

## Good Quarantine – Healthy Country

Abhishek TS<sup>1</sup> and Mohammed Ahmed Alshogari<sup>1</sup>

<sup>1</sup>Ph.D. Research Scholar, Dept. of Entomology, School of Agriculture, Lovely Professional University, Phagwara, Punjab

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### Abstract

The goal of the Plant Quarantine Unit is to stop the importation of harmful plant pathogens, soil, and pests from other nations. The national and state governments have established plant quarantine measures to stop the introduction and spread of dangerous pathogens and pests. However, governments only started using quarantine to protect plants and plant products at the turn of the century, in response to a series of disastrous pest and disease epidemics that occurred in various regions of the world. There is a lot of international collaboration, so either the exporting country can provide the importing country with a certificate that clears products or the importing country can keep inspectors to check the product before it leaves the country of origin.

For a nation like India, where agriculture dominates the economy, the quarantine restrictions are almost relevant.



### Introduction

The proverb "prevention is better than cure" is the golden rule to live by because it is simpler and more efficient to take appropriate preventive measures to fend off pest invasion or disease infection than it is to treat it after it has already made a home on the crop. One of the key strategies for preventing pest invasion is "plant quarantine." It is described as "as a legal



limitation on the movement of agricultural goods for the purpose of excluding, preventing, or delaying the spread of plant pests and diseases in uninfected areas" (Mallick et al. 2020).

The first line of defence for plant conservation is quarantine programmes, which should be supported in every way by all nations (Webster, 1985).

Insect pests and illnesses could potentially be transported from their natural habitat to a new place due to the recent increase in the quantity of plant goods imported and exported. Some foreign pests that have been introduced to our country and are causing significant damage include the giant African snail, the cottony cushion scale, the woolly aphid, the San Jose scale, and the potato golden cyst nematode. So, legal restrictions are implemented under the term "quarantine" to prevent the entry of exotic pests, diseases, and weeds from abroad or within the nation. Both domestic (domestic quarantine) and international plant quarantine regulations are implemented (Foreign Quarantine).

Quarantine laws are legal rules that support the implementation of the quarantine measures. It serves as a crucial tool for keeping pests out of the crop. Quarantine management is highly focused on controlling pests, which in turn helps to sustain crop yield (Rai et al. 2014).

### **Historical events**

- Human disease was the target of the earliest legal measures to stop the spread of disease.
- 1403– In response to the infamous bubonic plague outbreak that swept through Europe in the 14th century, the Venetian Republic appointed three public health guardians, barred infected and suspected ships, and imposed the first quarantine of affected districts in that year. The word "quarantine" is derived from the Latin "quarantagioni," which meaning "40 days."
- Travelers from Egypt and the Levant, both of which had endemic plague, were segregated in a detection hospital for 40 days.
- In Rouen, France, a quarantine rule was passed in 1660 that mandated the removal of barberry plants from the area around grain fields.
- An Act of 1866 granting emergency powers for the destruction of all cattle infected by rinderpest, which had been introduced into Britain by imported Russian cattle the previous year, was the first piece of British law against a disease in animals or plants.



- In order to stop the entry of the Colorado potato beetle (*Leptinotarsa decemlineata*) in 1873, an embargo was enacted in Germany prohibiting the importation of plants and plant products from the US.
- 1877: To stop the introduction of the Colorado beetle, the United Kingdom established the Destructive Insects Act.
- 1875 – States in North America issued the first laws addressing plant disease in that year.
- 1891 – The establishment of a maritime inspection station at San Pedro, California, marked the beginning of the United States' first plant quarantine measure.
- 1912- The Federal Plant Quarantine Act, passed by the US Congress, forbids the importation of plants into the country among other things.
- 1881 – Five nations signed the Phylloxera Convention, the first international plant protection agreement, at Berne on November 3, 1881. This agreement was in place until 1951, when the FAO established the International Plant Protection Convention in Rome. This agreement was created to ensure that common and efficient action would be taken to stop the introduction and spread of pests and diseases that affect plants and plant-based products.

