

# Greenhouse efficacy tests of contact nematicides with cotton grown in soil infested with lesion nematodes (*Pratylenchus brachyurus*).



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## Introduction

The root-lesion nematode *P. brachyurus* is a migratory endoparasite with a broad host range, able to penetrate the roots, causing necrosis and predisposing plants to other root diseases. Cotton (*Gossypium* spp.) is the main source of natural fibers, with 33 million hectares covered in the world. New contact nematicides have been developed and tested for several years, mostly on root-knot nematodes showing a good efficacy. Nonetheless, not many tests have been reported against other plant-parasitic nematodes, including *Pratylenchus* spp.

**Objective** The study's goal was to determine the efficacy and potential phytotoxicity of four different nematicides in the control of *P. brachyurus* on cotton.



Fig. 1 Cotton plants

## Materials and Methods

Two greenhouse experiments were performed to evaluate the efficacy and crop safety of four nematicides on cotton *Gossypium hirsutum* cv GC510 (Fig. 1). A sandy soil UC mix was infested with greenhouse culture raised nematode *P. brachyurus* (500 juveniles/100 cm<sup>3</sup>) (Fig. 2). Three sets of plants were simultaneously prepared. Each following week, one set of plants was terminated, and data for plant growth parameters and nematode population from roots and soil were collected. From each pot, a 100 cm<sup>3</sup> soil subsample was placed on a Baermann funnel for 5 days at 26°C. Nematodes from roots were extracted in a mist chamber over 2 weeks. A second greenhouse trial was performed using the same treatment setup but with three-weeks-old cotton seedling transplanted just before treatment application. After 60 days, data were collected as mentioned. The trial design was a randomized complete block with five treatments and replications. A one-way ANOVA was performed, followed by Fisher's LSD test for comparison of means. Numbers with the same letter are not significantly different ( $P \leq 0.05$ ).



