

Protecting plant varieties: Developments in New Zealand

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The protection of the interests of breeders of new and improved varieties of plants is the subject of this article. Such protection may be given under the ordinary patent law as well as under the recently enacted Plant Variety Rights Act 1987. Both patent law and the new legislation are examined by the author, and it is noted that having two separate systems of protection can create difficulties for the user of a plant variety. It is suggested that the specially designed plant variety rights (PVR) approach should be preferred over the patents system.

I. INTRODUCTION

The highly competitive nature of the agricultural and horticultural markets requires the development of increasingly more productive, and better quality plant varieties.

Since the New Zealand economy is heavily dependent on primary industry, encouraging plant breeding is in the national interest. Benefits of improved varieties accrue beyond the breeder, to consumers and commercial users.

However, plant breeding is an expensive, time consuming process. To breed a new variety usually takes 5 to 10 years and if a breeder is not assured an opportunity to make a profitable return on investment, breeding becomes economically unattractive.

One way of protecting a breeder's interest is by use of the patent law. Traditionally, plants could not be patented, but since the 1950's major developments in patent law have occurred which accept the possibility of patenting plants. Another way of gaining legal protection for the breeder is under plant variety rights legislation.

This paper will consider the patent law as it affects plant varieties then survey the current plant varieties rights legislation of New Zealand.¹

The PVR system is quite different from patents in the type of protection provided and the qualifications for receiving the protection. There is, however, nothing in the Plant Variety Rights Act 1987 or the Patents Act 1953 to prevent protection for plant varieties under both schemes.

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1 Plant Variety Rights (PVR) is colloquially referred to as "patenting plants".

II. PATENTS AND PLANTS

There are four requirements for patenting plants — invention, novelty, obviousness, and utility. These requirements and the relevant cases will now be considered in turn.

1. Invention

(a) Early developments

The major obstacle to allowing the patenting of plants came from the Patents Act's requirement that only inventions can be patented.² "Invention" is defined in section 2 as "any manner of new manufacture."

The general test for determining a manner of new manufacture was stated by Morton, J. in *Re G.E.C.*, in 1943³ as —

Whether there is a method which —

- (a) results in the production of a vendible product, or
- (b) improves, restores or preserves an existing vendible product, or
- (c) preserves a vendible product from deterioration.

In *Re G.E.C.* the patent application was in respect of zinc chloride solutions used in the extinguishing of incendiary bombs. The court initially stated a well-established rule that a claim defining a substance by its composition is construed as a claim to patent the substance itself. The mere fact that the claim specifies a use for the substance does not confer patentability if the substance has been used for any other purpose in the past. Since the claim here relied on a known substance being projected through an ordinary pump, it fell outside the three-factor test.

On its face, this test could have had significant impact on the patentability of plants. A "manner of new manufacture" required only a method resulting in a vendible product. "Vendible product" was not defined. Therefore, there was sufficient scope for a court to include a new plant variety in "vendible product" thus making the breeding method patentable. In *Re G.E.C.* Morton, J. stressed that the test was not "a hard and fast rule". This widened the scope for judicial creativity regarding the patenting of plants.

However, an obstruction to such developments existed in the requirement of "manufacture". The position was summarised in *Re Rau Gesellschaft's Application*,⁴ where it was decided that a patent could not be granted for the production of lupin seeds from selective cultivation. Luxmoore, J. stated that the selective breeding of animals and cultivated plants from a few individuals which are nearest the species' ideal to improve stocks has been the source of agricultural and horticultural development "since earliest times". It was an exercise of skill not regarded as being within the definition of "manufacture".

² Section 10.

³ (1943) 60 R.P.C.1, at 4.

⁴ (1935) 52 R.P.C. 362.

But in *Re N. V. Philip's Gloelampenfabrieken Application*⁵ the decision was influenced by *Re G.E.C.* Here, improvements in the method producing a new variety of poinsettia were claimed as an invention. Lloyd-Jacobs, J. acknowledged that modern developments in agricultural and horticultural products were analogous to those in industry, involving the use of equipment and labour. However, a "manner of new manufacture" must be "disclosed as an essential ingredient in the invention itself, it cannot be found in the means by which it is exploited". The alleged invention involved modifications to climatic conditions. The production of the poinsettia was the inevitable result of what was inherent in the plant, therefore it was not patentable.