### **Plant Quarantine is equipped into 3 divisions**

#### **Domestic quarantine**

- Restrictions on the movement of plants and plant-related materials between states that are connected to the manufacturing of state machinery
- There are numerous infectious items that are forbidden from being transported to neighbouring states for commerce and export, including: Apple scab; Potato cyst nematodes; Banana bunchy top virus (Assam, W.B., Kerala); (JK and HP).

#### **International quarantine**

Legal restrictions on clothing and plant-related products moving from one nation to another to assure materials free of pests and diseases.

#### **Embargo**

An official embargo on commerce or other commercial activity with a specific country when the country's safety precautions are insufficient and the pest risk is significant, making imports illegal.

### **Objectives of Plant Quarantine**

1. To prevent the introducing of dangerous diseases and pest are new race of a pathogen at their spread in the country.
2. The inspection of imported agricultural commodities for preventing the introduction of exotic pests and diseases inimical to Indian fauna and flora through implementation of DIP Act, 1914 and the Plant Quarantine (Regulation of Import into India) Order, 2003 issued there under.
3. Inspection of plants and plant material meant for export as per the requirements under International Plant Protection Convention (IPPC) 1951 of FAO to facilitate pest free trade.
4. The detection of exotic pests and diseases for their containment by adopting domestic quarantine regulations (Kumar et al. 2020).

### **History of Plant Quarantine in India**

Early in the 20th century, the Indian Government mandated the mandatory fumigation of imported cotton bales in order to stop the spread of the feared Mexican cotton boll weevil. This action raised awareness of quarantine measures in India (Antonymous grandis). The Destructive Insects and Pests Act (DIP Act), also known as the Comprehensive Plant Quarantine Act, went into effect on February 3, 1914. The DIP Act has undergone numerous revisions and corrections throughout the years. The expanding demands of WTO-led trade liberalisation require periodic observation and improvement over time.

Under the ministry of Food and Agriculture, the Directorate of Plant Protection, Quarantine, and Storage was established in 1946. With the beginning of the plant introduction programme in the Botany Division of the Indian Agricultural Research Institute (IARI) New Delhi in 1946, plant quarantine activities began. The Directorate began its quarantine operations at the seaport in Bombay in October 1949. The first plant quarantine and fumigation facility in India was formally opened on December 25, 1951. The National Bureau of Plant Genetic Resources (NBPGR) was established in August 1976. The Entomology, Plant Pathology, and Nematology divisions were part of the Division of Plant Quarantine in 1978. In isolation nurseries, post-entry quarantine for imported wheat, barley, and triticale began in 1981. Post-entry quarantine for the detection of viruses transmitted through seeds in exotic legumes began in 1983.



The DIP Act was used to create the Plants, Fruits and Seeds (PFS) (Regulation of Import into India) order in 1984. Increased imports of seed material followed the 1988 announcement of the New Policy on Seed Development (NPSD). The Plants, Fruits and Seeds Order of 1984 was updated in 1989 to comply with NPSD regulations and rising imports. Plant Quarantine (Regulation of Import into India) Order was issued in 2003. The creation of the new Plant Quarantine (Regulation of Import into India) demonstrates the government of India's primary attention to plant quarantine (Laxmi et al., 2014).

### **Role of Plant Quarantine in India**

The Destructive Insects and Pests Act (DIP Act) of 1914, as amended, governs plant quarantine procedures in India and forbids the importation of foreign plants, plant material, insects, fungus, and weeds (Dent, 1991). In India, certain diseased and pest-infested commodities cannot be moved from one stage to another due to rules and restrictions. Domestic quarantines cover this. Before the Government of India proposed a thorough Plant, Fruits and seeds order, 1984, which went into effect in June 1989, seed was not covered under the DIP Act (Anonymous, 1989).

