Soil Fumigation for Nutsedge Control

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Introduction

Control of yellow and purple nutsedge has long been a difficult weed to control in the vegetable production areas of the low desert. In the development of the Pest Management Strategic plan for lettuce, growers in the Coachella area identified nutsedge as a difficult pest to manage (PMSP 2003). None of the available lettuce herbicides, benefin, bensulide or pronamide control nutsedge. Herbicides such as halosulfuron could conceivably be used to control nutsedge in rotational crops and reduce overall nutsedge densities in a field. However, lettuce may not be planted for 18 months following a halosulfuron application. EPTC does have a SLN label for control of nutsedge in fallow ground in California, and lettuce can be planted 90 days after EPTC application (Syngenta 2002). However, growers are looking for something better to control nutsedge than EPTC alone (PMSP 2003). Soil fumigants used in combination with pebulate improved control of nutsedge in Florida (Locascio 1997). The objective of this work was to determine if sequential application of fumigants followed by EPTC could be used to control nutsedge in fallow ground, and to determine if this control was sufficient to reduce nutsedge densities in rotational crops grown 3-16 months after application.

Methods

These experiments were conducted in commercial fields in the Coachella Valley of California, to determine if nutsedge can be managed with sequential applications of 1,3-D plus chloropicrin (Telone C35™) or metam sodium/potassium followed by (fb) EPTC in fallow ground prior to lettuce planting. Metam sodium was applied by water run at 40 GPA, and Telone C35 at 28 GPA was applied by shank injection on June 19, 2003 near Indio, CA. An untreated control was also included. EPTC (Eptam™ 7 E) at 7 pts/A was applied to all plots, including the untreated, on July 1, 2003. Lettuce was planted at the Indio site on Oct. 13, 2003. The study at Coachella, CA was initiated June 15, 2004; where 50 GPA metam potassium and 20.5 and 26 GPA Telone C35™ were shank injected. The study at Thermal, CA was initiated Aug. 19, 2004 with 60 GPA metam sodium (Sectagon 42™) and 20.5 and 26 GPA Telone C35™. Following fumigant applications, both trials were treated with 7 pts./A EPTC. The studies were arranged in a randomized complete block with two replicates at Indio and three replicates at both Coachella and Thermal. Lettuce was planted at the Indio site Oct. 2003, at the Coachella site Sept. 2004 and again Sept. 2005. At the Thermal site, lettuce was planted Nov. 2004 and again Sept. 2005.

Nutsedge control assessments were made at Indio Nov. 2003, at Coachella during Oct. and Dec 2004, and Sept. 2005, and at Thermal in Mar. and Oct. 2005.

Results

In 2003 fallow applications of Telone C35™ at 28 gallons/A (GPA) followed by (fb) EPTC at 7 pts. /A resulted in excellent nutsedge control at Indio (Table 1). We lost access to the Indio field in 2004 due its development for housing, so no follow up ratings were possible. At Coachella, sequential applications of Telone C35™ at 20.5 to 26 GPA fb EPTC at 7 pt/A provided better nutsedge control than EPTC alone both in 2004 and 2005 (Table 2). The metam potassium fb EPTC treatments reduced nutsedge densities compared to EPTC alone in 2004, and in 2005. At the Thermal site there were no treatment effects on nutsedge densities in Mar. 2005 (Table 3). At Thermal on Oct. 5, 2005, there were no differences in nutsedge densities between Telone C35™ fb EPTC and EPTC alone (Table 3). At this same site, metam sodium fb EPTC had more nutsedge than EPTC alone. These results indicate clearly that Telone C35™ fb EPTC provides better suppression of nutsedge in the first crop, compared to EPTC alone. However, long-term nutsedge suppression results from Telone C35™ fb EPTC were mixed, with long-term benefits at 16 months after application at Coachella, but not at Thermal. Metam potassium and metam sodium fb EPTC treatments do not appear to provide consistent short- or long-term nutsedge suppression.

Table 1. Nutsedge control at Indio, CA.

Product [1]	**Rate**	**Nutsedge densities (no./A)** [2]
		Nov. 2003
EPTC	7 pts	1287 a
Metam potassium fb EPTC	40 GPA fb 7 pts	1023 ab
Telone C35 fb EPTC	28 GPA fb 7 pts	46 b

[1] Followed by (fb) means a sequential application.
[2] Data within a column sharing the same letter(s) were not different at P = 0.05.

Table 2. Nutsedge control at Coachella, CA.

Product [1]	**Rate**	**Nutsedge densities (no./A)** [2]	
		Oct.-Dec. 2004	Oct. 2005
EPTC	7 pts	710 a	365 a
Metam potassium fb EPTC	50 GPA fb 7 pts	203 b	75 c
Telone C35 fb EPTC	20.5 GPA fb 7 pts	57 b	225 b
Telone C35 fb EPTC	26 GPA fb 7 pts	29 b	116 bc

[1] Followed by (fb) means a sequential application.
[2] Data within a column sharing the same letter(s) were not different at P = 0.05.

Table 3. Nutsedge control at Thermal, CA.

Product [1]	Rate	Nutsedge densities (no./A) [2]	
		Mar. 2005	Oct. 2005
EPTC	7 pts	210	6163 b
Metam sodium fb EPTC	60 GPA fb 7 pts	110	11851 a
Telone C35 fb EPTC	20.5 GPA fb 7 pts	14	3661 b
Telone C35 fb EPTC	26 GPA fb 7 pts	45	4986 b

[1] Followed by (fb) means a sequential application.

[2] Data within a column sharing the same letter(s) were not different at P = 0.05.

LITERATURE CITED

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