



12-2003

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The University of Tennessee Agricultural Extension Service

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Recommended Citation

"SP341-V-Sampling Stored Grain for Insects, Molds and Related Problems," The University of Tennessee Agricultural Extension Service, 04-0166 SP341V 12/03(Rev) E12-4615, http://trace.tennessee.edu/utk_agexcrop/21

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Insects

Sampling Stored Grain for Insects, Molds and Related Problems

Charles R. Patrick, Professor, Entomology and Plant Pathology
Angela Thompson, Assistant Professor, Plant Sciences

Introduction

The periodic and timely sampling of stored grains can detect existing or potential problems before considerable damage has occurred. Proper sampling of stored grain can reveal increases in moisture or temperature and insect or mold problems in the grain.

It is important to be aware of the potential hazards of sampling inside a grain bin. Suffocation can occur in grain bins, and sampling should be done with caution.

Where to Sample

Grain should be sampled at weekly intervals to detect any moisture, temperature, insect or mold problems. The grain may be sampled less frequently during the winter months. However, if warm periods during the winter months continue for a week or longer, samples should be taken during that time.

Where to Send Samples

Samples of insects can be sent to the county Extension agents or the Plant Pest Diagnostic Center, 5201 Marchant Drive, Nashville, TN 37211-5112. Moldy samples that are suspected of containing harmful mycotoxins (aflatoxin) can be sent to:

Agdia, Inc.

30380 County Road 6

Elkhart, IN 46514 USA

Phone: 574-264-2014

Toll Free: 800-62-AGDIA (800-622-4342)

Fax: 574-264-2153

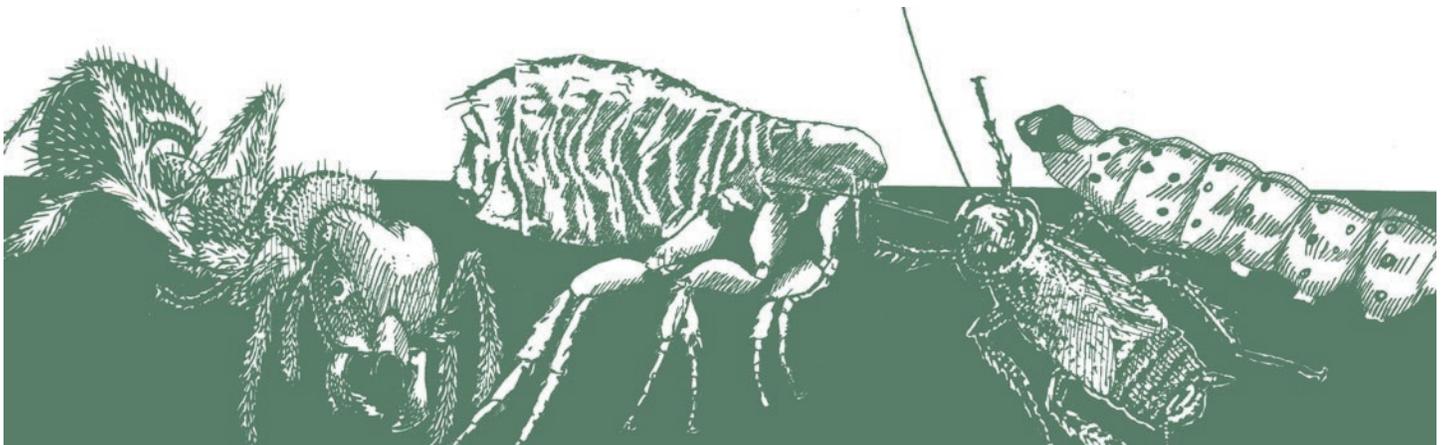
Storage Problems

Outside the bin, signs of storage problems can be easily detected. These problems may include leaking grain, bulging walls, standing water, insects, cracked walls and weeds.

Inside the bin, look for crusting of the upper level of the grain (bridged grain). Also look for moldy grain and insects. Note any large amounts of cracked kernels and insect-damaged kernels. These areas should be sampled because they are most likely to contain insects or molds.

Safety Precautions

Bridged grain may result in a cave-in and subsequent suffocation of the workers. Bridged grain is caused when grain mats together, forming a false floor in the upper level of the grain mass. Persons falling through this bridged area are subject to suffocation.



Sampling Devices

The deepcup (torpedo) grain probe is the most commonly used sampler available commercially. The deepcup grain probe (Illustration 1) consists of a separate brass or plastic cup about 8 to 12 inches long with a connected top, which separates upon removal from the grain, allowing a specified amount of grain to enter the cup. A separate handle and extension rod connect to the top of the cup, providing up to 12 or more feet of extension.



*Illustration 1.
Deepcup
grain probe.*

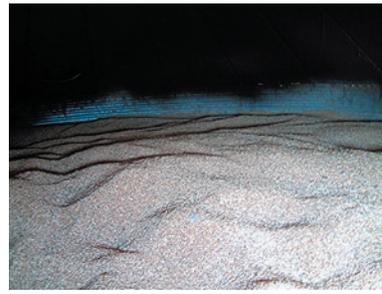
How to Sample

While standing on the grain mass surface, push the probe into the grain mass at a slight angle. The top of the cup will open as the probe is pulled up and out of the grain, allowing grain to fill the cup.

It is best to divide the grain surface into quarters and take at least three probes per quarter section of grain mass. This will provide a good representative sample of the grain to allow inspection for the presence of insects, molds or excessively moist grain.

Sampling Difficulties

Overfilled grain bins are difficult to sample for insects or molds. Sometimes the only access points are through the bin wall, door or roof. Sample in the center of the grain



*Illustration 2.
Top view of
grain mass
surface.*

mass as deeply as possible. Reach the bin wall if possible at two to three depths.

Examining the Sample

Place the grain sample in a specially designed weevil sieve (1½-inch diameter holes) if available and shake side to side at least 30 times to loosen any insects that may be in the grain. If a sieve is not available, place samples on a white piece of cloth for examination. Inspect the sample carefully for insects. It may be necessary to use a magnifying glass to see some of the smaller insects.

Equipment Needed for Sampling

- Deep bin compartment probe
- Deepcup probe
- Grain sieve with 1/12- or 3/16-inch round holes
- Sample vials
- Bin inspection forms (from author)
- Temperature probe

Summary

Close monitoring of stored grain is very important in preventing insect damage or moldy grain. If insects are found to infest a bin, the only recourse is expensive and hazardous fumigation procedures. If high levels of aflatoxins are found, it may be necessary to discard the grain. Even low levels of aflatoxin can cause long-term problems in livestock and poultry.

Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label. Persons who do not obey the law will be subject to penalties.

Disclaimer Statement

Pesticides recommended in this publication were register for the prescribed uses when printed. Pesticide registrations are continuously being reviewed. Should registration of a recommended pesticide be canceled, it would no longer be recommended by the University of Tennessee. Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others that may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product.

04-0166 SP341V 12/03(Rev) E12-4615

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Agricultural Extension Service Charles L. Norman, Dean