The effect of this judgment was that so long as the internal processes of the plant formed an essential ingredient of the alleged invention, it could not be "a manner of new manufacture". The implication from this was that otherwise, a plant could be patented.

In *Re Standard Oil Development Co's Application*⁶ a patent was sought for a herbicide. Lloyd-Jacobs, J. stated that if the method used had improved a vendible product, for example, a crop, it would have been patentable. However, the judge stated that the method affected the land, it did not result in a vendible product, so was outside the first limb of Morton, J.'s test. The herbicide did not improve the land intrinsically; it only rid it of weeds. Thus the method was also not within the second limb of the test. Since the herbicide killed a weed without the inventor's involvement, it could not be a manner of manufacture.

In the Australian Patent Office decision of *Rank Hovis McDougall Ltd's Application*⁷ in 1946, where it was stated that a patent could be granted if a variety is produced by a human-controlled process, and has useful, improved qualities. This test proved difficult to fulfil. To what extent must the process be controlled? And how little influence must the living matter have on the process for the process to be patentable?

Some clarification of the test can be gleaned from an earlier case, *Re Joseph Szuec's Application*, 1956.⁸ The alleged invention was the cultivation of mushroom tissue in an aqueous solution of nutrients. The court held that this was not a modification of conditions under which natural phenomena pursue their natural course. Here special conditions were supplied under which the tissue could develop along lines inherent in its organic nature. This was held to be an invention, so was patentable.

Therefore, human control of the process need not be total for it to be an invention; it is enough to employ artificial or atypical conditions for growth.

(b) *The Effect of National Research and Development Council v Commissioner of Patents*.⁹

The Australian case of *N.R.D.C. v. Commissioner of Patents* in 1961 was significant in facilitating the patenting of plants though its applicability has never been tested in New

5 (1954) 71 R.P.C. 192.

6 (1951) 68 R.P.C. 114.

7 (1976) 46 A.O.J.P. 3915.

8 (1956) R.P.C. 25.

9 [1961] R.P.C. 135.

Zealand courts. In *N.R.D.C.* an application for a patent was made in respect of preparation and application of a weedkiller to land. The material step in this process was within the weed; the weed metabolised the chemical releasing a toxic acid which killed the weed.

The Commissioner of Patents originally rejected the patent on the traditional approach that “manufacture” was restricted to vendible products and their associated production processes, and all agricultural and horticultural processes were excluded.

On appeal, the court discussed the circumstances in which inventions are patentable. A patent can be granted where an invention is a new method which uses already known material, or adapts that material to serve a new purpose, so long as a hitherto unknown quality of the material is exploited. Therefore, so long as a substance serves a new purpose, and a method of achieving the purpose is disclosed and is within the “manner of new manufacture” concept it is patentable. In this situation the method itself need not involve an inventive step, or be novel. The inventiveness and novelty come from the suggestion of a new use of the substance for a new purpose.

Significantly, the court stated that an invention should still be patentable where no effort is required after the research stage, and that the process is then completed by a “work of nature”. Only one inventive step is required for a process to be patentable, and it is acceptable that it occurs in research.

Obviously, this catches plant breeding where inventiveness occurs in the research leading to effective hybridisation of two varieties to produce a new variety.

The new variety is produced by using the plant’s own internal processes, i.e. by nature, not artificially. Accepting this interpretation of the judgment the authority of *Re Rau Gesellschaft*¹⁰ must be reduced by *N.R.D.C. v. Commissioner of Patents*. That plants are patentable is further supported in the judgment. In discussing Morton, J’s¹¹ test, the court stated that “product” must be understood as covering every end product. “Vendible” only indicates a requirement of utility. By this interpretation, the test is wide enough to include plants as vendible products, since they are the end product of a process, with great utility. This is contrary to the traditional view that “vendible product” implies an industrially manufactured product.

