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## Neem Oil and its combined mixtures effects on developmental behaviour of white fly *Bemisia tabaci* and vectors transmission impact.

**Dr. R.K. Jain****Abstract**

The insecticidal effect of neem (*Azadirachta indica*) seed oil was seen on the preimaginal stages, oviposition and Bhindi Yellow Vein Mosaic virus transmission by whiteflies *Bemisia tabaci*. Neem oil had retarded all preimaginal stages of whiteflies on stunnhemp plants. The emulsifiers soap and detergent and neem soap were inhibitory to the 4th nymphal instar only. Neem oil reduced oviposition and inhibited the development of nymphs beyond the 2nd instar. Transmission of virus was reduced by neem oil treatment of plants.

**Keywords:** whitefly, *Azadirachta indica*, *Bemisia tabaci*, Neem Oil

**1. Introduction**

Neem *Azadirachta indica* A. Juss has long been known for its insecticidal properties. Various products from neem such as leaf and kernel extract, oil, deoiled cake and the triterpenoid azadirachtin isolated from seed kernels have been tested but reports on the effect on whiteflies are few, Citronella oil from *Cymbopogon winterianus* Stapf. Contains several components which have been reported as insecticidal and antiovipositant Both neem oil and citronella oil are cheap and dasily available.

**Materials And Methods**

**Neem Oil:** 2% concentration of neem oil as commercial crude in water was used where emulsifies were used detergents 1% soap solution was mixed in neem oil. A commercially available neem soap was also tested at 1% concentration.

**Citronella oil:** It was obtained from Banaj Social Forestry Division, West Bengal. The oil is dissolved in acetone to get 5% stock solution. This was diluted with water to get 0.5% concentration in final dilution. Sparys were done with a spray atomiser, Single spray was done in all experiments. for phytotoxicity on sunnhemp *Crotalaria juncea* L. plants. The treatments were given in three replicates each in experiments.

Below is the Single spray after impact on preimaginal stages of white fly

**Observation, findings and analytic Computation**

Treatment	Concn. (%)	Survival (%) of preimaginal stages		
		Eggs	N <sub>3</sub>	N <sub>4</sub>
Untreated		81	80	65
Soap	0.9	40.6	2.5	24
Neem soap	0.9	31.9	9.6	17
Detergent in water	1.5-2.5 drops/100 ml	29	9	0.0
Acetone				
Water		75	63	69
Neem oil	1.9	0.0	0.0	0.0
Citronella oil	0.6	0.0	0.0	0.0

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\*Determined by no. of adults emerged upto 20 days after treatment.

N<sub>3</sub>- 3rd nymphal instar. N<sub>4</sub>-

4th nymphal instar.

Experiments are repeated 2-3 times and were conducted in the laboratory at 28±2°C

**Vector management**

Whiteflies were maintained on sun hemp or tomato plants at 30±2°C in insect proof cages in the glass house. Their life cycle was completed in 13 days.

For tests on the preimaginal stages, these were obtained by releasing 10 adult whiteflies each on sun hemp plants and removing them after 4 days. The eggs and nymphal instars which appeared subsequently were treated. The antiovipositional action was tested by spraying sun hemp plants. The white flies were removed after 4 days and the leaves observed for eggs and subsequent nymphal development. 30 plants were used for each test.

**Analytical discussion of result obtained**

In Table Neem oil and Citronella oil completely retard all preimaginal stages of whiteflies. azadirachin which cause prolonged larval period and inhibit ecdysis (Rembold et al. 1983, Condriat et al. 1985), the crude oil appears promising. and delayed adult emergence from nymphal stages by 2 days.

**Oviposition Analysis**

Citronella oil completely deterred ovioposition. Neem oil caused scanty oviposition and the nymphs which emerged did not survive beyond the 3rd instar stage, as antifeedant and antiovipositant to whiteflies (Dreyer, 1983)

**BYVMV Transmission Pattern**

Percent disease incidence on *Abelmoschus esculentus* L. was reduced as a result of neem oil spray

**Treatment after effect on nymphal development on position and survival of Bemisia Tabaci**

Treatment	Concn (%)	n1	n2	n3	n4	n5
Untreated		42	37	26	22	24
Soap	9.9	37	31	8	7	9
Acetone: Water		60	58	45	37	29
Neem Oil	4	43	27	7	0	0
Citronella Oil	7	36	15	0	0	0s

n1 - Total number of whiteflies released on 3 plants

n2 - Total no of whiteflies surviving after 4 days

n3 - Total no of eggs on treated leaves

n4 - Total no of 4th nymphal instars (pupae)

n5 - Total no of adults emerged after 20 days

**Conclusion**

Whitefly population is reduced by the use of Neem Oil & Citronella oil due to their strong insecticidal & antiovipositant action.

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