

Neem based formulations used against bud fly, *Dasyneura lini* Barnes in Linseed (*Linum usitatissimum*) crop

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Abstract- This investigation was conducted at Deptt. Of Entomology, IGKV, Raipur during rabi season 2009-2010. The efficacy of neem- based formulations to evaluate against linseed bud fly, *Dasyneura lini* Barnes in linseed crops. It was done under Randomized block design (RBD) with three replications. Among different formulations the NSKE 5% was found best with percent damage of 10.80 followed by Neem Seed Coat Extract (NSCE) 5% whereas, commercial Neem product (Nimbolin) gave only 13.30% bud infestation and untreated plot performed higher bud infestation of 29.07 per cent.

Index Terms- *Dasyneura lini* Barnes, Linseed bud fly, Neem-based formulations.

I. INTRODUCTION

Oilseeds occupy an important position in agriculture and industrial economy next to food grains in terms of area, production and value. The cultivated oilseeds comprise nine different crops namely groundnut, soybean, niger, rapeseed, mustard, sunflower, safflower and sesamum as edible oilseeds and castor and linseed as industrial oil crops (Mukherji et.al., 1999) Linseed is an important oilseed crop in India Linseed occupies a greater importance among oilseeds owing to its various uses and special qualities.

It is grown mainly for seed used for extracting oil in rainfed conditions. The oil content of the seed varies from 33-47%. Linseed oil is excellent dyeing oil used in manufacturing paints and varnishes, oilcloth, waterproof fabrics and linoleum and as edible oil in some areas.

Linseed cake is a very good manure and animal feed. Dual-purpose linseed straw produces fibre of good quality. Linseed is also used in making paper and plastics. That is why it is also known as plastic crop. Flaxseed is a common ingredient within many different home remedies, as it is a powerful herb used to help promote healthy digestion as well as reduce high cholesterol and heart disease.

In Chhattisgarh, linseed is cultivated over 64.08 thousand hectare area with a production of thousand tonnes and productivity of 284 kg/ha. Maximum area of this crop is grown

as 'utera' during rabi season. The important linseed growing districts of Chhattisgarh are Rajnandgaon, Durg, Bilaspur, Kabirdham, Raipur, Dhamtari, Surguja, Kanker and Raigarh (Krishi Darshika, 2014).

Linseed crop is attacked by number of insect pests at various phases of its growth. Linseed bud fly (*Dasyneura lini*) with 88 percent grain yield losses followed by Thrips (*Caliothrips incicus*), jassid (*Amrasca* sp.), semilooper (*Plusia orichalsia* Fab) and linseed caterpillar *Spodoptera exigua* Hub. Mallik et al. (2000)

Adult of linseed budfly is a small orange coloured fly. Its tiny pinkish maggots feed on the developing buds. The infested buds become hollow and can be easily identified from the healthy buds. Chemical insecticides have been recommended for the effective control of bud fly incidence in linseed. However, there are serious residual problems and ecological consequences of the insecticides. The need to phase out the use of chemical pesticides is now being felt and the use of plant products of plant protection are catching momentum of late.

Plant products derived from neem *Azadirachta idica* A.Juss. contain biologically active components that may act as toxicant, repellent, antifeedant and growth disrupting substance on insect pests and are not only ecologically safe but also free from residual problems (Gujar, 1992) All the parts of neem like seed, seed coat, kernel and leaf can be used to produce high quality product. Product derived from neem tree also act as powerful Insect Growth Regulator (IGR) (Subbalakshmi et al, 2012). Keeping these facts in view, studies on the efficacy of neem products against the bud fly in linseed crop were undertaken.

II. MATERIAL AND METHODS

A study was conducted in the rabi season 2009-10 to evaluate the neem based formulation at farm of IGKV, Raipur, Chhattisgarh under randomized block design with ten treatments (including control), replicated thrice. Plot size was kept 5x4 m² and distance from row to row and plant to plant were maintained at 30 cm and 8-10 cm, respectively. Linseed variety 'Neelum' was sown in November month. The treatments were applied twice at fortnightly interval starting from bud initiation stage. For Bud infestation was recorded at dough stage on ten plants per plot was recorded randomly and counts of infested and total buds were noted. The data on percent bud infestation recorded were

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transformed to arc sine. At harvest, seed yield per plot was also recorded and converted in kg per hectare.

Table-1 Following neem based formulations tested against *Dasyneura lini* on linseed

S.No.	Name of treatment
1	Neem leaf extract @2%,
2	Neem leaf extract @5%
3	Neem seed kernel extract @2%,
4	Neem seed kernel extract @5%,
5	Neem seed extract @2%
6	Neem seed extract @5%
7	Neem seed coat extract @2%
8	Neem seed coat extract @ 5%
9	Nimboline @0.5%.
10	Untreated control.

