

Broad Spectrum Weed Control

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Recent Developments in Turfgrass Weed Control

- Broadleaved
- Grasses
- Nutsedge

- Preemergence
- Postemergence

Herbicides may be categorized by the timing of application – preemergence before weed emerged or postemergence applied to the foliage after the weed is emerged. There are herbicides specifically active against grass or broadleaved weeds or non-selective with activity against both. Purple nutsedge is the “world’s worst weed” and there is generally more of it than yellow nutsedge in our desert landscapes.

Recent Developments in Turfgrass Weed Control

- Postemergence nutsedge control
 - Halosulfuron (SedgeHammer*)
 - Trifloxsulfuron (Monument*)
 - Sulfosulfuron (Certainty*)
 - Flazasulfuron (Katana*)
 - Sulfentrazone (Dismiss*)

For nutsedge control, acetolactate synthase (ALS) enzyme inhibiting herbicides have proven to be very effective since their development and introductions since the early 1980's. Imazaquin (Image* herbicide) was the first to be marketed and then halosulfuron (originally Manage* and now SedgeHammer*) followed in providing effective nutsedge control. More recently, trifloxsulfuron (Monument*), sulfosulfuron (Certainty*), now flazasulfuron (Katana*) have expanded the available number of effective products for nutsedge control. Sulfentrazone (Dismiss*)_ is not an ALS herbicide and has limited short-term efficacy against purple nutsedge. It should be more active against yellow nutsedge which is a bit more easily controlled by Dismiss.

Recent Developments in Turfgrass Weed Control

Postemergence nutsedge control

SedgeHammer* halosulfuron 75 WG	Monument* trifloxysulfuron 75 WG	Certainty* sulfosulfuron 75 WDG	Dismiss* sulfentrazone 4 SC	Katana* flazasulfuron 25 WG
0.062 lb a.i./A 1.3 oz prod/A	0.025 lb a.i./A 0.53 oz prod/A	0.06 to 0.09 lb a.i./A 1.25 to 2.0 oz prod/A	0.375 lb a.i./A 12 oz prod/A	0.047 lb a.i./A 3.0 oz prod/A
No limit	Limit of 1.7 oz/A per year	Limit of 2.66 oz/A per year	Limit of 12 oz/A	Limit 9 oz/A per year

All of the ALS herbicides are sold as wettable granule formulations and it takes only small packets of products to treat nutsedge infestations. A typical nutsedge infestation may begin appearing in the early spring months as early as February in desert turf. As long as available until regulatory changes occur, MSMA at the labeled rates should be used to “burn down” the emerging foliage as frequently as possible. Together with mowing, the stresses should weaken the nutsedge until the summer solstice in June when daylength start to shorten and carbohydrate reserves should begin flowing to store up in underground tubers. Begin applying any of the ALS herbicides around July 1 and then repeat when needed about 4 to 6 weeks later in August. Two applications following the MSMA should reduce the severity of the nutsedge population.

Recent Developments in Turfgrass Weed Control

Postemergence nutsedge control



An example of various nutsedge herbicides applied in an experiment carried out for 4 consecutive years. Diligently continue herbicide applications in subsequent years to get it under manageable levels.

Recent Developments in Turfgrass Weed Control

Postemergence grass control

- Crabgrass
 - Quinclorac – Drive XLR8*, Q4*
- Goosegrass
 - Foramsulfuron – Revolver*
 - Diclofop – Illoxan*
- *Poa annua*
 - Bispyribac-sodium - Velocity*
 - Ethofumesate – Prograss*,
*Poa Constrictor**
- Bermudagrass, bentgrass
 - Mesotrione – Tenacity*
- Most grasses (non-selective)
 - Fluazifop
 - Fusilade*, Ornamec*
 - Sethoxydim
 - Segment*
 - Clethodim – Envoy*

Examples of herbicide research activities against commonly found grass weeds in Arizona.

