read into the record excerpts from a letter Burbank had sent to Stark shortly before his death:

A man can patent a mouse trap or copyright a nasty song, but if he gives to the world a new fruit that will add millions to the value of earth's annual harvests he will be fortunate if he is rewarded by so much as having his name connected with the result. Though the surface of plant experimentation has thus far been only scratched and there is so much immeasurably important work waiting to be done in this line I would hesitate to advise a young man, no matter how gifted or devoted, to adopt plant breeding as a life work until America takes some action to protect his unquestioned rights to some benefit from his achievements.

According to Terry, LaGuardia, obviously embarrassed, "immediately took the floor and said: 'I withdraw my objection to this bill and move its adoption.'"[88] In fact, LaGuardia never made such a statement. Instead, the record shows that he persisted with his opposition to the bill saying that he did "not believe it possible to protect him (the plant breeder) by patent rights." In essence, he argued that the legislation would not be enforceable.[89] The bill was tabled for two weeks.[90] What if LaGuardia had known of Burbank's anti-patent statement and could have used that in the debate? What if he had been familiar with Burbank's controversial standing in the scientific community? We shall never know what might have happened. We do know, however, what did take place next.

Wavering politicians were targeted during the period was tabled. New York's Democratic Senator Royal S. Copeland, for example, acknowledged getting letters from constituents opposing the bill and asked for more time to study the objections. Within three days he had received stacks of mail from nurserymen. Copeland forthwith rose in the Senate to observe:

The Stark Delicious apple to my mind is one of the most delicious apples I have ever tasted. It is well named. It required years of effort in Missouri before the apple

88 Terry at 86, *supra* note 29. Curiously, Terry, who had access to Stark Brothers' files, shows the original Burbank statement to have been in the form of a letter addressed to Paul Stark, "Chairman, National Committee for Plant Patents." However, in the Congressional debate it was used as having come in an unsolicited telegram from his widow and having been a statement from a "manuscript." Did Stark ask Burbank's widow to telegram for dramatic effect the statement he had received himself four years earlier?

89 Linz, *Washington News: The Plant Patent Bill,* 27 Seed World 43 (1930). (The bill had been brought up on the "unanimous consent calendar." LaGuardia's opposition was all that was required to delay formal consideration at the initial reading.)

90 *Congressional Record,* U.S. House of Representatives, May 5, 1930: p. 8392.

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was developed. They now sell it under a bond that no one who has the trees may sell or give away any of the grafts. I have 100 of them on my farm. I think it is such a remarkable product that I feel extremely thankful that somebody had the energy to work out the development of the plant. . . . For my part, I am very happy to join in support of the bill.[91]

No small amount of confusion and misunderstanding is evidenced in the debate. Senator Copeland in the above statement refers to the years of effort required to develop the Delicious apple, an apple discovered by a farmer on his Iowa farm.

The particulars of the debate, while interesting, will not be further explored here. In summary, several representatives raised questions about the practicality and constitutionality of the bill. Others expressed concern about patenting food plants. The debate was spirited at times, but not sustained. Whether representatives had "better things to do," or became convinced of the merits of the bill and their own prior misconceptions of it as Terry suggests, cannot be conclusively determined. The bill had no organized opposition, and proponents made skillful use of House and Senate rules to guide the bill through both houses of Congress without a recorded vote.[92]

The bill quickly made its way to President Hoover's desk where it was signed as the Plant Patent Act of 1930 (PPA). Stark's committee had spent $12,000 on lawyer's fees and other expenses—a controversial amount within the American Association of Nurserymen.[93] But a landmark bill, the first ever to grant patent protection to plant varieties, had been passed. Within the coming months, six of the first eighteen patents issued would go to Stark Brothers for varieties developed by Burbank.[94]

The Substance of the Law

The crux of the problem faced by companies such as Stark—in the years leading up to the passage of the PPA in 1930— was not how to protect and promote research. The real problem—the one Stark and other nurseries had tried unsuccessfully to solve—was how to capture legal and economic control over "their" plant varieties, regardless of how those varieties had been fashioned. In fact, few of the varieties at that

91 *Congressional Record,* U.S. Senate, April 17, 1930: p. 7200.

92 After passage in the House, a motion to reconsider was defeated, evidence of some lingering but insufficient opposition.

