



Strategy for Nutsedge Control in Turf

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Figure 1. Purple nutsedge (*Cyperus rotundus*) growing over turfgrass.

The grass-like purple nutsedge (*Cyperus rotundus*) is a problem weed in agricultural crops, residential and commercial landscapes, and in turfgrasses on golf courses, sports fields, and home lawns (Figure 1). Both purple and yellow (*C. esculentus*) nutsedges occur in Arizona's low desert region, but purple is more prevalent and more difficult to control. Yellow nutsedge is more readily found at the higher elevation regions of Arizona where cool-season turfgrasses are grown year around. Both perennial sedges look like grasses with dark green, glossy and hairless leaves but they have stems that are solid and triangular in cross-section compared to rounded or folded and hollow grass stems.

If purple nutsedge is targeted for herbicide treatment, yellow nutsedge will also be controlled in most situations. An effective approach to control nutsedge is to combine frequent mowing and herbicide burndown sprays to weaken emerging nutsedge infestations in turfgrasses in the spring and early summer. Then after the summer solstice, apply acetolactate synthase (ALS, an enzyme

occurring in plants for amino acid production) - inhibiting herbicides that translocate to the underground tubers to achieve longer lasting control.

Purple nutsedge begins to emerge from individual growing points located on underground tubers residing under the turfgrass as early as February or March as the soil temperatures increase. When shiny green nutsedge plants first appear in the spring, frequent mowing with a low mowing height of cut will reduce the severity of the nutsedge infestation and competitiveness. The constant cutting of the foliage will force more regrowth from the tubers that uses up stored up carbohydrates thereby stressing the nutsedge plants. Optimizing the timing of irrigation and improving irrigation uniformity to reduce excessive soil moisture will make conditions less conducive for nutsedge proliferation. Managing cultural practices of increased frequency of mowing at lower cutting heights and eliminating excess soil moisture will complement the use of herbicides by favoring the turfgrass plants over that of nutsedge.

In tandem with frequent mowing at low heights, apply postemergence herbicides that cause “burndown”, a rapid foliar chlorosis (yellowing leaves) followed by desiccation. One choice is monosodium methylarsonate (MSMA) that is only for use on golf courses, sod farms, cotton, and highway rights of way. There is a limited use pattern allowed on golf course turf and sod farms. MSMA is no longer permitted for use on residential turf. Applications on existing courses are limited to spot treatments (100 sq ft per spot), not to exceed 25% of the total course area in one year. On sod farms, two broadcast applications are allowed per crop. A 25 foot buffer strip is required for fields bordering permanent water bodies.

MSMA has no preemergence soil activity and requires multiple postemergence applications to repeatedly burndown the continuously emerging nutsedge. Another postemergence herbicide choice is sulfentrazone (Dismiss CA*) that causes similar nutsedge foliar burning. Repeated postemergence “burndown” herbicide applications at 7-14 day intervals before the summer solstice will begin to exhaust the underground tubers of carbohydrate reserves as they use it to grow new shoots that subsequently get killed by the burndown herbicides and cut by frequent mowing. The duration of suppression from the resultant burndown may last 7 to 14 days but in tandem with continuous low mowing, nutsedge tuber carbohydrates will be reduced. The frequent burndown postemergence herbicide applications with frequent mowing may be difficult to achieve so an occasional skipped mowing would allow foliar growth of the nutsedge and more leaf surface area would be available for the herbicide spray to contact.

At the end of June or around the 4th of July holiday, following early season applications of MSMA and Dismiss CA and frequent mowing, the highly effective ALS-inhibiting herbicides can begin to be applied for further postemergence control of the purple nutsedge. The commercially available ALS-inhibiting herbicides that control nutsedge are SedgeHammer* (halosulfuron), Scepter* (imazaquin), Monument* (trifloxysulfuron), Certainty* (sulfosulfuron), Katana* (flazasulfuron), Celero* (imazosulfuron), and Vexis* (pyrimisulfan) (see Table). Combination herbicide products can be used at this timing of application – Tribute Total* (halosulfuron plus foramsulfuron [Revolver*] plus thiencazabone) as well as Dismiss South* (sulfentrazone plus imazethapyr). Imazethapyr is in the same chemical family as Scepter*. The timing of the next sequential application of these herbicides at 4 to 6 six weeks after the first application takes

advantage of the shorter day-lengths after the summer solstice. At that time, there is increased translocation of photosynthates (carbohydrates) to the developing tubers so the ALS-inhibiting herbicides enter the plants and move to the developing tubers and prevent their further maturation and thus decrease the formation of tubers for following years. These postemergence herbicides are effectively absorbed by the plants’ roots and shoots and are especially effective through the foliage when adjuvants are added to the spray mix. Results of several nutsedge control experiments conducted with these products are available when consulting resources. Always read and follow the instructions on herbicide labels that provide specific details for the use of adjuvants, timing of the appropriate number of applications, turfgrass species tolerance, and watering guidelines following spray applications.

The “1-2 punch” of MSMA/Dismiss CA followed by sequential ALS-herbicide applications will effectively reduce purple nutsedge populations in turfgrasses. Of course, the severity of the infestation and turf management practices will contribute to the level of control achieved. A dense population of nutsedge and excessive soil moisture content will make it more challenging to reduce the infestation. Generally, most of the ALS-inhibiting herbicide labels recommend a sequential application at 4 to 6 weeks after the first application. SedgeHammer*, Scepter*, and Vexis* have shown to provide only 2 to 4 weeks of control and then requiring a second application. Monument*, Katana*, Certainty*, and Celero* have given longer duration control beyond 4 to 6 weeks. The July application, when followed by a second mid-August application of ALS-herbicides, have demonstrated reduction of nutsedge going into the fall; however, the actual amount of control cannot be assessed until the following spring when nutsedge shoots emerge again (Figure 2). With spring emergence, repeating the same program of MSMA/Dismiss CA plus mowing followed by only two July-August ALS-inhibiting herbicide applications will eventually lead to manageable and acceptable nutsedge population levels.

