Intellectual Property Rights for Plants in the United States

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The United States offers several ways for plant breeders to protect their inventions; plant patents, utility patents, or plant variety protection. There are differences in the type of material that can be protected under each system and the criteria used to examine the application. There is often confusion among applicants regarding why the United States has so many choices, which choice or choices apply to their situation, how to file an application and how that application will be examined. This article provides a basic overview of plant patents, utility patents and plant variety protection in the US.

Keywords: Intellectual property rights, patents, plant variety protection, UPOV, DUS testing, essentially derived variety

Plant breeders may take 10-15 years to develop a new plant variety, but the variety’s market life can be as short as 2-5 years. Breeders and the companies who employ breeders use intellectual property rights (IPR) protection to control the marketing of their new varieties. In an ideal world, a win-win situation is created through the use of IPR. With control over access to their research, investors retain interest in plant breeding businesses. This leads to the release of improved varieties that are offered for sale. When gardeners and farmers buy varieties protected by IPR, they are buying high quality varieties from legitimate sources that can be expected to perform as described, with yield and performance traits to meet their marketing goals. Competitors are prevented from plagiarizing the hard work of others and cutting into their profits.

There are several ways to obtain IPR in the United States on plant cultivars or varieties. A breeder may obtain a plant patent, utility patent, or plant variety certificate of protection. Each type of protection has specific criteria that a variety must meet to qualify for exclusive marketing rights for a limited time. This extends the period in which the owner can benefit from having developed the variety. Owners have the potential to recover the costs of research and development, and that encourages them to reinvest in agricultural breeding work.

History of Intellectual Property Rights in the United States

Many people are baffled about IPR in the United States because there are so many options. Most of these options can be explained by the history of IPR in the United States. The first United States patent was issued in 1790 (ref. 1). Because they have been around for so long, people understand what a patent is and how it works, at least in a general sense. In contrast, most people are unaware of the Plant Variety Protection (PVP) Act.

Fruit and tree breeders in the 1890's realized that competitors could asexually propagate new varieties and sell them in competition with the originator. The breeders wanted protection for their plant 'inventions' similar to the protection offered to other inventors. Their petitions led to passage of the Plant Patent Act of 1930, which allowed for patenting of asexually reproduced plants (except tubers). This form of protection is used by breeders of trees (such as, fruit, citrus, nuts), shrubs (such as, azalea, viburnum), ornamentals (such as, chrysanthemum, rose, impatiens), and fruits (such as, blueberry, grape, raspberry, strawberry). There is only one claim in a plant patent – that of the variety itself.

Tubers and seed-reproduced crops were not included under the Plant Patent Act. After some European countries enacted laws related to plant breeders' rights under the 1961 UPOV Convention, several attempts were made to enact similar protection in the United States. Early attempts to revise the Plant Patent Act to include sexually reproduced plants were

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unsuccessful. The American seed trade turned to the Department of Agriculture to draft new legislation for seed-reproduced plants. The PVP Act was enacted in 1970. Similar to plant patents, only one claim is allowed – the variety itself.

Based on both the Plant Patent Act and the PVP Act, the United States joined UPOV in 1981 under the 1978 UPOV Convention. In 1994, the US PVP Act was amended to comply with the 1991 UPOV Convention, which expanded protection to all plant species. At that time, tuber reproduced plants were specifically added to the scope of eligibility under the PVP Act and an exclusion against F1 hybrids was removed. ‘Tuber’ is used in its most strict botanical sense, examples of which include potato, anemone, caladium, and oxalis. Inbred lines, open-pollinated or self-pollinated varieties, synthetic populations, hybrids and genetically modified plants are eligible for PVP; bacteria and fungi are excluded.

Court cases and legal interpretations of patent law have been made over the years, such as the US Supreme Court case *Diamond v Chakrabarty* and the US Patent and Trademark Office (USPTO) case *Ex parte Hibberd*. These legal decisions changed the interpretation of the US Patent and Trademark Act. Now, seed-reproduced plants can be protected under the general patent law. Many claims can be made within one utility patent application. Plus, it is possible for a seed-reproduced plant to obtain both a utility patent and a PVP certificate of protection.

<table>
<thead>
<tr>
<th>PVP examining activity</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010*</th>
</tr>
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<tbody>
<tr>
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<td></td>
<td></td>
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<td></td>
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<td>Agricultural crops</td>
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<td>412</td>
<td>492</td>
<td>598</td>
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<tr>
<td>Vegetable crops</td>
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<td>231</td>
<td>355</td>
<td>329</td>
<td>399</td>
<td>534</td>
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<tr>
<td>Tuber crops</td>
<td>58</td>
<td>43</td>
<td>77</td>
<td>64</td>
<td>58</td>
<td>48</td>
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<tr>
<td>Ornamental crops</td>
<td>12</td>
<td>8</td>
<td>12</td>
<td>4</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>First actions 2</td>
<td>308</td>
<td>251</td>
<td>438</td>
<td>457</td>
<td>391</td>
<td>443</td>
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<td>PVP application disposals, total</td>
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<td>263</td>
<td>327</td>
<td>339</td>
<td>353</td>
<td>332</td>
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<tr>
<td>Allowed PVP applications, total</td>
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<td>177</td>
<td>282</td>
<td>299</td>
<td>285</td>
<td>263</td>
</tr>
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<td>Abandoned or withdrawn by applicant, total</td>
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<td>83</td>
<td>36</td>
<td>31</td>
<td>64</td>
<td>68</td>
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<tr>
<td>Denied or declared ineligible by examiner, total</td>
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<td>3</td>
<td>9</td>
<td>9</td>
<td>4</td>
<td>1</td>
</tr>
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<td>PVP certificates of protection issued, total</td>
<td>262</td>
<td>233</td>
<td>308</td>
<td>338</td>
<td>307</td>
<td>307</td>
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<td>Processing time of average PVP application (months) 3</td>
<td>33.5</td>
<td>26.9</td>
<td>24.5</td>
<td>27.3</td>
<td>27.0</td>
<td>27.6</td>
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<td>PVP certificates of protection expired</td>
<td>208</td>
<td>207</td>
<td>153</td>
<td>102</td>
<td>213</td>
<td>314</td>
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</table>