Finally the court dismissed the notion that horticultural and agricultural processes are inherently outside the limits of patentability. In reality, the patentability issue should rest on the distinction between economic processes and non-economic endeavours. Horticultural processes have been traditionally classed as the latter. However, the court found no identifiable features of plants which took them outside patentability. It was stated that:¹²

The fact that the relevance of the process is to agricultural or horticultural enterprises does not in itself supply or suggest any consideration . . . which should weigh against the conclusion that the process is a patentable invention.

10 *Supra* n.4.

11 In *Re G.E.C.* *supra* n.3.

12 *Supra* n.9, at 147.

Such processes are not patentable, as in the case of *Philips*¹³ where the end result does not occur because of the process, but is an inevitable result of processes inherent in the plant. Where the process is analogous to a chemical process, and the end result follows from this process, it is patentable.

(c) *The Swift Application case*¹⁴

In the New Zealand case of *Swift's Application* the process in question was that of tenderising meat by injecting a live animal with enzymes, and allowing the animal's heart to distribute the enzymes through the body before it is slaughtered. Barrowclough, CJ. reviewed the *Re G.E.C.*¹⁵ test for patentability of a process and concluded that here there was an improved vendible product. An animal due to be slaughtered is a vendible product which is improved by the injection of enzymes; its utility in practical affairs is enhanced.

However, this interpretation of the "vendible product" test had been rejected in 1954 in *Re Lenard's Application*.¹⁶ There, a method of treating clove trees to prevent disease was held not to be patentable because agricultural and horticultural methods lacked the necessary industrial, commercial or trading character of a "process". By *Virginia-Carolina Corporation's Application*¹⁷ this rule was made applicable to biological processes.

Barrowclough, CJ. dealt with these authorities in light of *N.R.D.C. v. Commissioner of Patents*.¹⁸ The rejection of a patent application in *Lenard* on the ground that the process was agricultural is not of itself capable of precluding patentability. The tenderising process can therefore be a manner of new manufacture because there exists a vendible product. Following *N.R.D.C. v. Commissioner of Patents* the ultimate result was an artificial effect producing tenderised meat. There was a product which was vendible, so the process was held to be patentable.

(d) *The Present Position*

N.R.D.C. v. Commissioner of Patents established that plants are not precluded from patent protection merely because breeding is a horticultural process. The commercial nature of breeding allows it to be patentable. However, from *Lenard*¹⁹ and *Philips*²⁰ a breeder must do more than alter the growth conditions of the plant's normal environment, because change in the plant is caused by its innate adaptability. It seems necessary to remove the plant from its natural state and apply artificial conditions for the plant to be patentable. Breeding new varieties by cross-pollination and hybridisation can qualify as inventions. Discovered new varieties are obviously not patentable.

13 (1954) 71 R.P.C. 172.

14 [1961] R.P.C. 147.

15 *Supra* n.3.

16 (1954) 71 R.P.C. 190.

17 [1958] R.P.C. 35.

18 *Supra* n.9.

19 *Supra* n.16.

20 *Supra* n.13.

2. Novelty

To be patentable, an invention must be novel. The process must not have previously been published in New Zealand.²¹

There are few breeding methods of new varieties. Therefore, the process itself is similar for all varieties; it is only the end result, the variety, which is different. According to *Re Standard Oil's Application*²² invention focuses on the end product. By this, production of a new variety would satisfy the novelty requirement.

*Wellcome Foundation v. Commissioner of Patents*²³ states that where the use of a substance already forms part of the state of the art, it is not patentable. This implies that if a parent variety has been used to breed other varieties of the same species, any variety bred subsequently from that parent is not patentable. This view is supported by *N.R.D.C. v. Commissioner of Patents* where it was stated:²⁴

It must often happen in a sphere of human endeavour as old as that of primary production that a newly-devised procedure amounts to nothing more than an analogous application of age-old techniques; and where that is the case, want of novelty is a fatal objection to a patent.

The necessary interpretation of this is that once a breeding process has been patented in respect of one variety, it cannot be patented in respect of any other varieties because the process is analogous.