The Indian government established a new policy on seed development in September 1988 with the goal of giving farmers access to the best planting materials available globally to maximise production per unit area. The revised Plants, Fruits and Seeds (Regulation of Import into India) order from 1989, which the Indian government announced through a gazette notification, now covers the import of seeds and planting materials for crops such as wheat, paddy, coarse grains, oilseeds, pulses, vegetables, flowers, and ornamentals. It also details the procedures for their import and the related plant quarantine requirements (Anonymous, 1989).

The state governments were given the authority to enact their own legislation for the adoption of corrective measures under the terms of this Act. This led to the 1949 passage of the East Punjab Agricultural Pest, Diseases and Noxious Weed Act. Similar laws have been approved in other states. The East Punjab Agricultural Pests, Diseases and Noxious Weeds Act of 1949 states that the state government may enforce control measures for the eradication of pests, diseases, or weeds such as water hyacinth (*Eichornia crassipes*), hairy caterpillars, rats, *Pyrilla* and Gurdaspur borer of sugarcane, ergot of pearl-millet, and other weeds when necessary (Atwal and Dhaliwal, 1986).

The DIP Act gives the national government the authority to establish rules governing both the transfer of materials between states within India and the import of seeds and other planting materials. The state governments also have the authority to adopt laws that control how materials are moved from one location or region to another within a state.

### **Pesticide Legislation in India**

The Insecticides Act of 1968 and the Insecticides Rules of 1917 created under that Act, as well as the Prevention of Food Adulteration Act of 1954 and the Prevention of Food Adulteration Rules of 1955 created under that Act, are two significant pieces of central legislation that deal with pesticides (Atwal and Dhaliwal, 1986; Reddy and Joshi, 1992). India's regulatory or legislative actions can be divided into two categories: those that aim to stop the spread of pests (including weeds) and diseases in specific localised areas of the State or Union territory and those that aim to stop the introduction of exotic pests and diseases into the nation from abroad.

### **Agencies involved in Plant Quarantine**

The Directorate of Plant Protection, Quarantine and Storage, which is part of the Ministry of Agriculture, is primarily responsible for carrying out the quarantine laws and regulations established by the DIP Act. The company handles the bulk import and export of seed and planting supplies for businesses. There are currently 26 different quarantine stations spread out across 26 different locations, including 10 at airports (Amritsar, Bombay, Kolkata, Hyderabad, Chennai, New Delhi, Patna, Tiruchirpally, Trivandrum, Varanasi), 9 at seaports (Bhavnagar, Mumbai, Kolkata, Cochin, Nagapatnam, Rameshwaram, Tuticorin, Vishakapatnam), and 7 at land frontiers (Amritsar railway station, Attari-Wagha Border, Attari-Raiway station, Bongaon-Benapol border, Gede Road railwaystation, Panitanki, Kalimpong).

To stop the import and spread of diseases and pests by legislation and organisation across international borders, the FAO's International Plant Protection Convention (IPPC) was developed. The ten-region plant protection organisation has been updated based on biogeographical areas, and this convention supplied a model phytosanitary certificate for member nations to accept.

### **Limitations and Constraints**

- i. Lack of structured PQ services at the state level;

- ii. Absence of state border PQ checkpoints at railway and road links;
- iii. Absence of proactive and coercive state government action;
- iv. Absence of stringent seed/stock certificates or nursery contamination

### Conclusion

The introduction of new species (diseases and pests) into a habitat can have an impact on people's well-being, whether financially or physically. The PQ procedures serve as a crucial tool for keeping pests out of the crop. The management of pests is being heavily stressed through the use of quarantine, which also helps to preserve crop output.



**Table 1: Pests and diseases which have been introduced world wise**

S. No.	Pests and diseases	In	From	Year
1.	Late blight of potato ( <i>Phytophthora infestans</i> )	Europe	S. America	1830
2.	Powdery mildew of grape ( <i>Uncinulanecator</i> )	England	USA	1845
3.	Grape Phylloxera ( <i>Phylloxera vitifoliae</i> )	France	USA	1845
4.	Downey mildew of grape ( <i>Plasmoparaviticola</i> )	France	USA	1878
5.	Golden nematode of potato ( <i>Heteroderarostochinensis</i> )	USA, Mexico	Europe	1881
6.	Mexican boll weevil ( <i>Anthonomus grandis</i> )	USA	C. America	1892
7.	Chestnut blight ( <i>Cryphonectriaparasitica</i> )	USA	Asia	1904
8.	Citrus canker ( <i>Xanthomonas citri</i> )	USA	Asia	1907
9.	Blister rust of pine ( <i>Cronartiumribicola</i> )	USA	Europe	1910
10.	Fire blight of apple ( <i>Erwinia amylovora</i> )	New Zealand	N. America	1919

