The inspection of goods imported into or exported from Australia is basically to meet the quarantine requirements of Australia and countries with which we trade. Therefore, the principles of inspection and treatment are similar for both with products of similar quarantine risks.

Generally a much wider range of controls must be exerted over imports to give the degree of quarantine security necessary to protect our agricultural, pastoral and forestry industries. Quarantine policy with imports is based on an assessment of risk factors, including the goods, possible contamination, the pest or disease status of the exporting country, and acceptable treatment procedures. However, with both animals and plants introduced into Australia, post-entry quarantine is necessary to prevent the introduction of new diseases.

With exports, the aim is to meet the international health requirements for general freedom from pest and disease and also any additional requirements of the importing country. In addition, standards are set for export quality to ensure the product is sound, wholesome and of good appearance. These aim to protect Australia's good name as an exporting nation.

CO-OPERATIVE ARRANGEMENTS FOR INSPECTION - COMMONWEALTH/STATES

The Commonwealth Department of Primary Industry is responsible for the two Acts administering both imports and exports:

Quarantine Act - Animal and plant quarantine with imports.

Export Control Act - Exports of canned and frozen fruits, dairy produce, eggs, dried fruit, fresh fruit, fresh vegetables, fish, grain, meat and honey.

Because of the resources and expertise at State level, the inspections for animal and plant quarantine and exports of grain, fresh fruit and vegetables are vested in State Departments of Agriculture. In N.S.W. the force undertaking these duties are agricultural inspectors.

INTRODUCTION TO AGRICULTURAL QUARANTINE

Agricultural quarantine is administered by Government to protect all facets of agriculture and the environment from unwanted pests and diseases of animals and plants. This is achieved by controlling the entry into Australia of animals and plants; animal or plant products; soil; cultures of living organisms; packing material and commodities; and the conveyance of goods.

The use of Government authority to enforce agricultural quarantine is based on the premise—it is economically preferable to undergo some inconvenience and expense in an effort to exclude a pest or disease rather than submit to the expense of controlling it indefinitely.

Background to Quarantine

Quarantine is derived from the latin word "Quarantum" meaning 40. It originally
arose from the detention of ships and the isolation of passengers and crew when arriving from countries subject to epidemic diseases, such as bubonic plague, cholera and yellow fever. The 40 days had a traditional rather than a factual background.

The first quarantine is believed to have been imposed in Venice in 1376 when travellers suspected of being infected with bubonic plague were banned. It was not until 1850 that an international quarantine code relating to ships and commerce was drawn up at a convention in Paris.

While quarantine was first imposed for epidemic human diseases, the accent today is on animal and plant quarantine. In 1980 the World Health Organisation claimed the elimination of smallpox from the world and most countries have eliminated their quarantine surveillance of people arriving by sea and air. Australia has maintained a monitoring exercise for the occurrence of human diseases, such as cholera and malaria, but these are not quarantinable.

History of Agricultural Quarantine in Australia

As early as 1866 the colony of New South Wales passed an Act governing the importation of sheep and in 1871 for cattle. In Sydney, port inspection of plant material began in 1889 when the Export and Import Branch was established. The administrative office was in the old Mining Museum in George St. North, the fumigation chambers in Washington Lane near Day St. and seed was inspected at the Art Gallery in the Domain. The Commonwealth Constitution gave the Federal Government the full responsibility for human, animal and plant quarantine. Following Federation in 1901 the Quarantine Act was passed in 1908.

This shows that Australia was taking active agricultural quarantine measures as early as any other country. The first plant quarantine legislation was enacted by Indonesia when under Dutch control in 1877 to prevent the spread of coffee rust from Sri Lanka.

The Importance of Agricultural Quarantine

Those who expound theories of natural selection and survival of the fittest would suggest we let nature take its course and we do away with agricultural quarantine. This attitude could be disastrous for Australia because this continent was isolated from the rest of the world for eons of time and developed a unique flora and fauna.

Most countries have some native and unique species of plants, animals and birds. In Australia, most people are familiar with the more obvious of our species such as gum trees, kangaroos and kookaburras. But not all of a country's unique plant and animal life is quite so obvious. Each country, or region, has a collection of insects, fungi, bacteria, viruses, nematodes, snails and weeds that originated there. When man moves plants, seeds or goods from country to country he may transfer an insect pest or plant disease from its native habitat to a new location. No one can predict how the "immigrant" will behave in its new environment. But, freed from its natural enemies and competitors, and in contact with a possibly more susceptible host, it may be a more serious pest than in its native situation.

Man probably distributed more pests and diseases throughout the world during the last century than in any previous time in history. Many insects and diseases did not survive the long sea voyages of earlier days but too many did establish themselves in new countries. The large volume of cargo conveyed by fast transportation today has increased the risks for agricultural quarantine.
European Settlement in Australia

At the time of European settlement Australia had no commercial species of plants. The early settlers brought some plant pests and diseases, new to Australia, along with the crop species transported as plants or seeds.

