

INTERNATIONAL JOURNAL FOR LEGAL RESEARCH AND ANALYSIS



Open Access, Refereed Journal Multi-Disciplinary
Peer Reviewed

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ISSN

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THE IMPACT OF IPR COMMERCIALIZATION AND FARMER'S RIGHTS: A STUDY ON GM CROPS IN INDIA

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ABSTRACT

The study predominantly focuses on the impact of the commercialization of IPR in genetically modified crops and its sustainability. Intellectual property is an intangible property and is created out of human minds. Through this, the person who has created gets an exclusive right and protection over it. The main purpose of Biodiversity is to preserve the species and to maintain sustainability.

Genetic modification of plants involves adding new DNA to the plant's genome to change its characteristics. Through genetically modified crops biodiversity can be conserved even better and the crops can remain alive in any conditions. Genetically modified crops are primarily protected by the "TRIPS" Agreement and "Protection of Plant Varieties and Farmers' Rights Act, 2001", in India which grants intellectual property rights. "The Genetic Engineering Appraisal Committee" under the "Ministry of Environment, Forest and Climate Change" regulates the commercialization of genetically modified crops in India. Intellectual property rights for genetically modified crops are commercialized through licensing agreements between the rights holder and agricultural industry entities. These agreements set the terms for the use, sale, and distribution of the modified crops. The way of commercialization of the farmer's rights has been affected considerably and it is crucial to ensure the farmer's rights in prevailing commercialized zones. The challenges faced by the farmers to reach those gene modified crops are immense as it is solely dependent on the licensing agreement between the right holder and entity. The goal is to bring innovative agriculture technologies to market safely and sustainably but this has not been thwarted. The existing legal system in commercialization has to pave the way for the protection of farmers' rights for the sustainable development of biodiversity. The paper revolves around the commercialization of genetically modified crops that have protection under IPR and their impact on farmers' rights. The present laws have to be dynamic about the sustainability of modified crops and Farmer's rights in the IPR regime.

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Keywords: Commercialisation, genetically modified crops, biodiversity conservation, sustainability, governing laws, and farmers' rights.

INTRODUCTION

"Sustainability starts in soil"

Genetically modified (GM) crops in India have a significant impact on farmers' rights. Achieving a balance between technological innovation and farmers' rights requires strong regulatory frameworks, fair distribution channels, and initiatives that empower farmers. Commercialization plays a vital role in IPR. Several legislations have been enacted to provide farmers the right to commercialization of GM crops. The impact of farmers' rights in commercialization of GM crops leads to less development of farmers. Commercialization of GM crops is an advancing process that requires fair improvements to the farmers.

SIGNIFICANCE OF THE STUDY

This research aims to analyze the commercialization of genetically modified crops in IPR. There is a great need to study this because even though there are legislations and recommendations of various committees all these are not enough to overcome commercialization. So, this study is an attempt to explore the impact of farmers' rights in the commercialization of IPR in genetically modified crops in India.

REVIEW OF LITERATURE

“A literature review is the study and documentation of published and unpublished work in an area of specific interest to the researcher. Reviewing the existing literature is an essential early step in social or legal research”. In this study, the researchers have reviewed legislation, and published and unpublished research work regarding the impact of the rights of farmers in commercialization of IP in GM crops.

- Gouranga Kar, D. Blaise, T. K. Srivastava, Chandan Sourav Kar, P. Verma, A. R. Reddy, Pushpa Singh: Chapter 14 Commercial Crops (Jute, Cotton and Sugarcane), Springer Science and Business Media LLC, (2023). The main focus of this chapter is regard to commercial crops like Cotton, jute, and sugarcane.

- Sangeeta Bansal, Anchal Arora: Genetically Modified Crops in India: economic Analysis, World Scientific Pub CoPte Lt, (2015), the Analysis is based on the economic point of view of GM crops in India.
- Biotechnological Advances for Disease Tolerance in Plants, Springer Science and Business Media LLC, (2024). It focuses on the development of GM crops which are disease tolerant.
- Balashanmugam, S.K., S.R. Subramanian, and M. Padmavati: A South Asian Perspective on Whether Institutional Mechanisms Are Geared Towards the Introduction and Import of GM Crops, BIOTECHNOLOGY LAW REPORT, (2016). The author provides for the commercialisation and importation of GM crops, and their institutional mechanism specifically to the south Asian region.

