



Short communication

Effects of Neem leaves powder on groundnuts termites, *Microtermes thoracolis* and white curbs, *Phyllophaga crinita* and on Yield in Gedarif State

Received Date: Aug/24/2010

Accepted Date: Jan/09/2011

El.N.H. Suliman^{1*}

1- * Crop Protection Research Centre
Agricultural Research Corporation,
Sudan
Elnayer15@yahoo.com

ABSTRACT

Studies were conducted in Northern Gedarif State at Gadambalia area during 2000/01-2001/02 seasons to evaluate the effects of neem leaves powder on groundnuts termites, *Microtermes thoracolis* and white curbs, *Phyllophaga crinita* damage and on yield under rainfed conditions. Data on numbers of pods/5 plants, dead plants, % damage, harvested plants and yield were recorded. Two varieties of groundnuts viz., Sodary and Barberton were sown on flat 60 cm. a part and 20 cm. between plants on July 21 in both seasons. Two dose rates of neem leave powder viz., 50 and 100 Kg/fedd were used and corporate with soil before sowing. Neem leaves powder at two dose rates was gave good performance for controlling groundnuts termites and white curbs. The data was analyzed by using software MSTAT.C program. ANOVA was used for significant differences of the treatments and Duncan's Multiple Range Test for means separation.

Key-words: *Neem, Microtermes thoracolis, Phyllophaga crinita.*

INTRODUCTION

To reduce hazards due to chemical insecticides, worldwide search for insecticides of plant origin dominated the trend of studies for over 25 years. The low toxicity of these insecticides and their quick decomposing nature qualify them as replace chemical insecticides. The neem tree, *Azadirachta indica* A. Jus became one of the promising plant species because its active ingredients [mainly azadirachtin] are of very low toxicity and do not kill insects by contact [hence, they do not harm beneficial insects]. Moreover, insects could not develop resistance against their great number of diversified characteristics [5].

The neem tree *A. indica* is a fascinating and widespread tree. The extraction of neem possesses an array of compounds attacking different insect species, acting in concert on both behavioral and physiological processes of the insects. To utilize the insecticidal potential of a zadirachtin, the major active ingredient of neem, it is a must to clarify whether pests are able to develop resistance against the compounds [4].

Recently the efforts of scientists were directed towards the organic farming, adoption of IPM strategies and the search for natural products to combat insect pests and plant diseases. The neem tree proved to contain a substance in the leaves and seeds that, in addition to anti-feedants, feeding inhibitors, growth regulators and hormonal activities [ecdysone like] have properties that disturb the hormonal activity and balance. These substances are varied and many, the most famous and effective are azarachtin, salanin, geduinin and meliartriol [3].

The Groundnut crop, *Archie hypogea* L. is the most important crop adopted in the small farmers fields in Gedarif state. More than 80% of the villages in southern Gedarif grow groundnuts for both cash crop and diet.

Groundnut is a favorite food crop in Gedarif and constitutes an important daily diet of most farmers. Groundnut seeds can be eaten raw, roasted or boiled and as a paste called "Dakwa" with salad. It is regarded as a rich source of energy compared to other crops. Its biomass and byproducts after oil extraction from the seeds are highly valued feeds for livestock and poultry, respectively. Besides, groundnut crop is a potential source of foreign

exchange in the Gulf countries and in some parts of Europe [1-2].

Termite in heavy clay soil of Gedarif is considered as the most important pest of groundnut. Usually, the damage starts from the first week after emergence up to harvest time. The outbreak is serious when ever there is dryness. The species of termites in the area was identified as *Microterms thoracolis* Sjust. This species attacks the crop from sowing to the harvest, and causes losses up to 30% of yield under rainfed conditions.

White-grubs are beetles belonging to the order *coleoptera*, family *scarabaeidae*. There are several species of white-grubs worldwide, mainly in Asia, Africa and in latin America, attacking groundnut, sugar-cane and corn. White-grubs attack a range of host-plants preferences.

The initiated study was designed to determine the effects of neem leaves powder on groundnut termites and white-grubs and on yield.

MATERIAL & METHODS

The study was carried out during the period 2000/02 [July-December] rainy seasons at Gedarif Research Station Farm [at Gadambalia area].

