



MARUMEGH

Kisaan E- Patrika

Available online at www.marumegh.com



ISSN : 2456-2904
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Received: 10-07-2022

Accepted: 15-09-2022

INTELLECTUAL PROPERTY RIGHTS IN PLANT BREEDING

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Abstract

As per the Act, breeders can claim the Intellectual Property Right, provided their varieties are novel, distinct, uniform, and stable and are given an exclusive right to produce, sell, market, distribute, import, or export the variety. Like other streams of IP, the plant breeders also enjoy the same benefits. Numerous inventions in physical and biological sciences have produced unbelievable type of technologies for the exploration and control of life processes and other phenomena of the universe. Both public and private industry that contributed to these inventions frequently enjoy some legal protection in the form of Intellectual Property Rights to avoid infringement and to monopolize the production and sale of their inventions for financial gains and the enhancement of their scientific capabilities. This type of provision increased awareness among intellectuals working with plant materials to seek protection of their intellectual property. The inherent potential of all the major crop plants has been tremendously enhanced to attain the existing levels of agricultural production. Though all the productivity gains cannot ascribed to genetic improvement but at least 50 % increase in yield is attributed to improvements through plant breeding. It is in light of such amazing contributions of crop improvement that plant breeders have been driven to avail the legal protection of their intellectual property *i.e.* varieties and germplasm.

The right to intangible property that is the product of the human intellect are known as Intellectual Property Rights. It is the legal rights provided to an inventor to derive economic benefits from his invention/innovation. Plant Breeders Rights refers to the set of statutory provisions that empower a breeder or an originating institute of a variety to regulate the multiplication and marketing of seed of protected variety.

The essential criteria for Plant Breeders Rights –

Novelty: The variety to be patented must be new which has not been previously commercialized and known publicly. It should have easily distinguishable characteristics so that it can be identified from the existing varieties.

Uniformity: All the individuals of the variety express its distinguishing characteristics or other features for which variant types are properly described, predictable and commercially acceptable. The variety can be reproduced through multiplication of its seed without noticeable changes in its essential characteristics after repeated reproduction or propagation.

Distinctness: variety is distinctly different from other cultivated varieties and clearly distinguished by one or more identifiable morphological, physiological or other characteristic from any other previous variety.

Stability: The variety must be stable in its essential characteristics, that is to say, it must remain true to its description after repeated reproduction or propagation or, where the breeder has defined a particular cycle of reproduction or multiplication.

Plant Breeders' Rights in the form of Patents or other Acts provide legal protection to the breeder from infringement in multiplication and sale of the protected variety. The FAO developed the term Farmers Rights to represent the rights arising from the past, present and future contributions of farmers in conserving, improving and making available the plant genetic resources. Similarly, there is provision of Breeder's exemption so that variety can be used to create new variation for developing another variety but not for producing other variety like F₁ hybrid for sale. The PBRs are granted for a specified period for varieties as a whole and not individual features of a variety. The PBRs thus provide a minimum form of protection to traditional breeders against resale of the seed of protected variety but permit use of that seed as a source of developing new varieties through breeding. The provision of research exemption implies the use of a protected variety to produce new variety by inserting even a single gene through mutation, backcrossing or genetic engineering to produce and protect a new variety without rewarding the original breeder.

Forms of Intellectual Property Protection for Plants

Plant Patents: The Plant Patent Act, 1930 of the USA provides protection of asexually propagated varieties other than those produced by tuber and plant found in uncultivated state. A variety to be governed by this Act must be new, distinct and non-obvious. The Plant Patent Act restrains others from asexually reproducing the plant or selling or using the plant so produced. The requirement of variety to be new refers to the fact that plant did not exist previously in a capacity to reproduce itself. The distinctness comes through easily distinguishable characters of the variety to be patented. The non-obvious criteria require that variety does not reflect an obvious extension of what already exists. There must be human intervention in the inventive process rather than simple discovery of something existing in nature. A Plant Patent Act provides the breeder a legal right to regulate multiplication and sale of variety for specified period of time.

Plant Variety Protection Act (PVPA): It is patent like protection obtained from an extension of the Plant Patent Act to cover the sexually reproduced varieties of seed bearing plants excluding fungi, bacteria and first generation hybrid variety. A variety to be protected under this Act must be novel, distinct, uniform and stable (DUS). A plant variety protection certificate is granted to a protected variety which prohibits others from sexually multiplying and marketing the variety and also for using it to produce another variety. But the Act does not prohibit other breeders to use the protected variety for developing the new variety which is distinctly different from the protected variety. The Act also does not protect the distinguishing characteristic of the variety as another variety with same character can be developed provided it meets the DUS requirements. The protected variety can be used as a parent for hybridization or mutation or any other basic and applied research. The use of

protected variety to produce a hybrid, however, is infringement of Act. Similarly, the Act also does not prohibit the farmer to save and grow the seed for the next crop or even to sell the seed provided his primary occupation is not seed production and sale services. The Act thus has a provision of 'breeder's exemption' and 'farmer's exemption' within specified limits. The Act provides all the relevant legal rights to the owner for a period of 18 years after which variety can be multiplied and sold by any individual or agency.