However, it can be argued that this is not in accord with the rules relating to prior publication laid down in *Hill v. Evans*.²⁵ If a breeding process is already the subject of a patent, the specification for that patent will describe the process and the variety produced. According to *Hill*²⁶

[P]rior knowledge of an invention to avoid a patent must be knowledge equal to that required to be given by a specification, namely, such knowledge as will enable the public to perceive the very discovery, and to carry the invention into practical use.

Prior knowledge of the breeding process applied to another variety does not enable the public to perceive the “very discovery” in the form of a new variety.

This was supported by *General Tire & Rubber Co. v. Firestone*²⁷ in 1972, where it was stated that for prior publication to anticipate the present applicant's claim that publication must contain clear and unmistakable direction to do what the present applicant claims to have invented.

Therefore, according to these authorities, unless the prior publication is for exactly the the same breeding process, resulting in exactly the same variety, it will not preclude

21 S.21(1) (a)-(d), Patents Act 1953.

22 Supra n.6.

23 [1983] N.Z.L.R. 385.

24 Supra n.9.

25 (1862) 45 E.R. 1195.

26 Ibid p.1200.

27 [1972] RPC 457.

novelty when the breeding process is used again in a different context. Nevertheless *Firestone*²⁸ is a more recent New Zealand Court of Appeal authority, so is more likely to be followed. But, there appears to be a loophole in *Firestone* which allows more than one variety to be granted patent protection for use of the same breeding process. *N.R.D.C. v. Commissioner of Patents*²⁹ was interpreted to mean that the new use of a known material whose methods of production and characteristics are known, but whose hitherto unknown properties have been found to serve a new purpose, is patentable. From this interpretation, where a known variety is used to produce a new variety and the known variety's properties have not previously been used to produce this variety, and the new variety has a new purpose, that breeding process will be novel.

3. Obviousness

To be patentable, an invention must not be obvious.³⁰ In *Beecham Group Ltd v. Bristol-Myers Ltd.*³¹ it was stated that pursuit of an obvious line of research would result in an invention which was not obvious if a sufficiently distinctive advantage was discovered.

Since few breeding processes are available, new varieties are produced via obvious lines of research. The issue arises whether a variety exhibits sufficiently distinctive advantage. *Halsbury's Laws of England* interprets this to mean "some special property not possessed by the class as a whole".³² Since a variety is produced if it differs in one essential characteristic from all other varieties of the same species, it will not by this definition be obvious.

The authoritative test for obviousness was laid down in *Beecham Group v. Bristol Laboratories International South Africa Ltd*³³

- (a) Are the substances truly new?
- (b) Are their useful qualities the inventor's own discovery?
- (c) Is there a substantial advantage?
- (d) Is it, at least, substantially peculiar to the selected group?

Difficulties arise regarding "useful qualities" and "substantial advantage". Factors such as production cost, commercial viability, and yield are relevant. But it is difficult to evaluate ornamentals on these criteria, since their usefulness and advantage is based on more subjective judgment. This difficulty is, however, overcome by (d); a distinctive quality need only be peculiar within the species. Because the variety has one essentially different characteristic, it appears to qualify as being non-obvious.

28 Ibid p.485.

29 Supra n.9.

30 Supra n.21.

31 [1981] N.Z.L.R. 600.

32 Lord Hailsham (ed) *Halsburys Laws of England* (4ed. Butterworths, London, 1981) Vol 34, para. 509.

33 [1967] R.P.C. 406.

4. *Utility*

Plant varieties easily fulfil this criteria. So long as a variety is of some use to any person, it is patentable on this ground, according to *Badische Anilin & Soda Fabrik v. Levinstein*³⁴.

III. INADEQUACIES OF THE PATENT SYSTEM IN PROTECTING PLANTS³⁵

Features of plants and their economic value not possessed by other inventions make provisions of the patent system irrelevant or unworkable.

1. *Novelty*

Whether a variety forms part of a theoretical prior art is of little importance compared to whether it is practically distinguishable. A written description cannot adequately establish this distinctness.

2. *Obviousness*

It is not important that another breeder possessing average skill could have bred the variety based on knowledge already existing. It is the gain of the finished variety, not the inventiveness in the method of production, which secures economic reward to the breeder.

