
Effect of InLine (1,3 dichloropropene plus chloropicrin) on Purple Nutsedge (*Cyperus rotundus* L.) Control Using Two Drip Tapes per Bed

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Introduction

Methyl bromide alternatives research at UF/IFAS/NFREC-Suwannee Valley has included emphasis on using drip irrigated treatments of 1,3-dichloropropene and chloropicrin (InLine®, Dow AgroSciences, Indianapolis, IN). Research has evaluated the effect of various rates of InLine, virtually impermeable films, and various bed widths. This research has shown promise in using InLine treatments via drip irrigation under VIF mulch with a single drip tape on narrow bed widths.

Objective

This trial was conducted to determine if the application of InLine via two drip tapes under VIF mulch could provide purple nutsedge control during a period of high soil temperature.

Materials and Methods

Observational plots were established during the spring of 2003 on a Lakeland fine sand at the North Florida Research and Education Center - Suwannee Valley near Live Oak, FL. The soil was prepared by rototilling to a depth of 8 inches. Beds were formed on 5-ft centers using hilling discs. Four observational plots 200 ft long were established. Two plots were formed as 24-inch wide beds, and two plots as 32-inch wide beds. One plot of each width was treated with InLine and the other was left untreated. Each plot was covered with VIF mulch (Hytibarrier, Klerk's, Richburg, SC) and each plot had two drip tapes (Roberts RoDrip, San Marcos, CA) per bed. The tapes were placed to divide the beds into equal thirds.

InLine was applied to the treated beds by mixing InLine with water in a large bulk tank and pumping the mixture into the drip tapes. The InLine rate was 35 gal/treated acre, based on the width of the bed as the treated area. The InLine injection was made on 15 April, 2003. The time of injection was 108 minutes for the 24-inch wide bed, and 145 minutes for the 32-inch wide bed.

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Soil air was sampled for levels of 1,3-D using Gastec (Kanagawa, Japan) sampling tubes. The samples were taken in the center of the bed and on the shoulder; at the 4-inch depth. Samples were taken 3, 8, 14, and 21 days after treatment (DAT). Purple nutsedge counts were taken on 13 May (28 DAT) and 5 June, 2003 (51 DAT) from 10 ft sections of each plot.

Results

1,3-D gas levels on the first sampling date (3 DAT) were high in the center and shoulder of the treated beds of both bed widths (Table 1). The shoulder area was lower than the center on both bed widths. By the 8 DAT, 1,3-D levels had dropped significantly and by 14 DAT the levels were near zero in all plots.

Nutsedge counts were much lower in the treated plots on 13 May, about 95% lower than the untreated plots for each bed width (Table 2). By 5 June, the nutsedge populations in the treated plots increased greatly, 5-10 times, from the 13 May date. Populations were still lower in the treated plots than the untreated plots; however, overall control was poor in all plots on 5 June. These results suggest even when InLine is applied via two drip tapes to more completely wet the soil with 1,3-D, high soil temperatures speed the dissipation rate too quickly to provide excellent nutsedge control.

Table 1. Levels of 1,3-D in soil air on four dates under VIF mulch covered beds of two widths and when treated with InLine via two drip tapes per bed.

Date	1,3-D gas levels (ppm)							
	Treated				Untreated			
	24-inch bed		32-inch bed		24-inch bed		32-inch bed	
	Shoulder	Center	Shoulder	Center	Shoulder	Center		
4/18/03	300	400	400	500	0	0	0	0
4/23/03	50	90	115	175	0	0	0	0
4/29/03	0	0	0	15	0	0	0	0
5/06/03	0	0	0	0	0	0	0	0

Note: gas samples were taken in center of bed, four inches deep and also on the shoulder of the bed four inches deep.

Table 2. Effects of InLine fumigation via two drip tapes under VIF mulch on two bed width on purple nutsedge populations.

Date	Nutsedge counts (No/10 ft of bed)			
	24-inch beds		32-inch beds	
	Treated	Untreated	Treated	Untreated
13 May 2003	34	640	60	1275
5 June 2003	320	630	280	920