Utility Patents: Patents in the industry are usually granted for inventions and products that are novel, industrially non-obvious and subject to enabling disclosures. The acceptance of Patents for inventions even in living materials through major human interference opened the scope of Utility (industrial) Patent for products consisting of plant materials and processes related to the use of plant material. The most notable requirements of utility patent are enablement disclosures and non-obviousness. The requirement of non-obviousness demands the plant not to be an obvious variant of known art. The requirement of these patents demands a written description of the invention in clear, concise and exact terms so as to enable any person skilled in the art to which it pertains, to make and use the same. This provision restricts the application of such general purpose patents to plant varieties because it is difficult to describe precisely the steps so that another equally competent breeder can reproduce the product i.e. the same variety. The provision of compulsory deposits in plants also are anticipated to invite practical problems which further restrict the use of these patents for plant varieties. These patents afford protection to a broad category of plants or a part of plant material and plant varieties. Any part of plant like flower or fruit if patented debars the use of plant from cultivation. Unlike PVPA there is no provision of research exemption, farmer's exemption and mandatory license. Utility plants offer substantially broader protection for plants than is available under PPA and PVPA and is most powerful proprietary protection available for plants and plant related inventions. Since a product of nature is not patented so any variety discovered from wild or cultivated area cannot be protected under Utility Patent unless the 'hand of man' is established in the creation of product.

Trade Secrets: A trade secret is any information that can be kept secret to give competitive advantage to the owner over those who do not know it. Secret trading is a common practice for industrial products where the inventors keep a secret of the composition, manner and process of making the product. The inbred parents of first generation F₁ hybrids provide an opportunity for the breeder to maintain secrecy about the composition of hybrid variety so that fresh F₁ seed of the hybrid remains under the control of originating breeder. The breeder does not need any patent as he has a biological protection in such cases. Unlike PPA and PVPA there is no subject matter criteria for trade secrets as any information can be a trade secret. It is wonderful protection that gives unlimited monopoly for inventors but has nothing to seek compensation for infringements of this nature's trade secret especially if someone else discovers it by proper means. Use of trade secret led to the development of numerous research based seed companies especially concentrating on development of hybrids where protection through trade secret is most effective. Hence, PPA, PVPA, UPOV Act, application of Utility Patents to plants, Trade Secrets are some of the ways to provide ensured profits from investment in plant breeding research.

Advantages of PBR

1. The inventors shall improve their scientific capability through enhanced financial resources.
2. Private investment from resourceful organizations shall be encouraged and this would speed up the crop improvement research.
3. It shall reduce dependence on public sector institutes for plant breeding research.
4. Shall increase access to foreign varieties and germplasm for use in crop improvement.
5. Availability of good quality seed to farmers at faster rates and in sufficient quantity shall be ensured.

Disadvantages of PBR

1. Farmers especially of developing countries would be burdened by recurring cost of seed especially without the provision of 'farmer's exemption' in PBR.
2. Farmers would be deprived of local germplasm developed over generations being used as land races from which locally adapted types are being developed.
3. It shall restrict free flow of germplasm especially developed through biotechnology.
4. Germplasm may be locked in the hands of private companies that shall reduce its utility by public sector institutions.
5. It would lead to excessive use of limited part of outstanding germplasm that would narrow down the genetic base of crop plants which can pose potential danger of epidemics.
6. Monopoly by multinational companies shall increase the cost of seed.
7. Small companies may not survive the competition and shall be absorbed by big companies.
8. Private sector may concentrate on materials and varieties that require excessive use of their own agro-chemicals like weedicides and pesticides thus leading to enhanced cost of cultivation.
9. Private sector may not undertake breeding work for specialized situations of resistance to biotic and abiotic stress and
10. The patented genes and stocks shall be available at higher rates for the public research.

Conclusion

Indian is trying to evolve a *sui generis system* of PBR 'A *sui generis system*' simply means 'a system of their own' i.e., designed by them, India in this case. The essential features of UPOV 1978 Act are being considered to be adopted important features of the proposed Indian *sui generis system* are (1) farmers right, (2) researchers use right (3) protection period, 15 years (annual crops)/ 18 years (fruit trees and vines), (4) compulsory deposits in national gene bank, (5) compulsory certification (6) compulsory licensing and (7) establishment of a National Authority for the protection of breeder's, farmer's and researcher's use rights.

It is acknowledged that the concept of PBRs originated from the urge to make plant breeding an income producing activity. But the imposition of such rights is antagonistic to genetic progress because both of these can hardly go together especially on long term and sustainable basis. The most practical approach may be to have a system for economic benefit but which allows free use of germplasm for further breeding. It amounts to research exemption which

already is available under PVPA but need to be accepted at international level. The acceptance of the concept of common heritage for germplasm i.e. recognition of national freedom over genetic resources as per provisions of Biodiversity Convention negotiated at Rio de Janeiro Conference are obviously detrimental to free flow of genetic resources.

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