



Role of Plant Quarantine in Disease Management

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Introduction:

Plant diseases have in many cases caused significant losses to humans. The famine caused by potato late blight (*Phytophthora infestans*) caused starvation and uprooting of households. The virtual extinction of American chestnut by chestnut blight (*Cryphonectria parasitica*) and the direct economic loss (\$1 billion) occurred in one year to American corn growers from southern corn leaf blight (*Cochliobolus maydis* and *Anamorph Bipolaris maydis*) lost a valued resource. Most plant diseases cause less drastic losses annually across the globe but collectively represent major losses for farmers. Most methods, approaches, and procedures used in the management of diseases may be grouped under one or more very specific concepts.

The first principle (prevention) requires pre-infection disease control strategies (i.e. the plant is protected from disease), the second principle (therapy or curative action) works with any treatment introduced following infection of the plant (i.e. the plant is treated for the disease). An example of the first concept is quarantine compliance to avoid the introduction of a disease agent (pathogen) into an area where it is not present. Quarantines In recent years, the quantity of import and export of plant commodities has increased, and there is a distinct possibility of moving insect pests and diseases from their original native dwelling to new locations. Legal restrictions are imposed generally known as Quarantine to avoid the introduction of alien pests, diseases, and weeds from foreign countries or within the nation.

Plant quarantine

Regulatory steps for plant quarantine are taken at national (Domestic Quarantine) and international (Foreign Quarantine) level. Legal enactments support the implementation of the quarantine measures, called quarantine laws. The successful quarantine implementation for pest control is strongly emphasised, which in turn helps to preserve crop productivity. Analysis of the pest risk in the introduction of plants is important for determining whether or not a specific planting material should be permitted to enter. A material's attitude to the 'entry status' may be liberal or conservative, depending on the risks involved in its implementation. If the risks are small it would be liberal to allow quarantine to enter.

However, the content can be refused entry when the risks are very high. Factors such as the availability of skilled staff, successful identification methods, point-of-entry quarantine procedures, knowledge of the life cycle of the species, the nature of races and strains, world



distribution, modes of transmission, disease / pathogens establishment and spread factors, and the availability of precautions should also be taken into account. Examination of Domestic Quarantine Regulations Regulatory legislation to avoid the introduction and spread of harmful crop pests are operational through the "Insect and Pest Harmful Act, 1914". The central government operates the domestic quarantine regulations through powers conferred under section 4A, B & D and section 5 authorizes the state government to enact similar regulations and section 5A provides for the penalties. In 1944, central government released the first domestic quarantine notification against fluted scale (*Icerya purchasi*) and in 1953, the scale of San Jose (*Quadrastpidiotus perniciosus*).

A new plant Quarantine Order (PQ Order) was notified by the Government of India in 2003 to harmonize India's regulatory system with the International Plant Protection Convention (IPPC) and the internationally agreed standard and the World Trade Organization (WTO) SPS Agreement principles. Cotton cushion scale, woolly aphid, San Jose scale, golden cyst potato nematode, the giant African snail are some exotic plague introduced into India and inflict significant damage before the PQ Order 2003. The spread of banana bunchy top virus disease from Assam, Kerala, Orissa and Tamil Nadu. In 1959 the central government released a notification against potato wart (*Synchytrium endobioticum*), which banned the movement of potato from West Bengal states. In 1977, central government released a notification banning the export of apple planting materials from Himachal Pradesh to prevent the spread of apple scab (*Venturia inaequalis*) from state Himachal Pradesh. Overall, threats are greater with adding vegetative propagules than with true seed. Also, pathogens such as viruses, downy mildews, smuts and other bacteria borne within the seed without any visible symptoms pose much greater threats.

When introducing vegetative propagules, rooted plants, and other underground parts of plants such as rhizomes, suckers, runners, etc. Bring higher risks than wood in the bud, sawdust and unrooted cuttings. In either case, bulk introductions are often risky because rigorous inspection and treatment is very difficult in these cases and the area of planting is much too large to prevent the establishment and spread of the introduced pest / disease. Based on these factors, the introduction is governed by plant quarantine as follows: full embargo / prohibition, quarantine postentry, restricted and unrestricted.

Agencies involved in Plant Quarantine in India

Presently there are total 26 different quarantine stations located at 10 Airports (Amritsar, Mumbai, Kolkata, Hyderabad, Chennai, New Delhi, Patna, Tiruchirapally, Trivandrum, Varanasi), 9 at Seaports (Bhavnagar, Mumbai, Kolkata, Cochin, Nagapatnam, Rameshwaram, Tuticorin, Vishakapatnam) and 7 at Land Frontiers (Amritsar railway station, AttariWagha Border, Attari-Raiway station, BongaonBenapol border, Gede Road railway station, Panitanki, Kalimpong). Inspection procedures at quarantine station Visual inspection, X-ray testing, washing test, sedimentation testing, incubation testing, test growth, serological methods: (a) ELISA (Enzyme Linked Immuno-sorbant Assay) (b) DIBA (Dot Immuno-binding Assay) (c) ISEM (Immunosorbant Electron Micro Scopy) (d) Latex agglutination test, Nucleic acid hybridization and Polymerised chain reaction (PCR).



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