cold storage unit. In March they are potted and transferred to a frost-free frame where they remain until the following spring. At this time they are ready to be sold

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PLANT PATENTS AND LEGALITIES

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Article I of the Constitution of the United States grants Congress broad powers to enact legislation to "promote the progress of science and the useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries."

In 1793, the Congress enacted the Patent Act, which was authored by Thomas Jefferson. The Act, which was subsequently modified in 1836, 1870, 1874, and 1952, is essentially the same today as it was written by Jefferson.

In 1930, the Plant Patent Act was enacted to afford patent protection to certain asexually reproduced plants Before this time there were two factors which were thought to exclude plants from patent protection. First was the general belief that plants were products of nature, even though artificially bred. The second factor was that it was not thought that new varieties of plants could be adequately described by the written word. In passing the Plant Patent Act, the Senate, in its report on the Act, explained that the work of the plant breeder "in aid of nature" was a patentable invention. The Congress relaxed the written description requirement by providing for a "description as complete as reasonably possible."

Questions most frequently asked about the Plant Patent Law are:

1. What is a plant patent?

   A plant patent is a grant by the Government to an inventor (or his heirs or assigns) who has invented or discov-

ered and asexually reproduced a distinct and new variety of plant, other than a tuber propagated plant or a plant found in an uncultivated state, the grant being the right to exclude others from asexually reproducing the plant or selling or using the plant so reproduced.

2. For how long a term of years is the patent granted?

   Seventeen years from the date which it is issued.

3. How does a plant patent differ from other kinds of patents?

   A plant patent relates to a living plant which as a product of nature obviously cannot be "made" or "manufactured " In a utility patent (regular patent) the grant confers "the right to exclude others from making, using or selling" the invention; in a plant patent the grant confers "the right to exclude others from asexually reproducing the plant or selling or using the plant so reproduced."

4. Does a plant patent carry with it a guarantee of quality or merit.?

   No. The issuance of a plant patent is not the equivalent of an endorsement by the Government of quality and merit The only implication which can be drawn from the grant of the patent is that the plant is "distinct and new "

5. Is there any restriction as to persons who may obtain a United States plant patent?

   No. Any person may obtain a plant patent by complying with the provisions of the law. A foreign citizen may obtain a U S. plant patent under exactly the same conditions as a U.S. citizen.

6. Can there be joint inventors in an application for a plant patent?

   Yes. If each person had a share in the ideas resulting in the breeding of a new variety of plant, or if, in the case of found plant, more than one made the discovery, they may be joint applicants for a plant patent.

7. What new types of plants are patentable?

   New and distinct varieties of plants fall roughly into three classes· (1) sports, (2) mutants, and (3) hybrids. In the case of sports, the new and distinct variety results from bud variation and not seed variation. A plant or portion of a plant may suddenly assume an appearance or character distinct from that which normally characterizes the variety or species. In the case of mutants, the new and distinct variety results from seedling variation by self-pollination of species. In the case of hybrids, the

new and distinct variety results from seedlings of crosspollination of two species, of two varieties, or a species and a variety. In this case, the word "hybrid" is used in its broadest sense.

8. May new and distinct plants found growing in nature be patented?

   Yes. The present law indicates clearly that plant seedlings discovered, propagated asexually, and proved to have new characteristics distinct from other known plants, are patentable. The law, howver, specifically excludes plants found in an uncultivated state.

9. What are some of the characteristics that may distinguish a new variety of plant?

   The characteristics that may distinguish a new variety of plant would include, among others, those of habits; immunity from disease; resistance to cold, drought, heat, wind, or soil conditions; color of flower, leaf, fruit or stems; flavor; productivity, including everbearing qualities in fruits; storage qualities; fragrance; form; and ease of asexual reproduction.

10. How are plant varieties classified in the Patent Office?

    There are 89 subclasses in the class of plants. The major subdivisions are: roses; nuts; fruits; conifers; broadleaf; trees; shrubs or vines; herbaceous flowering plants; herbaceous ornamental foliage plants; and miscellaneous plants such as mushrooms and sugarcane.

11. What are some of the prerequisites for filing an application for a plant patent?

    The new plant variety: must have been asexually reproduced by the applicant; must not have been described in a printed publication nor introduced to the public nor placed on sale more than one year before filing of the application; must have originated either (a) as the result of some act of cultivation by the applicant, e.g. cross pollination, treatment, selection and/or breeding efforts, (b) as a seedling found by the applicant in a cultivated area, or (c) as a sport found by the applicant.

12. Of what does a patent application consist?

    A written document comprising a petition, specification and claims describing and defining the new plant, an oath or declaration, a drawing in those cases in which a drawing is possible, or a photograph, and payment of the filing fee.

    The application papers must be filed in duplicate. When color is a distinguishing characteristic of the new variety,

the drawing or photograph must be in color and two copies must be submitted.

