



Current Report

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NEMATODE CONTROL IN PEANUTS

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Nematodes can cause considerable reductions in yield for the peanut grower. Many species of plant parasitic nematodes are found in the Oklahoma peanut fields; however, only the Northern Root-knot (Meloidogyne hapla), Ring (Criconemoides sp.), and Root-lesion (Pratylenchus brachyurus) nematodes seem to be causing problems.

Chemical control has been demonstrated to be effective and economical. Peanut yields have been doubled following a nematicide-soil fungicide band treatment in a field heavily infested with Root-knot nematode.

Several nematicides are now available as liquid-fumigants and granular non-fumigants and when properly applied, will provide control of nematodes for one season. Trade names of satisfactory chemicals include: Fumigants - DD, Dowfume W-85, Telone, BBC 12, Nemagon, and Fumazone. Non-Fumigants - Dasanit, Mocap, and Thimet-Zinophos.

1970 PEANUT NEMATICIDE TRIALS¹

The nematode control trials and demonstrations were located on the Dickerson-Page farm and Keeton farm near Willis, Oklahoma. This program is designed to test the various nematicides under Oklahoma conditions in order that specific suggestions can be made to the grower. Observations were made of the various nematicides in com-

¹With the continued changes being made in restricting use of various pesticides, the peanut nematicide trials and demonstrations maintain and update our recommendations:

binations with soil fungicides. Special emphasis was placed on methods and time of application, which seem to play an important role in obtaining more economic control with both granular and liquid nematicides.

A study on the Dickerson-Page farm, consisting of 16 treatments of various combinations of Di-Syston, Dasanit and Namacur and a General Study, 17 treatments consisting of Furadan, Mocap, Thimet-Zinophos and Tirpate were made. Chemicals were applied to a sandy loam soil infested with Northern Root-knot (Meloidogyne hapla), Ring (Criconemoides sp.) and Root-lesion (Pratylenchus brachyurus) nematodes. Field sampling indicated populations of root lesion nematodes to be low. The greatest damage was expected from the heavy infestation of root-knot nematodes. DD mixture at 10 gals/A and Nemagon 12.1 EC at 1 gal/A were used as standards.

Plots were two 36" rows 100 ft long replicated 3 times and randomized. The variety "Argentine" was planted May 28 and all plots harvested October 30. Peanut samples were taken from each replication and nuts were rated for nematode damage to the hull. Rating: no necrosis = 1, 75% or higher = 4.

Method of Application

- I = In-furrow blending at planting (May 28).
- II = Band (7 inch) at planting (May 28).
- III = Band (14 inch) at planting (May 28).

- IV = Pegging application (July 14)
14 inch band over the row and incorporated.
- V = Seven inch band spray incorporated in furrow planting area (May 21).
- VI = Fourteen inch band spray incorporated in furrow planting area (May 21).
- VII = Broadcast spray incorporated at planting (May 21).
- VIII = Pegging application (July 14) applied as spray directed at the base of plant (pegging zone).
- IX = Injected at an 8 inch depth with one 45 degree "L" shank chisel per row.

CHEMAGRO STUDY-Dickerson-Page Farm, Willis, Okla.

Chemical, Rate Per Acre and Type Application	Yield lbs/a	Diff/a /Ck
1 Dasanit 15G - 3 lbs ai/a + Terr. Super X - 3 lbs ai/a - I + Dasanit 15G - 3 lbs ai/a + Terr. Super X - 3 lbs ai/a - IV	2662	709
2 Nema-cur 3 SC - 3 lbs ai/a - V + Nema-cur 3 SC - 3 lbs ai/a Spray - VIII	2569	616
3 Dasanit + Di-Syston 15G (1.1) - 4 oz/1000 ft. - III	2311	358
4 Dasanit 15G - 3 lbs ai/a - Terr. Super X - 3 lbs ai/a - I	2350	397
5 Dasanit + Di-Syston 15G (1.1) - 2 oz/1000 ft. - I	2231	278
6 Dasanit + Di-Syston 6 SC (1.1) - 4 oz/1000 ft. - VI	2198	245
7 Di-Syston 6 LC - 6 lbs ai/a - VII	2145	192
8 Check - No Treatment	1953	0

Treatments not significantly better than non-treated plots are not reported. For complete information, request Peanut Disease Progress Report #P-645.

Dickerson-Page farm results: Highest yields were obtained in plots treated with Dasanit 15 G, 3 lbs ai/A plus Terraclor Super X, 3 lbs ai/A applied by Method IV. The yield of 709 lbs/A was significantly greater than other treatments in the test. Treatments of Nema-cur 3SC, 3 lbs ai/A applied by Method V, followed by a similar pegging application (VIII) produced almost twice the yield increase (616 lbs/A) obtained in other treatments.

