CHEMICAL FALLOW FOR YELLOW NUTSEDGE SUPRESSION FOLLOWING WHEAT HARVEST

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Ontario, OR, 2004

Introduction

Yellow nutsedge is extremely competitive with onions and other crops. Few herbicide treatments are effective for managing yellow nutsedge within an onion crop. Herbicides that can be used in corn and dry bean can effectively reduce yellow nutsedge tubers in the soil. Generally, we think that yellow nutsedge does not grow well in a wheat crop because wheat is so competitive. However, following wheat harvest, yellow nutsedge shoots can be seen actively growing. Little is known about yellow nutsedge growth following wheat harvest and its potential to produce additional tubers during this time. Also, the time between wheat harvest and fall ground preparation may be a window to further reduce the yellow nutsedge population. A special registration for Eptam® in Arizona allows its use in the late summer as a fallow treatment in preparation for a winter crop. We conducted a trial to determine the number of tubers produced by yellow nutsedge following wheat harvest, and whether the use of Eptam as a chemical fallow could reduce tuber production.

Methods

A wheat field with a prior history of severe yellow nutsedge infestation was selected for this trial. Following wheat harvest, the field was corrugated and irrigated. As soon as the field was dry enough it was disked to remove yellow nutsedge shoots that had emerged and to level the field. Once the surface was dry, Eptam was applied at 7.0 pt/acre and immediately incorporated by disking to approximately 6-inch depth. The treatments compared in the trial included disking only or disking plus Eptam. The trial area was left undisturbed until bedding in the fall. Eptam was applied with a CO_2-pressurized backpack sprayer delivering 20 gal/acre at 30 psi. Plots measured 12 ft wide by 30 ft long and were replicated 4 times in a randomized complete block design. Shoot emergence was monitored by counting shoots within 1-yd^2 quadrats. Changes in tuber numbers were documented by taking 8 core samples 4.25 inches in diameter and 7 inches deep from each plot and washing the tubers from the soil. Core samples were taken prior to treatment and again at the conclusion of the trial. Initial core samples were taken August 3 and final core samples were taken October 21. In addition to sampling in the trial area, samples were taken from an area adjacent to the trial to provide observational data on the effect of disking once, disking twice, and disking twice with Eptam incorporated with the second disking.

Data were analyzed using paired t-tests at the 5 percent level (0.05).

Results and Discussion

The Eptam fallow label says that the field should not be irrigated for as long as possible to prevent the Eptam from volatilizing from the soil. The day after the Eptam treatments at least 0.5 inches of rain fell across the valley. Eptam incorporated with disking reduced yellow nutsedge shoot and tuber numbers compared to disking alone (Table 1). In plots that were disked only, tuber numbers increased by 97 percent while in plots where Eptam was incorporated with the disking, tuber numbers only increased 7 percent. When 1-ft^2 quadrats were harvested by hand in an attempt to recover tubers attached to actively growing shoots, there were significantly fewer tubers in the Eptam-treated plots compared to the disked-only plots (Table 2). The ratio of tubers in the Eptam-treated plots compared to the disked-only plots was much smaller than from the core samples. This demonstrates that the Eptam was reducing the production of new yellow nutsedge tubers, and likely inhibiting the germination of tubers that were present when the Eptam was applied. Sampling from nonreplicated strips in the field suggests that any additional management of yellow nutsedge growth decreased the total number of tubers produced. Disking once had the highest number of tubers followed by disking twice, and then by disking once and then applying Eptam and incorporating with a second disking.

This research demonstrated that significant numbers of yellow nutsedge tubers can be produced following wheat harvest. Management of yellow nutsedge growth following wheat harvest is essential to prevent the production of additional tubers and the potential buildup of tubers to levels that will make yellow nutsedge control difficult in following crops. The use of Eptam as a chemical fallow treatment significantly reduced yellow nutsedge shoot and tuber production.

Table 1. Yellow nutsedge shoot and tuber numbers in response to disking and Eptam® plus disking, Malheur Experiment Station, Ontario, OR, 2004.

Treatment	Yellow nutsedge shoots		Yellow nutsedge tubers		
	Sept. 16	Oct. 4	Initial	Final	Change
	----------no/yd^2----------		----------no/ft^2---------		%
Disking only	17	23	45	79	+ 94
Eptam + Disking	7	14	45	48	+ 7

Table 2. Yellow nutsedge shoot and tuber numbers in response to disking and Eptam®, taken from hand-harvested quadrats on October 21, Malheur Experiment Station, Ontario, OR, 2004.

Treatment	Yellow nutsedge	
	Shoots	Tubers
	no/yd^2	no/ft^2
Disking only	37	33
Eptam + Disking	11	7

Table 3. Average yellow nutsedge shoot and tuber numbers in response to disking and Eptam®, taken from nonreplicated strips adjacent to the trial area on October 6, Malheur Experiment Station, Ontario, OR, 2004.

Treatment	Yellow nutsedge	
	Shoots	Tubers
	no/yd^2	no/ft^2
Disked once	60	47
Disked twice	32	20
Disked followed by Eptam + Disking	14	5