

Managing the Nasty Weeds of Lawn Care
 Roch Gaussoin, Extension Turfgrass Specialist, University of Nebraska

50th Reinders Turf Conference
 MARCH 9-10, 2022 - WAUKESHA EXPO CENTER

EXTENSION

1



2

Yellow nutsedge

- A perennial weed found in both cool- and warm-season turfgrasses
- Tolerates close mowing and competes for water and nutrients
- Fast growing

3

Sedges *have edges*.....

- Parallel veins
- Triangular stems, solid, without nodes
- Three ranked leaves – arising from each side of the stem

4

Tubers

- Tuber production in yellow nutsedge is highly prolific
- Tubers can remain dormant in the soil for multiple years and can sprout multiple times
- Herbicide control of yellow nutsedge is often inconsistent or non-existent

5

Interference Between Kentucky Bluegrass (*Poa pratensis*) and Yellow Nutsedge (*Cyperus esculentus*) in a Home Lawn

Luqi Li and Roch Gaussoin
 University of Nebraska-Lincoln

Nebraska Lincoln

6

Treatments

Three irrigation levels:

- No Irrigation
- 80% total ET replacement per week
- Irrigate 2 inch /plot/week regardless of precipitation

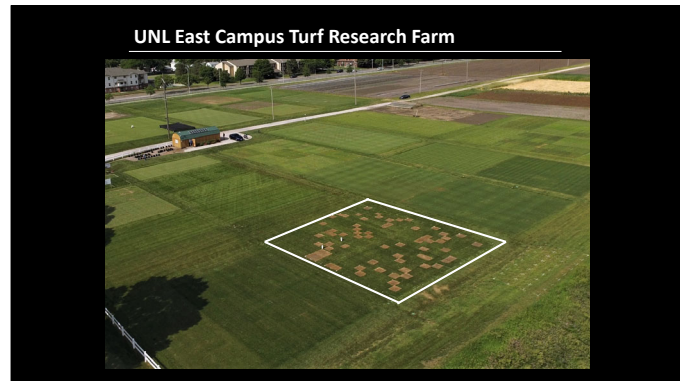
Three fertility levels:

- No additional fertility
- 2 lbs N/M/year
- 4 lbs N/M/year

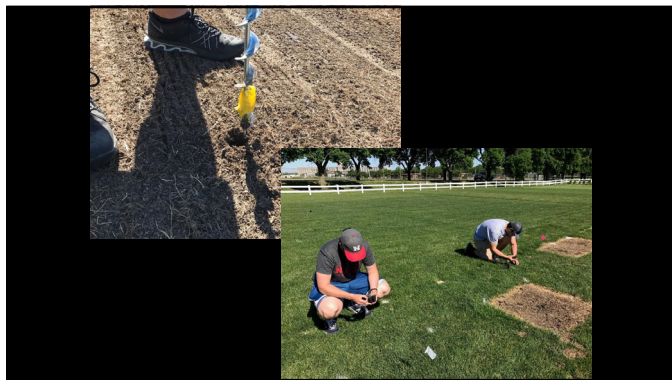
Two plot types: **Mowed at 3 inch weekly**

- Polyculture - Yellow nutsedge within Kentucky bluegrass
- Monoculture – Yellow nutsedge in bare soil

