

CREEPING WOODSORREL CONTROL IN BERMUDAGRASS TURF

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Introduction

Creeping or yellow woodsorrel, *Oxalis corniculata* L., is one of the most troublesome weeds in California turfgrass. It is a spreading herbaceous perennial that thrives in sun, shade, over/under fertilized lawns, and over/under irrigated areas. It is unknown how to keep this weed under control with cultural management.

Brief description of *Oxalis corniculata*

The cotyledons of creeping woodsorrel are oval in shape. The true leaves are compound with three heart-shaped leaflets that resemble clover leaves. Leaves often close and droop at night or under intense light. An oxalis plant can contain leaves of various shades of green to deep purple. Yellow flowers with five petals are borne singly or in small groups. The mature plant has creeping stems emerging from a slender taproot. Stems root at nodes and the plant spreads. Roots also survive cold temperatures and regrow. Seed pods are about 1/3-inch long and bear a resemblance to miniature okra. Each pod produces 10-50 seeds and it is estimated that each plant averages 5000 seeds. Pods burst open spreading reddish seeds 10 feet or more. Since the plants spread by seeds, roots, and stems that root at the nodes, eventually a carpet of oxalis occurs in a lawn.

Broadleaf herbicides for use in lawns

In the late 1980s triclopyr (Turflon®) was tested on lawns for broadleaf weed control and was soon registered for use in cool season lawns for the postemergence control of creeping woodsorrel and other broadleaf weeds. Because it was found harmful to bermudagrass lawns, triclopyr was not registered for use in warm season turfgrasses. Common postemergence broadleaf herbicides (two or three way combinations of 2, 4-D, mecoprop, and dicamba) have provided limited control of oxalis in warm season grasses. Several preemergence herbicides claim only partial control of oxalis in lawns.

Objectives of herbicide field trials

- To determine which active ingredients control oxalis.
- To compare similar products available at different concentrations to professional applicators and homeowners.

Methods and materials

- The experimental site was a Fresno city park with an extensive, uniform population of oxalis (average 85% weed coverage) growing in a well established, common bermudagrass turf.
- The experimental design was a split plot with 4 replications. Main plots (preemergence herbicides) measured 35 feet by 7 feet and sub plots (postemergence herbicides) were 3.5 feet by 7 feet in size.
- The herbicide applications were made with a CO₂ backpack sprayer at 30 psi using 1.5 gal/1000 ft² water volumes.
- Three preemergence herbicides were applied on November 18, 2003 and February 24, 2004: Dimension® (dithiopyr), Pendulum® (pendimethalin), and Barricade® (prodiamine).

- Nine postemergence broadleaf herbicides were applied on November 18, 2003 and February 24, 2004. Common broadleaf weed herbicides (2, 4-D, mecoprop, and dicamba) used in turf were tested. Homeowners have access to a less concentrated version of these herbicide combinations than do professional applicators. Two formulations (homeowner vs. professional) of three and four way combinations were tested and compared. Fluroxypyr (related to triclopyr) and Speedzone® (developed specifically for broadleaf weed control in warm season lawns) were also included.

A list of treatments including the herbicide trade names, common names, active ingredients, and concentrations is shown in Table 1.

Results

Visual ratings in December 03 and February 04 indicated that oxalis control was better in all plots receiving a postemergence herbicide application compared to the untreated check and the plots only receiving a preemergence application. In the December rating weed control by most postemergence herbicides was unsatisfactory (less than 5.0) and there was not much difference between homeowner and professional products. Speedzone Southern had higher ratings than common broadleaf weed killers, but products containing triclopyr and fluroxypyr brought the highest weed control ratings. By February weed control ratings were significantly better and there were no differences in any of the postemergence products. Untreated areas and plots with preemergence treatments only continued to have much lower weed control ratings.

All three preemergence herbicides were effective in keeping oxalis from germinating and over time had significantly higher weed control ratings than untreated plots.

Summary

Results showed that preemergence herbicides are effective in controlling creeping woodsorrel over time even when no postemergence herbicides are applied. Preemergence herbicides appear to be a vital component to extending oxalis control for an entire year. Several postemergence treatments provided good to excellent knockdown of existing populations of oxalis with little to no phytotoxicity (data not shown) to bermudagrass. Two active ingredients fluroxypyr and triclopyr provided better oxalis control sooner than other broadleaf weed killers, when applied in late Fall. Carfentrazone in Speedzone Southern® provided an extra boost to oxalis knockdown. Initially homeowner concentrations of postemergence broadleaf herbicides had less effect on oxalis control, but after 9 months and two treatments in combination with preemergence herbicides, there were no significant treatment differences between homeowner and professional products. This study will be repeated.

TABLE 1. List of Treatments

PREEMERGENCE herbicides (main plots)	AMT/1000 ft²
A. Dimension® - dithiopyr (12.7%)	1½ ozs
B. Pendulum WDG® - pendimethalin (60%)	(3.4lb/A) = 1¼ ozs
C. Barricade WG® - prodiamine (65%)	1½ ozs
POSTEMERGENCE herbicides (subplots)	AMT/1000 ft²
1. Untreated check	-
2. Homeowner Trimec (OSH) 2, 4-D (5.67%) MCP (2.67%) dicamba (0.63%)	1½ oz
3. Professional Trimec 992 (Gordon's) 2, 4-D (30.56%) MCP (16.34%) dicamba (2.77%)	1½
4. Homeowner Trimec Plus (Bayer) 2, 4-D (3.18%) MCP (1.60%) dicamba (0.79%) & MSMA (9.81%)	1½
5. Professional Trimec Plus (Gordon's) 2, 4-D (5.83%) MCP (2.93%) dicamba (1.46%) & MSMA (18.0%)	1½
6. Speedzone Southern 2, 4-D ester (10.49%) MCP (2.66%) dicamba (.67%) carfentrazone (.54%)	1½
7. Lontrel clopyralid (40.9%)	¼
8. Starane (Vista) fluroxypyr (26.2%)	½
9. Lontrel + Starane clopyralid (40.9%) + fluroxypyr (26.2%)	¼ + ½
10. Confront clopyralid (12.1%) + triclopyr (33.0%)	¾

**TABLE 2. Oxalis Control*
with POSTEMERGENCE Herbicides**

Treated – NOV 18	Rating DEC 8, 2003	Rating FEB 20, 2004
Untreated	1.4	5.3
Preemergence only	1.5	5.4
Trimec H	3.5	8.0
Trimec P	5.0	9.4
Trimec + H	3.1	8.8
Trimec + P	3.3	8.8
Speedzone	6.1	8.3
Lontrel	4.6	8.5
Starane	7.9	9.3
Lontrel + Starane	8.3	9.8
Confront	7.5	9.8
LSD (P + 0.05)	1.0	4.0
* Visual Rating 1 – 10: control	1 = No control	10 = 100% control

TABLE 3. Oxalis Control* with PREEMERGENCE Herbicides

Treated NOV 03 & FEB 04	Ratings			
	DEC 03	FEB 04	APR 04	AUG 04
Dimension (dithiopyr)	5.0 a	8.9 a	9.4 a	9.0 a
Pendulum (pendimethalin)	5.0 a	8.7 a	9.4 a	8.6 a
Barricade (prodiamine)	5.0 a	8.1 a	9.3 a	8.8 a
Untreated check	1.5 b	5.4 b	5.3 b	1.5 b
LSD (P = 0.05)	2.7	2.9	2.1	2.8
*Visual rating scale 1 – 10: control	1 = No control	10 = 100% control		