Cupgrass / Crabgrass

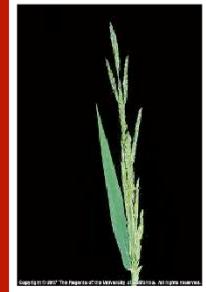
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Large crabgrass (*Digitaria sanguinalis*) inflorescence. J. M. DiTomaso



Large crabgrass (*Digitaria sanguinalis*) collar and sheath. Sheath often hairier. J. M. DiTomaso



Southwestern cupgrass (*Eriochloa acuminata*) inflorescence. J. M. DiTomaso

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Southwestern cupgrass (*Eriochloa acuminata*) collar and sheath. J. M. DiTomaso

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Differentiate crabgrass from cupgrass by observing hairs on crabgrass.
Seedhead is different between the two grasses.

Postemergence herbicides perform differently on the two grasses.

Recent Developments in Turfgrass Weed Control

Cupgrass / Crabgrass

Herbicides evaluated

- quinclorac (Drive XLR8*)
- MSMA
- flazasulfuron (Katana*)
- foramsulfuron (Revolver*)
- fenoxaprop(Acclaim*)

Exploratory postemergence applications of these herbicides have been made on large sized weeds.

Cupgrass

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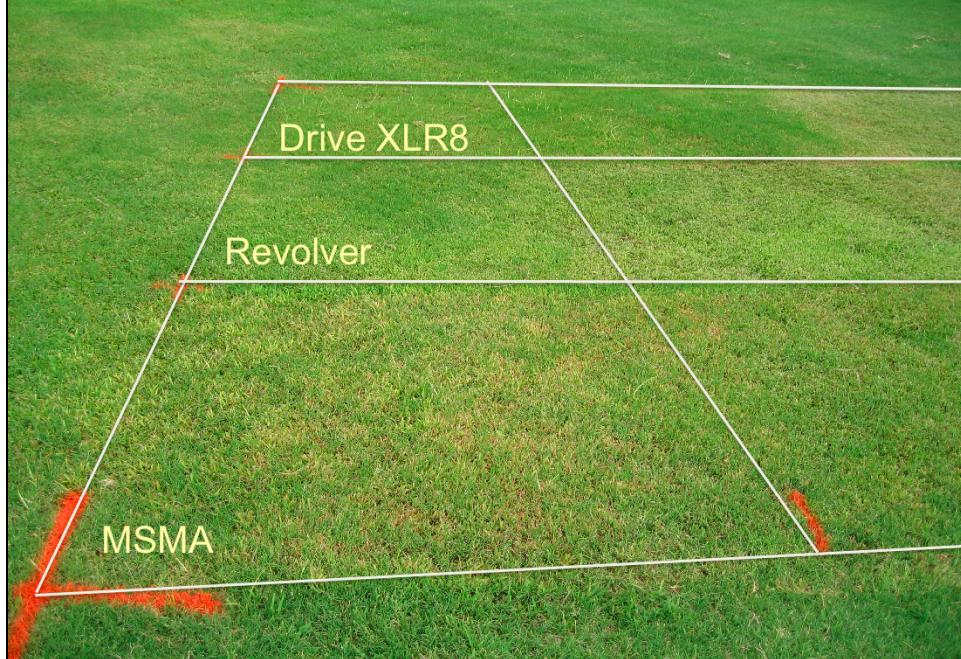


MSMA 3.0 lb a.i./A

MSMA was active postemergence against cupgrass among the three that were evaluated. Quinclorac (Drive) was applied as a dry formulation and was not as active against cupgrass when first tested.



Exploratory testing has shown that foramsulfuron (Revolver*) controlled cupgrass. Further testing is warranted by these initial findings.



MSMA was compared with foramsulfuron (Revolver*) and quinclorac (Drive XLR8*, a liquid formulation) postemergence against cupgrass.



Quinclorac (Drive XLR8*) appears to be more active against cupgrass when an adjuvant is added such as methylated seed oil (MSO) or ammonium sulfate (AMS).

Goosegrass

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Goosegrass is readily identifiable by the white coloration of the crown. It also has a distinctive seedhead.

