

- For Professionals
- For Homeowners

This publication is meant for turf professionals. For yellow nutsedge control for homeowners, see Turfgrass Management: Yellow Nutsedge Control (Purdue Extension publication AY-19-W), available from the Education Store, www.the-education-store.com.

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All photos by Aaron Patton except:
Figure 2 by Corey Gerber, Purdue Extension; and
Figure 13 by John Boyd, University of Arkansas.

Sedge Control for Turf Professionals

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Yellow nutsedge (*Cyperus esculentus*) is a troublesome, difficult-to-control weed that is often found in turf areas (Figure 1). It is also called chufa, nutgrass, or watergrass.

It is important to remember that yellow nutsedge is not a grass or broadleaf weed, but a sedge. While there are many sedge species in Indiana, yellow nutsedge is the most problematic. Sedge control requires different herbicides and application timings than grasses and broadleaves, so understanding the biology of sedges is important.

This publication describes the life cycle and identification of yellow nutsedge, and recommends cultural and chemical management options in cool- and warm-season turf for professional turf managers. This publication also addresses other problem sedges.

Life Cycle and Identification

Yellow nutsedge is a perennial plant that reproduces primarily by small underground tubers — called nutlets — that form at the end of underground stems — called rhizomes (Figure 2). A single plant can produce several hundred of these tubers during the summer. Yellow nutsedge can also spread by rhizomes (Figure 3). Yellow nutsedge produces a seedhead when unmown but its seeds rarely germinate.

Yellow nutsedge actively grows during the heat of summer when cool-season turf grows more slowly. Yellow nutsedge typically emerges (germinates from tubers) in the Midwest in late April or May (a few weeks after crabgrass germinates) and grows actively until the first frost in autumn (Figure 4). A frost will kill the plant's aboveground portion but the tubers will survive



Figure 1. Yellow nutsedge is a problematic turf weed that is difficult to control.

and overwinter in the soil. Dormant tubers can germinate and emerge throughout the following season and survive in the soil for more than three years.

Yellow nutsedge is most noticeable in summer because its leaves grow more rapidly than the turf during the hottest summer months (Figure 5). During spring and fall (when it is cooler) nutsedge growth is slower and not as easy to spot in turf.

Yellow nutsedge can be identified by the triangular shape of its stem (Figure 6). You can feel the shape by rolling the stem in your fingertips.

Yellow nutsedge leaves are arranged in groups of three (three-ranked), which also distinguishes it from grasses (Figure 7). The leaves are light green to yellowish, and each leaf has a long, tapered leaf tip. Each leaf also has a prominent midrib, and has a slick, shiny, or waxy appearance.

While many grasses (such as crabgrass) have hairs on the leaf blades, yellow nutsedge does not. Yellow nutsedge will produce a golden seedhead, although the seedhead seldom forms in frequently mown turf (Figure 8).

Site History and Cultural Control Methods

Yellow nutsedge is a problem in many agricultural fields, and (as can be expected by its reproductive methods) in lawns that have been converted from farmland. It also is a troublesome weed in horticultural and nursery crop production. Yellow nutsedge tubers can easily be spread by soil (topsoil or fill dirt) from one area to another during construction. Additionally, people and equipment can spread yellow nutsedge any time they move soil while planting or dividing ornamental plants in the landscape.

The best method for controlling yellow nutsedge (and other weeds) is to grow a healthy, dense, vigorous stand of turf that can compete with weeds. Encourage dense turf stands by following proper turf maintenance practices, including fall fertilization, proper irrigation, frequent mowing at the proper height, and over-seeding as needed.

Yellow nutsedge is most problematic in turf that is mown too short, and it thrives in areas where



Figure 2. This image shows a mature yellow nutsedge tuber (the brown structure on top) and a yellow nutsedge tuber forming on the tip of a rhizome.



Figure 3. This yellow nutsedge plant is spreading both by a rhizome (left) and a tuber (the swollen rhizome tip at the bottom of the photo).



Figure 4. This yellow nutsedge plant was visible in April shortly after emerging in a bare soil area.



Figure 5. Yellow nutsedge grows taller than the surrounding turf during the summer.



Figure 6. This cross-section of a yellow nutsedge stem shows its triangular shape.

soils remain moist from poor drainage or over-watering. However, yellow nutsedge can also be a problem in well-drained areas, especially thin turf (Figure 9).

If only a few yellow nutsedge plants are present, hand pulling will help eliminate the weeds but will not remove the tubers in the soil. Several weeks after pulling yellow nutsedge, check the area to see if the plants have regrown from the tubers. For yellow nutsedge in landscape beds, it is best to remove the entire plant (including the root/rhizome system) by digging around the plant's base. This will help ensure that you will not get regrowth from the nutsedge's underground rhizomes.