Fig. 2 *P. brachyurus*

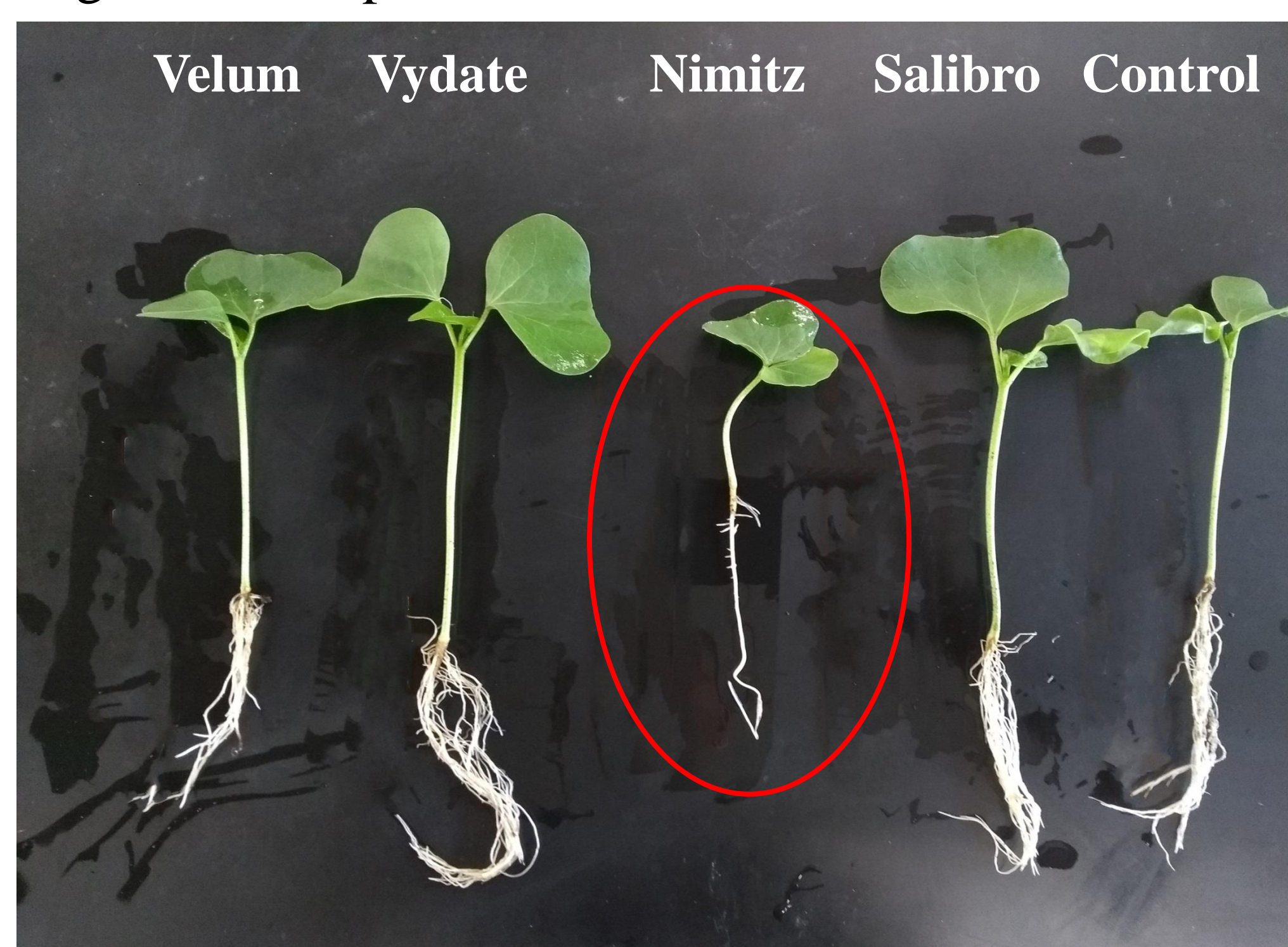


Fig. 3 Representative cotton seedlings at 7 days

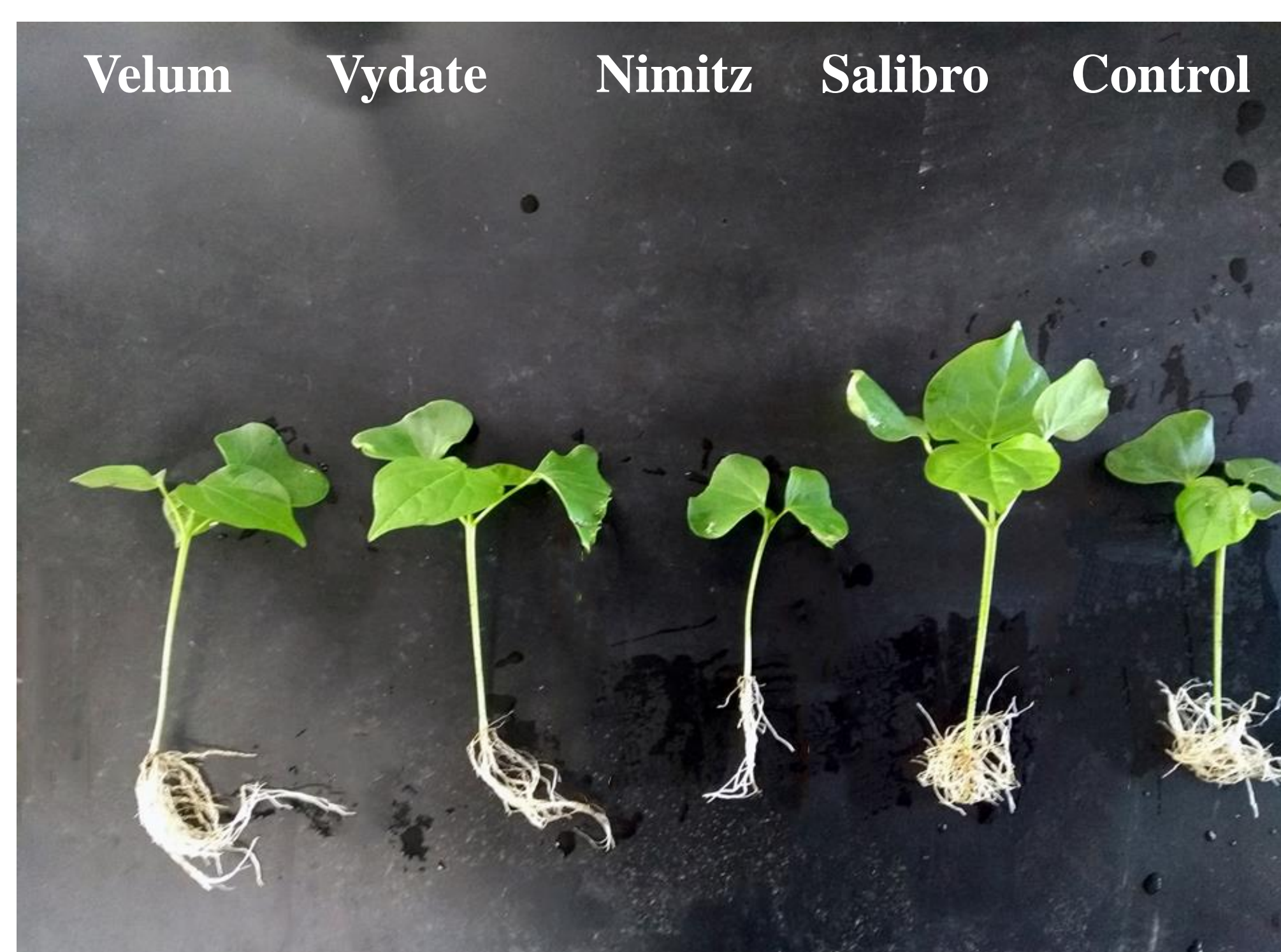


Fig. 4 Representative cotton seedlings at 14 days

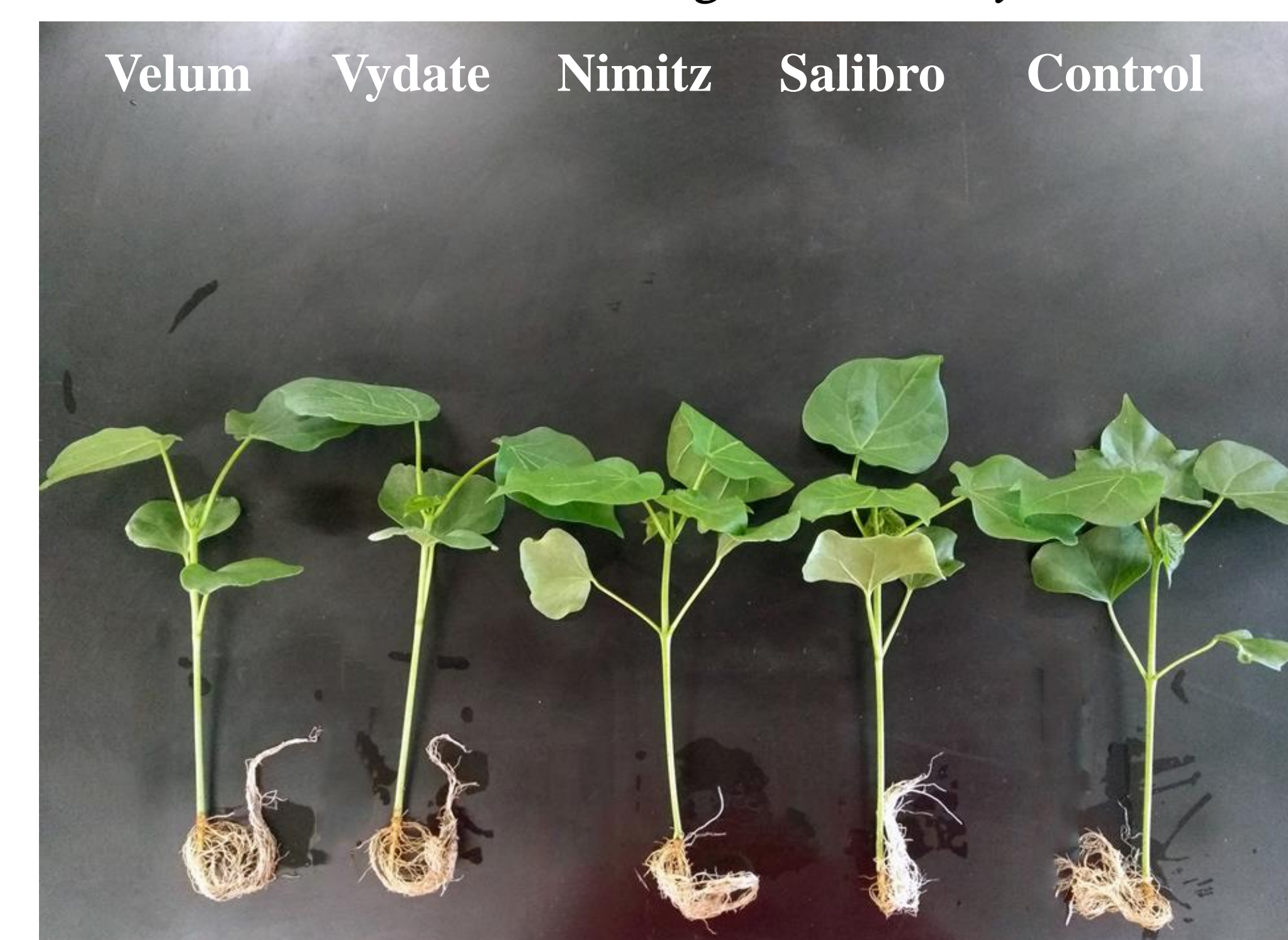


Fig. 5 Representative cotton seedlings at 21 days

**Results** Plant parameters represented by fresh weight and dry weight in the first set of plants at 7 days showed a difference in growth (Fig. 3) while in the other sets (Fig. 4) and (Fig. 5) and in the second experiment at 60 days, no growth differences were noticed (Fig. 1). The Nimitz treatment slowed seedling emergence, resulting in reduced growth and dry weight 7 days after seeding compared to all other treatments. Initially, seedlings grown in Velum and Vydate treatments grew more vigorously than the untreated control, but no differences were noticed a week later. All nematicides used in this study reduced the number of nematodes in soil and roots compared to the controls (Fig. 6-8). In the second trial at 60 days, Nimitz, Vydate, Velum, and Salibro reduced the total extracted nematode population to about 12, 17, 33, and 39% (Fig. 9), respectively, of the non-treated control. Plant growth parameters were not influenced at 60 days. No evidence of phytotoxicity (chlorosis, growth deformity, or necrosis) was observed in the experiments.

