

Monitoring, Preventing, & Controlling Weeds in Residential and Commercial Landscapes

Kai Umeda

Maricopa County
Cooperative Extension
Phoenix, AZ 85040
kumeda@cals.arizona.edu



THE UNIVERSITY OF ARIZONA
**College of Agriculture
& Life Sciences**
Cooperative Extension

Current Status of Herbicide-resistant Weeds in Turf

- *Poa annua* – annual bluegrass
 - ALS-inhibitors
 - Revolver*, Image*, Monument*, Velocity*
 - Microtubule inhibitors
 - Pendulum*, Barricade*, Dimension*
 - PS II inhibitors
 - Atrazine, simazine
 - EPSP synthase inhibitors
 - glyphosate
 - ALS + PS II inhibitors

Poa is reported to be resistant to the classes of sulfonylureas, imidazolinones, dinotroanilines (DNA's), triazines, and Roundup* and similarly formulated brands.

Most of the reports have been confirmed from the southeastern U.S. (i.e. TN, AL, NC).

<http://www.weedscience.org/summary/home.aspx>

Current Status of Herbicide-resistant Weeds in Turf

- *Eleusine indica* - goosegrass
 - ALS-inhibitors
 - Revolver*, Image*, Monument*, Velocity*
 - Microtubule inhibitors
 - Pendulum*, Barricade*, trifluralin
 - PS II inhibitors
 - Sencor*

Goosegrass, becoming more of a problem weed in turf in AZ, is reported to be resistant to the sulfonylureas, DNA's, and triazines.

Current Status of Herbicide-resistant Weeds in Turf

- *Digitaria ischaemum* – smooth crabgrass
 - ACCase inhibitors
 - Fenoxaprop (Acclaim*)
- *Digitaria sanguinalis* – large crabgrass
 - ACCase inhibitors
 - Sethoxydim

Acclaim* is not used in bermudagrass but sethoxydim (Poast* or Segment*) in ornamentals is reported as resistant by crabgrasses. There have been reports from CA that quinclorac products are not as effective against crabgrasses.

Factors for Potential Herbicide-resistant Weeds in Turf and Landscapes

- Perennial systems
 - Turfgrass
 - Ornamental trees and shrubs
- Limited or no cultivation or tillage
- Continuous use of a single herbicide
 - Postemergence
 - Preemergence

Turf and landscapes are generally perennial planting systems (except annual bedding plant areas) that are not regularly subject to the ground being tilled.

Often, for the ease of use and practice, the same POST herbicide, glyphosate branded products are used non-selectively against most annual and perennial weeds.

Glyphosate is typically applied for Poa control as well as winter annuals when bermudagrass is completely dormant in the winter.

Similarly, Pre herbicide use is generally limited to the DNA's.

When weeds are emerged following winter or monsoon rains in the desert, glyphosate is applied and may be tank-mixed with DNA's to provide residual weed control.

Factors for Potential Herbicide-resistant Weeds in Turf and Landscapes

- Weed's annual growth habit
- High seed production
- Adaptability to growing conditions and practices
 - Mowing
 - Irrigation
 - Inconsistent herbicide applications

The grass weeds found to be herbicide resistant in turf are prolific seed producers and grow effectively during long fall, winter, and spring seasons for *Poa* and long spring, summer, and fall seasons for the summer annuals.

Poa, goosegrass, and crabgrass can withstand very low mowing heights as low as 0.10 inch on golf greens. They can take advantage of irrigation systems for ornamentals when drip emitters leak or not appropriately set for run times.

Boom sprayer versus backpack sprayer applications lead to inconsistent spray coverage and weeds can be underdosed to survive applications.

Factors for Potential Herbicide-resistant Weeds in Turf and Landscapes



Poa and goosegrass growing on golf greens at heights less than 0.10 inch.
Poor spray coverage can underdose herbicides being applied to weeds.

Prevention and Control of Weeds in Turf and Landscapes

- Encourage vigorous and dense turf
 - Irrigate
 - Fertilize
 - Mow (remove clippings with weed seeds)
 - Aerify
 - Verticut
- Hoe, handweed younger weeds
- Mulch under trees and shrubs
- Efficient irrigation system
 - Set controllers
 - Fix leaks

Preventing and managing weeds in turf and ornamentals by cultural means reduces herbicide use. Herbicides can be integrated and used effectively in tandem with cultural practices.

Herbicide Control of Weeds in Turf and Landscapes

- **Preemergence herbicides**
 - Follow label rates
 - Do NOT cut rates
 - Apply sequential applications
 - Rotate chemistries
- **Postemergence herbicides**
 - Treat young weeds
 - Follow label rates
 - Rotate chemistries
 - Use tank-mixes
- **Integrate PRE and POST herbicides in a management strategy**

PRE and POST herbicides should be integrated into a strategy to manage weeds in turf and landscapes.

Use herbicides at recommended label rates and don't cut rates. When recommended to apply multiple applications, follow the correct timing of applications for maintaining season-long control.

Rotate chemistries among the different modes of action.