Australia now has one of the most productive, richest and diverse agricultural systems in the world based on introduced crop species. Although one might expect that Australian food and fibre crops should, by now, be afflicted with every significant pest and disease, such is not the case. There is little doubt that Australia's geographic isolation and the long sea voyages undertaken by the early settlers eliminated a number of crop pests and diseases. Perhaps the unusually extremes of the Australian climate did not favour the foreign pests because no one can predict how an introduced plant pest or disease will perform in a new environment. It may have been simply chance. However, the fact is that while Australia does have diseases and pests of commercial crops, most of them introduced, there is still a large number of significant plant diseases and pests of agricultural, forestry and horticultural crops not established in Australia. More importantly, new crops for Australia invariably are free of major pests and disease except for those that move across from existing plant species - either introduced or indigenous.

All commercial livestock used in Australia's primary production have been introduced at some time or other. Few countries are as free of animal diseases and pests as Australia.

The assessing or risk for animal quarantine is very complex. In addition to the number of livestock diseases which threaten Australia, it is necessary to consider the numerous avenues for possible entry. The most obvious means of introduction include infected animals or animal products such as meat. Goods such as farming equipment, animal containers, food containers, stockfeed, hay, straw packing may be carriers of animal diseases. Then there is the difficulty of detection. For example, the sheep disease, Scrapie, has an incubation period which can exceed four years. Rabies may incubate for nine months. Other diseases may be harboured in animal or plant products for extended periods such as Newcastle disease in frozen poultry for ten months; swine fever in frozen pork for several years and foot and mouth disease virus on hay for periods up to fifteen weeks. Other carriers of animal diseases include animal excreta, semen, eggs.

In respect of animals, the Australian native species such as the marsupials are not expected to be likely reservoirs for introduced exotic diseases such as foot and mouth or Bluetongue. However, a very significant problem could arise from feral animals such as pigs, horses, buffaloes, goats, donkeys, camels, if unfortunately a serious exotic animal disease should happen to reach Australia. Foxes, feral cats, feral pigs and dingoes could become a reservoir of infection for Rabies. Wild pigs are already under suspicion as carriers of a kind of tuberculosis that infects cattle.

COMPONENTS OF QUARANTINE ACTIVITY

There are several quarantine systems which are used separately or collectively to prevent the introduction and establishment of new pests and diseases. The use of a complete embargo or prohibition on a risk-product presents many problems as few countries are Self-sufficient and new genetic material is necessary to progress. Also, an embargo is likely to be more restrictive on a scientifically developed country which has recorded specific diseases or pests. The risks could be greater from countries with less technological development. While prohibitions must be maintained for high risk areas, the
use of controlled introductions involving inspection on arrival, prescribed treatment and post-entry quarantine generally provides the quarantine safeguards.

Inspection at point of entry is the first line of defence but has physical limitations. It is impossible to detect some stages of insects and diseases by inspection. Therefore quarantine prohibits the host material from infected areas considered a high quarantine risk. In this situation, inspection is limited to search and seizure of the host material. Despite the deficiencies, there is no alternative but to depend on inspection when volume is high and risk is low, e.g. with timber and seeds not specifically restricted. Controlled introductions of prohibited products are permitted when quarantine risks can be overcome. For instance, a fruit may receive a fumigation treatment to eliminate possible introduction of insects, such as an exotic fruit fly. Seed introduced for purposes other than sowing may be rendered non-viable via treatment to eliminate the risk of a seed-borne disease being established.

Inspection and certification at the point of origin with the provision of a phytosanitary certificate for fulfilling obligations under FAO-IPPC for freedom from pest and disease and for a prescribed treatment provides an acceptable quarantine safeguard.

QUARANTINE TREATMENTS

Treatments are generally selected to give the degree of quarantine security desired with least risk to the product. However, when there is no alternative, a treatment to give quarantine security may cause injury. This can be so with a fumigant, such as methyl bromide.

The range of treatments commonly used in quarantine at present include:

1) Fumigants - methyl bromide, ethylene dibromide, ethylene oxide, phosphine.
2) Pesticides, fungicides, bactericides, herbicides and sterilants.
3) Heat
4) Hot water
5) Cold sterilization
6) Ionising energy.

COMMON QUARANTINE USES

Live plants - 1, 2 and 4
Seed for sowing - 1, 2, 3 and 4
Seed for devitalizing - 1, 3 and 4
Fresh fruit and vegetables - 1 and 5
Timber - 1 and 3
Contaminants (seed, soil and insects) - 1, 2 and 3
Bales of used sacks - 6.