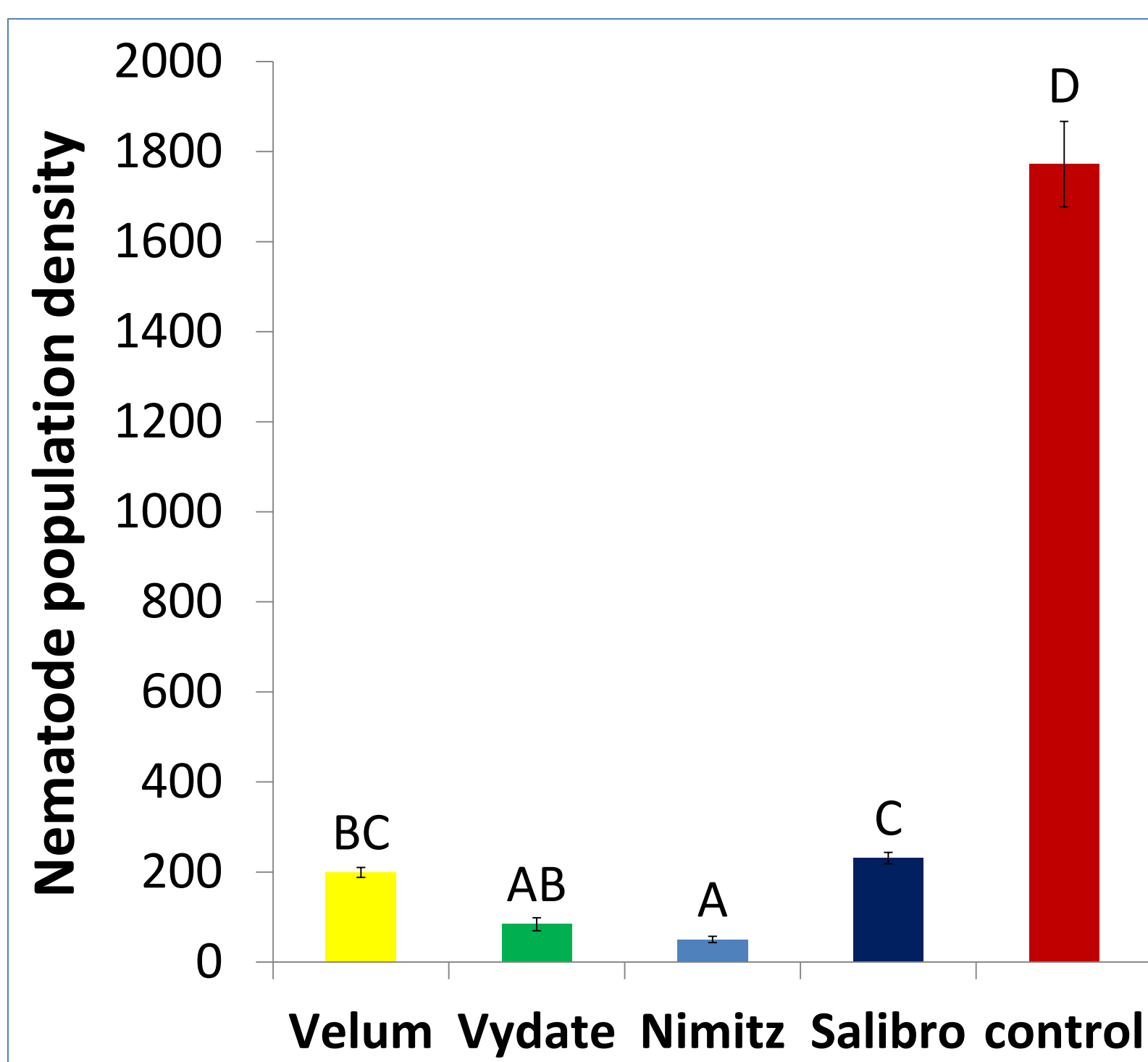


Fig. 6 Total number of lesion nematodes extracted from soil and roots at 7 days.