11.	Onion smut ( <i>Urocystiscepulae</i> )	Switzerland	France	1924
12.	Dutch elm ( <i>Ceratostomellaulmi</i> )	USA	Holland	1928-30
13.	Bacterial canker of tomato ( <i>Cornebacteriummichiganensis</i> )	UK	USA	1942
14.	Coffee rust ( <i>Hemilliavastatrix</i> )	Brazil	Africa and Asia	1970

(Kothekar, 1970; Mathys and Baker, 1980)

**Table 2: Exotic pests can cause huge losses to our crop wealth**

S. No.	Diseases	Host	Introduced from	Country	Losses caused
1.	Canker	Citrus	Japan	U.S.A	\$ 13 million; 19.5 million trees destroyed
2.	Dutch elm	Elm	Holland	U.S.A.	\$ 25 million - \$ 50,000 disease million
3.	Blight	Chestnut	Eastern Asia	U.S.A.	\$ 100-1000million
4.	Powdery mildew	Grapevine	U.S.A	France	80% in wine production
5.	Downy mildew	Grapevine	U.S.A	France	\$ 50,000 million
6.	Bunchy top	Banana	Sri Lanka	India	Rs.4 crores
7.	Wart	Potato	Netherlands	India (1953)	2500acres infected
8.	South American leaf blight	Rubber	Guiana	Dutch-Brazil	40,000 trees destroyed
9.	Flage smut	Wheat	Australia	India (1906)	-
10.	Blue mold	Tobacco	U.K.	Europe	\$ 50 million
11.	Golden nematodes	Potato	Europe	India (1961)	-
12.	Paddy blast	Rice	South Europe	Asia (1918)	-



**Table 3: Plant diseases introduced into India from foreign countries**

S. No.	Disease	Host	First record	Introduction from
1.	Leaf rust ( <i>Hemileiavastarix</i> )	Coffee	1879	Sri Lanka
2.	Late blight ( <i>Phytophthora infestans</i> )	Potato Tomato	1883	Europe
3.	Rust ( <i>Puccinia carthami</i> )	Chrysanthemum	1904	Japan or Europe
4.	Flag smut ( <i>Urocystitritici</i> )	Wheat	1906	Australia
5.	Downy mildew ( <i>Plasmoparaviticola</i> )	Grapevine	1910	Europe
6.	Downy mildew ( <i>Pseudoperonosporacubensis</i> )	Cucurbits	1910	Sri Lanka
7.	Downy mildew ( <i>Sclerosporaphilippinensis</i> )	Maize	1912	Java
8.	Black rot ( <i>Xanthomonas compestris</i> )	Crucifers	1929	Java
9.	Foot rot ( <i>Fusarium moniliforme</i> var. <i>majus</i> )	Rice	1930	South East Asia
10.	Leaf spot ( <i>Phyllachorasorghii</i> )	Sorghum	1934	South Africa
11.	Powdery mildew ( <i>Oidium heveae</i> )	Rubber	1938	Malaya
12.	Blank Shank	Tobacco	1938	Holland
13.	Fire blight Pear and other ( <i>Erwinia amylovora</i> )	Pomes	1940	England
14.	Crown-gall and hairy root ( <i>Agrobacterium tumefaciens</i> , <i>A. rhizogenes</i> )	Apple, Pear	1940	England
15.	Bunchy Top Virus	Banana	1940	Sri Lanka
16.	Canker ( <i>Sphaeropsis</i> spp.)	Apple	1943	Australia

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