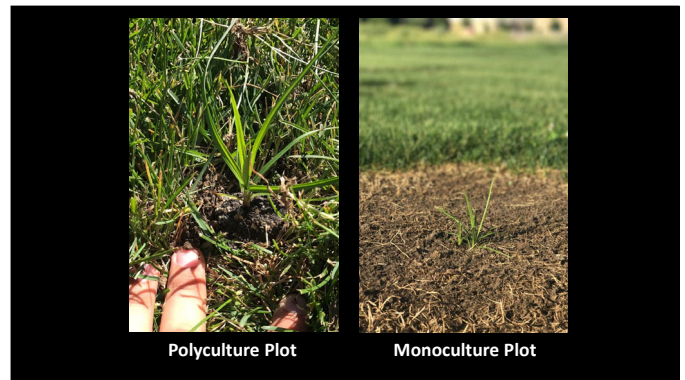
7



8



9



10



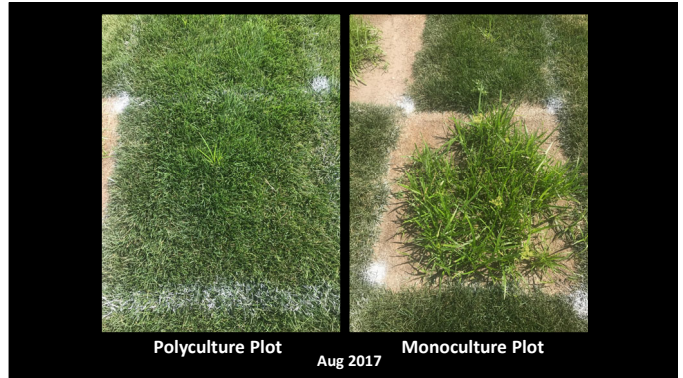
11



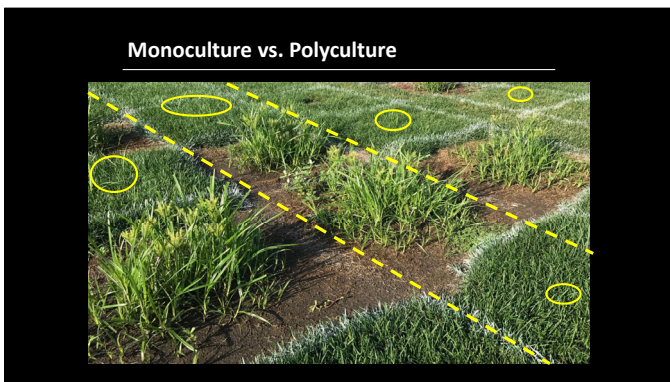
12



13



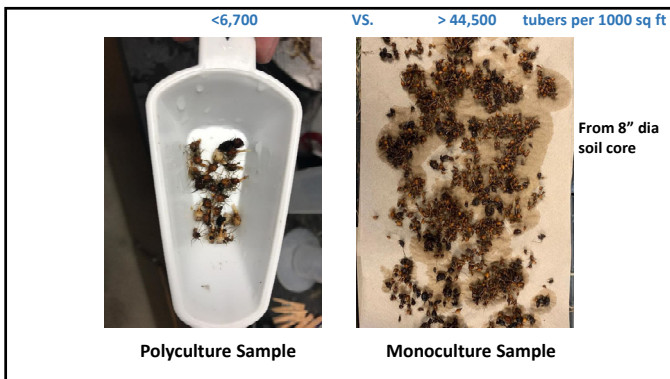
14



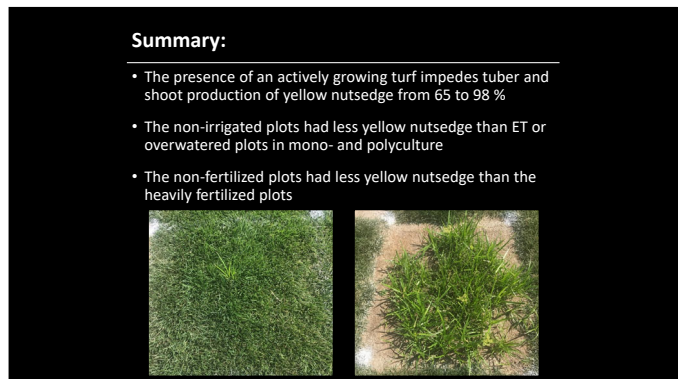
15



16



17



18

Chemical Strategies

19

Sulfentrazone

- *Dismiss* is the primary postemergence herbicide with sulfentrazone, although *SUREPYC* and *Solitare* (sulfentrazone + quinclorac) have a similar amount
- *Dismiss* may also provide preemergence with postemergence control; only *Echelon* (proflam + sulfentrazone) is labeled for preemergence control
- *Q4 Plus*, *Surge*, *SureZone* and *TZONE* all contain sulfentrazone; labeled for yellow nutsedge suppression, not control
- Injury will appear within a few days of application. Rate will affect the level of control but not the speed of activity
- Surfactant is not required, nor recommended