STATEMENT OF HYPOTHESIS

Due to the lack of a balanced and sustainable approach, and lacuna in legislation there is a mixed impact on the rights of farmers on commercialization of the intellectual property rights of genetically modified crops.

METHODOLOGY ADOPTED

The data for the study have been collected from primary and secondary sources. Primary data have been accumulated from Legislation and Government reports. The secondary data and appropriate literature have been derived from published and documented sources. For the incentive insight on the topic the previous study surveys and published literature have been reviewed. The method used for research is predominantly doctrinal. The data so collected have been tabulated and charted for analysis.

GENETICALLY MODIFIED CROPS IN IPR

Genetically modified crops are made out of human creation with an object to modify the genetic material using biotechnological methods to generate the desired output in a plant species or any living thing. Genetically modified organisms are goods that have been purposely altered through genetic engineering to possess new qualities and benefits.

INTERNATIONAL FRAMEWORK:

The utility and commercialization of GM crops in present times are enormous to regulating

these international instruments has been enacted and adopted by several nations.

(1) "WTO-TRIPS Agreement":

The main purpose of "TRIPS AGREEMENT" is to provide minimal standards for the promotion, and protection of intellectual property rights and regulate trade. India signed and ratified "TRIPS" in the year of 1994. It stressed that the plant varieties shall be protected by patent or sui generis system or of combination by every member nation. This includes the protection of GM crops rights.³

(2) "The Convention on Biological Diversity (CBD)"

The Convention is a part of UNEP was made available for signing in Rio de Janeiro in 1992 and came into effect in 1993. This particular convention has been ratified by many nations to protect and conserve Biodiversity. The articles of this convention incorporated principles relating to GM crops, sustainable use of resources, and access and benefit sharing of genetic resources. The "Nagoya Protocol"⁴ and "Bonn guidelines"⁵ stress about the benefit sharing of genetic resources when it is accessed. Whereas the "Cartagena Protocol" was put into effect to protect biodiversity and risks arising out of GMOs.

(3) "International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)"

The treaty was concluded in the year of 2001 after altering the provisions of IUPGRFA which came in to force from 2004. The purpose of this treaty is to preserve and sustainable use of "plant genetic resources for Food and Agriculture" and share the benefits for sustainability and food security. The farmers have the right to conserve, preserve, and develop the "plant genetic resources". The rights of farmers have been realized, recognized, and promoted.⁶ This treaty also stresses that the complementary approach has to be adopted and sustainable use of "plant genetic resources"⁷.

(4) "International Convention for the Protection of New Varieties of Plants"

The Convention was adopted in the year of 1961 and revised a few times. Lastly revised in the year 1991 and contains nearly 42 articles. The purpose of the convention is to encourage the development of new plant varieties and to provide protection for those plant varieties. The breeder's and farmers' rights have been recognized under this Convention and the contracting

³ "Agreement on Trade-Related Aspects of Intellectual Property Rights art. 27, Apr. 15, 1994."

⁴ "Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity, Oct. 29, 2010."

⁵ "Secretariat of the Convention on Biological Diversity, *Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization*, U.N. Doc. UNEP/CBD/COP/6/24 (2002)."

⁶ "The International Treaty on Plant Genetic Resources for Food and Agriculture, 2001", art. 9.

⁷ *Id.* arts. 5-6.

parties must grant rights. The Convention is administered and operated by UPOV.

INDIAN FRAMEWORK

1. "The Environmental Protection Act, 1986".

The "Rules for Manufacture, Use, Import, Export, and Storage of Hazardous Microorganisms, Genetically Engineered Organisms or Cells, Rules 1989" govern the research of genetically modified organisms and products under the "Environmental Protection Act, 1986".

