



STORED PRODUCT PESTS CAN CAUSE EXTENSIVE DAMAGE AND PRODUCT LOSS

Stored product pests (SPPs) are insects that harbor, feed on or gather around processed and non-processed dry foods such as pasta, flour, cereal, pet foods, dry milk, grains, spices, baked goods and other dry goods. SPPs generally affect food processing and food retail facilities. The ingredients and processes, along with a warm and often moist environment, can create conditions conducive to stored product pests. These insects can cause extensive damage and product loss.

There are four categories of stored product pests

Below is an illustration of how stored product pests feed on a grain kernel.

1. Internal Feeders

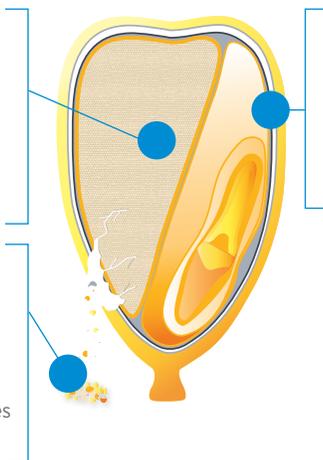
Insects lay their eggs within the grain so the larvae can feed on the product

- Angoumois Grain Moths
- Lesser Grain Borers
- Granary Weevils
- Rice Weevil

3. Scavengers

Insects feed on grain after the shell breaks by mechanical means or other insects

- Flour Beetles
- Sawtoothed Grain Beetles
- Foreign Grain Beetles



2. External Feeders

Insects feed on the outside surface of grain kernel and may chew through

- Indian Meal Moths
- Warehouse Beetles
- Cigarette Beetles

4. Secondary

Insects feed on deteriorating, moldy materials

- Psocids - small scavengers which live on fungi, algae and lichens

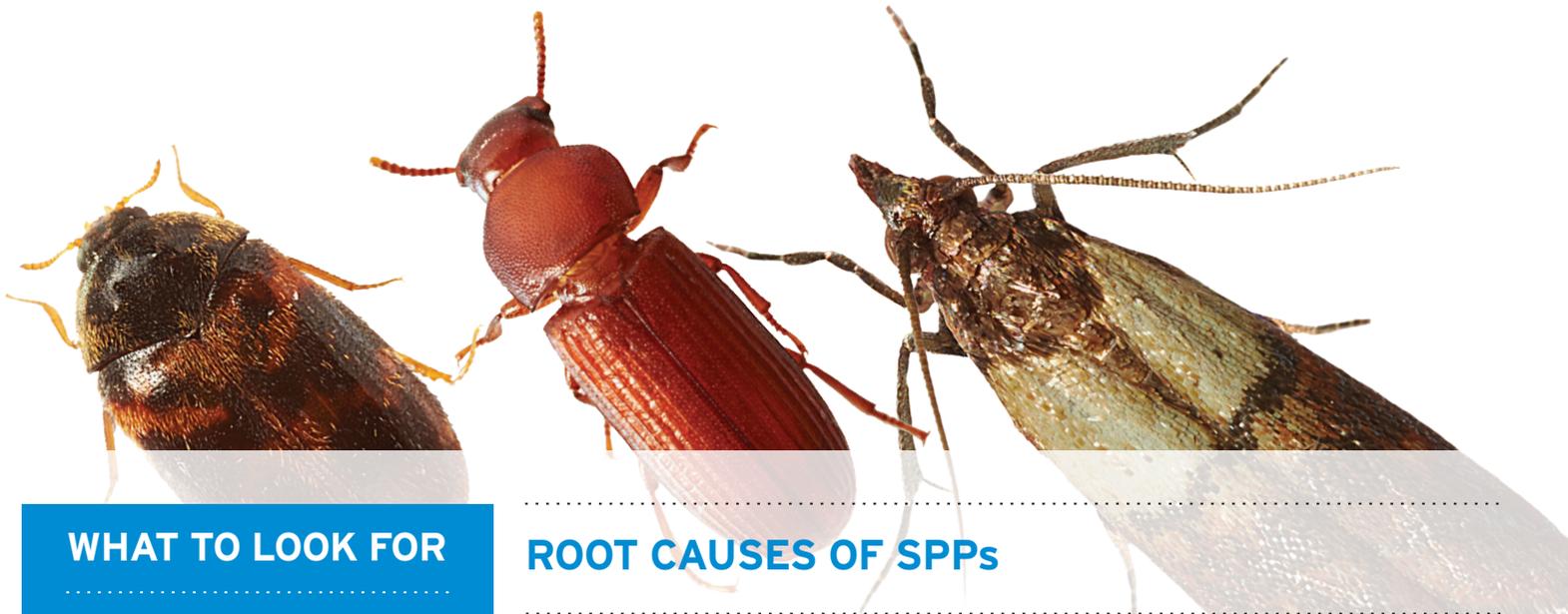
IMPACT TO YOUR BUSINESS

Stored product pests can damage food and food ingredients, and can have a major impact to your business.

- Product loss
- Lost production time
- Audit score deduction
- Treatment costs
- Brand reputation
- Consumer complaints

DID YOU KNOW...

- There are more than **60 species** of stored product pests in North America - most are either moths or beetles.
- According to research at the University of Florida 80% of human food comes from grains; 12% of harvest is lost to insects before harvest; another **36% is lost after harvest to insects.**
- Most stored product pests can survive and breed at temperatures ranging from **60 to 95°F.**
- All moths and beetles develop through a complete metamorphosis life cycle (egg, larvae, pupa and adult). In optimum conditions this **lifecycle can be completed in ~30 days** (depending on species).
- Some **stored product pests can chew through common packaging** such as cardboard and bags, and contaminate the finished product.



WHAT TO LOOK FOR

- Live and dead insects
- All life stages of insects - eggs, larvae, pupae, adults
- Larvae cast skins and insect fragments
- Frass (excrement)
- Silken webbing or tubes over food supply
- Trails in dust
- Damp product or materials due to excessive moisture
- Damaged product or packaging (bore holes)



ROOT CAUSES OF SPPs

Stored product pests enter and thrive in your facility due to a variety of reasons:



INTRODUCTION

Infested material being brought into a facility, or from outdoor pressure through open entries or gaps/holes.



PRODUCT ROTATION

Lack of proper FIFO (first-in, first-out) product rotation and insufficient shelf life maintenance.



SANITATION AND STRUCTURE

Improper or inefficient cleaning of equipment; hard-to-clean places and spillage; cracks or crevices where food debris can accumulate or insects harbor.

A PROACTIVE, PREVENTIVE APPROACH

Our program helps keep plants up and running while preventing stored product pests from infesting your facility and product.

Ecolab uses a partnership approach with a science-based protocol that will drive down stored product pest activity. By thoroughly **inspecting** for the presence of stored product pests and conditions conducive to pest activity, proper **identification**, continual **monitoring**, and implementing best **prevention** practices, together, we can **eliminate** these pests.

PARTNERSHIP IS KEY TO SUCCESS

A successful prevention program requires a strong partnership between you and Ecolab. Ecolab will identify and advise you on actions needed to correct structural, sanitary and operational inefficiencies, proactively treat susceptible areas and provide trend reporting. This proactive, partnership approach will help to prevent conditions that can cause pest-related issues.