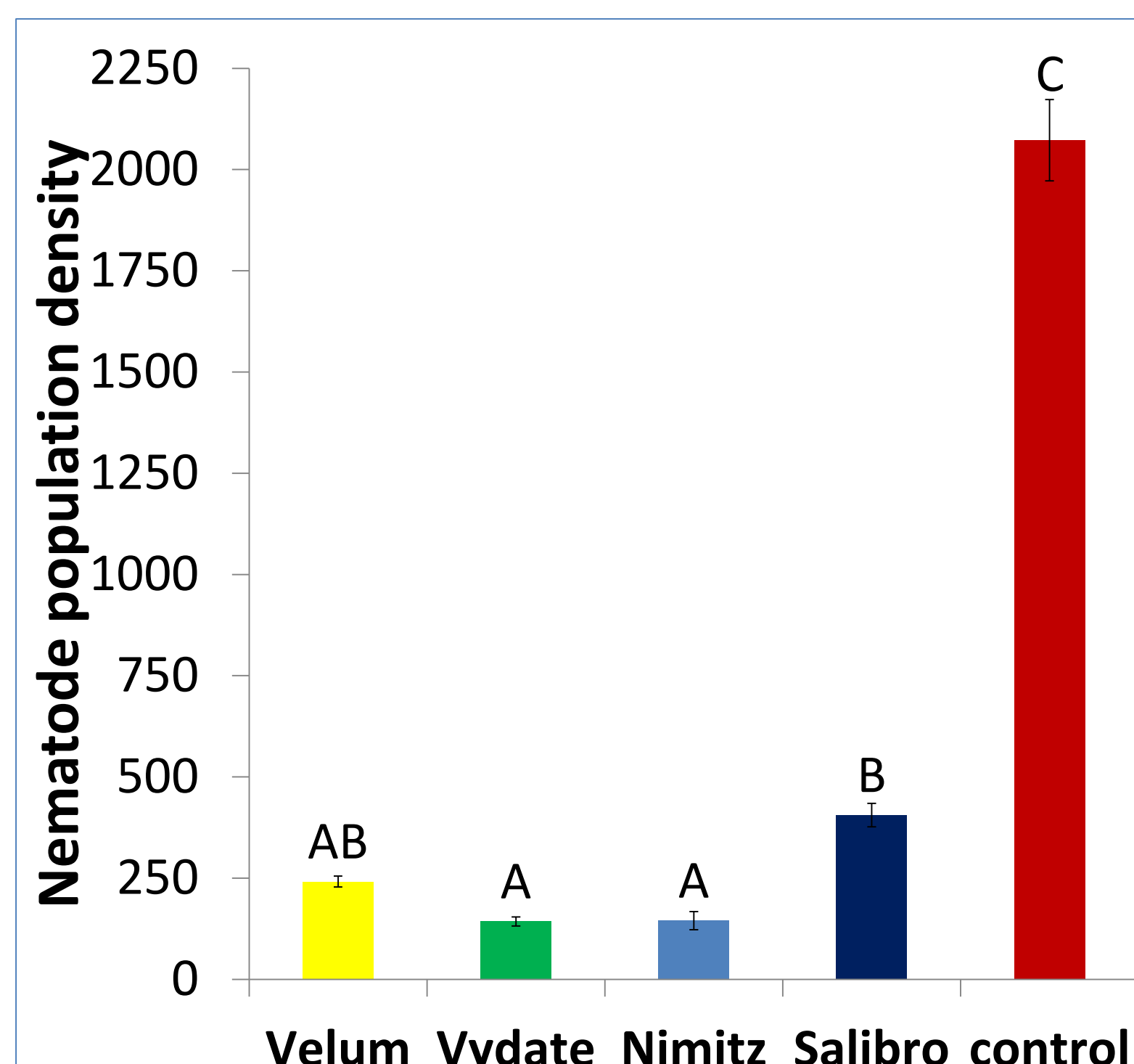


Fig. 7 Total number of lesion nematodes extracted from soil and roots at 14 days.