20

Halosulfuron

- *SedgeHammer*, *ProSedge*, *SedgeMaster* and others
- Many formulations require a surfactant
- *SedgeHammer+* formulation already includes surfactant
- Injury will appear in about two weeks following application

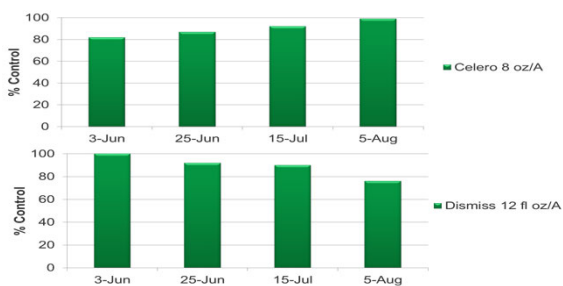
21

Imazosulfuron

- *Celero*
- Add NIS at 0.25% (v/v)
- Repeat application 21 days after the initial application if needed
- Do not apply to moist or wet turf
- Do not apply to golf course putting greens

22

UNL DATA



23

Mesotrione

- *Tenacity*
- Causes a bleaching effect on susceptible weeds
- Surfactant recommended
- Not labeled for creeping bentgrass
- Repeat applications recommended
- Safe at seeding

24

Bentazon

• *Basagran T/O*

- Four- to six-leaf stage of nutsedge growth
- Apply when the temperature is at least 75°F
- Add crop oil or a nonionic surfactant for best results
- Complete spray coverage is essential
- Repeat applications recommended

25

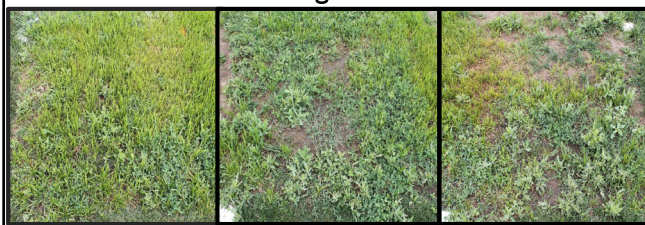
Pyrimisulfan

• *Vexis*

- Cool and warm season, including bentgrass, >½"
- Slow response (21-28 days)
- Granular (shake and bake)
 - Spot treating

26

Vexis Testing at UNL-2020



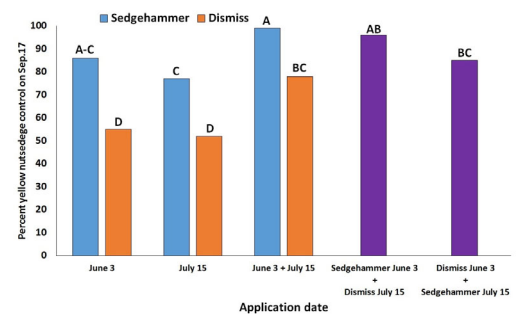
Control

1 app 3 tiller 40 dait

2X app 3 tiller 40dait 10dat (2nd)

27

Effect of application timing on yellow nutsedge control when Sedgehammer (1 oz/A) and/or Dismiss (4 oz/A) was applied on June 3 and/or July 15.



28

Rotating MOA's for Resistance Management

- Resistance in yellow nutsedge has been reported (Tehranchian et al., 2015)
- Rotate halosulfuron, imazosulfuron or pyrimisulfan (**Group 2**) with mesotrione (**Group 27**) or sulfentrazone (**Group 14**) or bentazon (**Group 8**) for postemergence yellow nutsedge control

29

When to control yellow nutsedge:

- Yellow nutsedge herbicide control programs must be implemented early in the season and in consecutive years
- As early as it is visible
- Tubers are immature
 - Controls/suppresses tuber formation
 - Herbicides are more readily translocated to roots, rhizomes and tubers
- Sequential application
 - Make a second application 3 or 6 weeks after the initial application
 - Sequential application works better than single app for most herbicides
 - Rotate modes of action

30



31

Prostrate knotweed

- Summer annual....sort of
- ultimate indicator weed for compacted, low O₂ soils
 - *alleviate problem, minimize weed opportunity*
- early germination and grass-like seedling stage confuse ID and control
- post germination growth rate increases exponentially, creating a dense mat of residue
- dead wire-like stems persist through winter
- Once established, control is very difficult

32

Preemergence Control

- Late fall (November or December) applications of isoxaben (Gallery, Isoxaben 75WG)
- Other preemergence herbicides will work, but less effective than isoxaben
- Late winter apps work, but spraying conditions may be unfavorable
 - *dead wire-like stems persist through winter to ID hot spots*
- It is difficult to predict exactly when prostrate knotweed might germinate, usually Feb/March in the central US.



