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YIELD LOSSES IN WHITE BUTTOM MUSHROOMS DUE TO NEMATODE INFESTATION

by
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Summary. Nematode infestation in mushroom leads from a very poor crop to total crop failure. The extent of damage depends upon the stage at which nematodes enter into the cropping system.

Among various species of mushrooms that are commercially grown in India, *Agaricus bisporus* (Lange) Singer is the most susceptible to the attack by myceliophagous nematodes (Khanna and Sharma, 1989). So far, seven species of the genus *Aphelenchoides* have been found to be harmfully associated with mushroom cultivation in India (Khanna and Sharma, 1988). Of these *Aphelenchoides composticola* Franklin, highly is the most prevalent and potentially highly damaging.

An investigation was made to estimate the extent of losses that this nematode could cause when mushrooms were inoculated at two different times during cropping.

Materials and methods

Twenty four polythene bags were each filled with 20 kg of pasteurized compost and spawned with a pure culture of

Agaricus bisporus. Eight bags were each inoculated with 500 individuals of *A. composticola* at the time of spawning; another eight bags were inoculated with the same number of *A. composticola* after 30 days (i.e. at casing time). Uninoculated bags were maintained as a control to compare the sporophore yields. Linear mycelial growth was estimated visually at the time of casing and nematode multiplication and total sporophore yields were recorded at the time of the termination of the experiment.

Results and discussion

In the bags inoculated with *A. composticola* at the time of spawning, inhibition and depletion of mycelium was apparent within two weeks and after 30 days there was a significant difference in percent mycelial growth between nematode inoculated and uninoculated bags (Table I).

TABLE I - Effect of *Aphelenchoides composticola* on mycelial growth, nematode multiplication and sporophore yields of *Agaricus bisporus*

Treatments	% mycelial growth after 30 days	No. of nematodes (10^3) after 30 days	No. of nematodes at termination	Multiplication rate	Sporophore yields (10^2 g)	% yield loss
Nematodes inoculated at spawning	26	69	25	50	3	95
Nematodes inoculated at casing	90	—	32	61	20	64
Control	91	—	—	—	55	—
CD at 0.05	7.7		1.7×10^3		2.4×10^2	

There was also a large increase in nematode numbers after 30 days in the bags inoculated with nematodes at the time of spawning but the rate of multiplication was less than in the bags inoculated at casing time.

The total sporophore yields drastically declined in both nematode treatments compared with the control. Damage was extremely high where nematodes were inoculated at spawning and yield losses reached 95 percent (Table I). Bags inoculated at casing also suffered a significant loss of yield (63 percent) compared with the control indicating that nematodes are a key factor in causing partial to total crop failures in mushrooms.

The results indicate that *A. composticola* multiplies rapidly when an adequate food supply is available as evident from the very high density of nematodes at casing time in the first treatment. Nematode populations thereafter declined as insufficient mycelium was available to support such a large number of individuals. On the contrary, the nematode number increased significantly in the second treatment where they were inoculated at a time when suf-

ficient mycelial growth had already developed in the compost. Multiplication rate of nematodes was thus found to be density dependent irrespective of the time of their inoculation as earlier also reported by Arroll and Blake, 1968. There were heavy yield losses of white button mushrooms in both the treatments, although damage was much higher when nematodes penetrated the mycelium at an early stage.

Literature cited

- ARROLL N.P. and BLAKE C.D., 1968 Some effects of the nematodes *Ditylenchus myceliophagus* and *Aphelenchoides composticola* on the yield of cultivated mushroom. *Ann. appl. Biol.*, 61: 161-166.
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