Control with Herbicides

Herbicides may be required when large patches of nutsedge are present in the turf. The traditional herbicides used to control dandelions (*Taraxacum officinale*) and crabgrass (*Digitaria* spp.) are ineffective since yellow nutsedge is a sedge and



Figure 7. The three-ranked leaf arrangement of yellow nutsedge.



Figure 8. Yellow nutsedge produces golden seedheads.



Figure 9. Yellow nutsedge can invade thin turf during the summer when turf is stressed.

not a broadleaf or grass. Many herbicides are available for yellow nutsedge control.

Regardless of herbicide selection, yellow nutsedge is a difficult-to-control weed that may require multiple herbicide applications. Follow label directions about when to make follow-up applications, if needed.

Late spring/early summer (when it is young and actively growing) is the ideal time to control yellow nutsedge. During its early growth stages, yellow nutsedge has not started producing tubers and is most susceptible to control with herbicides. As the summer progresses, nutsedge plants form seedheads and tubers. Since the tubers are the plants' primary survival structure, it is critical to control nutsedge early in the summer before it produces tubers.

Be patient. Two to three years of control using herbicides will be needed to reduce viable tubers in the soil by 90 percent. Herbicide applications will injure growing yellow nutsedge plants and help prevent more tubers from forming, but herbicide applications will not control tubers that are viable in the soil but have not yet produced plants.

Before using any herbicide, always refer to the product label for specific instructions about proper use and turfgrass tolerance. In most cases, herbicides will selectively eliminate yellow nutsedge from a turf area without damaging the desirable turf species; however, these products are labeled for use only on specific turf species. Most herbicides are safe to use on only on cool-season or only on warm-season turf species. Some can be used on both. Consult Table 1 and herbicide labels for more information about turf safety.

Find Out More

Purdue Extension offers many publications about establishing, maintaining, and controlling lawn pests. Get these publications from:

The Purdue Extension Education Store
www.the-education-store.com

The Purdue Turf Program
www.agry.purdue.edu/turf

Before using any herbicide, consider the following steps for successful yellow nutsedge control:

1. Read and follow all directions on the herbicide label.
2. Do not mow one or two days prior to or following the herbicide application.
3. Treat the area with the proper rate of herbicide and volume of water listed on the product label. Do not apply the herbicide if the turf is stressed due to drought or high temperatures ($\geq 90^{\circ}\text{F}$).
4. Six to ten weeks after the first application, repeat steps 2 and 3 if the yellow nutsedge has recovered or regrown from tubers.

Cool-season Turf

In cool-season turf — such as Kentucky bluegrass (*Poa pratensis*), perennial ryegrass (*Lolium perenne*), tall fescue (*Festuca arundinacea*) and fine fescues (*Festuca* spp.) — some sulfentrazone products can provide both preemergence and postemergence control of annual sedge and yellow nutsedge.

Echelon[®] (prodiamine + sulfentrazone) is labeled for preemergence yellow nutsedge and annual sedge control. Other products that contain sulfentrazone — such as Dismiss[®] and Solitare[®] (sulfentrazone + quinclorac) — are labeled for postemergence yellow nutsedge and annual sedge control.

Q4 Plus[®], Surge[®], SureZone[®], and TZONE[®] are among the many combination herbicide products that contain sulfentrazone, that are labeled for yellow nutsedge *suppression*, not control — that's because these product formulations contain a lower amount of sulfentrazone.

Of the various sedge control herbicides, sulfentrazone will provide the quickest control — injury symptoms appear on yellow nutsedge within a few days after application. While the rate of sulfentrazone affects the level of control, the rate will not affect the speed of activity. When using products that contain sulfentrazone, do not add a surfactant. If a second application is needed, apply six to eight weeks after the initial application.

Halosulfuron provides excellent yellow nutsedge control with very good turfgrass toler-



Figure 10. The bleaching effect caused by mesotrione application on a yellow nutsedge plant.

ance to all turf species. For best results, add 0.25 percent nonionic surfactant. Nonionic surfactant is a soap-like liquid that helps herbicide sprays better cover the leaf tissue and increase herbicide absorption to kill the weed. Expect to see injury to yellow nutsedge about two weeks after a halosulfuron application.

For spot treatments, mix a 0.9-gram packet of halosulfuron (see Table 1) and 2 teaspoons of nonionic surfactant in 1 gallon of water. For broadcast applications to larger areas, use 0.66 to 1.33 oz/A of halosulfuron 75DF.

