

# General Principles of Plant Quarantine

**Presented**

**By**

**Dr. Sapan Patel**

**Assistant Professor**

**School of Studies in Botany  
Jiwaji University Gwalior**

[sapanpatel79@gmail.com](mailto:sapanpatel79@gmail.com)

# Introduction

- Insects, mites, nematodes, fungi, bacteria, viruses, and other organisms are known to attack various crops of economic importance. These pests and pathogens not only reduce the quantity but also spoil the quality of the produce to a considerable extent.
- Various methods of pest/disease control are: exclusion, eradication, protection, therapy, resistance, and biological control. Exclusion or 'keeping out' is fundamental to the concept of plant quarantine while eradication methods are employed to eliminate a newly established pest/pathogen.
- Plant quarantine may, therefore, be defined as 'Rules and regulations promulgated by governments to regulate the introduction of plants, planting materials, plant products, soil, living organisms, etc.
- with a view to prevent inadvertent introduction of exotic pests, weeds and pathogens harmful to the agriculture or the environment of a country/region, and if introduced, to prevent their establishment and further spread

# Quarantine regulations

- Plant quarantine regulations are promulgated by the national and the state governments to prevent the introduction and spread of harmful pests and pathogens. Plant quarantine will be justified only when the pest has no natural means of spread.
- Based on these factors, plant quarantine regulates the introductions as follows:
- Complete embargo/prohibition: When the pest risk is very high, the safeguards available in the country are not adequate and, therefore, import is prohibited.
- Post-entry quarantine: The risk is very high but adequate safeguards in the form of post-entry isolation growing facilities are available.
- Restricted: Pest risk is not high and import permit is required stipulating conditions for entry, inspection and treatment.
- Unrestricted: Import permit is not required, and material may enter without restriction.

## Main activities of plant quarantine

- Tracing, identification and control of quarantine pests. Pest risk analysis, evaluation and determination of quarantine conditions for imported and transit plant shipments.
- Inspection, sampling, testing and undertaking quarantine regulations on imported and transit agricultural shipments.
- supervision and undertaking post-entry quarantine regulations on plants which are subject to the regulations.
- inspection, sampling, testing and issuing Phytosanitary certificate for exporting plant consignments.

# DOMESTIC QUARANTINE

- Rules and regulations issued prohibiting the movement of insects and Rules and regulations issued prohibiting the movement of insects and disease their host from one state to another in India is called domestic disease their host from one state to another in India is called domestic quarantine.
- Plant quarantine activities in India are carried out under the Destructive Insects and Pests Act Insects and Pests Act ( (DIP Act DIP Act) ) of 1914, and the rules and regulations of 1914, and the rules and regulations framed from time to time thereunder by the Govt. of India (Anonymous, framed from time to time thereunder by the Govt. of India (Anonymous, 1975).
- Seed was not covered under the 1975). Seed was not covered under the DIP Act DIP Act until 1984, when the until 1984, when the Govt. of India brought forward a comprehensive Govt. of India brought forward a comprehensive Plants, Fruits and Fruits and Seeds ( (Regulation of Import into India Regulation of Import into India) ) Order , , 1984' 1984' which came into which came into force in June 1985

# INTERNATIONAL QUARANTINE

- International Standards for Phytosanitary Measures are International Standards for Phytosanitary Measures are prepared by the Secretariat of the International Plant Protection prepared by the Secretariat of the International Plant Protection Convention as part of the United Nations Food and Agriculture Organization's global programme of policy and Organization's global programme of policy and technical assistance in plant quarantine.
- This programme technical assistance in plant quarantine. This programme makes available to FAO Members and other interested parties makes available to FAO Members and other interested parties these standards, guidelines and recommendations to achieve these standards, guidelines and recommendations to achieve international harmonization of Phytosanitary measures, with international harmonization of Phytosanitary measures, with the aim to facilitate trade and avoid the use of unjustifiable the aim to facilitate trade and avoid the use of unjustifiable measures as barriers to trade.