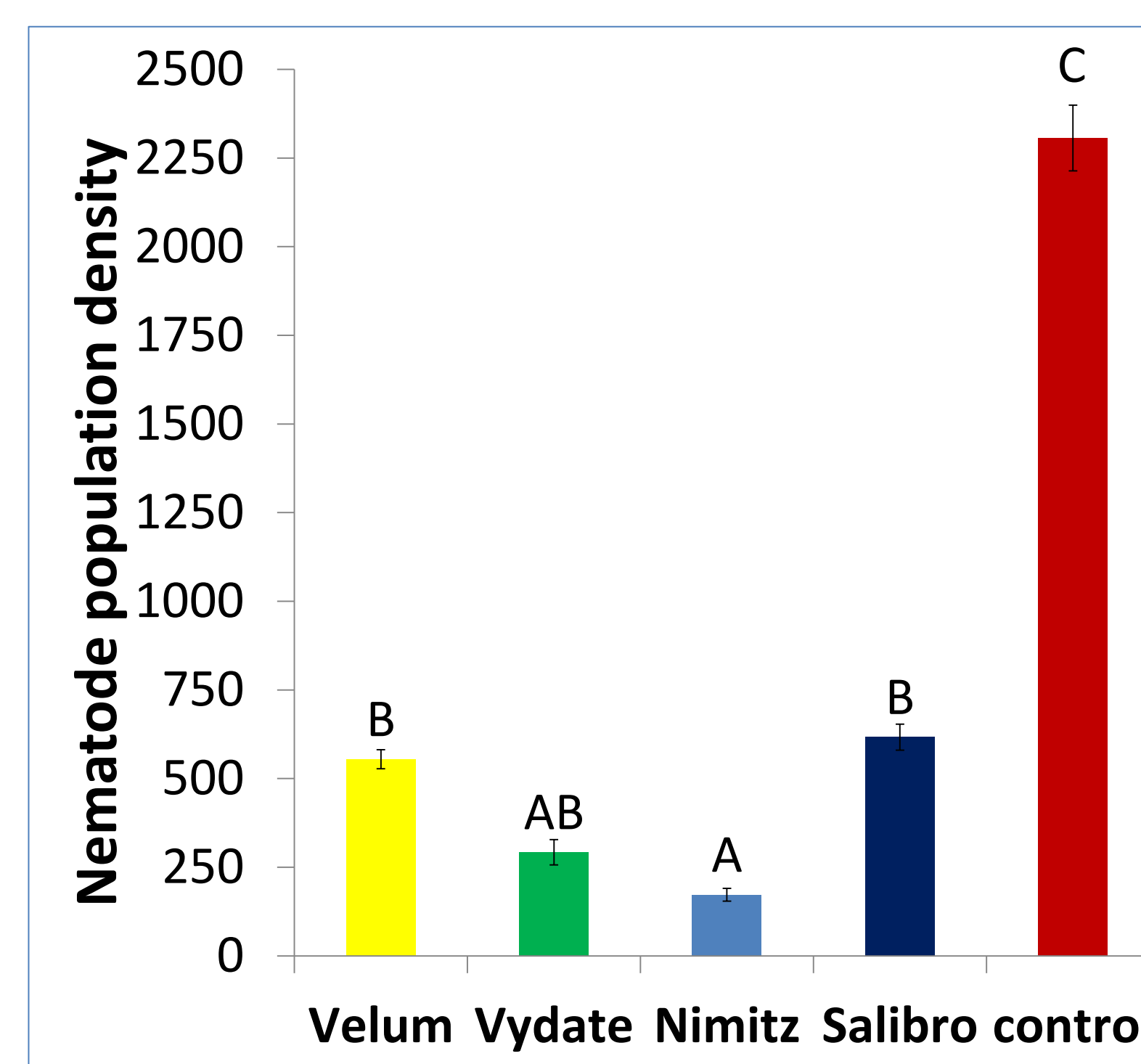


Fig. 8 Total number of lesion nematodes extracted from soil and roots at 21 days.