93 White, *supra* note 50, at 132.

94 Anonymous, *Plant Patents with Common Names* at 1 (American Association of Nurserymen 1963). Eventually 16 patents would go to Burbank posthumously: Plant Patent Nos 12, 13, 14, 15, 16, 18, 41, 65, 66, 235, 266, 267, 269, 290, 291, and 1041. Source: National Inventors Hall of Fame, http://www.invent.org/book/book-text/15.html

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time were the result of conscious breeding work. The solution obtained through the Plant Patent Act, as obvious as it might seem to someone in the 21st century, was not so obvious or easily promoted in 1930. Nursery companies were not seriously engaged in formal breeding work. Stark Brothers Nurseries was not, and had no real ambitions in this regard. They did, however, somehow want to obtain ownership and control over the varieties they were selling. But, these varieties were typically "discoveries," fence-row volunteers or sports as was the case with some of Stark's most important and famous varieties. Not only was the "inventiveness" open to question, but, of course, the subject matter of the patent was also atypical and controversial, as Rossman pointed out. The compromises made on the way to passage of the PPA first had the effect of eliminating seed crops, and then tuber crops used for food from the scope of the Act.

The Plant Patent Act offered rights to anyone who "has invented *or discovered* and asexually reproduced any distinct and new variety of plant, other than a tuber-propagated plant . . ." (my emphasis)

The original draft had included protection for "mere finds," a phrase which some Administration and congressional sources had found objectionable. The Commissioner of Patents stated rather disparagingly that the bill mostly seemed intended to "encourage our citizens generally to be on the lookout for varieties produced by natural processes; that is, by nature's accidental cross pollination . . ." His concern however was to encourage "*plant breeders,* nurserymen, and horticulturalists." (emphasis in original)[95] Given the rarity of actual "breeding" in the nursery business at the time, Stark's committee must have been concerned with how to protect the patentability of the results of "nature's accidental cross pollination" while meeting the Commissioner's concern. The compromise struck allowed for protection of discoveries as long as the discovery was not of a completely wild plant or one growing in wild, uncultivated circumstances.

Several other features of the Plant Patent Act are worth noting. First, the Act specified that the new variety must be "distinct," but did not define this term. Likewise, Congress (in agreement with industry) declined to require that the variety represent an "improvement" over existing materials.

Secondly, it eliminated the standard industrial patent requirement that the invention be described sufficiently well to enable someone skilled in the art to reproduce it. This was a major concession to the

95 Robertson, *Memorandum for Secretary of Commerce R.P. Lamont* (1930).

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patent applicant and the types of materials and actions covered under the Act.

Thirdly, the law protected the plant only, not its fruit or flowers and in so doing determined at what level royalties would be charged. The patent would cover the plant as an instrument of reproduction.

Finally, the law excluded from coverage broad categories of plants, opening the way for future legislative and legal efforts. Not only were sexually reproducing plants excluded, but tuber-propagated plants such as potatoes and Jerusalem artichoke were also excluded. Stark's cautions to the seed trade had been well founded. Congress was apparently not willing to allow patents to be placed on "food," as evidenced by the report to the House Committee quoted earlier.[96] This interpretation is confirmed by the fact that early patents were granted for *non-food* tuber-propagated plants.[97] In other words, it was not the "tuber propagating" characteristic which troubled the politicians or administrators, but the fact that the patent might cover the very item sold and consumed as food, according to Rossman, writing in the *Journal of the Patent Office.*[98] An amendment (H.R. 1490) to the Act to provide for the grant of patents on cereals, offered in the 73rd Congress, was not even given a committee hearing.

Interestingly, virtually all of these approaches embodied in the PPA have, since 1930, became crucial (and often controversial) in the context of expansion of protection to other categories of biological materials.

Closing Observations

While "scientific" plant breeding was revolutionizing the corn seed business making it possible for plant breeders to plan and direct the evolution of this crop, nursery businesses still relied upon farmer selections and the fortuitous discovery of chance mutations to provide them with new varieties. Fruit tree breeding—more time consuming and costly than breeding of seed-producing annuals—was not being practiced by nursery companies on the eve of passage of the PPA.

Woody plants such as fruits, berries and roses could be cloned—this technique was well understood. Utilizing cuttings, nurseries could make exact copies of varieties of these plants. Nursery companies taking advantage of this needed only to identify and obtain superior varieties in order to establish a business based on particular, established, identifiable

96 U.S. Committee on Patents, *supra* note 72, at 6.

97 Patents Nos. 17, 19, 32, 36, 43, 44, 77 and 98 cover tuber (bulb and corm) propagated flowers, e.g., freesia, gladiolus, dahlia.