- Herbicides evaluated

- Postemergence

• Illoxyan*	good control
• Revolver*	good control (suppresses large weeds)
• MSMA	poor to fair control
• Drive*	poor control
• Katana*	poor control

- Preemergence

• Pendulum*	poor to fair control
• Barricade*	poor to fair control
• Dimension*	poor to fair control
• Drive*	poor to fair control

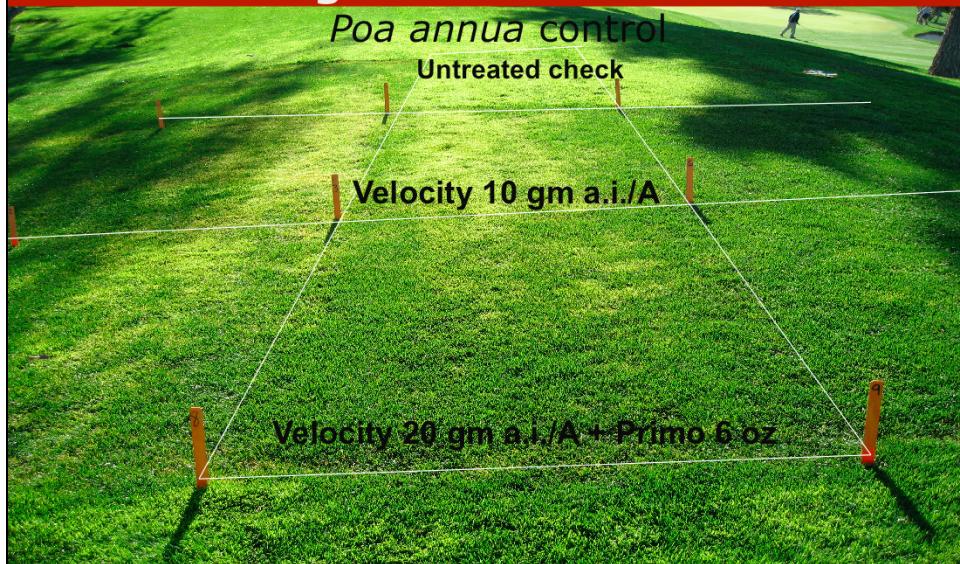
Preemergence herbicides were not as effective as were postemergence applications of Illoxyan* or Revolver*. Generally, a preemergence herbicide applied in a timely manner in the spring should provide acceptable control of goosegrass. Further experiments should be conducted to determine strategies incorporating preemergence and postemergence herbicides.



Revolver 0.6 oz/1000 ft²
Aug 2, 30, 2008

Revolver* applied two times at 4 week intervals on large sized goosegrass.

Recent Developments in Turfgrass Weed Control



Velocity* is showing some reduced populations of Poa annua and multiple applications are needed. Timing of application needs to be refined for optimal weed control. Combinations with other products are also being investigated.

There may be occurrence of slight perennial ryegrass yellowing under certain conditions.

Recent Developments in Turfgrass Weed Control

Bentgrass control in bluegrass/ryegrass mix



Tenacity 0.156 lb a.i./A applied 4 times at 3 week intervals

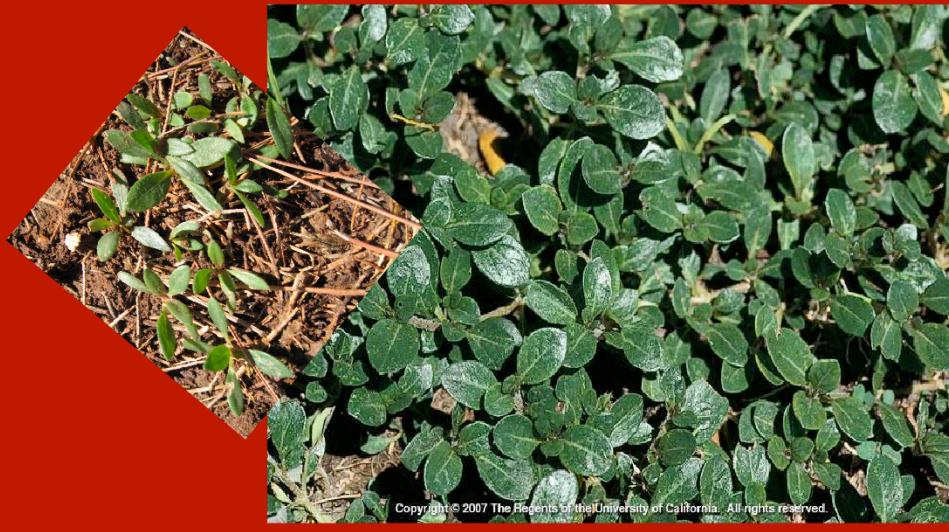
Mesotrione (Tenacity*) bleaches the foliage of treated susceptible weeds.
Multiple applications are required for optimal weed control.