FUTURE OF IONIZING ENERGY WITH QUARANTINE

Ionizing energy would appear to have an excellent future as a quarantine treatment. Its acceptance internationally as a quarantine treatment over the range of products discussed at this workshop will relate to public acceptance generally. While we lack experience in the use of irradiation for quarantine
purposes, it would appear to be a good tool particularly for some commodities and in particular foodstuffs, including fresh fruit and vegetables. The use of irradiation in the export of foodstuffs will be entirely dependent on acceptance by the importing country.

At this stage the Australian Quarantine Service accepts the use of irradiation in principle, and on the demonstration of its efficacy by an exporting country it could be accepted for a range of uses:

- the elimination of insects
- the elimination of disease
- devitalization and treatment of seed
- treatment of soil.

The treatment and dosage would need to be verified by an authority of the exporting country and certified by a phytosanitary certificate. This acceptance of irradiation by Australian Quarantine will be dependent upon our National Health and Medical Research Council setting up tolerance for particular foodstuffs. It would be necessary for research to determine if such dosages have any deleterious effect on the quality of the product as this will not be the major concern of quarantine. It is not expected that irradiation would replace fumigants as a major quarantine tool where no restriction is imposed on that usage, e.g., with products not intended for human consumption, such as timber. Fumigation is a very flexible procedure and is most suitable for large quantities of product. At this stage it would seem that irradiation will have most use with valuable goods of lesser volume and foodstuffs, including fruit and vegetables which may carry pest or disease of quarantine concern.
QUARANTINE INSPECTIONS

Agricultural Quarantine

Animals and animal products
e.g. cats and dogs ex New Zealand, cheese, tinned meats, hides, milk products, fishmeat, etc.

Plants and plant products
e.g. live plants, seeds, spices, edible nuts, cut flowers, fresh fruit and vegetables, dried fruit and vegetables, etc.

Other goods
Timber, timber packaging, secondhand agricultural machinery, motor vehicles, scrap metal, secondhand tyres, etc.

Key Locations in N.S.W.

Ports of Sydney, Newcastle and Wollongong
Airports of Sydney, Richmond and Williamtown.

Operational Areas

1. International terminals - Passengers and air crew baggage clearance, commercial aircraft, airforce and sea passengers.

2. Bond stores - Clearance of air and sea cargo.

3. Container terminals - The examination externally of containers for soil contamination and snails and inspection of cargo for infested, prohibited or contaminated goods.

4. Waterfront - Inspection of agricultural machinery and other cargo not containerised, examination of overseas yachts for prohibited foodstuffs and ships pets.

5. Mail exchange - Examination of parcels and packets from overseas for restricted, prohibited and infested foods of animal and plant quarantine interest.

6. Timber - Inspection for insect infestation and contamination with soil.
   Main countries of supply - North America, Malaysia, Philippines and New Zealand.

7. Approved premises which are private premises registered to perform various functions - processors of restricted imports, treatment areas, laboratories and examination areas.

8. Nursery stock - specialized staff
   Inspection and treatment of approved imports of live plants, subject to imports being grown in registered quarantine glasshouses for specified period.

9. Tropical fish - specialized staff
   Inspection and identification of approved imports, then post-entry quarantine under supervision for specified period.
EXPORT OF PRIMARY PRODUCE

The Export Control Act provides for the control over the export of primary products and the legislative backing for the administrative and technical requirements for export inspection.

Under the controls of Regulations or Orders, the export of specified goods are prohibited or restricted to certain places and conditions. These include the registration of premises to meet the necessary standards of construction, security, hygiene, lighting, sound, equipment and facilities for inspection. These may further control the granting of licences or permission to export. Notice must be given to an authorized person of the intention to export such goods.

An authorized officer has powers for entry, search, inspection and seizure in registered premises and to seek a warrant for the same powers in unregistered premises. If requested, it is an offence if the owner refuses to assist the officer in his duties.

Trade description is an important part of the Export Control Act. The contravention of the Regulations pertaining to a trade description or the use of a false trade description makes offenders liable to severe penalties. Trade description means any description, statement or pictorial representation of the nature, quality, quantity or grade of the goods; the origin exporter, etc. and includes any label indicating the above matters.

The majority of export inspection work by agricultural inspectors is undertaken in Sydney for fresh fruit and vegetables, nursery stock, grain and field crops. A large group of inspectors also inspects export grain and field crops at the Newcastle Terminal. Country based inspectors can be called upon to inspect fruit and vegetables being containerized at country centres. They are also becoming increasingly involved in the inspection of other field crops, e.g. rice and cotton, where importing countries require an international phytosanitary certificate (health certificate) for apparent freedom from pest and disease. Inspectors are required to determine that goods submitted for export meet the requirements set by Regulation or Order for export and that any specific requirements of the importing countries are met before completing the phytosanitary certificate and export permit.