2. "Biodiversity Act, 2002"

To achieve the objectives of The Convention on Biological Diversity, India enacted "The Biological Diversity Act, of 2002" to balance intellectual property rights, biodiversity conservation, and species rehabilitation in India. India, being rich in biological diversity, holds sovereign rights over its biological resources according to the "Convention on Biological Diversity". IP rights for inventions using Indian biological resources have strict regulations under this Act.

In 1992, the Earth Summit in Rio de Janeiro led to the adoption of the "Convention on Biological Diversity" (CBD)⁸. The CBD includes articles with principles for sustainable development, access to genetic resources, and the handling of biotechnology. To ensure fair and equitable sharing of benefits, the "Nagoya Protocol" was established in 2010. To this protocol, India is also a party.

3. "Plant Quarantine Order (2003)"

"The Destructive Insects and Pests Act, 1914", as amended by the "Plant Quarantine Order (2003)", forbids the import of specific plant species or plants from specific nations, whether they are genetically modified or not. The import of genetically modified plants for experimentation is analyzed in this order. India has a regulatory framework for the approval and commercialization of GM crops overseen by the "Genetic Engineering Appraisal Committee (GEAC)" under the "Ministry of Environment, Forest and Climate Change (MoEFCC)". The regulatory process involves a rigorous assessment of the safety and environmental impacts of GM crops before they can be approved for commercial cultivation.

4. The "Foreign Trade Policy Food Safety and Standards Act, 2006"

The "Foreign Trade Policy Food Safety and Standards Act, 2006" requires that imported food products derived from genetically modified organisms must have prior permission from GEAC. According to Section 22 of "The Food Safety and Standards Act, 2006", GM foods

⁸ "Convention on Biological Diversity, June 5, 1992."

cannot be manufactured, imported, or sold in India unless they are approved under the Act.

RIGHTS OF FARMERS:

Several farmer's rights have been enumerated in "The Protection of Plant Varieties and Farmer's Rights Act, 2001". Sections 39 to 46 deals with it. The farmer has the right to breed or develop a new variety and register under this Act and can claim protection over the new variety. The farmer has various rights which include sow, resow, share, sell, exchange, and so on. When he is involved in preserving genetic resources the reward shall be given to him by the gene fund. When varieties like propagating materials have been distributed or sold to farmers, the breeders of that variety must explain the performance of that variety, but when it fails to provide performance as mentioned at that time farmers can claim compensation by appearing before the competent authority. The opportunity is given to the other side to oppose the claim.⁹

The Protection can be claimed by the farmer for the innocent infringement done. When the farmer is not aware of the existence right it leads to infringement. The relief-providing court must look into matters placed before and intends to prove it by the innocent infringer.¹⁰

When the breeders develop an essentially derived variety from a Farmer's variety at that time no authorization shall be permitted without the consent of the farmers who have preserved, protected, or developed that variety.¹¹ Farmers and their groups are exempted from paying fees in any proceedings before the competent authority.¹² The "Gene fund" is constituted by the Central government for crediting compensation, contributions, and so on.¹³

COMMERCIALIZATION IN IPR

Commercialization in IPR is essential for innovation and economic growth. It encourages inventors, creators, and businesses to invest in research and development by providing them with the opportunity to profit from their intellectual property. Commercialization in genetically modified (GM) crops refers to the process of bringing these crops to market for agricultural use on a large scale. It involves various stages from research and development to distribution and adoption by farmers.

Biotechnology companies often seek intellectual property protection, such as patents, for their

⁹ "The Protection of Plant Varieties and Farmer's Rights Act, 2001, No. 53, Acts of Parliament, 2001 (India)."

¹⁰ *Id.* § 42.

¹¹ *Id.* § 43.

¹² *Id.* § 44.

¹³ *Id.* § 45.

GM crop technologies. This allows them to commercialize the crops and recoup their investment in research and development. Intellectual property rights provide companies with exclusive rights to sell, license, or otherwise exploit their GM crop technology. Patents are essential for the commercial development of technology. After developing and patenting GM crop technologies, biotechnology companies can license them to seed companies or agricultural biotech firms for commercialization. These licensing agreements establish the terms and conditions under which the licensee can utilize the patented technology, including the payment of royalties or other fees.