Recent Developments in Turfgrass Weed Control

- Postemergence broadleaved weed control
 - Carfentrazone
 - Quicksilver*
 - Speedzone* (plus 2,4-D, mecoprop, dicamba)
 - Sulfentrazone
 - Dismiss*
 - Surge* (plus 2,4-D, mecoprop, dicamba)
 - Q4* (plus quinclorac, 2,4-D, dicamba)
 - Echelon* (plus prodiamine)

The “zones” cause rapid burning symptoms of treated susceptible weeds.
Pre-mix products enhance the activity of these herbicides.

Alternanthera caracasana – mat chaff-flower
A. pungens - khakiweed, creeping chaffweed



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Khakiweed is also known as mat chaff-flower. It is a prolific summer weed.

Recent Developments in Turfgrass Weed Control

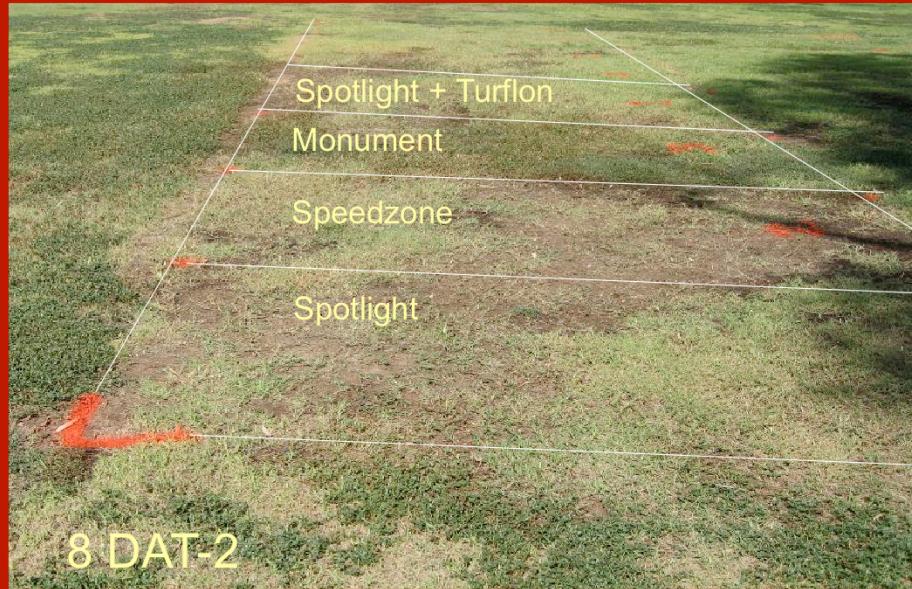
Khakiweed

Herbicides evaluated

- Spotlight + Turflon Ester
- Speedzone
- Trimec
- Surge
- Q-4
- Monument
- Image
- Katana
- Sureguard
- KJM-44

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Herbicides applied postemergence have been investigated against khakiweed over several years. The most recent explorations include flazasulfuron (Katana*), flumioxazin (Sureguard*), and KJM-44 (Dupont). The latter two herbicides are not labeled for use in turf.



Speedzone* and Spotlight* plus Turflon Ester* can reduce populations.
Multiple applications and combinations with preemergence herbicides may offer longer season-long control.



