POT POPPERS™ FUNGUS GNAT BIOCONTROL IN CELERY TRANSPLANTS

FUNDED BY:

THE ENVIRONMENTAL FACTOR INC.

Dept. of Plant Agriculture, University of Guelph
Ontario Crops Research Centre (2020-2021)

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Crop: Celery (*Apium graveloens* L.), cv. TZ 6200
Pest: Fungus gnat (*Bradysia sp.* (Winnertz))

Title: **Pot Poppers™ Fungus Gnat Control In Celery Transplants, 2020-2021**

Materials:

- Pot Popper™ Pearls (*Steinernema Feltiae*) – The Environmental Factor Inc.
- CITATION 75WP (cyromazine 75%)

Methods:

The trial was conducted in 2020-21 at the Muck Crops Research Station greenhouse in the Holland Marsh, Ontario. The experiment was designed to evaluate the efficacy of Environmental Factor, Inc. Pot Popper Pearls containing entomopathogenic nematodes (*Steinernema feltiae*) to control fungus gnats (*Bradysia sp.*) (FG) in vegetable transplant production. Treatments were: Pot Popper Pearls at the recommended, half and one-tenth rates of nematodes and CITATION 75WP (standard insecticide control). Untreated checks with and without fungus gnats were also included.

Results:

As presented in Table 1

Conclusions:

Celery grown in plug trays treated with the recommended or the half-rate had fewer fungus gnat larvae than trays treated with CITATION. All rates of Pot Popper Pearls had fewer fungus gnat larvae than the untreated check (Table 1). The number of nematodes was significantly higher in soil treated with the recommended rate compared to the one-tenth rate (Table 1).

All rates of Pot Popper Pearls resulted in celery plants that were taller and had a heavier root mass than celery from the untreated + fungus gnat check. Plants that received the recommended or the half rate of nematode pearls were also taller than those that were treated with CITATION and did not differ in height from celery not exposed to fungus gnat feeding.
These results demonstrate that fungus gnat larvae can significantly reduce the mass of plant roots as a result of feeding and that this reduces plant height. However, the low root weight observed in the untreated, no-gnat check celery maybe because the BugDorm reduced the amount of light compared to celery grown in the enclosure.

This study indicates that the addition of nematodes in the Pot Popper Pearls reduced the number of adult fungus gnats compared to the untreated control. There were no differences between the recommended rate and half rate for any of the factors assessed. However, fewer nematodes were found in the 1/10 rate and there was a numerical trend for slightly more fungus gnats and slightly shorter plant height at the lower rate. The recommended rate and half rate were consistently more effective than the CITATION insecticide. There were fewer fungus gnat adults and taller plants. These beneficial nematodes could be an effective addition to a greenhouse IPM program for vegetable transplants.

Table 1. Numbers of fungus gnat larvae and entomopathogenic nematodes found in plug soil and fresh top and root weights for celery, cv. TZ6200, treated with various rates of Pot Popper Pearls at Muck Crops Research Station, Holland Marsh, Ontario, 2020-21.

Treatment	# Fungus gnat larvae[1]	Nematodes/kg soil	Plant height[2] (cm)	Fresh top wgt[2] (g)	Fresh root wgt[2] (g)
Untreated + no gnats	0.0 a[3]	-	17.9 a	53.4 a	25.7 b
1/2 rate	1.8 a	5515 ab	18.2 a	37.9 b	40.9 a
recommended rate	2.0 a	8330 a	18.3 a	37.9 b	42.8 a
1/10 rate	2.3 ab	1920 b	17.2 ab	38.2 b	41.7 a
CITATION	5.3 bc	-	15.9 bc	39.1 b	39.1 a
Untreated + gnats	8.3 c	295 b	15.5 c	37.0 b	26.8 b

[1] Number of fungus gnat larvae in the soil of six plugs on 10 March.
[2] Average of 20 plants on 10 March.
[3] Numbers in a column followed by the same letter are not significantly different at P = 0.05, Fisher's Protected LSD test.

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