

Methods of test for

Cereals and pulses —

Part 18: Determination of hidden insect infestation

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- AFRC Institute of Engineering Research
- Agricultural Engineers' Association
- Association of Public Analysts
- British Edible Pulse Association
- British Maize Refiners' Association
- Department of Trade and Industry (Laboratory of the Government Chemist)
- Flour Milling and Baking Research Association
- Food and Drink Federation
- Grain and Feed Trade Association
- Home Grown Cereals Authority
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- National Association of Commodity Cargo Superintendents and Surveyors
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- Society of Chemical Industry
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- United Kingdom Agricultural Supply Trade Association Ltd.

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Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 Definitions	1
3 General principles	1
4 Sampling	2
5 Examination of samples	5
6 Expression of results	6
7 Interpretation of results	6
8 Test report	6
Appendix A Suitable data record sheet	7
Table 1 — Number of bags to be sampled	4
Table 2 — Incubation periods (in days) for the detection of the hidden stages of insects in samples of cereals and pulses kept under the suggested conditions	6
Publications referred to	Inside back cover

Foreword

This Part of BS 4317 has been prepared under the direction of the Food and Agriculture Standards Committee. It is based on ISO 6639-1, ISO 6639-2 and ISO 6639-3 published by the International Organization for Standardization (ISO). These International Standards were prepared with the participation of the UK but not approved by the UK, as they refer to ISO 6639-4, which describes rapid methods for determination of hidden insect infestation and which it was considered gave insufficiently reliable results. In addition, the UK considered that there was advantage in combining the general principles, sampling and method into a single document. For ease of production the data record sheet in Appendix A is reproduced from ISO 6639-3.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of BS 4317 describes a method for determining the extent of hidden insect infestation in cereals and pulses in any form of store or vehicle at any level of trade from producer to consumer. The method is suitable for use as a reference method in the calibration of rapid methods. It may be used in cases of dispute.

NOTE The titles of the publications referred to in this Part of BS 4317 are listed on the inside back cover.

2 Definitions

For the purposes of this Part of BS 4317 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 not visible but 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

2.3

grain

cereal grains and/or seeds of pulses

2.4

consignment

the quantity of grain delivered at one time and covered by one set of shipping documents. It is composed of one or more lots

2.5

lot

a stated quantity of a consignment, to be sampled using a particular sampling plan

NOTE 1 There is no need to restrict the size of the lot when sampling for hidden infestation. A consignment of the same origin and history may be regarded as one lot or may be split into several lots for sampling, whichever is more convenient. If the consignment is received in several barges, railway wagons, lorries, stacks, etc., it is usually more convenient to treat each part as a separate lot for sampling purposes. Any parts of a consignment known to be of different origin and/or history are to be sampled as separate lots.

NOTE 2 The definition of lot for the purposes of sampling for determination of hidden infestation differs from the definition of lot relating to sampling of grain and pulses for the determination of other characteristics.

2.6

increment

a small quantity of grain taken from a single position in the lot

2.7

bulk sample

the quantity of grain obtained by combining and mixing the increments taken from a specific lot

2.8

laboratory sample

the quantity of grain removed from the bulk sample, or a separate increment, and intended for examination

3 General principles

3.1 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.

3.2 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 in **3.1**, they are not easy to detect unless populations are large enough to induce noticeable activity.

3.3 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.