# CONTROL OF NEMATODES IN PEAT WITH FORMALDEHYDE[1]

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## Abstract

Dripping 37% formaldehyde solution at the rate of 5 ml per $ft^3$ onto dried peat on a conveyor belt before sealing in polyethylene bags eliminated saprophytic and free-living nematodes.

In 1968, a commercial peat processing company at Aylesford, Nova Scotia, was losing peat moss sales to mushroom growers due to nematode infestations. Using the Baermann funnel extraction technique (1) random samples of processed peat from polyethylene bags contained 0 to 69 nematodes per pound. The nematodes, identified by R. H. Mulvey and Dr. L. Y. Wu, Entomology Research Institute, CDA, Ottawa, consisted mostly of saprophytic or free-living forms of Panagrolaimus sp., Plectus sp., and Seinura sp.; a Ditylenchus sp. was found in an occasional sample.

Peat is generally stockpiled in heaps for 4 to 6 months before drying and bagging. Temperatures measured at depths of 8 and 36 inches from the surface in stockpiled peat were 100°F (37.8°C) and 139°F (59°C) respectively. At 139°F nematodes should not survive since most are killed after 30 min exposure to 120°F (48.9°C) (1). In 1968 samples taken from piled peat at depths of 0, 15, and 24 inches contained 44, 484, and 198 nematodes per pound of peat respectively. A 4-month-old pile sampled in 1969 contained 2414, 2147, 166, 0, and 0 nematodes per pound at depths of 6, 9, 18, 27, and 36 inches respectively. Processed peat from the center of the stockpile was nematode free but in the commercial operation it was impractical to separate the outer and inner layers of the pile. During processing the peat was subjected to an air temperature of 174°F (78.9°C) for about 15 sec but nematodes survived this exposure. It was impractical to increase either the temperature or the exposure time. Thus, nematodes were usually present in the bagged peat.

To evaluate the use of formaldehyde in killing nematodes in peat, bioassays were conducted by adding 37% formaldehyde solution (formalin) at rates of 5, 10, or 20 ml per $ft^3$ to 12 $ft^3$ polyethylene bags of peat. The bags were immediately closed with staples and were sampled for nematodes 7 and 14 days later. At 7 days nematodes were present at all rates of formaldehyde used, but at 14 days there were no nematodes present in any of the treated samples. At each sampling date nematode counts averaged 110/lb in the untreated peat. Subsequent tests were done with formaldehyde dripped onto peat on the conveyor belt at the rate of 5 ml per $ft^3$, either just before the peat entered the dryer or before the dried peat was bagged. The bags of peat were sampled for nematodes 1, 7, and 14 days later. Peat treated just before bagging was free of nematodes, but the drying process apparently destroyed the effectiveness of the formaldehyde (Table 1). Nematode counts increased in bags of untreated undried peat during the 14 day period following bagging but counts did not increase in untreated dried peat.

Thus in our tests 37% formaldehyde at the rate of 5 ml per $ft^3$ freed peat from nematodes. This process is being used commercially at a cost between 2 and 3 cents per $ft^3$ of peat.

**Table 1. Nematode counts in peat exposed on a conveyor belt to drip treatment with 37% formaldehyde and packaged in sealed polyethylene bags**

| Treatment | Avg no.* nematodes/lb of peat 1-14 days after treatment | | |
|---|---|---|---|
| | 1 day | 7 days | 14 days |
| Formaldehyde, 5 ml/$ft^3$, added after drying | 0 | 0 | 0 |
| Formaldehyde, 5 ml/$ft^3$, added before drying | 9 | 21 | 3 |
| Untreated control, packaged after drying | 15 | 18 | 6 |
| Untreated control, packaged without drying | 12 | 69 | 579 |

* Avg of three 12 $ft^3$ bags.

## Literature cited

1. Mai, W. F., chairman. 1968. Control of plant-parasitic nematodes, Vol. 4 in C. E. Palm, chairman. Principles of plant and animal pest control. National Academy of Sciences Publ. 1696. Washington, D.C.

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