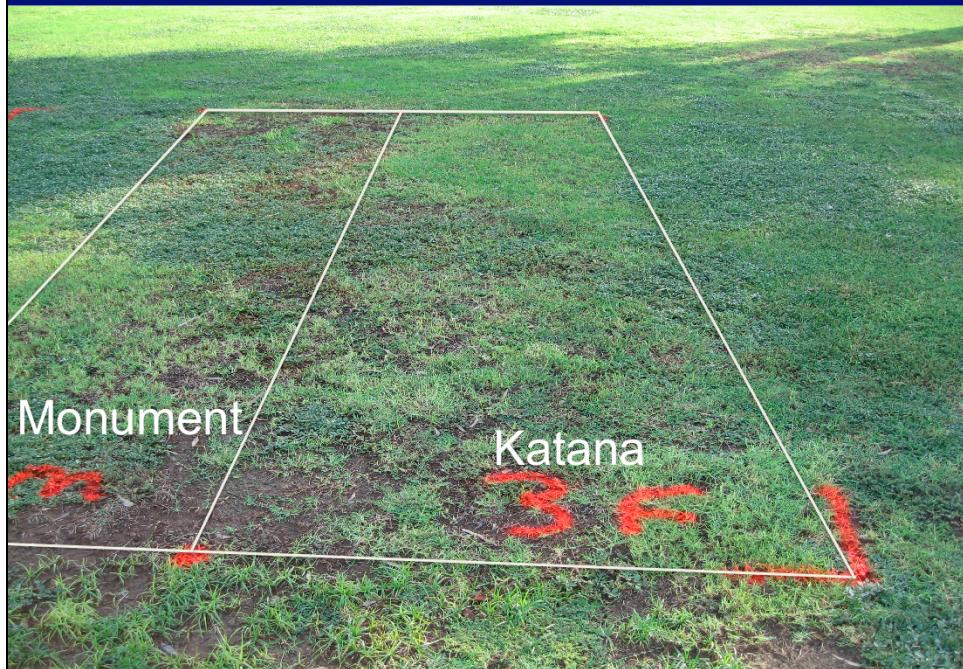
Speedzone* can partially reduce populations. Multiple applications and combinations with preemergence herbicides may offer longer season-long control and further investigations are warranted.

Khakiweed

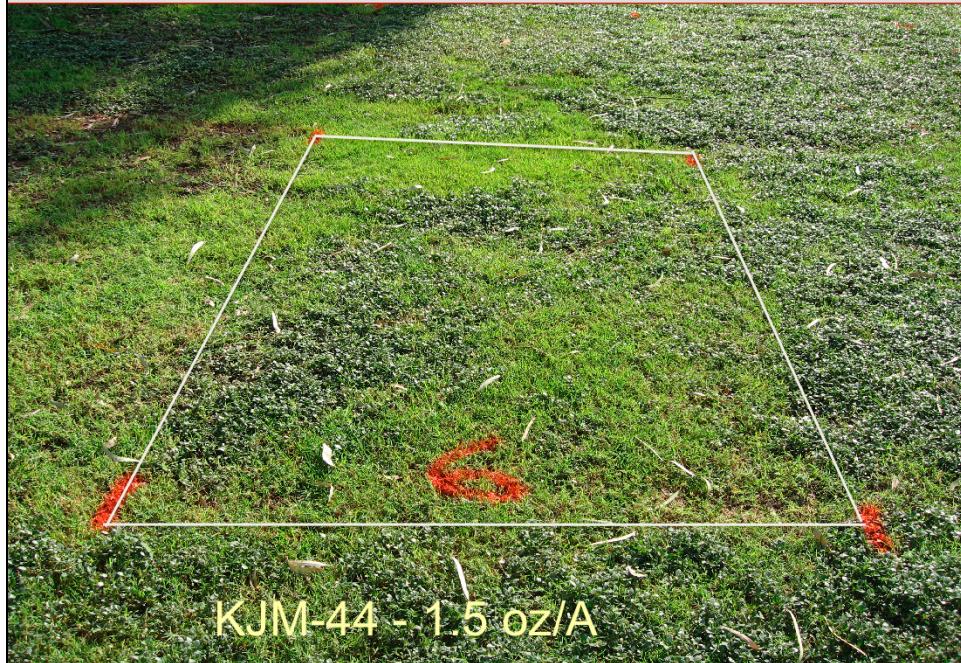
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Flumioxazin (Sureguard*) can reduce populations but turf safety and consistency need to be determined.