Farmers who adopt GM crops often become dependent on the companies that produce the seeds and associated chemicals. This can lead to higher input costs over time and reduced autonomy for farmers. There is ongoing debate about the safety of GM crops for human consumption and their potential long-term impacts on the environment and biodiversity. Due to this farmer meet fewer marketing opportunities. GM crops for human consumption and their potential long-term impacts on the environment and biodiversity.

GM technology can promote sustainable agriculture by reducing environmental impact, increasing resource efficiency, and enhancing resilience to climate change. GM crops can boost productivity and profitability, helping farmers to adopt sustainable farming methods that conserve natural resources and reduce greenhouse gas emissions.

Overall, the commercialization of GM crops in India is a complex issue influenced by Scientific, economic, social, and potential factors.

IMPACT OF FARMERS RIGHTS IN COMMERCIALISATION

The impact on the rights of farmers should considered whenever it is in question. The impact is dependent on various factors like market tactics, laws, licensing, and related agreements to commercialization. The protection of new plant varieties and genetically modified crops is ensured by the IP laws of the country when breeders farmers or their group or community develops it. It generally has a mixed impact on the rights of farmers. The development of GM crops with desired traits is encouraged to meet the demands of growth of population, food security, and tolerance. Generally, farmers are not involved directly in developing GM crops but they might be involved indirectly in the process of developing GM crops.

The term commercialization includes selling, manufacturing, distributing, licensing, marketing, and so on. These rights are conferred to breeders and farmers. When companies develop GM crops and commercialize them, they make a profit from the commercialization. The government has to fix the marginal price for that commercialization. The legal restrictions are also imposed on the farmers while using GM crops and they might face any of the legal consequences of it. Even though the "Protection of Plant Varieties and Farmers Rights Act, 2001"¹⁴ protects the farmers from innocent infringement they are not protected completely. Farmers become dependent on GM crops which are commercialized for the harvest so they lack and become ignorant of developing new plant varieties and crops. And it affects farmers' rights considerably to save seeds for harvest. From this, it can be understood the monopoly of technology and market in the agriculture field.

ROLE OF AUTHORITIES

Careful examination shall be done while giving protection by the concerned Authority. The licensing agreement shall be scrutinized by them to make it more legally valid and beneficial to the other party rather than benefit the licensor. When the breeder takes advantage of the protection granted to a new plant variety or GM crops developed, the authority shall interfere and shall grant a compulsory license to any interested person to satisfy that the crops developed must be distributed at a reasonable price and benefit to the public. Therefore, the role of authority must be crucial when it comes to the commercialisation part of IP of GM crops.

CASE STUDIES

1. "BT COTTON"

India's first GM crop is cotton developed in the year of 2002¹⁵ and has been approved for commercial release. Initially, ICAR conducted studies and found that it doesn't show any adverse impact on the environment. Still, now it is under cultivation in India. This makes India produce more cotton and one of the largest exporters of cotton in the world. But the necessary attention was not given to IPR about it. The main issue in "BT COTTON" is between Monsanto and Nuziveedu. Monsanto company claimed the patent rights over BT cotton. Later on, they licensed this variety to nearly 40 seed companies including Nuziveedu. The companies developed a new hybrid thing and a royalty, trait fee was paid to Monsanto which was fixed by

¹⁴ "The Protection of Plant Varieties and Farmer's Rights Act, 2001, No. 53, Acts of Parliament, 2001 (India)."

¹⁵ <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2042234>.

the Indian Government. Monsanto sued Nuziveedu for infringement of patent before the Delhi High Court and later on through an appeal placed before the Apex Court of India. The court upheld Monsanto's patent claim over BT cotton.

