

Spinosad bait, an organic green bio-insecticide to combat the Cucurbit Fly, *Dacus ciliatus* (Loew) and the peach fly, *Bactrocera zonata* (Saunders) (Diptera: Tephritidae) in Egypt

Sobhy Temerak¹, M.Lysandrou², A. Moussa³, A. Chloridis⁴ and P. Nagy⁵

¹ Research Entomologist Professor, Plant Protection Department, Assiut University, Egypt

²Dow AgroSciences_Export SAS_ Thoriko Lavriou, 19500 Lavrio, Greece

^{3,5}Dow AgroSciences Export S.A, ZAC du Font de l'Orme, 790, Mougin, France

⁴ Dow AgroSciences, Kalymnou 2, 55133, Thessaloniki, Greece

LET US GO

Down to Earth

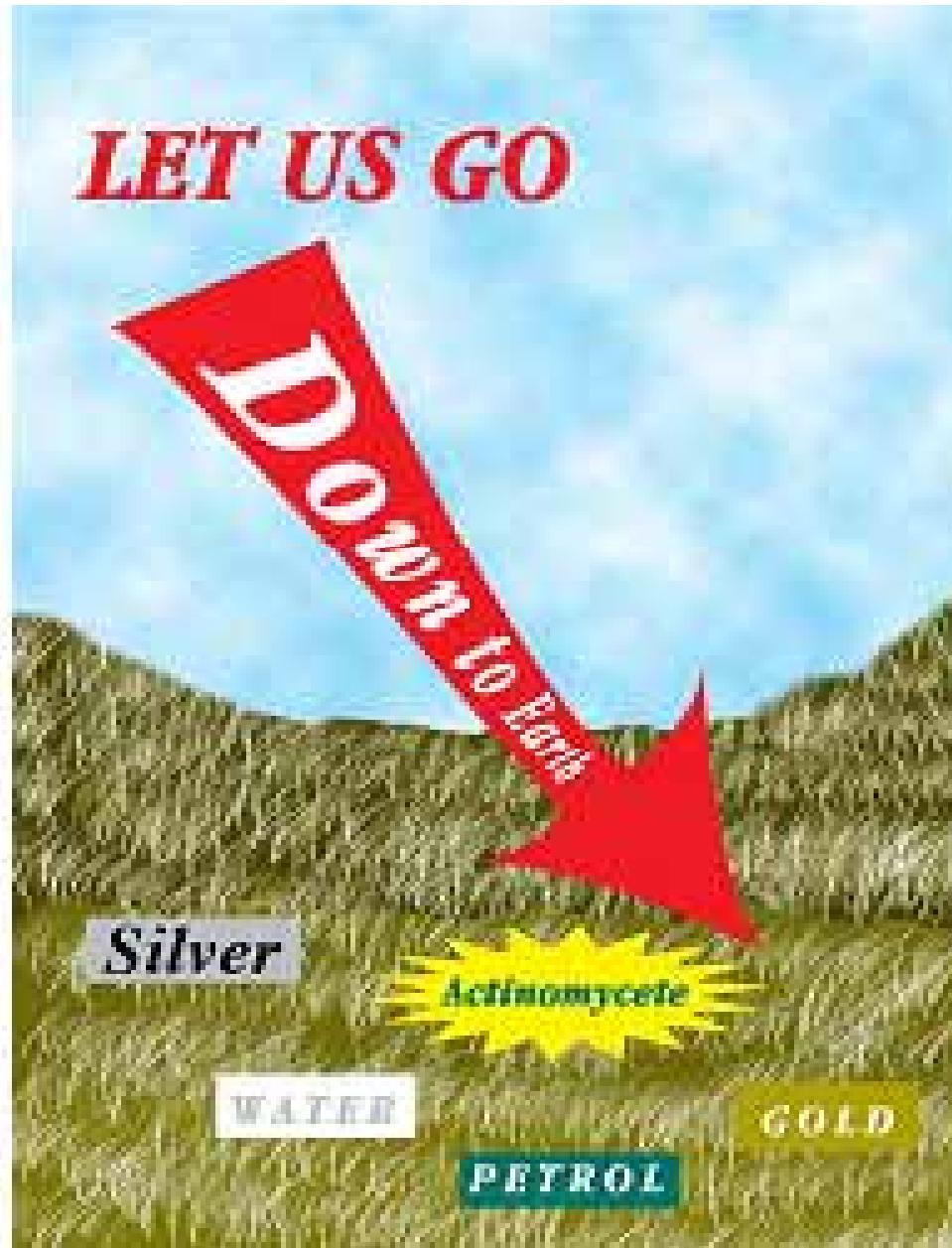
Silver

Actinomycete

WATER

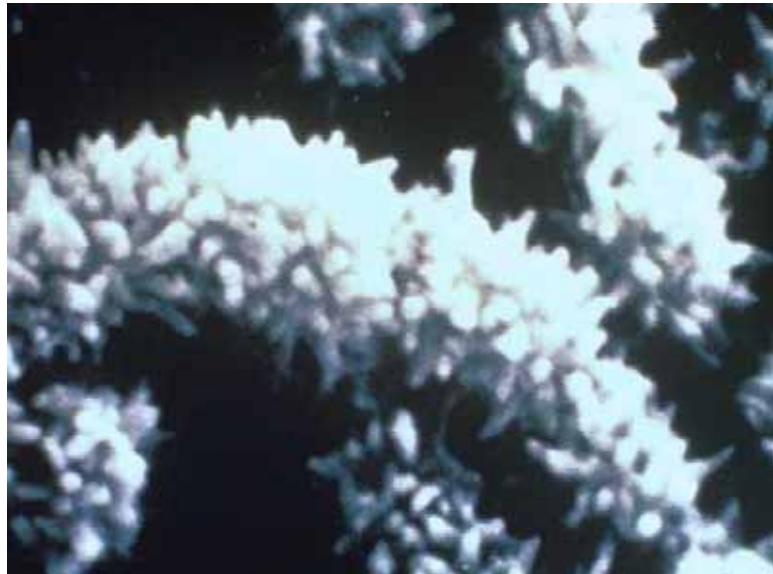
PETROL

GOLD



Saccharopolyspora spinosa: BACTERIA

- Belongs to the order of *ACTINOMICETALES*



Surface of bacteria



Transversal view of
vegetative stage

Actinomycete

Sccharopolyspora spinosa

Spinosad

Tracer 24 % SC

Spinetoram

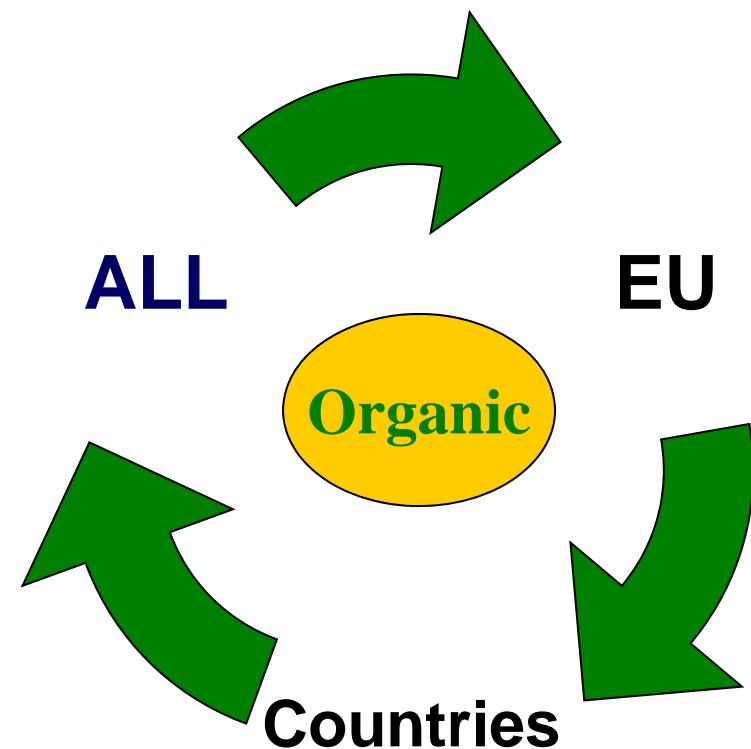
Radiant 12 SC

GF 120 0.024% CB

Spinosad(tracer-conserve)