# PRINCIPLES OF PLANT QUARANTINE AS RELATED TO INTERNATIONAL TRADE

## GENERAL PRINCIPLE:

1. Sovereignty
2. Necessity
3. Minimal impact
4. Modification
5. Transparency
6. Harmonization
7. Equivalence
8. Dispute settlement

# SPECIFIC PRINCIPLE:

1. Cooperation
2. Technical authority
3. Risk analysis
4. Managed risk
5. Pest free areas
6. Emergency actions
7. Notification of non-compliance
8. Non-discrimination



# LIST OF PLANT QUARANTINE STATIONS IN INDIA

- ▶ Airport:- Bombay, Calcutta, Madras, New Delhi, and Airport:- Bombay, Calcutta, Madras, New Delhi, and Tiruchurapally. Tiruchurapally.
- ▶ Sea port:- Bombay, Calcutta, Vishakhapatnam, Trivandrum, Sea port:- Bombay, Calcutta, Vishakhapatnam, Trivandrum, Madras
- ▶ Land frontiers:- Hussainiwala (Firozpur, Punjab)

# Plant quarantine system in India

- The main features of the existing plant quarantine regulations in India are as follows:
- No consignment of seeds/planting materials shall be imported into India without a valid 'Import Permit', which is to be issued by a competent authority, to be notified by the Central Government from time to time in the Official Gazette.<sup>2</sup>
- No consignment of seeds/planting materials shall be imported into India unless accompanied by a 'Phytosanitary Certificate', issued by the official Plant Quarantine Service of the source country.
- All consignments of plants and seeds for sowing/propagation/planting purposes shall be imported into India through land customs station, seaport, airport at Amritsar, Bombay, Calcutta, Delhi and Madras, and such other entry points as may be specifically notified by the Central Government from time to time, where these shall be inspected and, if necessary, fumigated, disinfested/disinfected by authorized plant quarantine officials, before quarantine clearance.
- Seeds/planting materials requiring isolation growing under detention, shall be grown in post-entry quarantine facility approved and certified by the Designated Inspection Authority (DIA) to conform to the conditions laid down by the Plant Protection Adviser to the Govt. of India.

# International/regional cooperation

- Plant quarantine, while being national in execution, is international in character. Therefore, international/regional cooperation is very necessary for achieving the objectives since plant genetic resources are a world resource meant for the welfare of the human race as a whole. Cooperation on the following lines would greatly help in safe exchange of germplasm materials.
- **Consortium of plant quarantine stations:** It is an excellent concept proposed by Kahn (1977) to facilitate the exchange of genetic stocks and scientific information at international/regional level. Any material passing through a plant quarantine station will have very low pest/pathogen risk. The material so generated should be exchanged with other plant quarantine stations promptly, before it is distributed locally and gets contaminated with local pests/pathogens. Several quarantine stations working independently may be processing the same material (same crop or even same variety) at each station. Under the proposed consortium concept, different quarantine stations would undertake the processing of different materials (several accessions of the same crop or a group of crops at each station) and then share the material. This would avoid duplication of efforts, reduce costs of processing and more material would be available with adequate quarantine safeguards. In the same spirit, scientific information (detection techniques, treatments, distribution of pests/pathogens) and antisera for sero-diagnosis of viruses and bacteria could be shared by quarantine stations of different countries.

- ▶ **Establishment of central seed health testing laboratories:** At present, thousands of seed samples of a variety of crops are being exchanged by different countries for breeding purposes and for conducting multiplication international trials. This has exposed many countries, particularly the developing ones, to the hazards of serious and new seed borne pests/pathogens. Sometimes, the volume of material may be so large that it is not physically possible for a quarantine service to process it with any degree of surety during the time at its disposal before the planting date. In many countries, seed health testing facilities may not be existing or they may be inadequate.
- ▶ **Neergaard (1977c)** proposed the concept of establishing a few central seed health testing laboratories well equipped with required facilities and trained personnel. These may be coordinated with regional gene banks or international centers, but should be independent of the organization for whom they are working. Such an arrangement would lower pest risk to a considerable extent and avoid duplication of efforts, thus reducing costs of processing. Plant quarantine services of different countries will have faith in such laboratories and will accept their certification.

- ▶ **Third country I intermediate quarantine:** The concept of third country quarantine is another example where international cooperation could play an important role in safe transfer of plant genetic resources. This is particularly helpful for transferring high risk tropical/sub-tropical plant genera from one country to another. The material could be grown, tested/indexed for hazardous plant pests and pathogens in a temperate country without much risk because either the possible hosts are not present there or the environment is unfavorable for their establishment.
- ▶ **Biogeographically regions:** The concept of biogeographically regions proposed by Mathys (1975) is an example of regional cooperation. The eight biogeographically regions proposed for effective quarantine are separated by natural barriers like sea, high mountains and deserts, making pest/pathogen dissemination extremely difficult so long as the exchange of genetic resources is judiciously regulated. Accordingly, all countries in such a region must have common quarantine regulations since the larger the land mass covered by the same set of regulations, the greater is the protection afforded to the agriculture of the region. Based on this concept, countries of the ASEAN region have come to an official level understanding and have formulated common set of quarantine regulations to protect the region against alien pests/pathogens. Understanding on the same lines among SAARC countries along with Afghanistan and Burma would be very useful in protecting the agriculture of the entire region.