3. *No prior publication*

Publication of a process prior to application for a patent extinguishes an inventor's right to patent protection. The invention cannot be new because it already forms part of common knowledge, the inventor may have copied the invention. This cannot apply to plants. More knowledge of a variety does not aid anyone in reproducing it; it is the supply of reproductive material which gives others the ability to replicate the variety. Knowledge of the variety does not enable anyone to copy it by reverse engineering so it can remain unique whereas other inventions cannot be guaranteed to so remain.

Also, the distinctiveness of a variety must be tested empirically, which requires public exposure of the variety before a patent could be granted. The provision that there be no publication is practically unworkable, since the trials must be documented.

IV. PLANTS VARIETY RIGHTS

New Zealand legislated for plant variety rights in 1973³⁶ after it signed the International Convention for the Protection of New Varieties of Plants 1961.³⁷ This

³⁴ (1887) 12 A.C. 710 (H.L.).

³⁵ A general discussion of this topic appears in *The Protection of Plant Varieties & The Debate on Biotechnological Inventions* U.P.O.V. INF/11, December 10, 1985.

³⁶ Plant Varieties Act 1973.

³⁷ The U.P.O.V. Convention.

Convention, and the Union formed under it were originally sponsored by multinational horticultural, chemical and seed production companies.³⁸

The law in general never seems very comfortable when dealing with matters biological, and this was never more the case than the example provided by the plant patenting system (PVR).³⁹

The Plant Variety Rights Act 1987, which superseded the Plant Varieties Act 1973, grants the breeder of a new plant variety proprietary rights and protections in respect of that variety. The Act strictly limits these benefits, in recognition of an intuitive notion of the law that living matter has a universal nature, so should be kept in the public domain in all but exceptional circumstances.

Anyone who has bred or discovered a new plant variety can apply to the registrar of plant varieties for a plant variety right.⁴⁰

The Act requires an application to be made within one year of sales of the variety commencing in New Zealand. The application must be within 6 years of sales of vines and trees beginning overseas, and within 4 years for other varieties.

A grant of a plant variety right gives the breeder 23 years of protection.⁴¹ A plant variety right gives the breeder the exclusive right to produce or reproduce reproductive material for sale and/or to sell such material, or to license others to do so. The breeder gets no exclusive right to the plant itself and the effect of this is to allow others to produce and sell the variety so long as the material is sterile.

The major benefit accruing from PVR is that it encourages the private sector to invest in plant breeding. Also, PVR facilitates access to varieties developed overseas. Foreign breeders with exclusive rights to sell their variety will be willing to supply the New Zealand market. Australia has found that foreign breeders refuse to release reproductive material there, since PVR does not exist.⁴²

V. ADVANTAGES OF PVR OVER PATENTS

1. *Homogeneity*

Patents give an inventor exclusive rights to produce exact copies of the patented item. Plants are incapable of such replication, therefore this strict scope of rights is inapplicable. However, the extent of protection must be defined so that it is ascertainable when infringement occurs. "Homogeneity" requires sufficient similarity between plants within a variety to define protection, but this standard cannot be applied within the patents system.

38 The most notable are Ciba-Geigy, ICI, Sandoz, Pfizer, Pioneer Hi-Bred, Monsanto, Royal Dutch/Shell, Cardo, Source: Joint Submission from the NZ Association of Scientists (Inc) and the Environment and Conversation Organisations of NZ (Inc) to the Plant Variety Rights Bill, 1985, August 2, 1985, p.2.

39 *Idem*.

40 Section 4.

41 23 years for woody plants, 18 years for other varieties, section 12.

42 *Senate Standing Committee on National Resources. Report on Plant Variety Rights*, May 1984, Canberra.

2. Stability

Long term protection of a variety necessitates that it remains stable in its essential characteristics. Consumers must be guaranteed the same features and quality when they buy the variety. Loss of these characteristics through natural mutation is possible, so a mechanism exists under the PVR system to cancel a breeder's rights.⁴³ No such provision exists under patent law. As a result, a variety can continue to be protected by a patent after it has ceased to exist in its patented form.