33

Postemergence Control

- 2,4-D by itself will provide only fair control of prostrate knotweed
- 2,4-D + triclopyr (Turflon Ester, Ultra or Triclopyr 4) or dicamba (Banvel, Vanquish) provide excellent control. Other products that contain 2,4-D and triclopyr include 4-Speed XT, Chaser, Chaser 2 Amine, Momentum FX2, Sure Power, Turflon II amine, and TZONE
- Combination products that contain 2,4-D and dicamba (Trimec 992 and SpeedZone) provide good control
- **Hit it hard and hit it early**

34

Change-Up (MCPA, fluroxypyr and Dicamba) Efficacy on Prostrate Knotweed

Spring and Summer, 2019

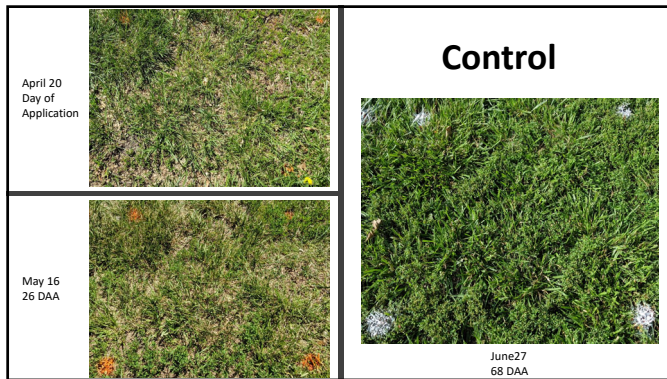
35

Visual percent control of prostrate knotweed following treatment with Change-Up. Initiated April 20, 2019.

	13 DAA May 3	26 DAA May 16	41 DAA May 31	55 DAA June 14	68 DAA June 27
Change-Up ²	42.5 A	81.3 A	81.3 A	77.5 A	72.5 A

1. Retraz applied at 0.72 oz/A
 2. Change-Up applied at 3.00A
 3. Means with a different letter are significantly different at P ≤ 0.05

36



37



38

Table 2. Percent control of prostrate knotweed following treatment with Change-Up applied at 3 pt/A . Initiated July 12, 2019.

	14 DAA July 25	22 DAA August 2	36 DAA August 16	42 DAA August 22	49 DAA August 29	64 DAA September 13
Change-Up ²	92.5 A	100 A	100 A	100 A	100 A	100 A

1. Reslar applied at 0.72 oz/A
2. Change-Up applied at 3 pt/A
3. Treatments with a different letter are significantly different at P < 0.05.

39

Summary

- **Spring:** Change-Up reduced prostrate knotweed populations up to 41 DAA
 - Change-up provided >70% control
 - Make multiple applications if applying early in the spring to compensate for germination post application
- **Summer:** Knotweed control was increased when applied in the summer
 - Change-Up provided 100% control

40

Is crabgrass a nasty weed?

- WSSA – most “common” weed -Crabgrass spp. (large, smooth and southern crabgrass)
- Resistance issues with long used chemistries (smooth; DNA’s)

41

Turf iNfo for the North Central US | University of Nebraska – Lincoln | turf.unl.edu

At least you haven't had to mow much
April 12, 2018

It's not a secret, spring is way behind this year. The good news, many haven't had to mow yet and it's still too early to apply those pre-emergence herbicides. The bad news, spring seeding will be much more difficult this year. The cold weather has slowed germination and is compressing the spring seeding window. That means there may not be a sufficient period of time for the seeds to germinate and mature before the summer stress ramps up. For homeowners, we don't want to force green up with a lot of nitrogen fertilizer and we need to hold off aggressive cultivation until the turf resumes normal growth.