- Following Bulk imports of planting materials should be discouraged as far as possible because the pest/pathogen introduction risk increases in proportion to the quantity of material. It is so because thorough examination and treatment of bulk consignments is difficult and the area under cultivation becomes too large for effective monitoring of the crops.
- If it becomes absolutely essential to import propagating material in bulk, it should be imported from seed companies/agencies reputed to produce seed/planting material under strict Phytosanitary conditions.
- Bulk imports for consumption should be de-vitalized making them unfit for planting and these should be processed immediately on arrival under supervision of quarantine officials.
- All imports, whether for consumption or planting for commercial or for research purposes, should be done under 'Import Permit' only, and all conditions mentioned in the permit should be strictly followed.
- All the plant material being brought by passengers coming to India must be handed over to the plant quarantine officials for inspection at the international airports/seaports, where separate 'Plant Quarantine Counters' should be established urgently.

- At the international post-offices, all the mail should be passed through some kind of detection or scanning system as is done at the time of security check, and intercepted plant materials should be passed on to the plant quarantine officials for inspection. In fact, a plant quarantine official should be posted at each of the international post-offices to coordinate the interception of planting materials and their dispatch to plant quarantine service for inspection before release.
- In case of germplasm, repeat introductions should be avoided as the pest risk increases with repeat introduction of germplasm material into the country. The National Bureau of Plant Genetic Resources, New Delhi, has been designated by the government as the national nodal agency for exchange of germplasm for research purposes. All requests for germplasm should be routed through this Bureau alone. This would help in avoiding repeat introduction and materials could be made available to the users much faster and with required quarantine safeguards.
- Effective linkages/cooperation should be established among various organizations/agencies involved in the import of plant material for effective plant quarantine implementation and smooth flow of material.
- Periodic workshops/meetings at national level involving concerned departments may be held to discuss common problems and impediments so as to help the national crop improvement programme.

# Summary

- Various plant pests and pathogens inflict heavy crop losses both under field as well as under storage conditions.
- Plant quarantine regulations promulgated by governments of different countries are designed to regulate the introduction and movement of plants, planting materials, plant products, etc.
- with a view to prevent the introduction of associated pests, pathogens and weeds exotic to a country or a region and which are harmful to its agriculture. Plant quarantine is effective only against such pests which have no natural means of transport.
- Plant quarantine as a national service and its complementary role have been briefly discussed. Techniques for the detection of pests and pathogens, and salvaging of infested/infected material have been described.
- Plant quarantine regulations with particular reference to India and the quarantine responsibilities of NBPGR in respect to the introduction of germplasm material for research use in the country have been discussed.
- Importance of national level coordination and national and regional cooperation in smooth flow of seed/planting material with effective plant quarantine safeguards have also been discussed.



# References

- ▶ Kahn, R.P. 1977. Plant quarantine: Principles, methodology and suggested approaches, pp. 289-308. In-Plant health and quarantine in international transfer of plant genetic resources (Eds., W.B. Hewitt and L. Chiarappa). CRC Press, Cleveland, USA.
- ▶ Kahn, R.P. 1979. Tissue culture application in plant quarantine, pp. 185-201. In Practical tissue culture applications (Eds., R. Maramorsch and H. Hirumi). Academic Press, New York, USA.
- ▶ Lambat, A.K., M.R. Siddiqui, Ram Nath, A. Majumdar and I. Rani. 1974. Seed-borne fungi of sugarbeet in India with special reference to *Phoma betae* Frank and its control. Seed Research. 2: 33-40.
- ▶ Mathys, G. 1975. Thoughts on quarantine problems. EPPO. Eur. Mediterr. Plant Prot. Organ. Bull. 5(2): 55.
- ▶ Neergaard, P. 1977a. Seed pathology, p. 1187. Macmillan Press Ltd., London, UK.
- ▶ Neergaard, P. 1977b. Methods for detection of seed-borne fungi and bacteria, pp. 33-38. In Plant health and quarantine in international transfer of genetic resources (Eds., W.B. Hewitt and L. Chiarappa). CRC Press, Cleveland, USA.
- ▶ Neergaard, P. 1977c. Quarantine policy for seed in transfer of genetic resources, pp. 309-314. In Plant health and quarantine in international transfer of genetic resources (Eds., W.B. Hewitt and L. Chiarappa). CRC Press, Cleveland, USA.
- ▶ Rao, Y.P. and J.C. Durgapal. 1966. Seed transmission of bacterial blight disease of Sesame (*Sesamum orientale* L.) and eradication of seed infection. Indian Phytopath. 19: 402-403.