The two highest yield increases (709 and 616 lbs/A) were obtained in plots receiving the planting and pegging nematicide applications.

Lesion nematode populations obtained from the October root sampling were found to be lower in treatments receiving pegging applications. All samples taken established that a heavy infestation of root-knot occurred over the test area during the season.

Suggested Grower Use: Dasanit 15G at 3 to 4 lbs ai/A applied as band incorporation at planting and/or pegging, not to exceed 7 lbs ai/A total for season.

GENERAL STUDY-Dickerson-Page Farm, Willis, Okla.

Chemical, Rate Per Acre and Type Application	Yield lbs/a	Diff/a /Ck
1 Tirpate 10G - 2 lbs ai/a - III	2403	814
2 Tirpate 10G - 4 lbs ai/a - III + Terraclor 30G - 4 lbs ai/a - I + Tirpate 10G - 4 lbs ai/a - IV + Terraclor 30G - 6 lbs ai/a - IV	2337	748
3 Tirpate 10G - 4 lbs ai/a - III	2291	702
4 Tirpate 10G - 4 lbs ai/a - III + Terraclor 30G - 4 lbs ai/a - I + Terraclor 30G - 6 lbs ai/a - IV	2158	569
5 Mocap 10G - 3 lbs ai/a - III + Mocap 10G - 3 lbs ai/a - IV	2139	550
6 Thimet-Zinophos - PCNB - Terrazole comb - 100 lbs form/a - I + III	1990	331
7 DD 100% - 10 gal/a - IX (Applied May 5) - Standard	1894	305
8 Mocap 10G - 3 lbs ai/a - III	1874	285
9 Furadan 10G - 4 lbs ai/a - III	1854	265
10 Furadan 10G - 1 lb ai/a - I + Furadan 10G - 2 lbs ai/a - IV	1788	199
11 Thimet-Zinophos - 1 lb ai/a - III	1741	152
12 Check - No Treatment	1589	-

Treatments not significantly better than non-treated plots are not reported. For more complete information, request Peanut Disease Progress Report #P-645.

GENERAL STUDY RESULTS: Plots receiving various treatments of Tirpate produced the highest yield increases (569-814 lbs/A). Yield increases obtained from Mocap (550 lbs/A), Thimet-Zinophos + PCNB-Terrazole combination (331 lbs/A), and Tirpate 10G treated plots (569, 702, 748, and 814 lbs/A) were not significantly greater than the standard, DD 100% mixture at 10 gal/A (305 lbs/A), however, they were better than other treatments. Yield increases were significantly greater in plots receiving the higher rates of Furadan 10G, 4 lbs ai/A and Thimet-Zinophos 7.5 - 7.5, one lb ai/A. Application of Mocap 10G, 3 lbs ai/A applied in 14 inch band at planting produced greater yields than

pegging time applications at this location.

Further testing of Tirpate is warranted and additional yield information is needed from various rates and methods of application. Furadan has performed well in this test as in other studies and can be suggested for growers use when federal clearance is obtained.

Suggested Growers Use: Mocap 10G at 3 to 4 lbs ai/A applied as band incorporation at planting.

Large Field Plot Demonstration,
Keeton Farm, Willis, Oklahoma

Field plots were four 36 inch rows approximately 1,500 ft. long (approximately $\frac{1}{2}$ acre). Liquid fumigants applied preplant and at plant were injected at an 8 inch depth with one 45 degree "L" shank chisel per row. Fumigants applied at pegging were injected 8 to 10 inches deep with straight shank knife 6 to 8 inches from base of plant. Granular chemicals (non-fumigants) were applied at plant with Gandy 901 Jr. applicator mounted on a John Deere 71 Flexi Planter and pegging applications made with Gandy 901 Jr. applicator mounted on a Lilliston cultivator. Non-treated plots (checks) were maintained adjacent to each chemical treatment. The preplant applications of DD, DD + Chloropicrin combinations, and Nemagon were made May 21 and plots planted June 8. The non-fumigants were applied at planting, June 8. Pegging time applications were made July 15.

LARGE FIELD PLOT RESULTS - FUMIGANTS:

The increased yield (467 lbs/A) produced with the higher rate of DD, 20 gal + Chloropicrin, 21.9 lbs/A may reflect control of various pests including soil fungi. Higher rates of Nemagon 12.1 EC, 1.5 gal/A produced greater yield increases (383 lbs/A) than the 1.0 gal/A treatments applied at plant. Pegging application of Nemagon 12.1 EC, 1 gal/A show increased yields, however, higher rates, 1.5 gals/A, reflect a yield decline.