98 Rossman, *Plant Patents,* 13 Journal of the Patent Office 16 (1931).

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and stable varieties. The commercial drawback was that once marketed, these varieties were accessible to all and could be easily multiplied and sold by competitors. Attempts by the leading nursery company, Stark Brothers, to maintain control over its varieties by erecting fences around the original tree of a variety, and by contracting with buyers of their trees not to multiply them further and sell them, proved ineffective.

The struggle to control and benefit from plants is an old one.[99] In an era of commercialized agriculture however, it becomes centered not on species, but on particular varieties possessing unique and valuable traits. Experiencing the inadequacy of existing mechanisms of control, social agents contest ownership and control questions in a new arena engaging in a sustained and conscious attempt to legislate. Efforts to establish a legal system of varietal ownership are facilitated by the milieu of innovation and progress that exists.[100] As the Act is being passed in 1930, the Empire State Building is under construction, on its way to becoming the world's tallest building. Inventors and innovators Alexander Graham Bell, Thomas Edison, and Henry Ford are household names. Lawmakers are aware and appreciative but not particularly knowledgeable of the efforts of plant breeders. In lobbying for the PPA, proponents compare and equate plant breeding with mechanical invention. Plant breeders become inventors—a change in perception that is not trivial politically or legally.

Burns and Ueberhorst have noted that the introduction of new technology involves social reorganizing and that new technologies sometimes do not "fit" with existing legal structures.[101] On the surface, this would seem to be such a case. With the development of plant breeding tools allowing for the science of breeding to replace the magic of evolution and selection, it might seem logical that laws be formulated to protect this new class of inventors. Indeed, this argument is made. But it is made by and for actors who are not engaged in typically inventive activity. Nursery companies are not breeding new varieties. They are taking newly discovered varieties and commercializing them. So while new technologies provide part of the context of the 1930 Act and are used by

99 Farney, Dennis. "Meet the Men Who Risked Their Lives to Find New Plants." Smithsonian, June 1980. P. 134. Crosby, *The Colombian Exchange: Biological and Cultural Consequences of 1492* (Greenwood Press 1972). Brockway, *Science and Colonial Expansion: The Role of the British Royal Botanic Gardens* (Academic Press 1979).

100 It is interesting to note, however, that the actual science related to the PPA was still controversial. The Scopes trial took place just five years before the PPA was signed into law. Legislation to prohibit the teaching of evolution was debated in North Carolina, for instance, post-Scopes. There was an Anti-Evolution League, and considerable sentiment against Darwin among conservative and fundamentalist religious groups.

101 Burns and Ueberhorst, *Creative Democracy: Systematic Conflict Resolution and Policymaking in a World of High Science and Technology* at 299 (Praeger 1988).

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actors as a political tool in their efforts to create the Act, current and anticipated use of the new technology is not the immediate impetus behind the efforts of these interest groups. These groups and individuals, in other words, are not constructing laws to facilitate their use of the technology or help make its use more profitable.

Finally, while the Plant Patent Act of 1930 represents a remarkable and radical change in the rules regarding ownership of plant materials, inconsistencies and deficiencies are immediately noticed. Joseph Rossman, an examiner for the Patent Office observes less than a year after passage of the PPA that:

> After the law in its present form, or as modified, has begun to function smoothly, justice demands that it be extended to cover sexually reproduced varieties. In the last analysis, this is the field most needing patent protection for no sexually reproduced variety can possibly be the result of casual hybridization, or a chance find, as are many varieties in the field covered by the present law.[102]

Stark had been prescient in his observation that the Plant Patent Act could and hopefully would set the stage for the extension of patent protection to seed crops. Not even he could have foreseen the changes in intellectual property rights law to come in the latter decades of the century, however. Remarkably, 1930's patent lawyer Robert Starr Allyn[103] jokingly anticipates more far-reaching implications in the *Journal of Heredity.* "Who," he asks, "will say that a patent may not be granted for a bread and milk plant produced by crossing a bread fruit tree with a milkweed by the dark of the moon?"[104]

102 Rossman, *supra* note 58, at 25.

103 Allyn, *The First Plant Patents: A Discussion of the New Law and Patent Office Practice* (Educational Foundations Inc. 1934).

104 Allyn, *Plant Patent Queries: A Patent Attorney's Views on the Law,* 24 The Journal of Heredity 58 (1933).

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