

ON THE USE OF FURFURAL TO CONTROL NEMATODES IN SUGARCANE

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Following a report from the USA that furfural (2-furfuraldehyde) suppressed numbers of plant parasitic nematodes, two laboratory tests and four field trials were conducted to investigate its effect on the nematodes associated with sugarcane and, in the field trials, its effect on the growth of the cane. The performance of the furfural in the four field trials was compared with that of the non-volatile nematicide, aldicarb, and in two of the trials, with the fumigant 1,3 dichloropropene (1,3-D).

In the laboratory tests furfural applied at a concentration of 0,4 mL/L soil to small pots reduced numbers of *Helicotylenchus dihystrera*, *Paratrichodorus* spp, *Pratylenchus zaeae*, *Tylenchorhynchus* sp, *Xiphinema elongatum* and *X. mampara*. At 0,1 or 0,2 mL furfural/L soil there was a greater reduction in the numbers of *Paratrichodorus* spp and *Xiphinema* spp than *H. dihystrera*, *P. zaeae* and *Tylenchorhynchus* sp. The effect of furfural was greater when the soil moisture content was low. Numbers of non-plant feeding nematodes were, for the most part, unaffected by the furfural.

In three of the field trials (two ratoon and one plant crop), furfural at 60-320 L/ha was applied to the soil by means of hand held fumigant injectors. The 1,3-D, at 25-100 L/ha, was applied in the same manner. The chemicals were injected into the soil adjacent to one or both sides of the row at 25 cm intervals, to a

depth of 25 cm. Treatments were applied to the ratoon cane three to four weeks after cutting the previous crop and to the plant crop four weeks after planting. The treatment with furfural had little effect on the nematodes. Conversely, 1,3-D at 50-100 L/ha reduced the numbers of *Helicotylenchus*, *Pratylenchus*, *Xiphinema* and, in one trial, *Paratrichodorus* spp, during the first eight weeks after treatment ($p < 0,5$). Aldicarb reduced the numbers of *Helicotylenchus*, *Paratrichodorus* and *Pratylenchus* spp in one or more of the trials.

At one of the sites furfural at 160 L/ha and 1,3-D at 50 L/ha increased the mass of cane from 50 to 60 tons/ha ($p < 0,05$). Only at one of the sites was there a significant yield increase following treatment with aldicarb (from 19 to 47 t cane/ha; $p < 0,05$). As expected, 1,3-D was phytotoxic. The symptoms were poor regrowth of the ratoon cane and poor 'germination' of the plant crop. Subsequent better growth of the surviving stalks partly compensated for the phytotoxicity. No symptoms of phytotoxicity from furfural were observed in the three field trials where it was applied at up to 320 L/ha with the fumigant injectors. However, furfural at 160 L/ha was very phytotoxic when, in the one trial, it was sprayed over the cane setts in the planting furrow prior to covering with soil. Lower rates were phytotoxic in the laboratory.

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