Notes: 1 Fiscal year starts 1 October and ends 30 September
2 First action occurs when the status changes from filed/pending
3 Processing time = issuance date - filing date
* Preliminary
and about 3 per cent are for tuber crops. Agricultural crops make up 83 per cent of applications and vegetable crops account for 13 per cent of applications. Only 56 applications for first generation hybrids have been received, in artichoke, asparagus, bermudagrass, broccoli, field corn, sweet corn, hibiscus, melon, pepper, spinach, sunflower, tobacco, tomato, twinspur, and watermelon.

Analysis of Applicants
Forty eight per cent of patent applications are filed by residents of foreign countries.\(^{11}\) Fifty-two per cent of patent applications are filed by US citizens.\(^{12}\) Of those, less than 0.2 per cent of applications are filed by US government agencies.\(^{13}\)

Eighty-one per cent of PVP applicants are US citizens or companies (Table 2). An additional 9 per cent of applicants are from public institutions, such as universities or government agencies. Only 10 per cent of PVP applications are received from non-US citizens or companies.

Criteria for Granting Rights
Any person who ‘invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent,’\(^{14}\) subject to the conditions and requirements of the law. These classes of subject matter taken together include practically everything which is made by man and the processes for making the products. The patent law specifies that the subject matter must be new, non-obvious, and ‘useful.’ Because of this, they are also called ‘utility patents’. Patents are granted for 20 years from the date of filing the application. The patent gives the holder the right to exclude others from making, using, offering for sale, or selling the invention in the United States or ‘importing’ the invention into the United States. What is granted is not the right to make, use, offer for sale, sell or import, but the right to exclude others from making, using, offering for sale, selling or importing the invention. A patent can be filed up to one year following the date of first sale, offer for sale, public use, or publication of the invention. The US Patent Office website explains many of the legal details and allows readers to search issued patents and pending patents that have been on file for more than 18 months.

Developers of new varieties of plants that are sexually reproduced (by seed) or are tuber-propagated may obtain a PVP certificate of protection. To get a certificate of protection, the variety must be new, distinct from other varieties, and genetically uniform and stable through successive generations.\(^{15}\) PVP certificates of protection are granted from the date of issuance for 20 years for most crops or for 25 years for trees, shrubs, and vines. The owner of a US protected variety has the right to exclude others from selling the variety, or offering it for sale, or reproducing it, or importing it, or exporting it, or using it in producing (as distinguished from developing) a hybrid or different variety therefrom, to the extent provided by this Act.\(^{12}\) The rights extend to any variety that is essentially derived from a protected variety, varieties which are indistinguishable from a protected variety, any variety whose production requires repeated use of the protected variety, and harvested material of the variety, which includes entire plants and plant parts. A PVP application can be filed up to one year following the date of first sale, offer for sale, public use, or publication of the invention in the United States, or within 4 years if these acts are done in a foreign country.

Method of Examination
In both the Patent Office and the PVP Office, applications are judged by the contents of the application. All information used to determine whether a variety meets the specified criteria, is gathered and reported by the applicant to the office. Government-run trials are not conducted and site visits are not required. Examiners base their decisions

<table>
<thead>
<tr>
<th>Source of applications filed</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010*</th>
</tr>
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<td>350</td>
<td>304</td>
<td>455</td>
<td>412</td>
<td>492</td>
<td>598</td>
</tr>
<tr>
<td>Filed by residents of the United States</td>
<td>229</td>
<td>214</td>
<td>352</td>
<td>314</td>
<td>381</td>
<td>530</td>
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<td>Filed by government agencies 2</td>
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<td>55</td>
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</tr>
<tr>
<td>Filed by residents of foreign countries</td>
<td>58</td>
<td>35</td>
<td>52</td>
<td>45</td>
<td>64</td>
<td>39</td>
</tr>
</tbody>
</table>

Notes: 1 Fiscal year starts 1 October and ends 30 September
2 Includes US universities and experiment stations
* Preliminary
on the descriptive information and trial data supplied by the applicant. Clarifying or supplementary data may be requested from the applicant during the course of the examination. This may require that the applicant conduct additional trials or tests, or provide specimens.

Both the Patent Office and the PVP Office are completely user-fee funded. Fees collected from applicants and other users of services pay for salaries, rent, supplies, and other costs of doing business. The fee schedules are available on the offices' websites. One difference between the two offices is that the Patent Office has maintenance fees that is charged after issuance of the patent, whereas the PVP Office does not charge any such fees.

Conclusion

The United States has several forms of IPR for plants. The concepts are easy to understand so that working professionals and private citizens are able to file for intellectual property rights. In-depth information, instructions and forms are available online. This provides a strong legal basis for plant breeders to protect their new plant varieties. With these incentives in place, breeders can recover research costs and continue developing improved varieties for many years to come.

References