EFFICACY OF PIC-CLOR 60 USED WITH TOTALLY IMPERMEABLE FILM FOR NUTSEDGE CONTROL

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Introduction

Pre-plant soil fumigants are used in plasticulture vegetable production for the control of nematodes, some weed species, and pathogenic bacteria and fungi that can damage these high value crops. The ban on methyl bromide brought about extensive research on alternatives that are both efficacious and economical, but finding a comparable substitute has been challenging. A 39:60 mixture of 1,3-dichloropropene and chloropicrin (Pic-Clor 60) is an alternative used for control of soil-borne pathogens and nematodes and is currently being used for tomato and pepper production in Florida. Virtually impermeable film (VIF) and totally impermeable film (TIF) retains more fumigant than low and high density polyethylene that is typically used in plasticulture. This experiment was initiated to determine the effect of Pic Clor-60 on nutsedge control when used in conjunction with TIF and to establish the lowest rate that can be used, while maintaining efficacy.

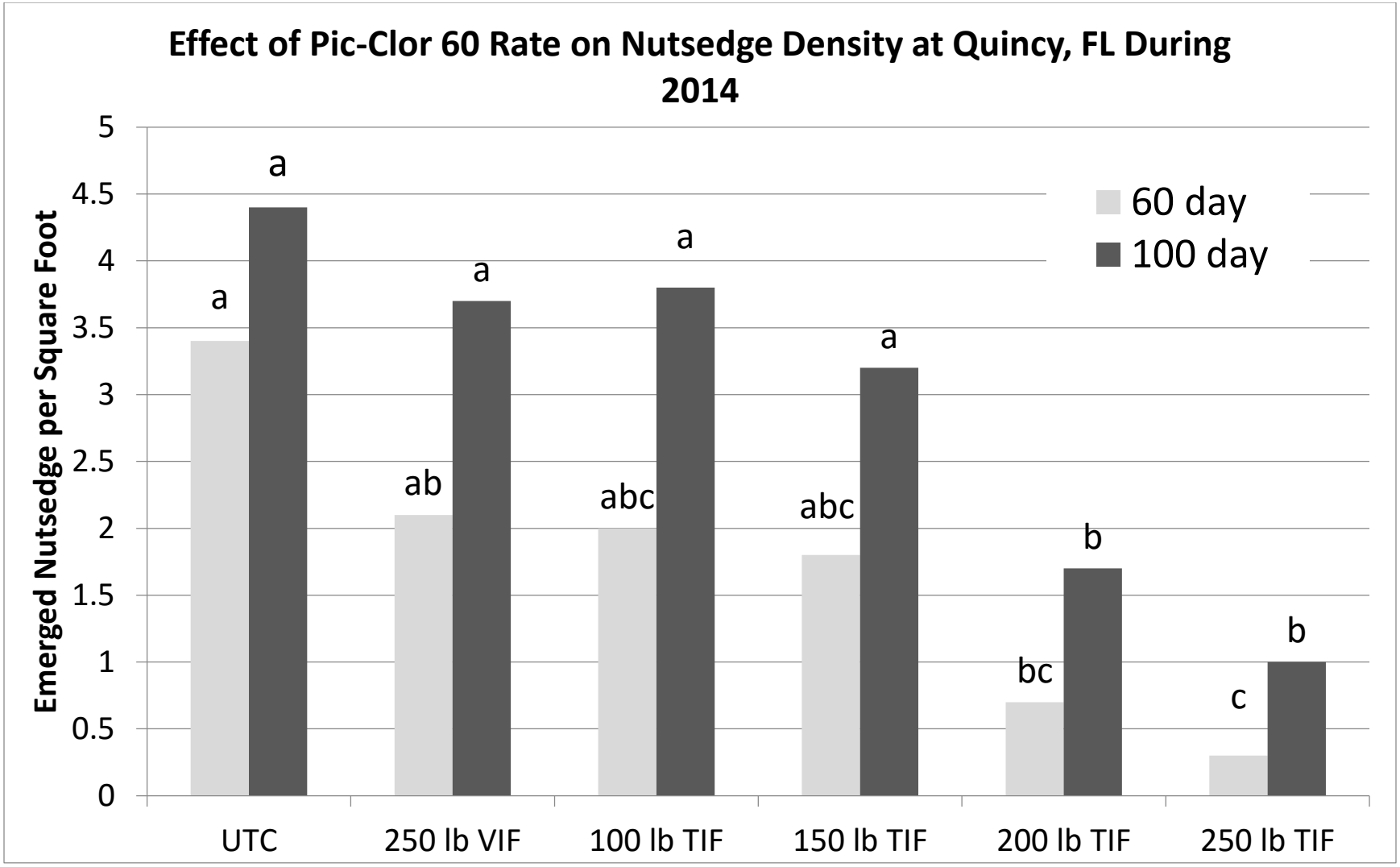
Materials and methods

Treatments in this experiment were arranged in a randomized complete block design with four replications. Four rates of Pic-Clor 60 (100, 150, 200, and 250 lbs/acre) used with TIF and 250 lbs/acre Pic-Clor 60 used with VIF were compared to an untreated control used with VIF. This experiment was conducted during the fall of 2014and spring of 2015 at Quincy,FL and during the fall of 2015 at Citra, FL. Treatments at Quincy were applied using a single row combination bed press with three back-swept shanks, and with two shanks at Citra. Beds were 30 inches wide and 8 inches tall. Experimental plots consisted of a single row 100 feet long. A hand held photoionization detector (MiniRAE 300) was used to measure soil fumigant concentration in the soil air after fumigation. Each plot was sampled 3 times per sampling date, and nutsedge that had emerged through the plastic was counted at 30, 60, and 90 days after fumigation.

Experiments were commenced on June 27, 2014 and February 13, 2015 in Quincy and August 12, 2015 in Citra.

Results

The results inidicated that using TIF significantly increases retention of Pic-Clor 60 and while providing equivalent or improved nutsedge control. When using Pic-Clor 60 with TIF at a rate of 200 lbs/acre, nutsedge populations were similar or significantly less compared to a higher rate of 250 lbs/acre with VIF. This demonstrates that the use of TIF with a reduced rate of Pic-Clor 60 has the potential to decrease input costs, without sacrificing efficacy.


Effect of Pic-Clor 60 Rate on Nutsedge Density at Quincy, FL During 2014
Emerged Nutsedge per Square Foot
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
60 day
100 day
a
a
a
a
ab
a
abc
a
abc
b
bc
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250 lb VIF
100 lb TIF
150 lb TIF
200 lb TIF
250 lb TIF