A new formulation called SedgeHammer+[®] (pronounced SedgeHammer plus) is available that already includes a surfactant, so adding a surfactant to this product it is unnecessary. For spot treatment with SedgeHammer+[®], use 0.5 oz/1,000 ft² and do not include a surfactant. If a second application is needed, apply six to 10 weeks after the initial application.

Iodosulfuron (Celero[®]) is similar to halosulfuron. It provides excellent yellow nutsedge control with very good turfgrass tolerance and is labeled for use on all major turfgrass species except annual bluegrass. Apply 8 to 14 oz of Celero[®] with a nonionic surfactant at 0.25% (v/v) for yellow nutsedge control.

Mesotrione (Tenacity[®]) is labeled for postemergence control of yellow nutsedge in

Weed Control Help for Professionals

More information about weed control for turfgrass professionals is available in Purdue Extension publication AY-336, *Turfgrass Weed Control for Professionals*, available from the Purdue Extension Education Store:

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Kentucky bluegrass, perennial ryegrass, tall fescue, and fine fescue. Some preemergence yellow nutsedge activity has also been observed with this herbicide, but it is not labeled for preemergence control. Mesotrione causes a bleaching (whitening) effect on susceptible weeds (Figure 10). Adding a nonionic surfactant according to label recommendations will improve control. Research shows that two applications of Tenacity[®] (made 14 days apart) will be required for control.

Warm-season Turf

In warm-season turf (such as bermudagrass and zoysiagrass), professionals can use any of the sedge herbicides mentioned above except Tenacity[®].

In addition, professionals can use some other sulfonylurea herbicides to control yellow nutsedge in bermudagrass and zoysiagrass. These products include Monument 75WG[®] at 0.53 oz/A, Katana[®] at 3.0 oz/A, or Certainty[®] at 1.25 oz/A. Expect to see injury to yellow nutsedge about two weeks following application. Repeat applications of these herbicides will often be needed if regrowth appears. Follow instructions on product labels about when to make follow-up applications. Add 0.25 percent (v/v) nonionic surfactant when applying these herbicides.

Other products — including Basagran T/O[®] (bentazon), Blindside[®] (metsulfuron + sulfentrazone), Tower[®] (dimethenamid), FreeHand[®] (dimethenamid + pendimethalin), and Pennant MAGNUM[®] — are also labeled for yellow nutsedge control in warm-season grasses. Tribute TOTAL[®] (thiencarbazone + foramsulfuron + halosulfuron) is labeled for yellow nutsedge control in bermudagrass.

Table 1. Sedge control and turfgrass tolerance ratings for professional products¹.

Herbicides	Professional Product	Sedge Control				Turf Tolerance							
		Sedges				Cool-season					Warm-season		
		annual sedge	kyllinga spp.	purple nutsedge	yellow nutsedge	annual bluegrass	creeping bentgrass	fine fescue	Kentucky bluegrass	perennial ryegrass	tall fescue	bermudagrass	zoysiagrass
2,4-D + quinclorac + dicamba + sulfentrazone	Q4 Plus [®]	P	P	P	F	S	NR	S	S	S	S	S	NR
bentazon	Basagran T/O [®]	G	F	P	G	S	S	S	S	S	S	S	S
dimethenamid 	Tower ^{®2}	G	P	F	F-G	NR	NR	NR	NR	NR	NR	S	S
dimethenamid + pendimethalin 	FreeHand [®]	G	P	F	F-G	NR	NR	NR	NR	NR	NR	S	S
flazasulfuron 	Katana [®]	G	G	G-E	G-E	NR	NR	NR	NR	NR	NR	S	S
halosulfuron	Halosulfuron Pro [®] , Profine 75 ^{®3} , Prosedge [®] , Sanda ^{®3} , SedgeHammer [®] , SedgeHammer+ [®]	G	G	G-E	G-E	NR	S	S	S	S	S	S	S
halosulfuron + dicamba	Yukon ^{®3}	G	G	G-E	G-E	NR	S	S	S	S	S	S	S
iodosulfuron	Celero [®]	G	G	G-E	G-E	NR	S	S	S	S	S	S	S
mesotrione	Tenacity [®]	P	P	P	G	NR	NR	S	S	S	S	NR	NR
metolachlor 	Pennant MAGNUM [®]	G	F	F	G	NR	NR	NR	NR	NR	NR	S	S
sulfentrazone	Dismiss [®] , Spartan 4F ^{®3}	G	F	P-F	E	NR	S	S	S	S	S	S	S ⁵
sulfentrazone + 2,4-D + mecoprop + dicamba	Surge [®] , Surezone [®]	P	P	P	F	S	S	S	S	S	S	S	S
sulfentrazone + carfentrazone	Spartan Charge ^{®3}	G	F	P-F	G-E	NR	S	S	S	S	S	S	S ⁵
sulfentrazone + metsulfuron 	Blindside [®]	G	F	P-F	E	NR	NR	NR	S	NR	S-I	S	S ⁵
sulfentrazone + prodiamine	Echelon ^{®4}	G	F	P-F	E	NR	S	S	S	S	S	S	S ⁵
sulfentrazone + quinclorac	Solitare [®]	G	F	P-F	E	NR	NR	NR	S	S	S	S	S ⁵
sulfosulfuron 	Certainty [®]	G	G	E	G-E	NR	NR ⁶	NR	NR ⁶	NR	NR	S	S
thiencarbazono + foramsulfuron + halosulfuron 	Tribute TOTAL [®]	G	G	G-E	G-E	NR	NR	NR	NR	NR	NR	S	NR
triclopyr + sulfentrazone + 2,4-D + dicamba	TZONE [®]	P	P	P	F	S	S	S	S	S	S	S	S
trifloxysulfuron 	Monument [®]	G	G	E	G	NR	NR	NR	NR	NR	NR	S	S