The formulations were prepared by following method.

- Neem leaf extract** –Extracted the pure juice of fresh neem leaves by crushing and squeezing them.
- Neem seed kernel extract**- Neem seed kernels were soaked in water on weight basis before 72 hours of application.
- Neem seed extract**- Whole neem seeds were soaked in water on weight basis before 72 hours of application.
- Neem seed coat extract**- Only neem seeds coat was soaked in water on weight basis before 72 hours of application.

All extracts were filtered with the help of fine muslin cloth before spraying.

III. RESULTS AND DISCUSSION

All the neem plant product formulations including the commercial product significantly reduced the per cent incidence of bud fly.

Bud fly infestation

Bud fly infestation ranges from 19.2 to 26.7 percent in different Neem based formulations as against 32.6 percent bud damage in untreated control. NSKE 5% with bud infestation of 19.2 percent was most effective against budfly. followed by Neem Seed Coat Extract (NSCE) @ 2%,with 20.8 percent bud infestation. Neem leaf extract 2 percent with highest bud damage of 26.7 percent was least effective against bud fly among Neem based formulations as against 32.6 percent bud damage in untreated control.

Effect on grain yield

The data on grain yield indicated that NSKE when applied at 5% was most effective against bud fly with highest grain yield of 838 kg/ha. It was significantly followed by Neem seed extract (NSE) 2% with grain yield 790 Kg/ha. The latter was at par with Neem seed extract (NSE) 5% and Neem seed coat extract (NSCE) 2 % with 778 and 763 Kg/ha respectively. Hence, as an

alternative strategy to synthetic insecticides, neem based insecticides are gaining greater attention and popularity worldwide owing to their biodegradability and bio safety to non target pests is concerned. While testing the neem products against *D.lini* Gupta *et al.* (2000) recorded highest grain yield and maximum net profit with neem oil 0.1% followed by neem oil 0.5%.

While testing the bioefficacy of different neem products against linseed bud fly at Faizabad, Ali (2002) found that NSKE performed better than other botanicals. He further reported that neem based insecticides were significantly superior in reducing the incidence of *D.lini* and enhancing the seed yield. Similar finding was reported by Humayun (2008) that NSKE @ 5 per cent when applied twice at 15 days interval starting with bud initiation stage was most effective against linseed bud fly with the lowest bud damage of 14.15 per cent and the highest grain yield of 1309.325 kg/ha and maximum net profit of Rs. 11106.6. Prasad and Prasad (2003) also reported 6.48 percent minimum damage by linseed bud fly and 1.96 percent damage by capsule borer and maximum yield of 1288.06 kg/ha and net monetary return of Rs. 9467/ha at Ranchi when the crop was sprayed five times at ten days interval with NSKE 5 percent.

