

REVIEW

Summary of Animal and Plant Quarantine Objects in the Imported Parcels and X-ray Pattern Identification

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ABSTRACT

The quantity of the imported parcels in China has increased rapidly, becoming an important means for criminals to hide the prohibited animal and plant quarantine objects. The x-ray applied to the port of post inspection can speed up inspection and better protect the ecological safety of China by mastering its method of judging animal and plant quarantine objects.

1. Introduction

With the development of e-commerce and overseas purchasing, international exchanges and personnel exchanges are increasing type growth^[1]. The rapid increase and convenience of the imported parcels, while also making it more diversified and subtle. The presence of these characteristics has made it possible for criminals to hide contraband items, raw beef from BSE areas, venomous poisonous snakes and plants containing quarantine pests in infected areas can be entered by mail. This risk of carrying harmful organisms and spreading epidemic diseases is increasing, and the ecological safety of our country, production of agriculture, forestry and the health of the people are seriously threatened. Quarantine of the imported parcels is to effectively prevent infectious, parasitic, dangerous, pests and weeds and other pests from being carries by mail into the country^[2].

At present, the X-ray equipment is used in all post inspection points to identify the imported parcels on-line, and combined with artificial opening sensory judgment.

2. Animal and Plant Quarantine Objects in the Imported Parcels

2.1 Species of Animal and Plant Quarantine Objects

At present, the main law enforcement basis for quarantine of the imported parcels in China is the Entry-exit Animal and plant Quarantine Law and its implementing regulations, The list of prohibited articles under quarantine shall be prescribed by the Catalogue of animals and plants and products whose carriage is prohibited by the people's Republic of China and sent by mail to China (Announcement NO. 1712). Divided into animals, plants and other three categories. Animals include live animals, raw and mature meat and its products, animal milk and milk products,

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eggs and products, bird's nest, hoof horn and products, etc. Plants include fresh fruits, vegetables, tobacco leaves, seed seedlings, organic culture media, soil and so on. A review of the interception data from the national postal inspection shows that the share of animal and plant quarantine products in all dangerous source articles entering China with the imported parcels is the largest. Apart from common meaty plants, all kinds of raw and cooked meats and their products, sea cucumbers in bird's nest, It also includes a lot of seed seedlings and live animals, including radiation turtles, ivory, earth incense and other internationally endangered protected animals and plant products.

2.2 Harm from Illegal Mailing of Animals, Plants and Products

Animals and plants and their products that enter illegally with the imported parcels will cause animal and plant diseases. Based on the data intercepted in the past, the most virulent poison was detected from HongKong mail, eggs containing highly pathogenic avian influenza virus found in Vietnamese mailings, the content of lavender teddy bear from Australian mail detected the detection of epidemic pests: *Avena sterilis* L. subsp. *Sterilis* and *Avena ludoviciana* Durieu, detection of quarantine pest *Hypothenemus* coffee from India, Brazil, Vietnam and other postal products, have appeared in the imported parcels. The invasion of alien pests will lead to new ecological system damage, ecological imbalance, resulting in economic losses and environmental damage.

3. Method for X-ray Mapping of Animal and Plant Quarantine Objects

Inspection of the imported parcels by X-ray at the inspection site at the post office, The information of the inspected object can be quickly and rich, at the same time the inspection staff can avoid the risk of the unknown in the postal object.

3.1 X-ray Imaging Principles

X-ray is a highly penetrating electromagnetic wave, when it strikes a subject, partially passes through it, while the other part is emitted. The internal structure of the object is reflected on a fluorescent screen by an image of the X-ray through various components and density materials by signal conversion.

3.2 Imaging Characteristics of Animal and Plant Quarantine Objects and Mapping Methods can be Identified by Colour, Angle, Density and Shape

Depending on the density of the object and the x-ray absorption characteristics of the material, the orange, green

and blue colors represent organic matter, mixture and no machine respectively, the classification and coloring of images make different substances easier to distinguish. Most of the animal and plant quarantine products take in X-rays and they appear orange, organic. A few special images, such as ivory, dried sea cucumber, animal hoof angle, appear green.

The same animal and plant quarantine objects present different images at different passing angles depending on the angle in which they are placed in the parcels. The sausage if a horizontal image shows a high-density array of dots, this is the top view: if the tile is vertical in a parcel it shows the outline of the sausage.

Since the electronic density and atomic number of most of the items are determined [3]. The thickness and density of the color in X-ray images correspond to the thickness and density of the object being inspected. The size of the density is used to determine the number of animal and plant quarantine objects, and the density of the object can also be determined by the to identify the presence of animal and plant quarantine objects somewhere. A seed in a book hidden away in mail, The book will appear different depth of x-ray images, you can identify the inner sandwich, and the corresponding density of the clip, can identify whether the amount contained is more or less.

Compared with other articles in the imported parcels, animal and plant quarantine products have their specific shapes. The x-ray imaging has strong appearance identification and characteristic.

4. Summary

The physical mechanism of X-ray interaction with matter provides an important and comprehensive guarantee for public safety. With the rapid development of electronic commerce, the safety of inbound postal materials is particularly important. A thorough understanding of the X-ray method for the identification of animal and plant quarantine objects in the imported parcels can help the inspectors at mail ports to identify them quickly and further improve the efficiency of inspection.

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