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History and objective of plant quarantine in India: A review

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Abstract
Quarantine is derived from Latin word 'Quarandum' which means forty (40) days. It is a system to define which was used in case of ship during from country affected from pathogen cholera. In India the Destructive Insects and Pests Act was pass in 1914 (DIP act) for quarantine regulation. The term 'Quarantine' came to be only used for the inhibition and the practices related with it. Important of pathogen free country with efficient plant quarantine service so that instruction and treatment is obtaining planting material from the free sheet non source with the selected country. Untreated seed so that detected of seed borne pathogen is seed pathologist have looking healthy seed free from often and official certification of freedom from pest and diseases from the exported country.

Keywords: Quarantine, epidemics, pests and diseases

Introduction
Quarantine is derived from Latin word 'Quarandum' which means forty (40) days. It is a system to define which was used in case of ship during from country affected from pathogen cholera. In India the Destructive Insects and Pests Act was pass in 1914 (DIP act) for quarantine regulation (Reddy, 2010) [8]. The crew and the traveler used to be helpless to remain isolated on board for enough periods to permit the diseases to develop and detect. The purpose of the health authorities was to establish adequate detention period. The term 'Quarantine' came to be only used for the detention and the practices connected with it. The term got associated from the human disease field to the animal disease field and on adopted to cover protective methods for the exclusion of pests and diseases of agricultural and horticultural crops.

Plant Quarantine rule are promulgated by the national and the state governments to prevent the introduction and spread of harmful pests and pathogens. Protection of the plant and plant products by quarantine but only become the governments at the turn of this century, following a series of catastrophic pest and diseases epidemics in different parts of the world (Rai, *et al*., 2014) [6a]. In addition to endemic problems there are many crop pests which are implant India from other countries therefore in earlier years India did not have an functional control measure (Plant Quarantine) system to stop the introduction of exotic pests, diseases and weeds. Quarantine plan are the first line of safety in plant protection and they should be stimulate in every way actual in every country (Webster, 1985) [9].

In a survey of pests named in quarantine regulation in 125 countries, 614 were species of insects and mites (Kahn, 1983) [2]. Cottony cushion scale, woolly aphid, San Jose scale, golden cyst nematode of potatoes, the giant African snail are some exotic pest introduced into our country and cause spacious damage (Khan, *et al*., 2017) [3]. On the other hand, the pathogen finds a large amount of available sensitive tissue on which it can treat and multiply unchecked. Few of the worst plant disease epidemics, e.g., the downy mildew of grapes in Europe and the bacterial canker of citrus, chestnut blight, Dutch elm disease, and soybean cyst nematode in the United States, are all diseases caused by pathogens that were introduced from abroad. It has been estimated, of soybean rust were introduced into the United States it would result in losses to consumers and other sectors of the U.S. economy of several billion dollars per year (Agrios, 2005) [1].

History of Plant Quarantine in India

The consciousness to quarantine measures in India started in early 20th century when the Indian Government in 1906, ordered compulsory fumigation of imported cotton bales to prevent the introduction of the dreaded Mexican cotton boll weevil (*Antonymous grandis*). On February 3, 1914 Comprehensive Plant Quarantine Act, known as Destructive Insects and Pests Act, (DIP Act) become operative. Over the years the DIP Act was revised and correct separate times. After some time needs to be periodically observe and improve to conspire the growing requirements of liberalized trade under the WTO. In 1946, the Directorate of Plant Protection, Quarantine and Storage, under the ministry of Food and Agriculture were set up. In 1946, Plant quarantine activity stared with the onset of plant introduction scheme in the Botany Division at Indian Agricultural Research Institute (IARI) New Delhi. In October 1949, the Directorate started its quarantine activities at Bombay seaport. On December 25, 1951 the first plant Quarantine and fumigation station in India was formally inaugurated. In August, 1976 the National Bureau of Plant Genetic Resource (NBPGR) was created. In 1978, the Division of Plant Quarantine was making with Entomology, Plant Pathology and Nematology sections. In 1981 post entry quarantine of imported wheat, barley and triticale started in isolation nursery. In 1983 the post entry quarantine for detection of seed transmitted viruses in exotic legumes started. In 1984 Plants, Fruits and Seeds (PFS) (Regulation of Import into India) order issued under DIP Act. In 1988 New Policy on Seed Development (NPSD) announced, resulting in increased import of seed material. In 1989 Plants, Fruits and Seeds Order (1984) revised to meet the requirements of NPSD and increasing imports. In 2003 Plant Quarantine (Regulation of Import into India) Order. The development of new Plant Quarantine (Regulation of Import into India) reflects the main plant quarantine care of the Government of India (Laxmi *et al*., 2014) [6b].