Monument* is labeled and should reduce populations. Katana* will soon be marketed in turf and further investigation is needed to confirm its efficacy against khakiweed as well as other weeds.



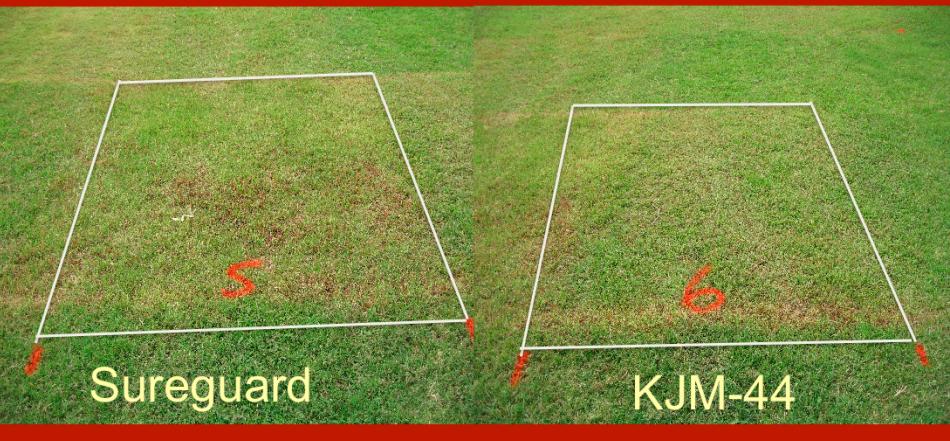
KJM-44, a very early experimental herbicide shows promise for use in turfgrasses.

Spurge

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Flumioxazin (Sureguard*) and KJM-44 may have promise in future spurge control strategies.

wild carrot (*Daucus carota*)wild celery (*Apium leptophyllum*,
Cyclospermum leptophyllum)swinecress (*Coronopus*)

Differentiate between wild celery and two other very similar weeds – swinecress and wild carrot.



Speedzone 5 pt/A



Trimec 4 pt/A

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Speedzone * and Trimec* were effective against wild celery when applied to large-size weeds. Effective control took about 3 weeks.

Recent Developments in Turfgrass Weed Control

- Postemergence burclover control
 - Quicksilver*
 - Speedzone*
 - Dismiss*
 - Surge*
 - Sureguard* (flumioxazin)
 - Octane* (pyraflufen)
 - Drive XLR8*
 - Onetime* (quinclorac + dicamba)
 - Trimec*

Maturing burclover was controlled by most of these herbicides.

Medicago polymorpha – burclover
[California burclover, barrel medic]