Another issue we are seeing on golf courses is winterkill. While it isn't as widespread as 2014 and 2015, there are patches and areas of dead turf. It's been tough to tell for sure because it's been so cold. Is the turf really dead or just slow to wake up? To definitively know, bring plugs inside and watch for green up. I'm sure some areas will be dead and others will just be slow. It is good to know, especially with the shortened seeding window.

42

Turf iNfo for the North Central US | University of Nebraska – Lincoln | turf.unl.edu

Soils slow to warm in 2018, don't be in a hurry to apply preemergence herbicides
April 12, 2018

Spring 2018 has moved at a snail's pace and even the slightest warming trend has consumers and professionals ready to get going. One management practice that is closely linked with soil temperature is the application of preemergence herbicides. Summer annual grasses such as crabgrass require optimal soil temperature and moisture to germinate and persist. Crabgrass and foxtail germination will occur when soil temperatures in a lawn at the 0-2 inch depth are consistently between 60 and 70 F. For preemergence herbicides to be most effective, they must be applied before the soils reach this optimum temperature range. A soil temperature of 55 F (daily average) for several consecutive days is a reasonable based estimate for preemergence application timing. You can monitor soil temperature yourself with a thermometer but, in my opinion, a far easier and more precise measurement of soil temperature across Nebraska can be found at:

<https://cropwatch.unl.edu/cropwatchsoiltemperature>

Left: One-day average soil temperatures. Right: Seven-day average soil temperatures.

43

Turf iNfo for the North Central US | University of Nebraska – Lincoln | turf.unl.edu

Preemergence herbicide failure
September 6, 2018

The growing season in 2018 up until now has been challenging. Looking back on this summer, lawn care applicators and homeowners were mentioning "failure" of preemergence herbicides at a frequency greater than what I have seen in most years. I do not see this as herbicide failure as much as strange early season weather. Research indicates that crabgrass begins to germinate when the average daily soil temperatures reach 57 to 64 F at a one-inch depth. That said, the greatest flush of crabgrass germination will not start until soil temperatures increase to 73 F or above at a one-inch depth (Fidanza et al., 1996) and will continue until soil temperatures reach 95 F. In my estimation, a relatively cool spring was good for herbicide degradation in the soil but not good for crabgrass germination. Then soils warmed up later than "normal", resulting in the largest flush of germination occurring as the concentration of herbicide was declining. I believe that is why we saw a larger than normal flush of crabgrass later in the season. To avoid this in future years, consider tracking soil temperatures and delaying preemergence applications in the spring until temperatures are optimal for crabgrass germination. This will be much easier for single location consumers than lawn care operators who deal with a significantly greater number of locations. If products must be applied earlier than optimal due to client needs, then consider using a longer residual product containing proflinane.

Reasons for reduced efficacy in preemergence herbicides were discussed in earlier Turf iNfo's posted on March 26, 2018 and April 16, 2018.

44

Why was 2018 an issue.....

Precipitation

Soils cooler than norm

return to norm

crabgrass growth flush

Preemerge conc.

— 50 yr Mean — 2018

45

Chemical Control

- Preemergence
 - Apply before weeds germinate
 - Very effective on annual weeds
- Postemergence
 - Apply to actively growing weeds
 - Contact
 - Systemic

46

When to apply preemergence herbicides

- Soil temperatures exceed 50-55 ° F
- Max emergence occurs at 70°+
- Occurs first:
 - In landscape beds
 - Thinned turfgrass
 - Near sidewalks
 - Usually, around April 15 (NE)
- Most turf stands
 - Around May 1-15 (NE)
 - Better to apply early than late

47

Crabgrass control on July 15 from PRE's applied on 6 different dates in fall/spring. (Averaged over three years, UNL 2013)

% Control (July following app)

■ Dimension 2EW 0.5 lbs ai/a
 ■ Barricade 4 FL 0.75 lbs ai/a
 ■ Pendulum AQ 3.0 lbs ai/a

48

Preemergence Herbicide “efficacy”