2. “BT BRINJAL”¹⁶

Bt brinjal, also known as genetically modified eggplant, has been altered to include an insecticidal protein sourced from “*Bacillus thuringiensis* (Bt)”. Bt brinjal was developed by the Indian seed company “Mahyco (Maharashtra Hybrid Seeds Company)” in collaboration with “Monsanto (now part of Bayer)”, “Tamil Nadu Agricultural University”, Coimbatore, and ICAR – “Indian Institute of Vegetable Research”, Varanasi, and several Indian agricultural universities. In 2009, after nearly a decade of field trials and regulatory assessments, the Indian regulatory authority, “The Genetic Engineering Appraisal Committee (GEAC)”, approved the commercial cultivation of Bt brinjal.

Commercialization of Bt brinjal may lead to increased reliance on GM seed companies, eroding farmers' traditional seed-saving practices and sovereignty over seeds. The decision to approve Bt brinjal was opposed by farmers where it leads to environmental impacts, loss of biodiversity, and other health issues. Opponents emphasize the need for more comprehensive safety assessments, transparency in decision-making, and consideration of alternative agricultural approaches. Small-scale farmers have implications in access to seeds, technology, and markets. Bt brinjal (genetically modified brinjal) has not been commercially licensed for cultivation in India. While it received approval from the Indian regulatory authorities for commercial cultivation in 2009, the government imposed a moratorium on its release in 2010 due to concerns raised by various stakeholders, including environmental activists, farmers, and civil society organizations. Since then, the moratorium has remained in place, effectively prohibiting the commercial cultivation of Bt brinjal in India.

3. “GM MUSTARD”¹⁷

GM mustard, specifically a variety called “DMH (DHARA MUSTARD HYBRID) -11”, was developed by scientists at the University of Delhi with support from the Indian government's Department of Biotechnology. The approval for genetically modified (GM) mustard in India was recommended by the “Genetic Engineering Appraisal Committee (GEAC)”.

GM mustard is not popular among beekeepers and honey cultivators, as bees are crucial for

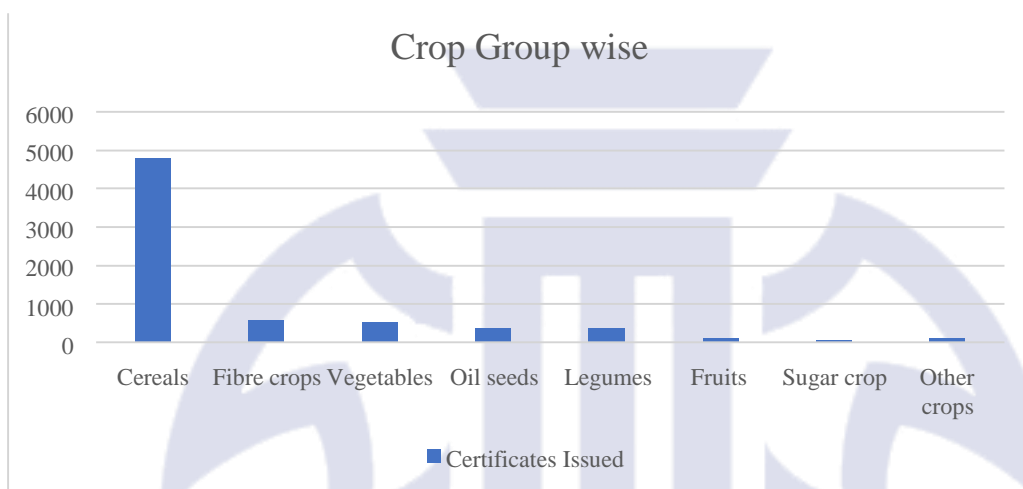
¹⁶ [https://www.isaaa.org/resources/publications/pocketk/foldable/Pocket%20K35%20\(English\).pdf](https://www.isaaa.org/resources/publications/pocketk/foldable/Pocket%20K35%20(English).pdf).

¹⁷ <https://icar.org.in/genetically-modified-gm-mustard-hybrid-will-boost-production-and-productivity>.

