

Examples of maize intercropping taken up by farmers

Farmer	Mulberry spacing	Maize intercropping spacing	Maize intercropping duration
K.C Shanmugasundaram	4' x 4'	1' x 1'	90 days
Jayakumar	3' x 3'	1' x 1'	90-120 days
Venkataraman	(5'+3') x 2'	Green manuring with Daincha	Twice 60 days each
K. Vellaiyan	4' x 4'	1' x 1'	120 days

Rearing performance after intercropping

Name of the farmer	Rearing period- 2023	Dfls reared	Cocoon yield/ 100 dfls (kg)	Rate/Kg (Rs.)
K.C. Shanmugasundaram	Oct	162	80	430
	Nov	175	79	440
Jayakumar	Oct	50	36	350
	Nov	100	38	370
Venkataraman	Oct	150	70	430
	Nov	150	93	420
K. Vellaiyan	Nov	150	93	375
	Dec	150	96	410

Similarly, non-spinning issues were observed in Tamil Nadu with Sri K. Vellaiyan from Kanavaipatty, Sri K. C. Shanmugasundaram from Kalingiyam, Sri Jayakumar from NG Palyam, Sri Venkataraman from Kattupalayam. Leaf and soil samples were subjected to Paper Strip analysis that revealed pesticide contamination. Based on the survey data and results of paper strip method, maize intercropping, judicious use of recommended pesticides, safeguarding of mulberry crops from pesticide contamination, etc., are suggested to dissipate the pesticide effect in mulberry garden to save silkworm crops.

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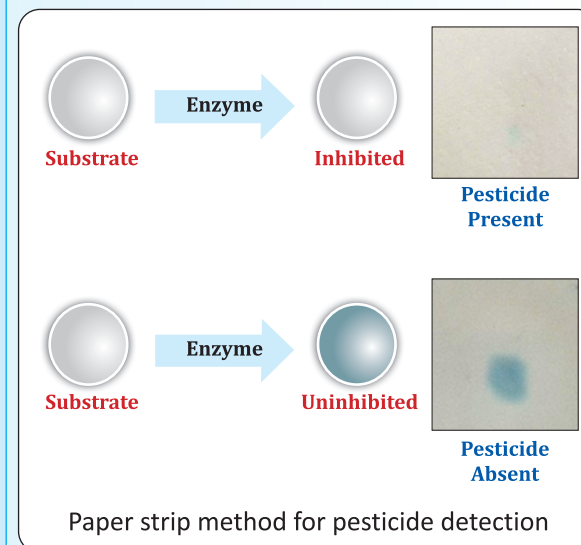
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Non-Spinning Syndrome in Silkworm: Causes, Symptoms, Detection and Remedial Measure

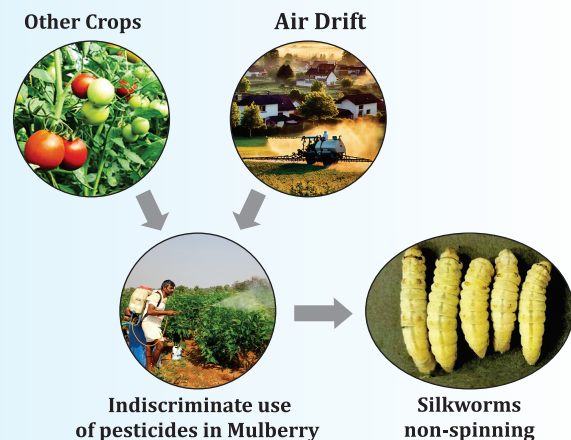


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Introduction

Non-spinning syndrome is the developmental arrest in fifth-instar silkworm larvae that continue to feed and grow but do not spin the cocoon or pupate. Of late, silkworm crop losses due to non-spinning of cocoons have escalated, creating havoc in the sericulture industry. Nearly 54% non-spinning and 34% mortality incidences were noticed among the failed silkworm crops due to pesticides residue. Till recently, not much was known on the non-spinning syndrome in silkworms. The research work at CSB-CSRTI, Mysuru has thrown light on the non-spinning syndrome and its relationship with the usage of indiscriminate and non-recommended pesticides.

Mortality of silkworms was mainly observed among the new sericulture farmers who have shifted from agricultural crops to mulberry. This could be due to uptake of pesticides by the mulberry plant and the leaf that is being fed to the silkworms. Silkworm crop loss due to pesticide contamination is by three routes - a. Shifting from one agricultural crop to mulberry, b. Through air-drift and c. Indiscriminate and non-recommended pesticide usage in mulberry cultivation.



Symptoms due to pesticide contamination

Silkworm bioassay studies were conducted to find out the effect of pesticides used in sericulture and surrounding crops. These different classes of insecticides include:

- Bifenthrin 10% EC,
- Flubendiamide 39.35% SC,
- Buprofenzin 23.1% + Fipronil 3.85% SC,
- Emamectin Benzoate 5% SG,
- Chlorantraniliprole 18.5% SC,
- Imidacloprid 17.8% EC, and
- Fenprothrin 30% EC.

The pesticide concentrations in the study ranged from recommended field doses to serially diluting 25-fold reduced concentrations. The pesticide effect was observed, evident with the larval symptoms like vomiting, flaccid body, rectal protrusion, chain feces, body shrinkage, partially and non-spinning, and also mortality (S-shape and hook shape). Non-spinning was observed in some of the specific concentrations of all the pesticides tested.



Pesticide detection

CSB- CSRTI, Mysuru, developed a new technology in the form of a paper strip method for semi-qualitative detection of pesticides in mulberry leaves and soil. This paper strip method is a cost-effective and user-friendly technology that could help farmers in the early detection of pesticides in soil and mulberry leaves, thereby preventing silkworm crop loss due to pesticides before taking up the rearing.

A Case Study

Sri Prabhswamy, a farmer from Gundlupete, had planted mulberry with 4' × 6' spacing after uprooting tomato and beans. He suffered complete crop loss due to mortality of silkworms in the first rearing itself. The leaf and soil samples were collected and tested for pesticide contamination, through paper strip method on 31.05.2023 and found to be positive for the presence of pesticide. It was suggested to take up maize inter-cropping in the mulberry garden. After two months, maize was uprooted and mulberry was pruned. The mulberry leaf and soil samples were again tested by paper strip method on 02.09.2023. Interestingly, the samples were found to be negative for pesticide. Based on this result the farmer took up bivoltine double hybrid rearing with 50 dfls and recorded cocoon spinning on 31.10.2023. This field study is a classical example that has proved to be a successful story on regaining the silkworm crop affected by pesticide contamination in mulberry garden.

Yield (kg)/ 50 dfls	Single cocoon 50weight (g)	Single Shell weight (g)	Shell ratio (%)	Rate/ kg (Rs.)
38	1.89	0.391	20.6	461/-