Inspectors at grain terminals also inspect the terminals for hygiene and freedom from insects, and direct cleaning procedures and treatments where necessary. Also, they survey ships for freedom from insects and infestable residues and direct treatments where necessary before giving permission to load.

INTERNATIONAL PLANT PROTECTION CONVENTION (IPPC)

Australia is a member of IPPC which operates within the Food and Agricultural Organisation (FAO) of the United Nations.

The contracting parties recognise the usefulness of international co-operation in controlling pests of plants and plant products and in preventing their spread and especially their introduction across national boundaries and, desiring to ensure close co-ordination of measures directed to these ends, have agreed as follows:

(1) With the purpose of securing common and effective action to prevent the spread and introduction of pests of plants and plant products and to promote measures for their control, the contracting parties undertook to adopt the legislative, technical and administrative measures specified in
this convention and in supplementary agreements pursuant to Article III.

(2) Each contracting party shall assume responsibility for the fulfilment within its territories of all requirements under this convention.

As a member of IPPC we are bound by the rules and it is important when we issue Phytosanitary Certificates that these be correct and meet the requirements of the importing country.
EXPORT INSPECTION - FRESH FRUIT AND VEGETABLES

Reason for Inspection

1) For compliance with export standards involving:

- Pest and disease
- Maturity
- Soundness
- Grade standards
- Minimum sizes
- Fungicide treatments
- Pre-cooling
- Packaging
- Product ability to out-turn satisfactorily.

2) Phytosanitary certification as required by importing countries:

- Fruit fly disinfestation by
  - EDB fumigation
  - Cold sterilization
- Area freedom - 80km/12 mths for Queensland Fruit Fly - New Zealand
- Area freedom - Onion smut - New Caledonia
- Area freedom - Cattle tick - Fiji
- Endorsement re San Jose scale - Germany
- Special inspection/treatment - Light brown apple moth - Canada.

Place of Inspection

Exporters premises at Flemington Markets
At orchard/packing shed
At cold stores
At shipside.

Method of Inspection

Aim to inspect 10% of total consignment in a detailed systematic manner.

Suitable equipment - knife, magnifying glass, size rings, weighing scales, maturity testing equipment, good light, work bench.

On completion, leave product in condition similar to that at start of inspection.

Supervision of Loading

Air cargo - Suitably stowed to avoid damage
Containerised sea cargo
- Dunnaging
- Free air flow
- Head space of 50mm.

Documentation

Notice of intention to export/the export permit
- Need for accurate detail
- Need for advance notice of intention to ship
- Distribution of copies.

Phytosanitary certificates
- Various types
- Accuracy of detail
- No erasures/alterations
- International Plant Protection Convention rules
- Number of copies/distribution.

Out-turn Inspection

Role of Australian Horticultural Officer, Singapore and London.
IMPORTANT PESTS - IMPORT AND EXPORT INSPECTION

Some important pests which are of concern and the methods of treatment are:

Quarantine - Exotic pests

Khapra Beetle - The most serious stored product insect in the world. Not recorded in Australia. Infestations are treated by fumigation with methyl bromide at 80g/m³ for 48 hours at 21°C.

Giant African Snail - A serious pest of horticultural and agricultural crops. Not recorded in Australia. Infestations treated by fumigation with methyl bromide at 128g/m³ for 24 hours at 21°C.

Carpenter Ant - A wood damaging ant that can cause structural damage to timber in service. Not recorded in Australia. Infestations treated by fumigation with methyl bromide at 48g/m³ for 24 hours at 21°C.

Other Pests of Concern - West Indian Drywood Termite, Oriental Fruit Fly and other exotic fruit flies, timber pests (Bostrychid, Cerambycid, Scolytid beetles and Wood Wasps), exotic aphids, thrips and mites. A variety of treatments may be used to control these pests including methyl bromide, ethylene oxide, ethylene dibromide and heat treatment.

Exports - Pests which occur in Australia

Queensland Fruit Fly - Some countries accept area freedom certificates (i.e. produced 80 km from known occurrence), whereas other countries require treatment with EDB or cold sterilization.

San Jose Scale - Fruit is inspected for freedom from scale prior to export. Treatments are applied if requested by importing country.

Codling Moth - Fruit inspected prior to export. Treatments applied if requested by importing country.

As well as inspection of fruit and vegetables, an important role in export inspection is the inspection and certification of grain and various plant products. This involves the inspection of grain and plant products at export, as well as the inspection prior to loading of the vessels and/or containers carrying these cargoes.

A nil tolerance for live insects is enforced for grain exports. Some of the insects which are of concern in export grain and plant products are lesser grain borer, rust red flour beetle, saw-toothed grain beetle, rice weevil and tropical warehouse moth.

Treatments for these insects detected during loading of grain or plant products, or during inspection of vessels or containers are spraying with insecticides or fumigation.