STIMULATION OF NUTSEDGE EMERGENCE WITH CHLOROPICRIN

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Chloropicrin (Pic) is typically combined with soil fumigants, such as methyl bromide and 1,3-dichloropropene, to enhance control of soil-borne diseases. Results of previous field research have suggested that perhaps Pic may have a stimulatory effect on nutsedge emergence. This research was conducted to determine if, and at what rate, Pic stimulates nutsedge emergence.

An experiment was conducted at the Gulf Coast Research and Education Center in Bradenton, Fla. during spring 1999, fall 1999, fall 2000, and fall 2001. Treatments were 6 rates of Pic (0, 50, 100, 150, 200, and 250 lbs/acre Pic) replicated 4 (spring 1999) or 6 (fall of 1999, 2000, and 2001) times in a randomized complete block design. Plots were 30 (fall 1999 and 2000) or 40 (spring 1999 and fall 2001) feet long with 32-inch wide bed-tops. Treatments were established on 2 March in Spring 1999, 9 Sept. in fall 1999, 12 Sept. in fall 2000, and 7 Sept. in fall 2001. Pic was applied through three chisels spaced 12 inches apart to a depth of about 8 inches in raised beds. The beds were covered with polyethylene mulch immediately after Pic application.

Nutsedge (a mixture of *Cyperus esculentus* and *C. rotundus*) populations were higher in spring 1999 than in the fall seasons, and populations in fall 1999 and fall 2000 were greater than those in fall 2001. Therefore, the data for spring 1999 were analyzed separately. Data for fall 1999 and fall 2000 were pooled. Data obtained during fall 2001 were not reported because of low nutsedge counts.

In spring 1999, a rate response of nutsedge population to Pic rate was seen as early as 2 weeks after treatment application (WAT). The number of nutsedge shoots increased from 0.08 to 0.40 shoots/ft^2 with an increase in Pic rate from 0 to 100 lbs/acre; 0.02 to 0.04 shoots/ft^2 were present with 150 to 250 lb/acre Pic. At 7, 9, and 16 WAT, the number of shoots increased in a quadratic manner with increases in Pic rate. At 16 WAT, nutsedge shoot counts increased from 18 to 29 shoots/ft^2 as the Pic rate increased from 0 to 150 lbs/acre, respectively; with further increases in Pic rate from 200 to 250 lbs/acre, the nutsedge population declined from 26 to 14 shoots/ft^2, respectively.

In fall 1999 and fall 2000, a stimulatory effect of Pic on nutsedge emergence was not observed until later in the season (last counts of the season obtained 8 and 18 WAT in fall 1999 and fall 2000, respectively). The number of nutsedge shoots, averaged over both seasons, increased quadratically from 4 to 7 shoots/ft^2 with an increase in Pic rate from 0 to 150 pounds, respectively. The nutsedge population declined from 7 to 5 shoots/ft^2 as the Pic rate was increased from 200 to 250 lbs/acre, respectively.

In conclusion, the results indicated the following:

- X Pic stimulated nutsedge emergence in three seasons (spring 1999, fall 1999, and fall 2000), and the stimulatory effect in these seasons was greatest at 100 to 150 lbs/acre.
- XAn early-season stimulatory effect of Pic on nutsedge emergence was only observed in one (spring 1999) of the three (spring 1999, fall 1999, and fall 2000) seasons during which there were moderate to high nutsedge populations. Thus, additional research is needed to confirm results obtained in spring 1999.

Stimulating nutsedge emergence with Pic at the beginning of a growing season would be beneficial because:

- XChemicals are most effective against nutsedge that is actively growing.
- XHerbicides or a drip-applied fumigant such as Vapam could be used to eliminate sprouted tubers before planting a crop.