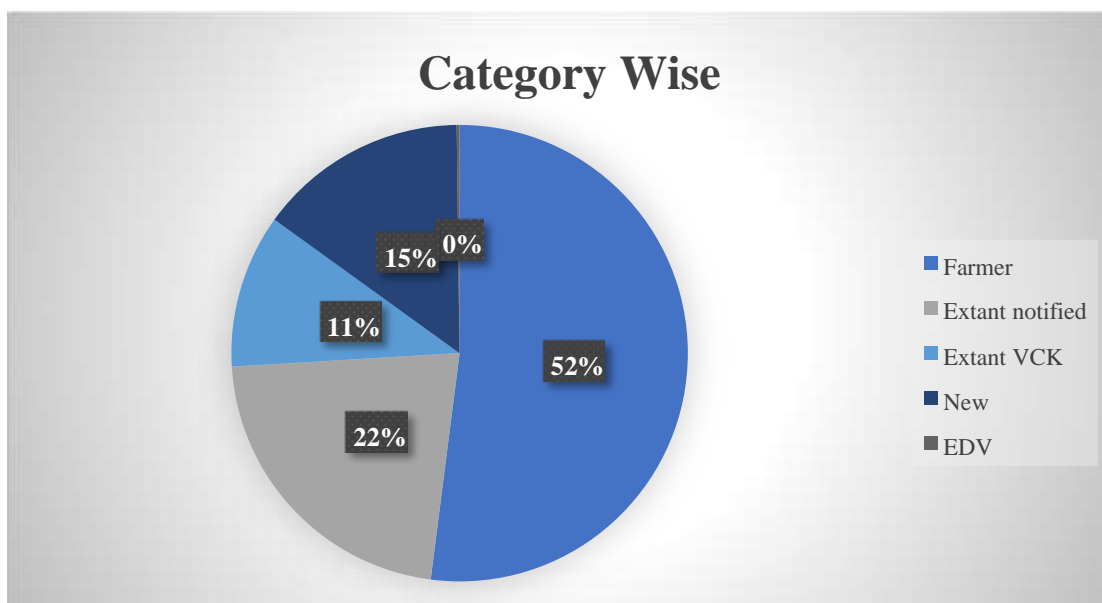
agriculture, and mustard flowers are essential for beekeeping. Indian farmers are not in favor of GM mustard as it poses a threat to their cultivation practices. Mustard is not just an oil seed, but also a significant part of Ayurvedic medicine. If GM mustard is allowed, it could lead to significant losses for beekeepers in India, which is the 5th largest exporter of honey. Exporters are also concerned that the “Herbicide Tolerant (HT)”, GM mustard could have a substantial impact on honey production and exports.