The oath or declaration required of the applicant, in addition to the averments required in the conventional oath or declaration for other patents, must state that he has asexually reproduced the plant. Where the plant is a newly found plant, the oath must also state that it was found in a cultivated area

The description of the plant variety as given in the specification should be complete and detailed and expressed in botanical terms in the general form followed in standard botanical textbooks It is mandatory that the specification include the origin or parentage of the plant sought to be patented and where (geographic) and in what manner (cuttings, grafting, etc) the plant has been asexually reproduced When the color is a distinctive feature of the plant, the color should be positively identified in the specification by reference to a designated color atlas or dictionary. When the plant originated as a newly found seedling, the specification must particularly point out the location and character of the area where the seedling was discovered to establish that it was not found in an uncultivated state

13 Is it necessary to submit specimens of the plant variety, its flower or fruit when filing the application?

No Specimens of the plant variety, its flower or fruit should not be submitted unless specifically called for by the examiner.

In addition to the Plant Patent Act, which covers asexually reproduced plants, we have the Plant Variety Protection Act, which covers sexually reproduced plants. This Act was passed in 1970 to provide certificates of Plant Variety Protection to breeders of any novel variety of sexually reproduced plants.

The Plant Patent Act specifically excludes tuber propagated plants from protection The Plant Variety Protection Act when passed excluded six vegetables from protection. These were okra, celery, peppers, tomatoes, carrots and cucumbers. This exclusion was removed by a bill passed by Congress this week (December 8-12, 1980) which now awaits the President's signature.

The protection offered by the Plant Patent Law and Plant Variety Protection Acts differs slightly. The Plant Patent Law protects the patent holder against asexual reproduction of his patented plant, whereas the holder of a Plant Variety Protection Certificate is protected against either sexual or asexual reproduction of the protected plant The term of the grant in both instances has been 17 years. The changes to the Plant Variety

Protection Act passed this week change the term of the grant on sexually reproduced plants to 18 years to bring the Act into conformity with the International Convention For The Protection Of New Varieties Of Plants.

One might ask what benefits accrue to the public from the Plant Patent Law.

Since the enactment of the Plant Patent Law in 1930, research and development in many areas of plant breeding have significantly increased. As a natural outgrowth of increased research, many improvements have been forthcoming. In varieties of fruits and nuts we have seen improved flavor; better form, increased size; increased yields; harvest spread over longer seasons; fruits which are adapted to mechanical planting, growing, harvesting and grading, with improved "keeping" qualities that permit them to be shipped over a much wider area.

In environmental plans, the public has seen improvements in the form of the plant, in vigor of plant growth, hardiness and disease resistance; and in the flowers, improved form, color, fragrance and lasting quality.

Improvements as a direct result of the Plant Patent Law are so great that many fruits which were popular 50 years ago have been entirely supplanted by newly developed cultivars brought about by the favorable climate for plant development. Only a few of the cultivars of rose and chrysanthemums which were grown in our gardens in 1930 are still commercially available because they too have been supplanted by new and improved cultivars. We have many more hardy plants now — azaleas are a good example of what intensive breeding programs can do.

The Plant Patent Act has given the consumer-public protection from unscrupulous promoters in two ways: The Patent owner within certain limits, can keep a patented plant from being produced and sold by growers not qualified to produce the quality to which the public is entitled; and through the use of the cultivar name associated with the patented plant, to assure the consumer of getting the true cultivar. Before the days of the Plant Patent Law an unscrupulous grower could easily take a superior new cultivar, rename it as his own, and freely enjoy the benefits of another's work.

By the same token, you might ask what are the benefits of the Act to the hybridizer or plant breeder.

The Plant Patent Act made it possible for a hybridizer to specialize and concentrate his attention on developing new plants. He is no longer forced to divide his time and efforts by being concerned with production to support his hybridizing program. If he is skilled in the art, he can become a specialist in the field of hybridizing and support himself and even profit from his

time and investment.

A nurseryman who owns a patented plant can afford to educate the public and other nurseries on the benefits of the invention. The patented plant, therefore, comes into wider use *more quickly than would be possible without such education. If* he did not have patent protection, education would be impractical and the public might be denied the benefits until it became known; usually a slow process.

Plant Patents have upgraded the nursery industry. This has occurred through the development of superior new products brought about by the increased research made possible by the Plant Patent Law.

It is interesting to point out that due to the encouragement of the U.S. Plant Patent Law, a number of foreign hybridizers have been able to expand their research and breeding. This is also of direct benefit to the nursery industry in the United States and the ultimate benefit of the American public. The more important aspect of this, however, is that, following the lead of the United States, many countries have granted patents on new plants. This has stimulated the interest of American breeders in promoting their new plant cultivars in these countries, which in its small way contributes to international good will and may contribute to a favorable balance of trade for the United States.

The nursery industry exists only because there is a public demand for plant material. The Plant Patent System enables the industry to allocate money for research and development of new and better cultivars to satisfy that demand. The American landscape would be less colorful and interesting for all if it were not for patented plants.