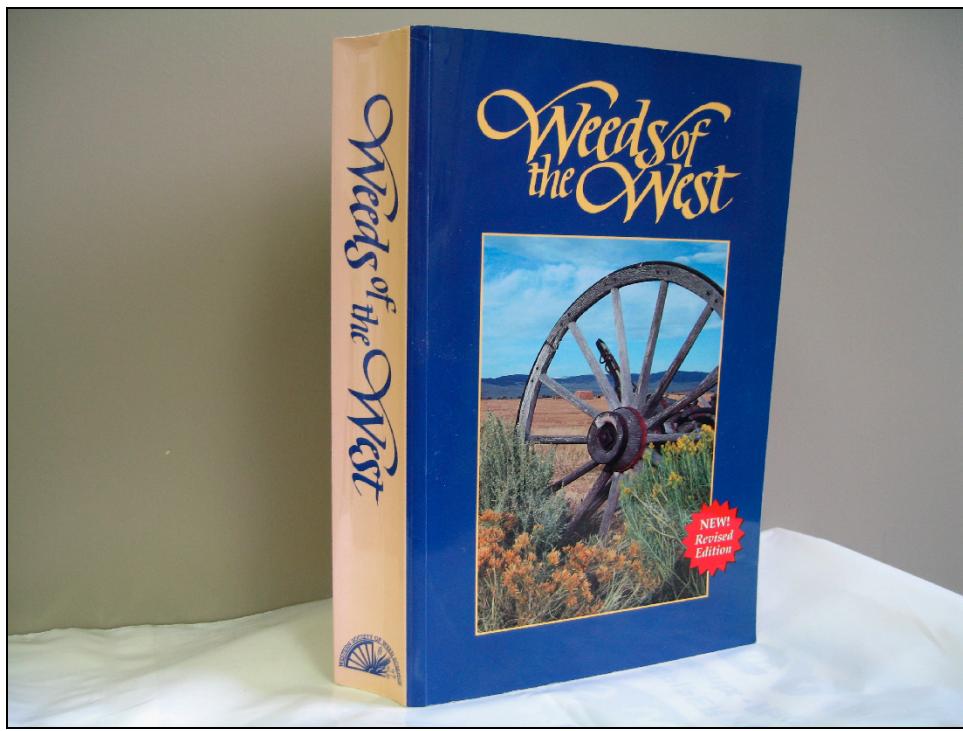
The clover-leaved weeds look very similar and include burclover, medic, and oxalis.

M. lupulina - black medic

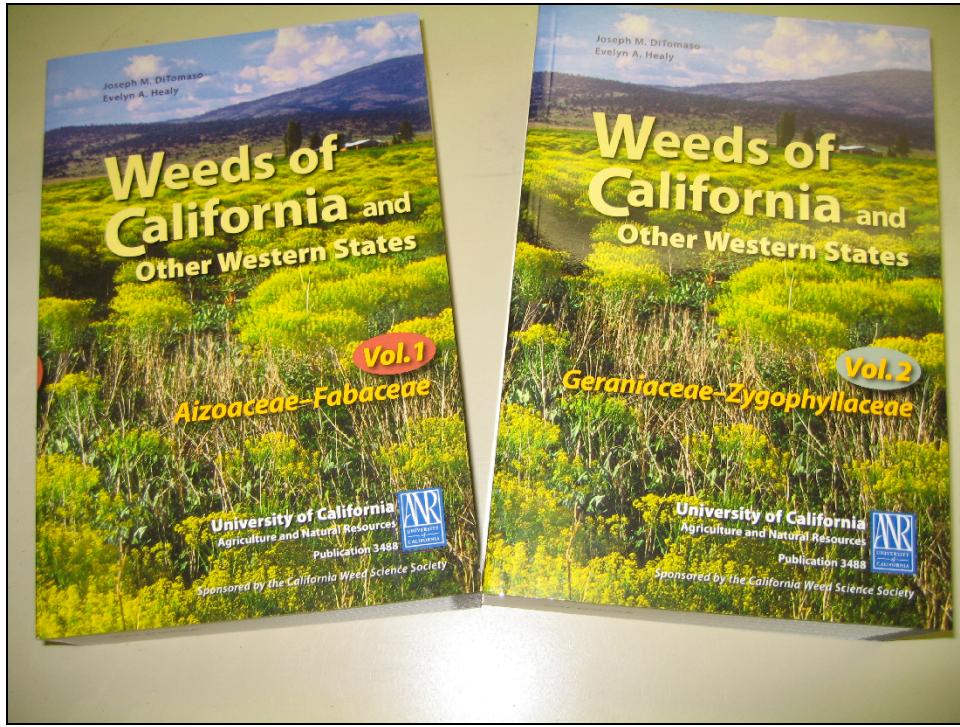


Oxalis corniculata
creeping wood sorrel





Proper weed identification is critical to making choices for which herbicides to use. Weeds of the West is available from the Western Society of Weed Science at www.wsweedscience.org



These 2 volumes and a CD of Weeds of California and other western states is available at www.cwss.org

<http://turf.arizona.edu>



Information about turfgrass research, researchers, publications, calendar of events, and outreach education are at the website for University of Arizona Turfgrass Research, Extension, and Education.