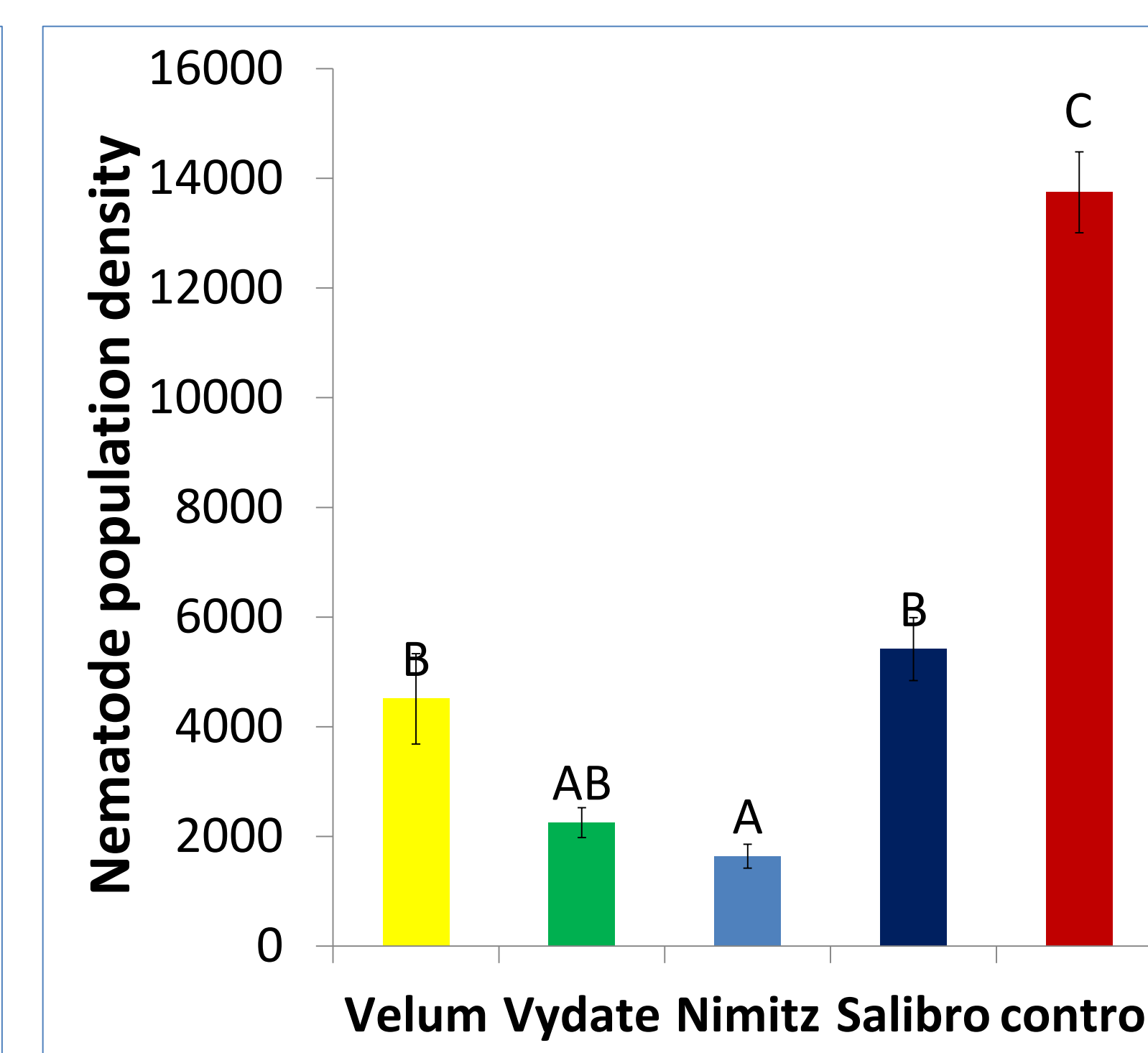


Fig. 9 Total number of lesion nematodes extracted from soil and roots at 60 days.

**Conclusion** This greenhouse study demonstrated that the use of fluensulfone, fluopyram, and fluazaindolizine reduced the population of the lesion nematode on cotton plants for at least 2 months. The nematicides had no influence on plant growth. The nematode infestation was apparently too low to cause significant crop damage.

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