3. Identification of the variety

Section 10 of the Patents Act 1953 requires an applicant for a patent to provide a complete specification describing the invention, the best method of performance, and defining its scope. Description of a plant is not easily reduced to words. Drawings and photographs contribute to the effectiveness of such disclosure. But exact description is possible only by examination. Article 7(1) of the U.P.O.V. Convention recognises this as the only feasible method of describing the variety. Such testing is not required nor allowed under the present Patents Act.

4. The Scope of Protection

- (a) Patent protection extends to all uses of an invention. This goes beyond what is required to prevent exploitation of, and secure economic reward for a breeder. The U.P.O.V. Convention prescribes the minimum scope of protection in that PVR protection must cover the production of reproductive material for commercial marketing and sale. Members can adopt wider protection, but this is against the practice of members and the spirit of the Convention.
- (b) The patents system protects the breeding process and the resulting plant. However, once initial stocks of the plant are established, the plant is multiplied by its own reproductive process, the breeding process is no longer used. It is uncertain whether this is outside patent protection, since the end product is no longer produced by the patented process. The U.P.O.V. Convention specifically addresses this problem by stating that protection has effect for each reproduction.⁴⁴ There is no provision requiring any particular method of reproduction.
- (c) PVR recognises the economic importance to the agriculture industry of saving seed from one season to sow the following season. It does not provide protection for such production of propagating material which is used on the producer's land, but not marketed in that form (as reproductive material). Since the scope of patent protection is wider, such use constitutes an infringement of the patent. There is no equivalent "public interest" limitation on protection to those that exist under PVR.
- (d) Breeding a new variety from a protected variety does not infringe a breeder's rights. Such use of an invention is contrary to a patentee's exclusive rights over all

⁴³ Section 16, Plant Variety Rights Act 1987.

⁴⁴ Article 5(1).

uses of that invention. Thus, breeding of new varieties is hindered by patenting plants. This goes against the aims of PVR and the patent system, which seek to encourage breeding and invention. Plant variety rights (PVR) secure this opportunity in two ways —

(i) Avoidance of exploitation

A new variety is easily acquired and reproduced by other growers. Because these growers have not incurred breeding costs they can afford to sell their reproductions at a lower price than the breeder. By giving the breeder exclusive rights to produce and sell the variety's reproductive material,⁴⁵ the breeder benefits from the market returns that the work generates.

(ii) Providing adequate reward

By being the sole producer of a variety, or by charging royalties from growers licensed to reproduce it, the breeder is compensated for the cost of breeding.

PVR can also be justified on an equitable ground. Breeding requires the use of a breeder's skill, creativity and knowledge. As such, breeding is essentially the same as invention or artistic creation, which receive protection under patent and copyright law respectively. It would be anomalous and unfair if breeders could not receive similar treatment.

VI. CONCLUSION

In New Zealand protection of plants can be granted under PVR legislation, and is not prohibited under the Patents Act. This creates potential difficulties for a user of a variety, who must discover whether one or both schemes apply to determine what use can be legally made of the variety. For example, sale of non-reproductive material will not infringe PVR, but does infringe patentee's rights.

All other U.P.O.V. member states prohibit patent protection for plants. There is considered no need to have both protections available. Some merit is seen in all varieties competing in the market on equal terms, all having protection of the same length and scope. Breeders in New Zealand seek protection under PVR, not under the patents system. In light of these facts, limiting protection to the PVR system seems sensible.

Fitting plants within the patent system is difficult because of the legal requirements for patentability and because of fundamental deficiencies in the patents system to accommodate the special features of plants. The PVR system has been specially designed to meet such problems, and should be preferred over the patents system in providing protection to breeders.

Plant variety rights have established themselves as an effective means of protecting and rewarding the breeder. The rights are directed to meeting the needs of the breeder, whilst recognising the importance of plants to the population. Despite its weaknesses, PVR is the most comprehensive and the only plant-specific protection scheme presently available for new plant varieties.

⁴⁵ "Reproductive Material" unless otherwise stated, includes vegetative propagating material.