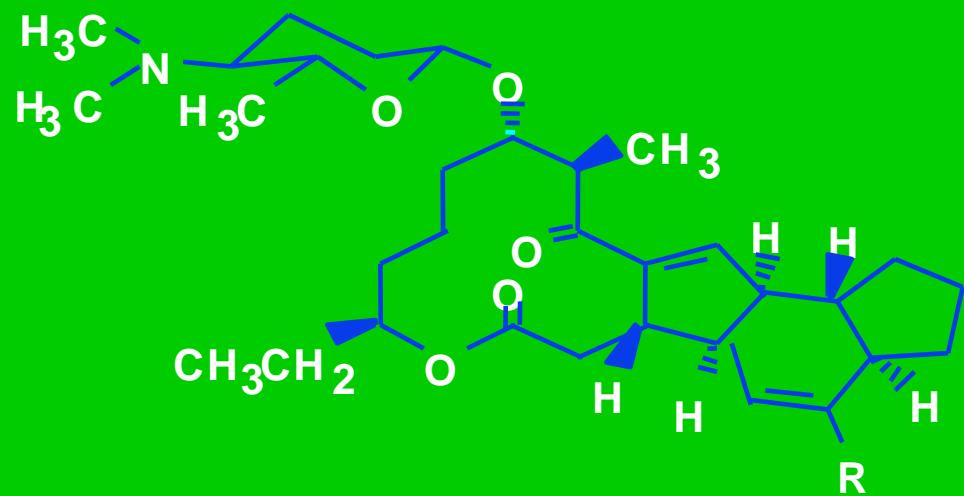
2002 *Spinosad* 2008



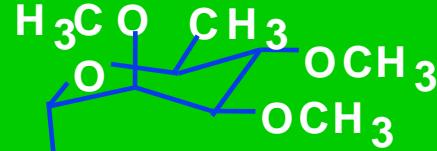
Spinosad

Unique structure

Forosamine sugar



Rhamnose sugar



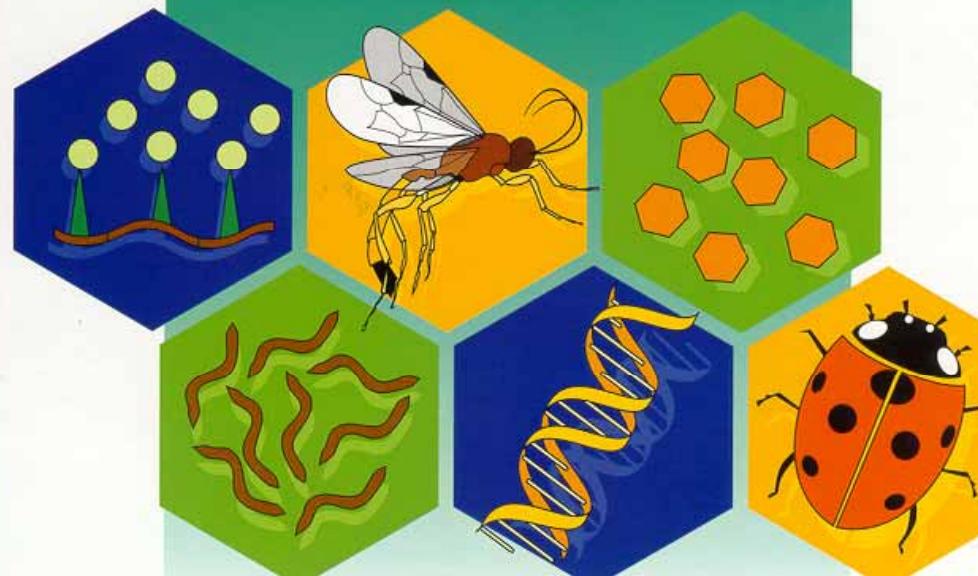
Tetracyclic ring system

A WORLD COMPENDIUM

The BioPesticide Manual

First Edition

Editor: L G Copping

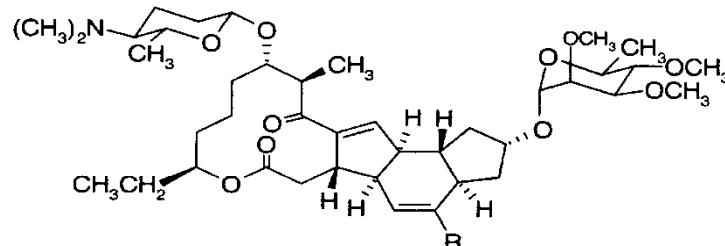


BRITISH
CROP
PROTECTION
COUNCIL

1:27 spinosad

Microbial insecticide

The Pesticide Manual - 11th edition: Entry number 754



spinosyn A, R = H-

spinosyn D, R = CH₃-

NOMENCLATURE: Approved name: spinosad (ANSI, ISO pending).

CAS RN: [131929-60-7] spinosyn A; [131929-63-0] spinosyn D.

Development codes: XDE-105; DE-105.

SOURCE: The commercial product is a mixture of spinosyn A and spinosyn D. Both compounds are secondary metabolites of the soil actinomycete, *Saccharopolyspora spinosa*. The organism is composed of long, yellowish-pink aerial chains of spores encased in distinctive, spiny spore sheaths. The bacterium is aerobic, gram-positive, non-acid fast, non-motile, filamentous and