Limiting ALS-inhibiting herbicides to only two summertime applications for nutsedge control will reduce the chances of purple nutsedge developing resistance to this class of herbicides. Switching among the brands of ALS-inhibiting herbicides which all have the same mechanism of action and applying them more often will increase the selection pressure for developing resistance that may ultimately result in less nutsedge control. Sub-lethal doses of ALS-inhibiting herbicides for nutsedge control may potentially increase the chances of developing

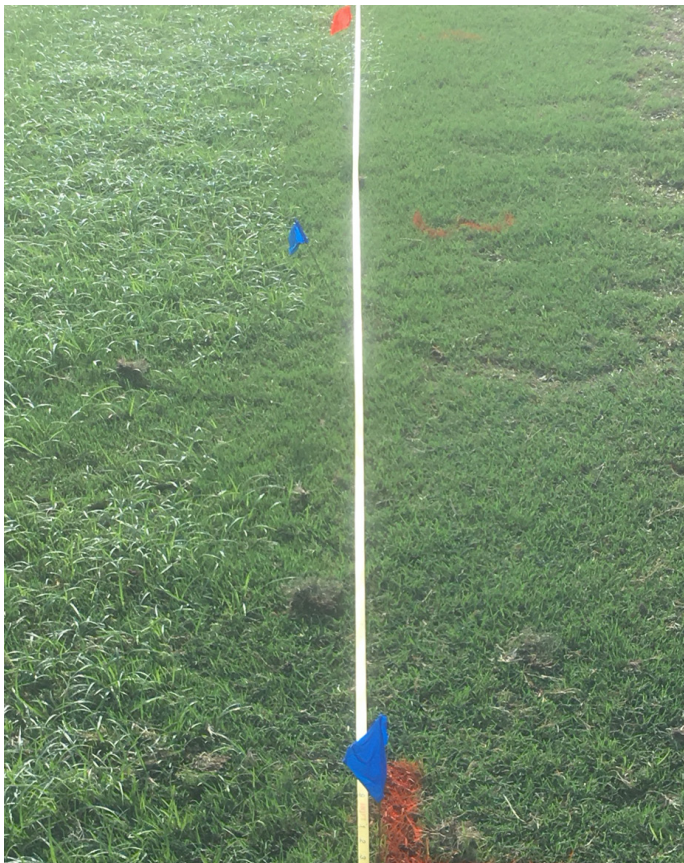


Figure 2. Purple nutsedge control in turf with ALS-inhibiting herbicide treatments (right of tape).

herbicide resistance. Importantly, do not expect some of the ALS-inhibiting herbicides (also commonly referred to as sulfonylurea [SU] herbicides) such as Monument or Katana to control nutsedge when applied at lower rates to remove overseeded ryegrass during spring transition.

Preemergence herbicides have not proven to be effective against purple nutsedge. Some preemergence herbicides may offer yellow nutsedge control. Pennant Magnum* (s-metolachlor) and Tower* (dimethenamid) generally will not provide acceptable control of purple nutsedge. Dismiss CA and several other pre-mix products that contain sulfentrazone might offer better yellow nutsedge suppression or reduction. These sulfentrazone-containing products only cause temporary and slight burning of nutsedge foliage.

The MSMA/Dismiss CA followed by ALS-inhibiting herbicides is an effective strategy of multiple postemergence herbicide applications when used in combination with low height of cut and frequent mowing. The strategy will require diligence and patience to achieve manageable purple nutsedge populations in turf over time.

*Product names mentioned are registered trademarks. All brand names of active ingredients are not represented and

Table. Herbicides for nutsedge control in turf¹

Active ingredient	Product name ²	Percent a.i. content in formulation ³	Product rate (oz/A)	Active ingredient rate (lb a.i./A)	Application limit
flazasulfuron	Katana	25 WG	3.0	0.047	9.0 oz/A per year
halosulfuron	SedgeHammer	75 WG	1.3	0.062	None stated
halosulfuron + foramsulfuron + thiencazone	Tribute Total	60.5% WDG	3.2		6.4 oz/A per year
imazaquin	Scepter	70 DG	11.5	0.5	None stated
imazosulfuron	Celero	75WDG	14.0	0.66	None stated
MSMA				4.0	Spot treatment only
pyrimisulfan	Vexis	2.5% G	188 lb/A	0.047	
sulfosulfuron	Certainty	75 WDG	1.25	0.06	2.66 oz/A per year
sulfentrazone	Dismiss CA	4 SC	4-12	0.25 - 0.37	12 oz/A per 12 months
sulfentrazone + imazethapyr	Dismiss South	4 SC	9-14.4		None stated
trifloxysulfuron	Monument	75 WG	0.53	0.025	1.7 oz/A per year

¹ Herbicides listed in this table are a compilation of commonly used products and prior to any use of these products, the user must read and follow the actual product label instructions to ensure safe use.

² Product names mentioned are registered trademarks. All brand names of active ingredients are not listed and any products that are mentioned, shown, or indirectly implied in this table do not imply endorsement by The University of Arizona.

³ WG, WDG = water dispersible granule; SC = suspension concentrate; G = spreadable granule

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Resources

Turfgrass, Landscape and Urban IPM Research Summary.

The University of Arizona Division of Agriculture, Life, and Veterinary Sciences, and Cooperative Extension
<https://turf.arizona.edu>

Western Society of Weed Science annual Research Progress Reports. 2020, 2018, 2014, 2013. <http://www.wsweedscience.org/publications/research-reports/>



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