- Less than adequate control
- Application rates are correct, so...?
- Reasons for “failure”
 - Poor turf conditions
 - Tough weeds
 - High rainfall/irrigation
 - Non-Uniform application
 - Climate variability

49

Crabgrass Postemergence Weed Control

- Herbicide uptake and translocation vary
- Death of the weed may be slow
- Mature weeds may not be controlled completely
- Hit them hard and early

50



51

Perennial Grass Control

“The best way to control undesirable perennial grasses in the lawn is to spot treat with glyphosate.” (1994)



52

Windmillgrass – *Chloris verticillata*

- Warm-season, native perennial
- Topramezone (Pylex) plus triclopyr provide the best control
- Mesotrione (Tenacity) and Acclaim Extra (fenoxaprop) less expensive option
- Adding triclopyr (Turflon Ester Ultra or Triclopyr 4) at 1 qt/A to either topramezone, fenoxaprop, or mesotrione will significantly improve control.
- Apply at least 2 times, target applications in the late spring and early summer



Image from Midwest Weeds and Wildflowers, Missouri State University.



53

Nimblewill – *Muhlenbergia schreberi*

- Warm-season, perennial
- Mesotrione (Tenacity) applied in the spring (with NIS), two or three applications.
 - For three applications, use the 5 fl oz/A rate (or 6, 6 and 4 fl oz/A) due to label restrictions.
 - Late summer and fall applications will work but start by August for best results.
- Topramezone (Pylex) at 1-1.5 fl oz/A at 21- to 28-day intervals starting in late April; include a methylated seed oil.



Above image from Midwest Weeds and Wildflowers, Missouri State University.

Above and right image from Purdue University.

54

Creeping Bentgrass – *Agrostis stolonifera*

- Cool season, perennial
- Mesotrione (Tenacity) is safe for use in Kentucky bluegrass (5-8 fl oz/A), perennial ryegrass (5 fl oz/A), tall fescue (5-8 fl oz/A), and fine fescue (5 fl oz/A) and will control creeping bentgrass
- Timing is critical. Begin applying in early September. Three or four applications at two-week intervals. At least three applications are required for best results. Loses effectiveness later in the fall.
- Spring and summer applications provide less consistent control.

Images at right from University of Minnesota Extension.

55

Smooth Brome – *Bromus enermis*

- Cool-season, perennial
- Research conducted at Nebraska with Mesotrione (Tenacity) + NIS
 - 5.3 fl. oz./acre three times 10 days apart or
 - 8 fl. oz./acre applied two times 10 days apart,
 - applied in July resulted in about 85% control by Sept. 15.
- Spring applications had <30% control.

Image above from Katy Chayka, Minnesota Willflowers.

56

Bermudagrass, *Cynodon spp.*

- Warm-season, perennial
- No "efficient" selective herbicides in cool-season turf.
- Three applications of topramezone (Pylex) at 1.33 fl oz/A at 21-day intervals starting in late summer to suppress bermudagrass. For best results, tank-mix triclopyr at 1 qt/A and include a MSO.
- Repeat applications of fenoxaprop (Acclaim Extra) 28 fl oz/A during late spring and late-summer/fall provide suppression. Adding triclopyr improve turfgrass safety and suppression.
- Use with with an overseeding of a desirable cool-season turfgrass post last application; repeat for 2-3 consecutive years.

Images from Aaron L. Patton, Purdue Extension Turf Tip.

57

Zoysiagrass – *Zoysia spp.*

- Warm-season, perennial
- No "efficient" selective herbicides in cool-season turf.
- Like bermudagrass, three applications of topramezone (Pylex) at 1.33 fl oz/A with MSO at 21-day intervals starting in late summer will suppress zoysiagrass (no triclopyr).
- Use with an overseeding of a desirable cool-season turfgrass after the last application; repeat for 2-3 consecutive years.
- Expect 50-75% zoysiagrass removal per year with this topramezone, plus overseeding strategy.

Image above from Missouri Botanical Garden.
Image right from North Carolina State Extension.