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

S. No.	Pests and diseases	In	From	Year
1.	Late blight of potato (*Phytophthora infestans*)	Europe	S. America	1830
2.	Powdery mildew of grape (*Uncinula necator*)	England	USA	1845
3.	Grape Phylloxera (*Phylloxera vitifoliae*)	France	USA	1845
4.	Downey mildew of grape (*Plasmopara viticola*)	France	USA	1878
5.	Golden nematode of potato (*Heterodera rostochinensis*)	USA, Mexico	Europe	1881
6.	Mexican boll weevil (*Anthonomus grandis*)	USA	C. America	1892
7.	Chestnut blight (*Cryphonectria parasitica*)	USA	Asia	1904
8.	Citrus canker (*Xanthomonas citri*)	USA	Asia	1907
9.	Blister rust of pine (*Cronartium ribicola*)	USA	Europe	1910
10.	Fire blight of apple (*Erwinia amylovora*)	New Zealand	N. America	1919
11.	Onion smut (*Urocystis cepulae*)	Switzerland	France	1924
12.	Dutch elm (*Ceratostomella ulmi*)	USA	Holland	1928-30
13.	Bacterial canker of tomato (*Cornebacterium michiganensis*)	UK	USA	1942
14.	Coffee rust (*Hemillia vastatrix*)	Brazil	Africa and Asia	1970

(Kothekar, 1970; Mathys and Baker, 1980) [4, 6]

Importance

The entry of a single exotic insect or disease and its establishment in the new environment continues to cause great, national loss (table 2) till such time it is brought under effective control. In certain cases a country has to spend a few million rupees before success in controlling the introduced insect pest or disease is achieved.

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 (*Hemileia vastarix*)	Coffee	1879	Sri Lanka
2.	Late blight (*Phytophthora infestans*)	Potato Tomato	1883	Europe
3.	Rust (*Puccinia carthami*)	Chrysanthemum	1904	Japan or Europe
4.	Flag smut(*Urocystis tritici*)	Wheat	1906	Australia
5.	Downy mildew(*Plasmopara viticola)*	Grapevine	1910	Europe
6.	Downy mildew (*Pseudoperonospora cubensis)*	Cucurbits	1910	Sri Lanka
7.	Downy mildew(*Sclerospora philippinensis*)	Maize	1912	Java
8.	Black rot (*Xanthomonas compestris*)	Crucifers	1929	Java
9.	Foot rot (*Fusarium moniliforme* var. *majus*)	Rice	1930	South East Asia
10.	Leaf spot(*Phyllachora sorghi*)	Sorghum	1934	South Africa
11.	Powdery mildew(*Oidium heveae*)	Rubber	1938	Malaya
12.	Blank Shank	Tobbaco	1938	Holland
13.	Fire blight Pear and other (*Erwinia amylovora*	Pomes	1940	England
14.	Crown-gall and hairy root (*Agrobacterium tumefaciens, A. rhizogenes)*	Apple, Pear	1940	England
15.	Bunchy Top Virus	Banana	1940	Sri Lanka
16.	Canker (*Sphaeropsis* spp.)	Apple	1943	Australia
17.	Wart (*Synchytrium endobioticum*)	Potato	1953	Netherlands
18.	Bacterial blight	Rice	1959	Philippines
19.	Golden nematodes	Potato	1961	Europe
20.	San Jose scale	Apple	1900	Italy
21.	Wooly aphid	Apple	1928	Australia
22.	Downy mildew	Sunflower	1985	Australia

Agencies involved in plant quarantine

The authority to instrument the quarantine regulations framed under DIP Act rests mainly with the Directorate of Plant Protection, Quarantine & Storage, under the Ministry of Agriculture. This organization handles minority import and export of seed and planting material for commercial purpose. Under this organization 19 seaports, 12 airports and 14 land frontiers and 5 regional head quarter are such as New Delhi, Chennai, Calcutta, Mumbai and Amritsar functioning. These are the recognized ports for entries for import of plant and plant material. The names and places of the ports and stations are as follows.

Points of Entry for Import of plants/ plant materials and other articles decesion under Plant Quarantine (Regulation of Import into India) Order, 2003

A. Seaports - Place State / Union territory

1. Alleppey- Kerala 2. Bhavnagar-Gujarat 3. Calcutta-West Bengal 4. Calicut-Kerala 5. Chennai-Tamil Nadu 6. Cochin-Kerala 7. Cuddalore-Tamil Nadu 8. Goa-Goa 9. Gopalpur-Orissa 10. Haldia-West Bengal 11. Jamnagar-Gujarat 12. Beypore-Kerala 13. Kakinada- Andhra Pradesh 14. Kandla-Gujarat 15. Karwar-Karnataka 16. Krishnapattinam- Andhra Pradesh 17. Machlipatnam-Andhra Pradesh 18. Mandvi-Gujarat 19. Manglore-Karnataka.

