Nesolynx thymus for uzi fly

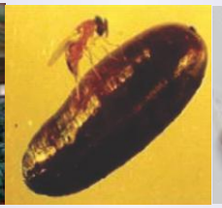
Nesolynx thymus is a hymenopteran ecto-pupal parasitoid of the uzi fly which is a serious pest of silkworms.

Uzi fly

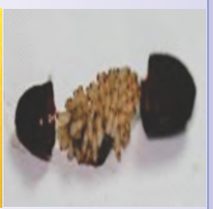
Uzi infested silkworms

Each female *N. thymus* lays about 250 eggs at the rate of 50-70 eggs per pupa ie., each female can destroy about 4 to 6 uzi pupae from which uzi flies never emerge, instead, the adults of N.T. emerges.

N.T. pouch



Egg laying by N.T.



N.T. developing inside uzi pupa

Schedule of release: 2 pouches/100 dfls on 3rd day of 5th instar. From each pouch about 10,000 to 12,000 parasitoids emerge.

Method of release: Two pouches of *N. thymus* are kept in rearing house 3-4 days after IV moult. After the completion of rearing, same pouches are shifted to mounting/harvesting place and finally to litter pit. From each pouch, *N. thymus* adult emergence continues for 7-10 days.

Advantages of Biological control

- Bio-control agents search and kill the target pests
- Biological control is safe to environment
- It can be integrated well with other methods of pest control
- It is self propagating and self perpetuating
- Problem of pest resistance is not there
- No harmful effects on humans, livestock and other organisms
- It is virtually permanent

Precautions

- No insecticide should be sprayed after releasing bio-control agents

Bio-control agents available at

- CSR&TI, Mysore, Ph: 0821-2903285
- NBAIR, Bangalore, Ph: 080-2351 1982
- Parasite Breeding Lab, Dept. of Agric., Mandya, Ph: 08232-238602
- S.R.K Bio-control Centre, Hosur, Tamil Nadu, Ph: 099946 22647

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BIOLOGICAL CONTROL OF INSECT PESTS IN SERICULTURE

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Biological Control of Insect Pests in Sericulture

Biological control is the utilization of one living organism to control another. This is an age old practice and since the time immemorial, man is using cats to control rats. Similarly, to control insect pests also, biological method is being successfully implemented almost since three decades. This method is safe, eco-friendly, cheap and long lasting.

Mulberry, like most of the other crops, is attacked by a vast pest complex. Important among them are pink mealy bug, papaya mealy bug, leaf roller and Bihar hairy caterpillar. Similarly uzi fly is a serious pest on the silkworm. It is estimated that mealybug infestation contributes in bringing down the leaf yield by about 1,800 kg/acre and uzi fly causes cocoon yield loss of about 10-15%. To suppress these pests, few effective insect predators and parasitoids are available. They are as follows:

Lady bird beetles for tukra mealybug

Two species of ladybird beetles namely *Scymnus coccivora* and *Cryptolaemus montrouzieri* feed voraciously on all the stages of pink mealybug which causes tukra symptom in mulberry.

Mealybug infestation

Scymnus beetle

Cryptolaemus beetle

Besides feeding, they also lay their eggs in the midst of mealybug colony. The grubs which hatch out from these eggs also devour various stages of the mealybug which feed for nearly 20 days after which they pupate. In about 7-9 days, adult beetles emerge from these pupae and the total life cycle is completed in about 30-35 days. Adults live for about 2 months.

Recommendation: 2 units/acre/year (in two equal splits at an interval of 6 months).

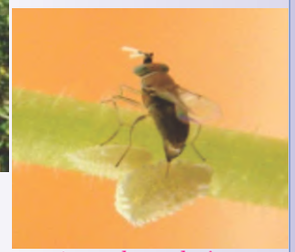
(1 unit= 250 adults of *Scymnus* or 125 adults of *Cryptolaemus*)

Method of release: Release adult beetles near mulberry plants having tukra symptom, covering the entire garden.

Acerophagus papayae for papaya mealybug

These are tiny exotic hymenopteran parasitoids which are very effective against papaya mealybug. They actively search the mealybug nymphs and parasitize them by laying eggs inside their host body. They are host specific, early nymphal parasitoids and complete life cycle in 15-16 days, with a fecundity of 50-60 eggs and adult longevity of 5 to 6 days.

Papaya mealybug infestation



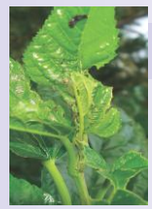
Acerophagus laying eggs inside pest body

Recommendation: On noticing the pest, release the parasitoids@ 100 parasitoids or 1 vial/acre.

Method of release: The lid of the parasitoid container should be removed and walked throughout the papaya mealybug infested garden so that they will come out of the container and go in search of the hosts for parasitization. One time inoculative release is sufficient and repeated releases are not required.

Trichogramma chilonis for leaf roller

This is a very minute hymenopteran egg parasitoid which parasitizes the eggs of leaf roller as well as Bihar hairy caterpillar by laying their eggs inside the host eggs. They complete their life cycle in bout 8-10 days. They are so small that 10-15 individuals can sit on a pin head.



Leaf roller damage symptoms

Hairy caterpillar damage symptoms

Tricho card fixing

Trichogramma parasites

Recommendation: 4 tricho-cards/acre/crop @ 1 card/week starting from 5-6 days after sprying insecticide (July to December).

Method of release: Each card may be teared into small pieces and stapled on the underside of mulberry leaf at random, during cooler hours.