The lower yields produced by plots receiving preplant and at plant treatments may be due to the low population of root-

knot and heavy infestations of lesion nematode. The grower reported a 900 lbs/A increase on 80 acres from Nemagon 12.1 EC, 1.0 gal/A applied as a pegging treatment (July 10-15). Severe wilting occurred following application, suggesting a two weeks earlier treatment may cause less plant damage. Further studies on pegging application are needed before growers usage can be suggested with confidence. The increased yield obtained in plots treated with the higher rates of DD and Chloropicrin may reflect a control of various soil pests by fumigation, however, the disagreeable nature of this combination does not enhance its usage.

LARGE FIELD PLOTS-FUMIGANTS Keeton Farm, Willis, Ok.

<u>Chemical and</u> <u>Rate/Acre (Actual)</u>	<u>Yield</u> <u>lbs/a</u>	<u>Diff/a</u> <u>/Ck</u>
1 Nemagon 12.1 - 1 gal - II + Nemagon 12.1 - 1 gal - III	2787	505
2 DD 100% - 20 gal + Chloropicrin 21.9 lbs - I	2749	467
3 DD 100% - 10 gal - I + Terraclor - 10 lbs - II + Nemagon 12.1 - 1 gal - III	2712	430
4 Nemagon 12.1 - 1.5 gal - III	2712	430
5 Nemagon 12.1 - 1 gal - III	2426	144
6 Nemagon 12.1 - 1.5 gal - II	2378	105
7 DD 100% - 20 gal - I	2330	48
8 DD 100% - 10 gal + Chloropicrin 15.6 - I	2330	48
9 Nemagon 12.1 - 1 gal - II	2330	48

Applications as noted: I = preplant, II = at planting, III = early pegging.

LARGE FIELD PLOT RESULTS - NON-FUMIGANTS: Furadan 10G, 1 lb ai/A plus Polyram 10G, 4 lbs ai/A applied at plant followed by an additional application of Furadan 10G, 2 lbs ai/A plus Polyram 10G, 6 lbs ai/A produced 625 lbs/A greater yield than average of untreated adjacent plots. Mocap 10G, 3 lbs ai/A applied at plant and pegging produced 331 lbs/A increase in yield and greater increases than either treatment alone. The combination of Thimet-Zinophos - PCNB - Terrazole produced 459 lbs/A more than average of adjacent non-treated plots. Increased yields were obtained in plots receiving pegging time treatments. Fewer lesion nematodes were recovered by root incubation in plots treated with Furadan and Thimet-Zinophos.

LARGE FIELD PLOTS-NONFUMIGANTS-Keeton Farm, Willis, Ok.

Chemical and Rate Per Acre	Yield lbs/a	Diff/a /Ck
1 Furadan 15G - 1 lb ai + Polyram 10G - 4 lbs ai - II + Furadan 15G - 2 lbs ai + Polyram 10G - 6 lbs ai - III	2987	625
2 Thimet-Zinophos - PCNB - Terrazole comb. G - 100 lbs - II	2822	459
3 Furadan 15G - 1 lb ai - II	2726	364
4 Mocap 10G - 3 lbs ai - II + 3 lbs ai - III	2693	331
5 Mocap 10G - 3 lbs ai - III	2590	230
6 Mocap 10G - 3 lbs ai - II	2488	126

Applications as noted: II - at planting, III - early pegging.

Peanuts harvested from the treated plots were brighter and clearer showing less nematode pod damage. Harvest samples were lost therefore grade determination could not be made. The increased yields produced in the Furadan-Polyram and Thimet-Zinophos plus PCNB-Terrazole treatments were quite impressive. The difference in bright, clear color of the peanuts from all treated plots as compared to non-treated could be easily noticed when each bin was dumped in trailer.

Results of the peanut nematicide trials and field demonstrations indicate the need for continued work on method

and timing of application. These factors seem to be critical in the application of granular nematicides. Tests would indicate that time of nematicide application may be related to the nematode species and future control recommendations may depend on species found with the field population.

SUGGESTED CHEMICAL CONTROL FOR NEMATODES IN PEANUTS IN OKLAHOMA 1971^{1/}

Nematicide - Rate Formulation/Acre ^{2/}	Row Application
DD Mixture 10-20 gals	Injected 8" deep with chisel-Pre-plant. Allow 1 week for each 10 gal applied.
Nemagon 12.1 EC 1.5-2 gals	Injected 6-8" deep at planting not to exceed 26 lbs ai/a total for season. Feeding restriction.
Dasanit 15G 20-26 lbs	Band incorporation at planting and/or pegging. Not to exceed 7 lbs ai/a total for season. Feeding restriction.
Mocap 10G 30-40 lbs	Band incorporation at planting.

^{1/} Chemicals have been tested under Oklahoma conditions and proven effective.

^{2/} Rates are given as actual amount of active ingredient in the formulation to be used per treated area per/a.

Oklahoma growers seem to prefer granular application over liquid sprays and injected fumigants. The handling of granular chemicals is considered easier and a safer method of application.

The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.