DATA ANALYSIS OF PLANT VARIETY

1. CROP GROUP WISE - 2024¹⁸



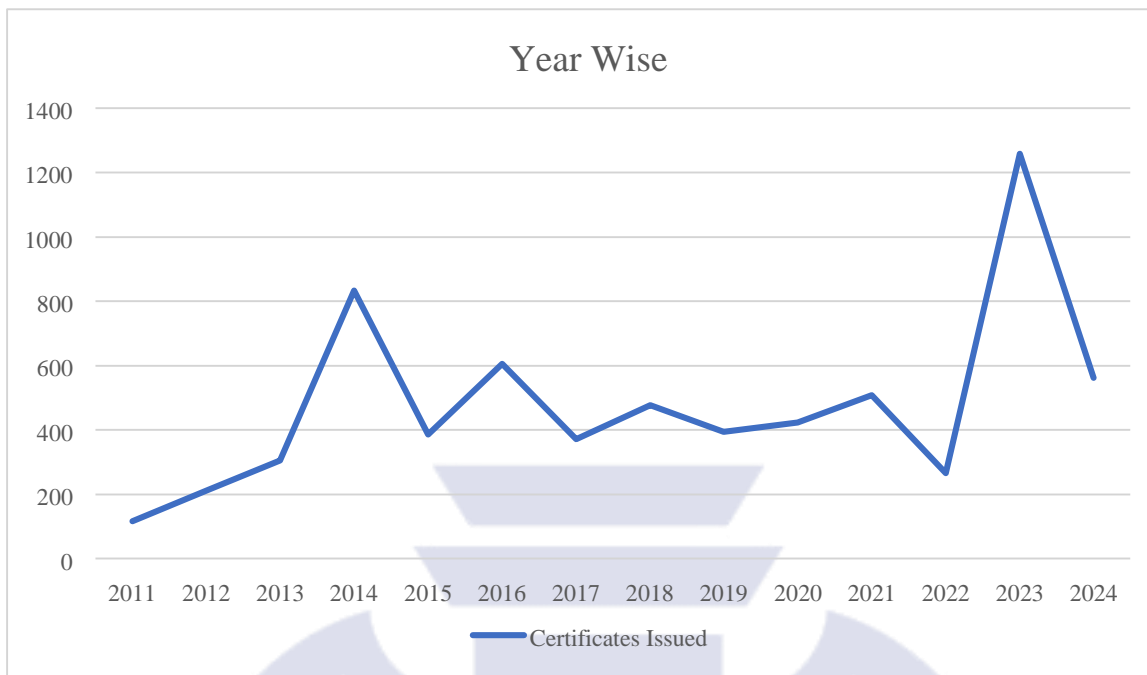
2. CATEGORY WISE - 2024¹⁹



¹⁸ <https://plantauthority.gov.in/>

¹⁹ *Id.*

3. YEAR WISE²⁰



To achieve agricultural development, it is necessary to protect the rights of farmers. They make demands which are often met by receiving applications. GM crops have the potential to balance the growth of agricultural sectors, and farmers should be allowed to develop new varieties.

Certificates are also issued to acknowledge their contribution to conserving, improving, and making plant genetic resources available for the development of new plant varieties.

4. (Bt) COTTON IN INDIA²¹

SI.NO	CROP	GENE(s)	EVENT	DEVELOPER	STATUS	YEAR OF APPROVAL
1	Cotton	Cry1Ac	MON-531	Mahyco/Monsanto	Commercialized	2002
2	Cotton	Cry1Ac and cry2Ab2	MON-15985	Mahyco/Monsanto	Commercialized	2006
3	Cotton	Cry1Ac	Event-1	JK Agri- Genetics	Commercialized	2006

²⁰ Id.

²¹ "ISAAA, *Biotech Cotton in India, 2002 to 2014: Adoption, Impact, Progress & Future*," https://www.isaaa.org/resources/publications/biotechcottoninindia/download/Biotech_Cotton_in_India-Adoption_Impact_Progress_and_Future.pdf."

4	Cotton	Fused genes cry1Ab and cry1Ac	GFM Event	Nath seeds	Commercialized	2006
5	Cotton	Cry1Ac	BNLA-601	CICR (ICAR)&UAS, DHARWAD	Commercialized	2008
6	Cotton	Synthetic cry1C	MLS-9124	Metahelix Life Sciences	Commercialized	2009

Bt cotton has boosted cotton production sustainably. However, pest resistance has caused yield losses in extensively cultivated regions. The dominance of Bt cotton in India raises concerns about farmers becoming overly reliant on a single variety, increasing vulnerability to market fluctuations and limiting crop diversification.

CONCLUSION

To conclude, the rights of farmers have to be ensured in all the ways in the IP regime. Commercialization is playing a major role in the IP and Agricultural fields. The developed GM crops have both boon and bane which in turn has an impact on the rights of farmers provided under various legal instruments. GM crops aid in meeting the demands sustainably which were created by many factors. The Laws and authorities must be vigilant in providing a balanced approach in matters of commercialization of IP and the rights of farmers.

SUGGESTIONS

The following are the suggestions for the impact of the rights of farmers due to the commercialization of GM crops in the IP regime.

- The expert committee shall be constituted while examining the application for the protection and commercialization of GM crops.
- The IP Laws must be in a balanced approach to the rights of farmers.
- When the licensors abuse exclusive rights over the newly developed GM Crops the authorities may impose a penalty for the action.
- The innocent infringers like farmers shall be safeguarded with their rights.

- The opportunity for the farmers and their groups shall be widened because breeders who develop GM crops take away the opportunity of farmers.
- The Laws shall be stringent when it comes to commercialization of IP.

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