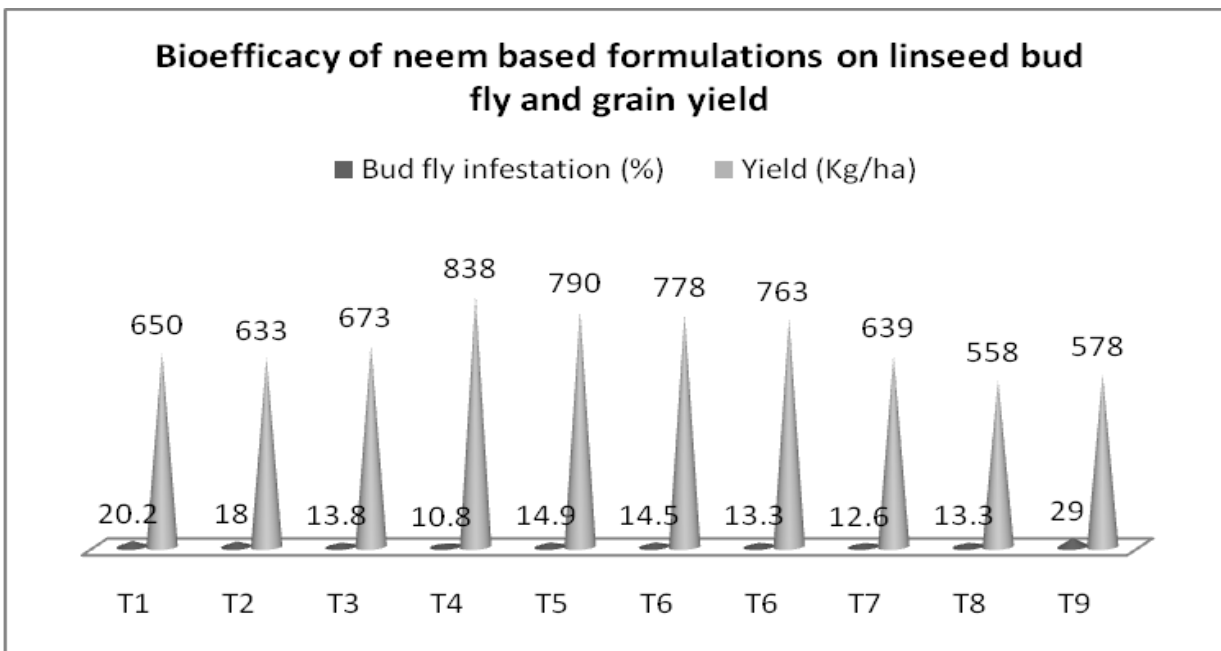
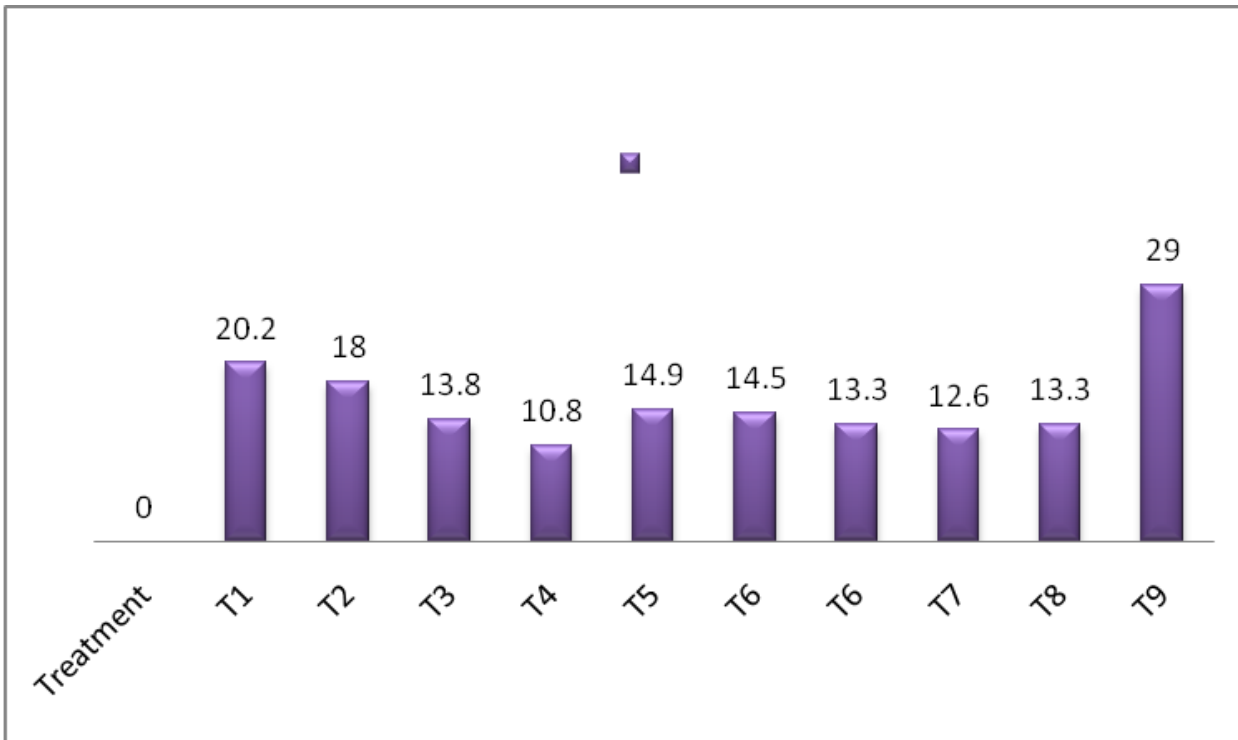
Gupta and Rawat(2004) reported reduction in the incidence of *D.lini* and increase in the grain yield with increase in the concentration of neem leaf extract, NSKE and neem oil.

Table-2: - Performance of Neem based formulations against bud fly infestation percentage and grain yield in linseed crop

Treatment	Name of treatment	Bud fly infestation (%)	Yield (Kg/ha)
T1	Neem leaf extract 2%,	20.2(26.7)	650
T2	Neem leaf extract 5%	18.0(25.1)	633
T3	Neem seed kernel extract 2%,	13.8(21.8)	673
T4	Neem seed kernel extract 5%,	10.8(19.2)	838
T5	Neem seed extract 2%	14.9(22.7)	790
T6	Neem seed extract 5%	14.5(22.4)	778
T7	Neem seed coat extract 2%	13.3(21.4)	763
T8	Neem seed coat extract 5%	12.6(20.8)	639
T9	Nimboline 0.5%.	13.3(21.4)	558
T10	Untreated control	29.0(32.6)	578
SE(m)±		0.46	24.8
CD (at 5%)		1.36	73.7

Values in parenthesis are transformed value

Performance of Neem based formulations against bud fly infestation percentage





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