Two varieties of groundnuts viz, Barberton [B] and Sodory[S] were sown on July/21 in both seasons. The treatments were arranged in randomized complete block design [RCBD] with four replications. The plot size was 42 square meters. Two dose rates of neem leaves powder were tested viz., 50 kg/fedd [Ne1] and 100 kg/fedd [Ne2], neem leaves were incorporated with soil before sowing the crop. All cultural practices were observed by the instruction act set by the Agricultural Research and Technology Corporation Standard. The mean number of dead plants/m², pods/5 plants, damaged pods/5 plants and yield were computed.

The data was analyzed after transformation by using software MSTAT.C program. ANOVA was used for significance of the treatments; Duncan's Multiple Range test was used for means separation.

Treatments:

1. 50 kg/fedd neem leaves powder [N1]
2. 100 kg/fedd neem leaves powder [N2]
3. Fernsan-D standard [F]
4. Control [Untreated] [C]

RESULTS & DISCUSSION

Results presented in [Table 1] showed differential response between treatments and percent damage with treatments 1, 2 and 3 scoring lowest damage compared to untreated control. Significant differences between treatments 1 and 2 were observed as for the dead plants where the treatments 1 and 2 were less damaged compared to other treatments.

The highest yield was obtained by treatment I and the poorest yield was recorded by untreated control.

CONCLUSION

During 2001/02 season, different treatments showed good performance compared to the previous season. Results in [Table 2] Showed that the percent damage was significantly different between treatments. Damage pods were significantly less in treatment 1. Treatments 4, 7 and 5 obtained high yield compared to other treatments.

REFERENCE

1. Binyason, S. A. (2004). Effect of sowing dates for managing white-grub damage on groundnuts at Rahad Scheme. The 70th. Meeting of the Pest and Disease Committee, 14 June, 2004, Wad Medani Sudan.
2. El Nayer, H. S. (2001). Agric. Research Corporation, Gedarif Resarch Station. Annual Report 200/01.
3. El Sidig, F. I. Bashir, N. H. H. and El Hag, F. A. (2002). Evaluation of different Neem preparations on *Microterms thoracolis* Sjost. (150 ptern: Termitidae) infesting Groundnut. The 66th. Meeting of the Pest and Disease committee, Wad Medani, Sudan.
4. Ma De;omg (1997). Utilization of Neem strategy control the American ball worm. Hand back, Dept. of Entomology, University of Queens land, Australia.
5. Siddig, A. Siddig (1997). Potential uses of Neem in crop Protection. Integrated Pest Management in Vegetables, Wheat and Cotton in the Sudan. 125-127. FAO/ARC IPM Project, Wad Medani, Sudan.

Table 1. Mean number of pods/5 plants, dead hearts,% damage and yield during 2000/01 season

Treatments	% damage	No. pods/ plants	No. harvest of plants	% of dead plants	Yield (Kg) fedd
1. BN2	4.6 (12.39) b	200.5 a	54.0 a	10.2 (18.6) b	304.85 a
2. BN1	6.25 (14.54) b	199.5 a	47.0 a	13.3 (21.4) b	249.9 b
3. Fernsan-D	13.9 (21.89) b	188.0 a	50.5 a	18.3 (25.3) b	237.3 b
4. Control	23.4 (28.93) a	107.0 b	34.5 b	43.3 (41.2) a	153.5 c
Total mean	48.15	695.25	186.0	85.0	946.1
Mean	12.04	191.31	46.5	21.3	241.5
S.E ±	3.70	9.5	3.7	6.5	23.5
C.V. %	30.7	4.9	7.7	30.6	9.7

- Number (s) between parentheses was transformed to arcsine.
- Means having the same letter (s) were not significant at 5% level according to Duncan's Multiple Range Test.

Table 2. Mean number of dead plants, damage pods/plant, plants/ m² and yield during 2001/02 season

Treatments	No. of dead plants	Damage pods	No. pods/ m ²	Yield (Kg.)/ fedd
1. Bc	2.00 c	0.74 d	12.8 a	250.5 b
2. SN2	5.00 b	3.5 b	11.5 b	252.3 b
3. BN1	7.10 a	3.6 b	12.3 a	220.8 b
4. BN2	3.50 c	1.7 c	11.8 b	361.5 a
5. SN1	1.50 c	1.8 c	12.0 a	325.0 b
6. Sc	4.50 b	2.7 c	11.5 b	235.0 b
7. BF	1.00 c	1.7 c	12.0 a	318.0 b
8. SF	9.00 a	7.2 a	10.0 c	242.8 b
S.E ±	0.80	0.35	0.32	35.3
C.V. %	8.9	4.8	5.8	3.5

- Means having the same letter (s) were not significant at 5% level according to Duncan's Multiple Range Test.