differentiated into substrate and aerial hyphae. The aerial mycelium is yellowish-pink and the vegetative mycelium is yellow to yellowish-brown. The parent strain was originally isolated from an abandoned rum still in the Caribbean.

PRODUCTION: Spinosad is obtained from a whole broth extraction following fermentation of the organism on a feedstock of water, vegetable flours, sugar and animal fat.

TARGET PESTS: Recommended for the control of caterpillars, leafminers, thrips and foliage feeding beetles.

TARGET CROPS: May be used on row crops (including cotton), vegetables, fruit trees, turf, vines and ornamentals. No crop phytotoxicity has been observed.

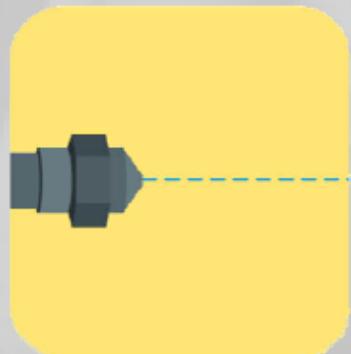
BIOLOGICAL ACTIVITY: **Mode of action:** Spinosad effects on target insects are consistent with the activation of the nicotinic acetylcholine receptor but at a different site than nicotine or imidacloprid. Spinosad also affects GABA receptors but their role in the overall activity is unclear. There is currently no known cross-resistance to other insecticide classes.

