



1.800.858.7378 npic@oregonstate.edu

Call, email, or chat Mon-Fri

    A to Z



Spinosad General Fact Sheet

- What is spinosad?
- What are some products that contain spinosad?
- How does spinosad work?
- How might I be exposed to spinosad?
- What are some signs and symptoms from a brief exposure to spinosad?
- What happens to spinosad when it enters the body?
- Is spinosad likely to contribute to the development of cancer?
- Has anyone studied non-cancer effects from long-term exposure to spinosad?
- Are children more sensitive to spinosad than adults?
- What happens to spinosad in the environment?
- Can spinosad affect birds, fish, and other wildlife?

What is spinosad?

Spinosad is a natural substance made by a soil bacterium that can be toxic to insects. It is a mixture of two chemicals called spinosyn A and spinosyn D. It is used to control a wide variety of pests. These include thrips, leafminers, spider mites, mosquitoes, ants, fruit flies and others.

Spinosad has been registered for use in pesticides by the US Environmental Protection Agency (EPA) since 1997.

What are some products that contain spinosad?

Currently, spinosad is found in over 80 registered pesticide products. Many of these are used on agricultural crops and ornamental plants. Others are used in and around buildings, in aquatic settings, and as seed treatments. These products are commonly sprays, dusts, granules, and pellets. Some of these products are approved for use in organic agriculture.

Spinosad is also found in some drugs regulated by the US Food and Drug Administration. These products are used to control head lice on people and fleas on dogs and cats.

IMPORTANT: Always follow label instructions and take steps to minimize exposure. If any exposures occur, be sure to follow the First Aid instructions on the product label carefully. For additional treatment advice, contact the Poison Control Center at 800-222-1222. If you wish to discuss a pesticide problem, please call NPIC at 800-858-7378.

How does spinosad work?

Spinosad affects the nervous system of insects that eat or touch it. It causes their muscles to flex uncontrollably. This leads to paralysis and ultimately their death, typically within 1-2 days.

How might I be exposed to spinosad?

People are most commonly exposed to very low levels of spinosad through their diet. Exposure can also occur if you breathe it in or get it on your skin or eyes. For example, this can occur while applying sprays or dusts during windy conditions. This can also happen after using a product if you don't wash your hands before eating or smoking. You can limit your exposure and reduce the risk by carefully following the label instructions.

What are some signs and symptoms from a brief exposure to spinosad?

Spinosad is low in toxicity to people and other mammals. However, if it gets on your skin or in your eyes it can cause

irritation and redness. In one study, 28 dogs were fed low to moderate doses of spinosad. One dog that received a moderate dose vomited. No effects related to spinosad were observed in the other dogs.

What happens to spinosad when it enters the body?

When eaten, spinosad is readily absorbed. Once inside it moves to many areas of the body and is broken down. The majority leaves the body in feces or urine within 1-2 days. Spinosad is absorbed poorly through skin contact.

Is spinosad likely to contribute to the development of cancer?

No. In multiple studies, animals were fed low to moderate amounts of spinosad in their diet for 1.5 to 2 years. No increased incidence of cancer was observed. Moreover, spinosad has not been found to alter or damage genes. As a result of these experiments, the EPA has classified spinosad as not likely to cause cancer.

Has anyone studied non-cancer effects from long-term exposure to spinosad?

In one study, dogs were fed low doses of spinosad for one year. Effects to gland and immune cells and increases in some proteins and fats in the blood were observed.

Scientists have also tested whether spinosad causes developmental or reproductive effects in rats and rabbits. In these studies, animals were fed low to moderate doses daily throughout their lives or during their pregnancies. Effects were only observed at the highest doses. These included lower body weights and effects to some organs. Abnormal vaginal bleeding, more difficult labors, and abortions were also observed in some pregnant animals at the highest doses tested. No direct effects to their offspring occurred at any dose level.

The EPA limits the levels of pesticides, including spinosad, allowed on food. Due to this, it is unlikely that individuals would be exposed to spinosad at levels this high through their diet.

Are children more sensitive to spinosad than adults?

Children may be especially sensitive to pesticides compared to adults. However, there are currently no data showing that children have increased sensitivity specifically to spinosad.

What happens to spinosad in the environment?

Spinosad is broken down rapidly by sunlight. In the presence of sunlight, half-lives on leaves are 2 to 16 days and less than one day in water. When applied to leaves, some spinosad can be absorbed. However, it does not readily spread from leaves to the rest of the plant. In the absence of sunlight, spinosad breaks down very slowly in water. Half-lives of more than 30 days to 259 days have been reported. However, it binds rapidly to sediment. The half-life in sediment, where no oxygen is available, ranges from 161 to 250 days.

Spinosad also sticks to soil and has a very low potential to move through soil towards ground water. In field studies, no breakdown products of spinosad were found below a soil depth of two feet. In the top layers of soil, spinosad is rapidly broken down by microbes. Soil half-lives of 9 to 17 days have been reported. After it is applied, spinosad is not likely to become airborne.

Can spinosad affect birds, fish, or other wildlife?

Spinosad is practically non-toxic to moderately toxic to fish depending on the species. It is slightly to moderately toxic to aquatic invertebrates. However, spinosad is very highly toxic to eastern oysters. Spinosad is practically non-toxic to slightly toxic to birds, based on studies with bobwhite quail and mallard ducks. It is moderately toxic to earthworms. Spinosad is very highly toxic to bees. However, evidence suggests that spinosad has little or no effect on honey bees and other beneficial insects after sprays have dried.

Where can I get more information?

For more detailed information about spinosad please visit the list of referenced resources or call the National Pesticide Information Center at 1-800-858-7378 or visit us on the web at <http://npic.orst.edu>. NPIC provides objective, science-based answers to questions about pesticides.

Date Reviewed: August 2014

Please cite as: Bunch, T. R.; Bond, C.; Buhl, K.; Stone, D. 2014.

Spinosad General Fact Sheet; National Pesticide Information Center, Oregon State University Extension Services.

<http://npic.orst.edu/factsheets/spinosadgen.html>.

NPIC fact sheets are designed to answer questions that are commonly asked by the general public about pesticides that are regulated by the U.S. Environmental Protection Agency (US EPA). This document is intended to be educational in nature and helpful to consumers for making decisions about pesticide use.



Related Topics:

- [Spinosad Overview](#)
- [Spinosad Video](#)
- [PDF Version](#)

What are pests?

- [Learn about a pest](#)
- [Identify a pest](#)
- [Control a pest](#)
- [Integrated Pest Management](#)

What are pesticides?

- [Herbicides](#)
- [Disinfectants](#)
- [Fungicides](#)
- [Insecticides](#)
- [Natural and Biological Pesticides](#)
- [Repellents](#)
- [Rodenticides](#)
- [Other types of pesticides](#)

Please read our [disclaimer](#) | [Contact us](#) | [About NPIC](#) | [En español](#)

NPIC provides objective, science-based information about pesticides and pesticide-related topics to enable people to make informed decisions. NPIC is a cooperative agreement between [Oregon State University](#) and the [U.S. Environmental Protection Agency](#) (cooperative agreement #X8-84067801). The information in this publication does not in any way replace or supersede the restrictions, precautions, directions, or other information on the pesticide label or any other regulatory requirements, nor does it necessarily reflect the position of the U.S. EPA.