

Effect of thermal and fumigation treatment of *Brachiaria decumbens* seeds infested by nematodes.

INTRODUCTION

The seed-borne nematodes can be introduced into a new area through the seeds used in exchange genetic materials between countries.

The thermotherapy proprieties of high temperature can compare with fumigation proprieties in order to control seed-borne nematodes.

Previous results indicate that thermotherapy properties shown the nematode eradication from different botanic seeds, such as rice; oat; wheat; maize; *Panicum*.

In this context, this study had the purpose to verify the efficacy of dry thermal treatment and fumigation to eliminate nematodes from *Brachiaria decumbens* seeds, without damage to the seed, avoiding the risks of new species and races introduction.

MATERIAL AND METHODS

The effectiveness of fumigation, chemical and physical treatments applied against *Aphelenchoides besseyi* on *Brachiaria decumbens* seeds were evaluated under laboratory conditions at Embrapa/Brazil.

Wet thermal treatment was 40°C followed 57°C (previous exposition time 15 and 30 min.) followed by 15minutes, for both variations.

Previously dry thermal treatment, seed humidity was decreased (at 24°C and 15% of relative humidity/8days).

Dry thermal treatment was 60°C/6 or 3h. and 95°C/3h.

Fumigation with aluminium phosphate / 72 h. exposition time.

NaOCl (2%) + Formol (1%) / 30min.

Treatments were eight (8) plus two (2) controls (without any treatment) and each treatment had four replicates, with 200 seeds each (Table 1).

The evaluated parameters were:

- Seed germination (G) - made one week after treatments;
- Seedling vigour (V) - made two weeks after treatments;
- Root size of seedlings (RS) made two weeks later treatments;
- Number of survived nematodes (NN) extracted two weeks after treatments.

RESULTS

The results were summarised in Table 1 and demonstrated that Thermal Wet 2; Thermal Dry 2 and Chemical Treatments DID NOT AFFECT the germination seeds of *Brachiaria decumbens*.

Refer to Vigour, HAD LOWER AFFECTED, for the others treatments: Thermal Wet 1; Thermal Dry 1 and Chemical Treatments.

Therefore, in the Thermal Wet Treatment, the results showed later germination for treated seeds when compared with controls, and the increasing was 0.87%.

Regarding to root size of *B. decumbens* were positive affected by the Thermal Wet Treatment, being bigger than controls.

Except Fumigation, all other variations of Thermal and Chemicals Treatments, WERE ABLE to eradicate the nematode, *Aphelenchoides besseyi* from *B. decumbens* seeds, when small amount of seeds was treated.

The reduction of humidity did not affect the Germination, Vigour and Root Size, but the number of nematode was the double of the control (without any treatment).

Table 1. Results from different types of treatments applied on *Brachiaria decumbens* seeds infected by *Aphelenchoides besseyi*.

Treatment	G-Seedling number	G(%)	V Seedling number	V(%) ^(*)	RS	NN
Control	162,25	81,125	139,50	85,98	6,93	5
Humidity reduction	163	81,50	135,25	82,98	7,82	10
Chemical	162,25	81,125	159,50	98,30	6,21	0
Fumigation	158,50	79,25	134	84,54	6,03	1
1 Thermal Wet 30m./15m.	156	78	161,25	103,36	5,94	0
2 Thermal Wet 15m./15m.	167	83,50	149	89,22	7,13	0
1 Thermal Dry 6h./3h.	151	75,50	105,50	69,87	7,96	0
2 Thermal Dry 3h./3h.	160,50	80,25	118,25	73,68	7,60	0

Mean of four replicates

(G) Seed germination; (V) Seedling vigour; (RS) Root size of seedlings; (NN) Nematode Number.

(*) Later Germination



Figure 2. Evaluation of *Brachiaria decumbens* infected by *Aphelenchoides besseyi*.

CONCLUSION

The Thermal Treatment could be recommended for z eradication from *Brachiaria decumbens* seeds, in lower exposition time to heat.

The cost benefit analysis and treatment of imported materials were crucial in decreasing the risks of introduction of new nematodes.

All measures to avoid new introduction of quarantined nematodes are justified and the cost benefit is valid and collaborate with Brazilian Agriculture

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Figure 1. Evaluation of *Brachiaria decumbens* infected by *Aphelenchoides besseyi*; a - seedlings under greenhouse conditions; b - seedlings the collected day; c - root length measures.