As mentioned earlier, the only amendment to the Plant Patent Act became law on September 3, 1954, to permit the patenting of "newly found seedlings." This amendment in itself seems to recognize and establish that the significant part of the inventive act is the discovery and preservation of a new and distinct plant rather than the particular cross that may have brought it about. A careful examination of the historical background of Plant Patents demands recognition of the fact that unusual skill is required in the discovery or selection process.

The Plant Patent Law is a workable and proven law. It has withstood the test of time and the courts. We often find breeders making the same crosses, but we have yet to see a case of interference as a result of the duplication of such crosses. More than 4600 Plant Patents have been granted. The number contested as to validity in the Federal Courts number less than 3 dozen. No Plant Patent has been declared invalid for failing to meet the standard of unobviousness.

Since the Plant Patent Act came into force, the Patent Office has held consistently that the term "plant" as used in the Act, meant "plant" in the ordinary and accepted sense "in the common language of the people," but not in the strict scientific sense. This definition excluded bacteria, but included fungi.

A recent landmark decision of the Supreme Court involved the patenting of a bacteria. The case at issue was Sidney A. Diamond, Commissioner of Patents and Trademarks, versus Ananda, Chakrabarty *et al.* Chakrabarty, a microbiologist, filed a patent application for a bacteria which is capable of breaking down multiple components of crude oil. This bacterium would be able to "eat" oil spills, thus eliminating environmental contamination. His application was denied by the patent examiner on the basis that, first, micro-organisms are "products of nature" and, second, that as living things they are not patentable.

Chakrabarty appealed to the Patent Office Board of Appeals, and the Board upheld the examiner on the second grounds. This decision was reversed by the Courts of Customs and Patent Appeals.

The Commissioner of Patents, obviously wanting a definitive decision on the law, filed writ of certiorari to the Supreme Court. Very briefly, the Supreme Court held that the patent should be granted. Some of the comments of the Court in this case are of extreme importance in respect to the Plant Patent Act and Plant Variety Protection Act.

The government leaned heavily on the theory that enactment of the Plant Patent Act in 1930, and the Plant Variety Protection Act in 1970, evidenced Congressional understanding that the terms "manufacture" or "composition of matter" did not include living things. If they did, the government argued the Acts would not have been necessary.

The Court rejected this argument

Next the government argued that micro-organisms cannot qualify a patentable matter until Congress expressly authorizes such protection. This argument was predicated on the fact that genetic technology was unforeseen when Congress enacted the Patent Law. This argument was also rejected.

In rejecting these arguments, the Court held strongly to the Jeffersonian philosophy that "ingenuity should receive liberal encouragement." Also, the Court noted that Congress, in 1952, expressed the intent that the law "include anything under the sun that is made by man." Under these conditions, neither the Plant Patent Law nor the Plant Variety Protection Act were necessary since the general Patent Laws are broad enough to provide protection to plants reproduced either sexually or asexually.

In closing, the Plant Patent Act has well attained its purpose

of affording a sound basis for investing capital in plant breeding and, consequently, stimulating plant development through private enterprise. The more than 4600 Plant Patents issued have been developed by private industry without the help of Government funds. Many of these patents cover food bearing plants, plants that are of better quality, offer higher yields, require less care because of their resistance to insects and disease, and, as a result, make available to the consumer a cheaper, better product. The Plant Patent Act has also led to the development of ornamental plant material which is resistant to disease, drought and cold, all without the aid of Federal funds.

COMMERCIALLY-FEASIBLE MICROPROPAGATION OF MOUNTAIN LAUREL, *KALMIA LATIFOLIA*, BY USE OF SHOOT-TIP CULTURE

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Abstract. The multiplication at rates feasible for commercial production of mountain laurel, *Kalmia latifolia*, by micropropagation using shoot-tip cultures has been demonstrated Shoot-tip explants placed initially in liquid woody plant medium (WPM) supplemented with 4-16 μM N^6-(Δ^2-isopentenyl)-adenine (2iP) produced axillary shoots by 1 to 2 months. These new shoots were excised from the original explant and placed on the same WPM solidified with agar The resultant shoot mass was subcultured monthly Actively multiplying shoot-tip cultures were produced within 6 months A comparison of 7 concentrations of 2iP, varying from 0 to 64 μM, showed that a concentration of 8 μM 2iP produced the greatest number of utilizatble shoots after 8 weeks in culture Stock cultures were maintained or increased monthly by removing and subculturing shoots elongating from the basal mass. Thirty to forty utilizable shoots were harvested from each culture 6 to 8 weeks after the initial subculture Multiplication rates of 8 to 10 times were readily achieved Harvested shoots rooted with 73% success in 4 to 6 weeks when placed in a 100% peat medium in a high humidity chamber. After a period of acclimation, these plants can be treated like young seedlings in commercial production

"We invite you to rediscover the long-neglected laurels, a favorite and familiar American plant. But we warn you that you may experience some frustration, for mountain laurel selections are at present difficult to root and slow growing" (2). However, the situation is improving. A number of programs continue to