B. Airports

1. Amritsar-Punjab 2. Bangalore-Karnataka 3. Calcutta-West Bengal 4. Chennai-Tamil Nadu 5. Hyderabad-Andhra Pradesh 6. Mumbai-Maharashtra 7. New Delhi-New Delhi 8. Patna-Bihar 9. Tiruchirappalli-Tamil Nadu 10. Trivananthapuram-Kerala 11. Varanasi-Uttar Pradesh 12. Guwahati-Assam

C. Land frontiers

1. Amritsar Railway Station-Punjab 2. Agartala-Tripura 3. Attari Railway Station-Punjab 4. Attari-Wagah Border-Punjab 5. Bongaon Benapol Border-West Bengal 6. Gede Road Railway Station-West Bengal 7. Jogbani-Bihar 8. Moreh-Manipur 9. Pantitanki-West Bengal 10. Raxual-Bihar 11. Rupadia-Uttar Pradesh 12. Sonauli-Uttar Pradesh 13. Banbasa-Uttar Pradesh 14. Zokhwathar-Mizoram.

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.

Guidelines for importance of germplasms

1. Important of pathogen free country with efficient plant quarantine service so that instruction and treatment is obtaining planting material from the free sheet non source with the selected country.
2. Obtain untreated seed so that detected of seed borne pathogen is seed pathologist have looking healthy seed free from often and official certification of freedom from pest and diseases from the exported country.
3. The smallest amount of planting materials, the small amount of less chance of carrying infection carefully unarrivable and treat.
4. In other precaution are not adequate the material to post internal quarantine. There are total four agencies which have been a single to responsibility of quarantine processing of plants and planting material.
5. National Bureau of Plant Genetic Resources, (NPBGR)-New Delhi.
6. Forest Research Instiute, (FRI) Dehradun (Uttarakhand).
7. Botanical Survey of India (BIS) - Calcutta.

The ongoing activities assigned under the scheme include

1. To issue import permits with additional declarations and special conditions to facilitate safe imports of agricultural products.
2. To undertake quarantine inspection and laboratory testing of plants and plant material to ensure freedom from exotic pests.
3. To undertake Phytosanitary Crtification (issuance of Phytosanitary Certificates (PSCs); 150 Nos. of Officers from Central/ State/ UT Governments have been authorized for this purpose.
4. To undertake fumigation/disinfestations/disinfections of commodities to control infestation/infection.
5. To undertake certification of post-entry quarantine facilities and inspection of imported growing plants and plant material; 41 Nos. of Inspection Authorities have been designated.
6. To support Export market access for India's Agriculture products from the Phytosanitary point of view.
7. To facilitate safe global trade in agriculture by assisting the producers and exporters by providing a technically competent and reliable Phytosanitary certificate system to meet the requirements of trading partners.
8. To provide Grants-in-aid to Designated Inspection Authorities to meet the travel expenses and also to State PSC issuing authorities for equipping them with minimal equipments required for export inspection/certification.

Conclusion

The purpose of the health authorities was to establish adequate detention period. The term 'Quarantine' came to be only used for the detention and the practices connected with it. Plant Quarantine regulations are promulgated by the national and the state governments to prevent the introduction and spread of harmful pests and pathogens.

References

1. Agrios GN. Plant Pathology, Fifth Edition, Elsevier publication, 2005, 295-296.
2. Kahn RP. Safe guarding the international exchange of plant germplasm. In: 10th International Congress of Plant Protection. Proceedings of a conference held at Brighton, England. 1983; 2(20-25):866-872.
3. Khan HH, Verma SS, Saleem M, Verma SK, Usmani TA, Naz H *et al*. Role and history of plant quarantine in India- A review. International Journal of Chemical Studies. 2017; 5(6):2034-2037.
4. Kothekar VS. In: A Hand Book of Pests, Disease and Weeds of Quarantine Significance. Amerind Publishing Co. Pvt. Ltd., New Delhi, 1970, 13-103.
5. Mathys G, Baker EA. Annual Review of Phytopathology, 1980; 18:85-89.
6. Rai VL, Geetanjalym, Sharma P. Plant Quarantine: An Effective Strategy of Pest Management in India. Research Journal of Agriculture and Forestry Sciences. 2014; 2(1):11-16.
7. Reddy D. Applied Entomology, New Vishal Publications, 2010; 75.
8. Webster HS. In: Plant Protection an Integrated Interdisciplinary Approach. Kalyani Publishers, New Delhi. 1985; 19-24.