For POST applications, treat small-sized and younger weeds and not weeds that have matured, hardened-off, and set flowers and seeds.

Again, use chemistries that represent different modes of action and utilize tank-mixes or pre-mix products.

Preemergence Herbicide Control of Grass Weeds in Turf and Landscapes

Herbicide	MOA Group	
Benefin	3	
Dithiopyr	3	<i>Poa</i> & crab – fall/spring
Oryzalin	3	
Pendimethalin	3	
Proflam	3	<i>Poa</i> & crab – fall/spring
Trifluralin	3	
Oxadiazon	14	Goosegrass – late spring
Isoxaben	21	Broadleaved weeds
Metolachlor	15	
Dimethenamid	15	
Bensulide	8	

The DNA's typically offer effective control of most grasses and some small-seeded broadleaved weeds. To prevent potential development of resistance, if possible, rotate among different modes of action.

In turf, proflam and dithiopyr are used for *Poa* control prior to overseeding. They are again used for crabgrass control in the spring.

Monitoring grass weed populations may allow changing chemistries or utilizing POST applications of other herbicides.

Postemergence Non-selective Herbicide Control of Weeds in Turf and Landscapes

Herbicide	MOA Group
Glyphosate	9
Glufosinate	10
Diquat	22
Pelargonic acid	26

Non-selective POST herbicides can be effective on non-overseeded bermudagrass in the winter. Glyphosate may cause injury if bermudagrass is showing any green. Multiple applications may be needed if winter rains bring on more germinating broadleaved weeds and *Poa*.

PRE / POST Herbicide Control of Weeds in Turf and Landscapes

Herbicide	MOA Group
Indaziflam	29
Flumioxazin	14
Simazine	5

Control of *Poa* in dormant non-overseeded bermudagrass now has effective options by using Specticle* or SureGuard*. Both are effective against small, 1-2 leaf sized *Poa*, and controls most weeds through the winter and well into the spring.

All 3 of the PRE /POST options represent different modes of action and can be integrated into a strategy where overseeding may be skipped occasionally.

Postemergence Herbicide Control of Weeds in Turf and Landscapes

Grass Herbicides	MOA Group	
Clethodim	1	Landscape
Sethoxydim	1	Landscape
Fluazifop	1	Landscape
Ethofumesate	8	Turf
Amicarbazone	5	Turf
Methiozolin	30	Turf
Quinclorac	4	Turf
Broadleaved Turf Herbicides	MOA Group	
2,4-D	4	
Dicamba	4	
Clopyralid	4	
Triclopyr	4	
Sulfentrazone	14	
Carfentrazone	14	

Different modes of action can be used against various grass and broadleaved weeds, especially in turf.

The grass herbicides, “FOPS” and “DIMS” are very good against bermudagrass growing in ornamentals.

Prograss*, Xonerate*, and PoaCure* are being further investigated for use against *Poa* in the desert turf on golf courses.

Quinclorac products have been effective against crabgrass and southwestern cupgrass in turf.

The broadleaved turf herbicides generally are pre-mixed by various companies and are very good in overseeded winter turfgrasses. Temperature restrictions limit use on warm-season turf due to some phytotoxicity.

ALS-inhibiting Postemergence Herbicides in Turf

Herbicide	MOA Group
Foramsulfuron (Revolver*, Tribute Total*)	2
Trifloxysulfuron (Monument*)	2
Sulfosulfuron (Certainty*)	2
Flazasulfuron (Katana*)	2
Halosulfuron (SedgeHammer*, Tribute Total*)	2
Metsulfuron (Manor* & others)	2
Rimsulfuron (TranXit*)	2
Iodosulfuron (Celsius*)	2
Bispyribac-sodium (Velocity*)	2
Imazaquin (Image*)	2
Imazethapyr (Dismiss South*)	2

The most diverse and broadspectrum ALS-inhibiting herbicides are being adopted for many uses year-around in turf.

Low doses Monument*, Certainty*, Katana*, Manor*, Tribute Total*, and TranXit* can be used for spring transition to remove overseeded ryegrasses from bermudagrass.

Higher rates of Monument*, Certainty*, Katana*, and Tribute Total* are very effective against purple nutsedge in the late summer.

The ALS-inhibitors control other weeds and undesirable vegetation in turf, overseeded and non-overseeded, so their use is extended over the winter, spring, summer, and fall.

The potential for herbicide resistance is very possible for this mode of action family.

Prevent and Monitor Weeds in Turf and Landscapes for Herbicide Resistance

- Culturally manage turf and landscapes
 - Encourage vigorous and healthy plants
 - Efficiently manage water
- Rotate available herbicide chemistries
 - Use label rates
 - Don't cut rates

In summary, herbicide resistance is not yet documented in desert turf and landscapes. The potential exists but diligent monitoring and utilizing cultural practices can prevent the onset of resistance. Many herbicide alternatives exist but learning to integrate them into a strategy can lessen the pressure on the few existing reliable herbicides used commonly today.

<http://turf.arizona.edu>