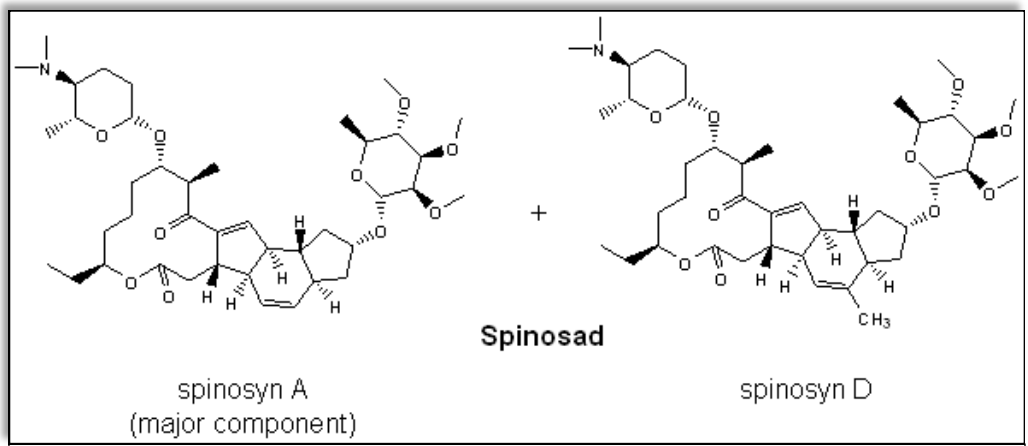
Alternative Insect Control – Spinosad

We have been presenting a series of articles on effective pest control measures you can use as alternatives to the chemical pesticide approach. This month we highlight Spinosad. Spinosad is an insecticide based on chemical compounds produced by the bacterium *Saccharopolyspora spinosa*. *S. spinosa* was isolated from soil collected inside a nonoperational rum distillery in the Virgin Islands. While on vacation in the Caribbean in 1982, a scientist discovered the soil dwelling bacterium in the abandoned distillery.



Spinosad is a mixture of spinosyn A and B. They are have very close chemical structures as seen above. Can you spot the difference. *Hint: look for the methyl hydrocarbon group.*

When grown in culture, *Saccharopolyspora spinosa* produces chemical compounds called spinosyns. Spinosad is a mixture of two of these compounds called spinosyn A and spinosyn D. Spinosad has been registered for use in pesticides by the EPA since 1997. Spinosad is manufactured using a fermentation process in which *Saccharopolyspora spinosa* colonies are grown using natural products such as soybean and cottonseed meal. Currently, spinosad is found in over 80 registered pesticide products.

Group	5	INSECTICIDE
Active Ingredient: spinosad (a mixture of spinosyn A and spinosyn D)		22.5%
Other Ingredients		77.5%
Total		100.0%

Contains 2 lb of active ingredient per gallon.

When in doubt, look for "spinosad" on the product label. Always read the label before using.

Spinosad affects the nervous system of insects that eat or touch it. It causes muscle hyperactivity – they get an uncontrollable nervous twitch. This leads to paralysis and ultimately death, typically within 1-2 days. They simply run out of gas. Spinosad has been shown to be effective against a large number of garden pests including mites, and insects in Thysanoptera, Lepidoptera, Coleoptera, Diptera, Orthonoptera, Hemiptera and Hymenoptera. That means two-spotted spider mites, caterpillars, thrips, aphids, leafminers, leaf-footed bugs, stink bugs, flea beetles, Colorado potato beetles, cucumber beetles, grasshoppers, etc. It is also toxic to honeybees and other pollinators but only during the first 3 hours following application. Individual product labels will give you all this information for each product. Apparently, spinosad has some systemic properties and quantities as low as 1 mg/plant could protect tomato plants from mite infestation when root applied. Foliar applications have shown only minor translaminar movement. It is generally considered a contact insecticide that must be ingested by the target pest. It has shown a mortality rate of 100% when required dosage amounts are ingested. It is registered for use in organic production, has extremely low mammalian toxicity but is toxic to aquatic invertebrates.

Spinosad is broken down in the environment by UV radiation and microbial activity but has slightly better residual when compared to Bt. Some products available that contain Spinosad include: Monterey Spinosad Garden Insect Spray, Entrust SC, Southern Ag Conserve Naturalyte Insect Control, Ferti-Lome Spinosad, Conserve SC and others. Spinosad is a relatively new weapon in the IPM arsenal that more gardeners should consider using.

~Dr. Joe Willis