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International Standard



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**Cereals and pulses — Determination of hidden insect infestation —  
Part 1: General principles**

*Céréales et légumineuses — Détermination de l'infestation cachée par les insectes — Partie 1: Principes généraux*

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## Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 6639/1 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*.

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# Cereals and pulses — Determination of hidden insect infestation —

## Part 1: General principles

### 0 Introduction

This International Standard describes methods of determining hidden insect infestation in cereals and pulses. It consists of the following parts:

*Part 1: General principles.*

*Part 2: Sampling.*

*Part 3: Reference method.*

*Part 4: Rapid methods.*

### 1 Scope and field of application

This part of ISO 6639 establishes the general principles of methods of determining hidden insect infestation in cereals and pulses.

### 2 Definitions

For the purpose of ISO 6639, the following definitions apply.

**2.1 initial observed infestation:** Those free-living insects that are immediately apparent to the eye when the sample is first examined.

**2.2 hidden infestation:** Those insects which are present within individual grains either because they are at juvenile stages and have developed from eggs laid inside the grains, or because they have entered the interior of individual grains through cracks or other damage, usually to feed. (Hidden infestation is not normally apparent upon first examination of the sample.)

**2.3 grain:** Cereal grains and/or seeds of pulses.

### 3 General

Some species of insects are especially adapted to attack whole grains and normally spend a considerable part of the life cycle, including the entire larval feeding period, inside grains. Other

species also take advantage of holes or cracks in grains to enter and feed inside them. These insects constitute a *hidden infestation* that cannot readily be seen in consignments or samples.

Most insect pests of stored grains are very small, under 5 mm in length, cryptic in behaviour and dull in colour. Those that fly do so mostly in dull light or at high temperatures. Thus, even when they are living freely outside the grains and do not constitute a hidden infestation as described above, they are not easy to detect unless populations are large enough to induce noticeable activity.

Being mobile, at least in the free-living form, insects are capable of moving through a bulk of grain and tend to concentrate in those parts of the bulk most favourable for feeding and breeding. Such centres of insect activity are not necessarily static; they may expand, contract or move for many complex reasons. The most important reasons are changes in the physical condition of the grain (for example temperature and moisture content) and overcrowding of the insects due to rapid breeding. Thus, the distribution of insects in a bulk of grain is rarely random, and their detection requires specialist knowledge and techniques.

### 4 Sampling

The methods of sampling cereals and pulses specified in ISO 950<sup>1)</sup> and ISO 951<sup>2)</sup> are not appropriate for sampling for hidden infestation in cereals and pulses, because of the non-random distribution of insect populations, particularly after a period of prolonged storage or transportation.

Special techniques, not relevant or desirable for the purposes of determination of grain quality, for which ISO 950 and ISO 951 were developed, include selecting samples from the top and outer layer of bags or packages in a stack and sampling from the surface layer and warmer regions of bulk grain. These are locations in which insect infestation is generally most likely to be found, and therefore justify the departure from the basic principles of representative sampling. Despite these differences, it will be possible in most instances for the same personnel to use the same equipment to obtain samples for either the determination of grain quality or the determination of hidden insect infestation, or for both purposes, during the same operation.

1) ISO 950, *Cereals — Sampling (as grain)*.

2) ISO 951, *Pulses in bags — Sampling*.