

Spinosad

Q. What exactly is spinosad?

A. Spinosad is an insecticide used to control a variety of insect pests, including fruit flies, caterpillars, leafminers, thrips, drywood termites, and certain beetles. Spinosad is the common name of a mixture of spinosyn A and spinosyn D, two molecules derived naturally from a bacteria through fermentation. Spinosad is the active ingredient in several pesticides that are registered with the U.S. Environmental Protection Agency (EPA): DowAgro's Conserve®, SpinTor®, Success®, and Tracer®.

Q. How does the U.S. Department of Agriculture (USDA) use spinosad in efforts to eradicate fruit flies?

A. USDA's Animal and Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) are using a spinosad-based bait spray to control fruit flies. A small amount of spinosad is mixed with bait that includes sugar and a protein byproduct of corn.

Q. How does spinosad work?

A. Spinosad kills susceptible species by causing rapid excitation of the insect nervous system. To affect the target species, fruit flies must feed on the bait mixture and ingest the insecticide.

Q. How is spinosad applied?

A. Both aerial and ground applications of spinosad bait spray may be used in fruit fly programs, depending upon the size and location of the outbreak. Aerial applications are performed with helicopters or fixed-wing aircraft. Ground applications involve the use of backpack or hand sprayers or those mounted on all-terrain vehicles for eradication, and hydraulic sprayers for crop certification in commercial, host-plant nurseries or orchards.

Q. What is the rate of application for spinosad bait spray?

A. The application rate per acre includes a mixture of 0.008 percent spinosad and 28 percent sugar and attractants. The mixture is diluted in water. This application rate results in actual deposition of 0.00025 pounds active ingredient per acre of spinosad, or 0.01 oz/acre contained in 48 fl oz (6 cups) of bait-spray product per acre.

Q. How does USDA determine whether to use aerial spray or ground applications of spinosad?

A. Currently, USDA and CDFA use aerial application of spinosad and bait in areas that are predominately in commercial production. In urban areas, USDA uses ground applications of spinosad, unless the size of the infested area or severity of the infestation requires an aerial spray application. Control actions are typically prompted by the detection of a reproducing population of exotic fruit flies. The size of the application area will depend on the location of detections.

Q. What effect does spinosad have on nontarget species?

A. The use of a bait mixture that targets fruit flies limits the impact to nontarget species attracted to the bait. The formulation of spinosad used in this program has a low concentration of active ingredient that is not toxic to bees.

Q. How long do treatments last?

A. Spinosad applications usually are administered 5 days apart until eradication is achieved, as determined by the absence of detections in baited traps. Applications may continue for two life cycles of the pest beyond the date of the last detection in the treatment area to ensure that immature life stages, such as eggs and larvae, develop and are exposed to the treatment. APHIS is often able to reduce the number of applications when the situation allows the use of sterile fruit flies, the preferred eradication strategy.

Q. Are there any health risks associated with the spinosad treatments?

A. Health risks from exposure to spinosad bait spray treatments depend upon the amount of exposure and individual susceptibility. Spinosad poses low hazards and negligible risks when handled properly. Extremely large doses of spinosad (at least 2,000 times the application rate for the program) are necessary for acute intoxication of humans and other mammals. The small amount of exposure that members of the public have with spinosad bait spray is well below what is known to cause acute toxicity for humans.

Q. Does spinosad cause cancer or birth defects?

A. There is no evidence of carcinogenicity of spinosad based on chronic rodent feeding studies. Reproductive and developmental toxicity occur only at exposures much greater than any exposures that could occur from applications of spinosad bait spray.

Q. Can spinosad damage the eyes?

A. Spinosad showed slight conjunctival irritation, or agitation of the membranes lining the eyelids, in primary eye irritation tests. The low levels of exposure from spinosad bait spray applications are insufficient to cause visual problems.

Q. How does spinosad affect people with allergies, chemical sensitivity, and other special health problems?

A. Immunological responses to chemical exposure within a population vary. Spinosad is not a skin sensitizer, but some individuals may have allergic or hypersensitive reactions to spinosad or the bait.

Q. What precautions should people take in the treatment area?

A. People should do their best to minimize exposure. Avoid unnecessary contact with pesticides. Remain indoors during spinosad bait spray applications. Do yard work before treatment begins rather than after. Rinse off outdoor play areas. Wash skin and clothing if contact occurs. There is no need for people to relocate during aerial applications of spinosad bait spray if they take proper precautions to avoid potential exposure.

Q. Is it okay to eat fruits and vegetables exposed to treatments?

A. Before cooking or eating homegrown vegetables, rinse them with water, just as you would those purchased from the grocery store. Washing further minimizes any potential exposure.

Q. What is the swimming pool re-entry interval after an area has been treated with spinosad?

A. There is no re-entry interval, and the low rate of applications ensures that exposure from swimming is not of concern.

Q. How long will spinosad residue remain in yards?

A. Residues from applications of spinosad bait spray are short-lived. The half-life of spinosad on cotton is only a few hours on a sunny day. The average length of persistence depends on the amount of sunlight and precipitation. Increased exposure to sunlight and increased rainfall accelerate the breakdown of spinosad.

Q. What effect will treatment have on wildlife?

A. Spinosad as applied in fruit fly eradication programs does not pose any hazard to mammals, birds, reptiles, amphibians, fish, or aquatic insects. Under normal circumstances, spinosad poses no hazard to most pets. It can be toxic to those invertebrate species that ingest the bait, and temporary reductions in the populations of some terrestrial insects could occur.

Q. Why is it that these applications of spinosad are toxic to insects but not to people?

A. The sensitivity of insects to spinosad is far greater than humans because of difference in physiology, site of toxic action, and types of enzymes present. The bait treatment used in the eradication programs is attractive to flies and stimulate their feeding. As a result, flies eat the pesticide, resulting in greater exposure and better pest control.

Q. Could there be any cumulative effects from other exposures that I could receive?

A. The low application rate ensures that exposures are unlikely to have any effects on humans. The rapid degradation rate of spinosad ensures that it will not persist long in the natural environment. Spinosad is readily eliminated from or broken down by enzymes in the human body. Cumulative exposures would require multiple exposures within a short period of time. This is highly unlikely for fruit fly program applications.

Q. Can fruit flies become resistant to spinosad?

A. Resistance to spinosad would require the survival of multiple generations of flies exposed to spinosad. The eradication program applications of spinosad bait spray do not allow survival of fruit flies, so the development of resistance is highly unlikely. The rapid degradation of spinosad also ensures that sublethal exposures to flies are unlikely to result from residues.

Q. Has EPA authorized the use of spinosad for fruit fly eradication?

A. Yes, temporary tolerances are in place to allow use in fruit flies programs. Spinosad has been granted permanent tolerances for some fruits (including citrus), nuts, vegetables, cotton, and meat.

Q. Will spinosad contaminate groundwater?

A. Spinosad adheres readily to organic matter and is relatively immobile in soil. Spinosad is not expected to leak into groundwater. Test results indicate that spinosad typically decomposes before reaching groundwater.

Q. Where can I get more information on the fruit fly eradication program?

A. If you have questions about the fruit fly eradication program, contact APHIS' Plant Protection and Quarantine (PPQ) headquarters at (301) 734-8645.

You can also call your State's regulatory officials, usually listed under department of agriculture, plant protection, or regulatory division, in the State government section of your telephone directory.

In addition, APHIS' Internet home page (<http://www.aphis.usda.gov>) provides up-to-date information on various agricultural pests and disease and other related topics.

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