58

Turfgrass Weed Control for Professionals

https://mdc.itap.purdue.edu/item.asp?item_Number=TURF-100

59

How to Use the Tables in this Publication	70	Successfully Using Plant Growth Regulators in Turf	117
Nonselective Herbicides/Fumigants for Turfgrass Renovation	71	Plant Growth Regulator Suppression and Suggested Reapplication Intervals	119
Nonselective Herbicides for Turfgrass Border Maintenance (Edging)	72	Annual Bluegrass Suppression in Creeping Bentgrass Putting Greens with Plant Growth Regulators (PGRs)	120
Preemergence Herbicides	73	Pesticide and Plant Growth Regulator Math	121
Weed Control Ratings for Preemergence Herbicides	73	Common Weights and Measures	121
Turfgrass Tolerance to Preemergence Herbicides	74	Ounces or Ounces	122
Preemergence Herbicides	75	Amount of Product Needed	122
Postemergence Herbicides	79	Amount to Add to the Spray Tank	123
Weed Control Ratings for Postemergence Broadleaf Herbicides	79	How Many Tanks (trips with my sprayer) Does it Take?	123
Weed Control Ratings for Postemergence Grass Herbicides	82	What If the Recommended Rate is in Pounds of Active Ingredient?	123
Turfgrass Tolerance to Postemergence Herbicides	84	How Much Does This Herbicide Cost per Acre (or 1,000 ft ²)?	124
Postemergence Herbicides	86		

Format: Book.

60

Sedge Control Herbicides From - Turfgrass Weed Control for Professionals

Sedge Control and Turfgrass Tolerance Ratings

Herbicide	Sedge Control				Turf Tolerance									
	Sedges and Kyllinga				Cool-season					Warm-season				
	annual sedge	late-green kyllinga	purple nutcracker	yellow nutcracker	annual bluegrass	perennial bluegrass	fine fescue	Kentucky bluegrass	perennial ryegrass	tall fescue	bermudagrass	bahia grass	zoysiagrass	
2,4-D + fluroxypyr + triclopyr + sulfentrazone (Blumentum 4-Scene)	P	P	P	F	S	S	S	S	S	S	NR	NR	NR	
2,4-D + MCPA + dicamba + sulfentrazone (Tread SFZ Solart)	P	P	P	F	S	S	S	S	S	S	S	S	S	
2,4-D + quinclorac + dicamba + sulfentrazone (Q4 Plus)	P	P	P	F	S	NR	S	S	S	S	S	NR	S	
2,4-D + triclopyr + dicamba + sulfentrazone (Fountain)	P	P	P	F	S	NR	S	S	S	S	NR	NR	NR	
bentazon (Basagran T/O)	G	F-G	P	F	S	S	S	S	S	S	S	S	S	
dimethenamid (Tower)	G	G	F	F-G	NR	NR	NR	NR	NR	NR	NR	S	S	
dimethenamid + pendimethalin (FreeHand)	G	G	F	F-G	NR	NR	NR	NR	NR	NR	NR	S	S	
flazasulfuron (Katana)	G	G	G-E	G-E	NR	NR	NR	NR	NR	NR	S	S	S	
halosulfuron (SedgeHammer)	G	F	G	G-E	NR	S	S	S	S	S	S	S	S	
halosulfuron + dicamba (Yukon)	G	F	G	G-E	NR	S	S	S	S	S	S	S	S	
imazapic (Plataou)	F	F	F	F	NR	NR	NR	NR	NR	NR	S	S	NR	
imazaquin (Image 70DG)	G	G-E	G	F	NR	NR	NR	NR	NR	NR	S	NR	S	
imazosulfuron (Celero)	G	E	G-E	G-E	NR	S	S	S	S	S	S	NR	S	
mesotrione (Tenacity)	P	P	P	P	NR	NR	S	S	S	S	NR	S	NR	
mesotrione (Branco) MAGNUM	P	P	P	P	NR	NR	NR	NR	NR	NR	S	NR	NR	

61

Other resources:

- <http://www.mobileweedmanual.com/> Jim Brosnan, Ph.D.




62

Contact Information

- Roch Gaussoin
- rgaussoin1@unl.edu
- [@rockinsince57](https://twitter.com/rockinsince57)

Thank you!



63