Efficacy: The mode of action causes a rapid death of target phytophagous insects. Its

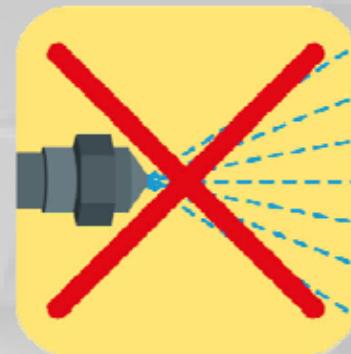
Conserve in Spain terrestrial application



The use of conical spray nozzles with a diameter of
0,8 - 1 mm, without difusor is recommended



Conical nozzle without difusor

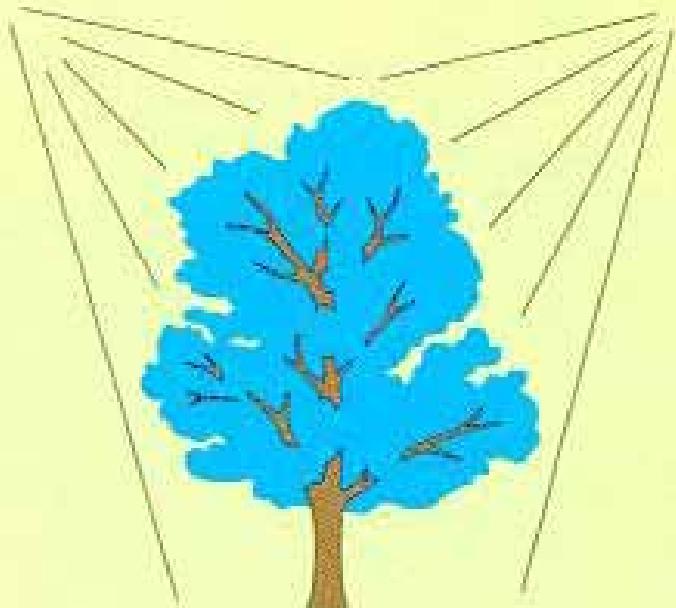


Conical nozzle with diffusor

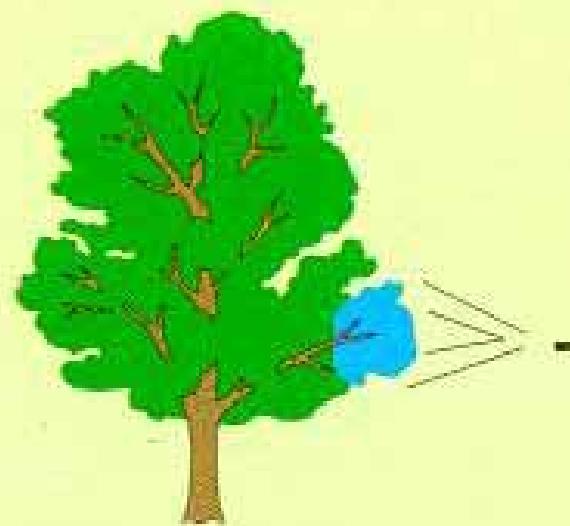
رش كامل

رش جزءي

Insecticide cover sprays



Bait sprays



Bait sprays minimise insecticide usage.

DOW RESTRICTED - For internal
use only

Droplet distribution of foliar application



Last sample infestation by *D.ciliatus*

Products	ml / L/ Fed	squash		cucumber		Snake	
		Infest.%	% adults	Infest.%	% adults	Infest.%	% adults
Gf120	500/ 4 L	0	0	11	25	13	55
	500/ 6 L	0	0	16	50	19	56
	500/ 8 L	1	0	18	62	21	58
malathion	500 / 200 L	63	88	28	86	50	90
Untreated		100	94	63	87	81	89

partial spray every 5 meter except malathion full spray

All 3 prays with 7 days interval

Last sample fallen and non fallen fruit infestation % by *B.zonata*

Product	ml /v.water	Rate	Average Infestation %		General average
			fallen	uptree	
GF-120	400 / 4 L		4	1	5
	500 / 4L		2.6	1	3.7
Gf 120	500 /10L		4.6	1.3	6
Untreated			15	4.6	19.6

All 3 prays with 7 days interval

partial spray malathion full spray

Conclusion

- The spinosad bait (GF-120) proved to be a very effective and viable alternative to malathion, and could be a valuable tool within IPM programs for the control of both fruit fly moths in Egypt.