 This product is labeled for use in predominantly warm-season turf. See the label for a list of tolerant grasses.

¹ E=excellent (≥90% control). G=good (75-90% control). F=fair (50-75% control). P=poor control (≤50% control). S=safe at labeled rates on healthy, mature turf. I=intermediate safety or some injury may occur, may cause minor damage to mature, healthy turf. Consider using the lower end of the rate range. Do not apply to turf under stress. NR=not registered for use on this species. These are relative control rankings based on research. Weed control will vary with environmental conditions, application timing, turfgrass vigor, and other factors. This table is only a guide. Repeat applications are needed for complete control of sedges with all herbicides.

² For use on cool- and warm-season grasses on golf courses (see label) and warm-season use only on sod farms, commercial and recreational turf, and residential turf.

³ For use on sod farms only.

⁴ Labeled for preemergence control of sedges and for postemergence control.

⁵ Safety varies by zoysiagrass cultivar.

⁶ A label change in 2011 no longer allows Certainty[®] use on cool-season turf. These changes are effective on product packaged and shipped after May 2011. All cool-season turfgrass uses for Certainty[®] have been removed from the 2011-2012 label (product packaged and shipped after May 2011). Product packaged before these changes can continue to be used according to label directions in cool-season turf. Previous label stipulations recommended that Certainty[®] was safe for use on creeping bentgrass, 100% Kentucky bluegrass turf, or for use on Kentucky bluegrass + perennial ryegrass and/or fine fescue mixtures, but not safe for use on tall fescue + Kentucky bluegrass mixtures.

Other Problem Sedges

Purple nutsedge (*Cyperus rotundus*), annual sedge (*Cyperus compressus*), and kyllinga (*Kyllinga* spp.) are other sedges that are less common in Indiana turf. Purple nutsedge and kyllinga are not as cold hardy as yellow nutsedge, so these two species are limited to southern portions of Indiana. Yellow nutsedge and annual sedge can be found statewide.

Purple nutsedge has darker leaf blades than yellow nutsedge, and has a more blunt leaf tip (Figure 11). Purple nutsedge has a purple- to maroon-colored seedhead (Figure 12).



Figure 11. Purple nutsedge (left) has a blunt leaf tip, while yellow nutsedge has a sharply pointed leaf tip.



Figure 12. Compare the color of this purple nutsedge seedhead with the yellow nutsedge seedhead shown in Figure 8.

Annual sedge (Figure 13) and kyllinga (Figure 14) are smaller sedge species that have more compact seedheads. Like yellow and purple nutsedges, annual sedge and kyllinga can be identified by their triangular stems and three-ranked leaf arrangement. Annual sedge and kyllinga can also survive lower mowing heights than yellow nutsedge and can be found in golf course fairways, tees, and putting greens, as well as other turf areas.

Cultural control practices for these other sedge species are limited, but similar to those of yellow nutsedge. Purple nutsedge, kyllinga, and annual sedge can be controlled with similar herbicides used to control yellow nutsedge, but purple nutsedge is more difficult to control with these products.



Figure 13. An annual sedge seedhead.



Figure 14. A seedhead typical of many kyllinga species.

Summary

In summary, sedges are problem weeds and require herbicide use for control. Many herbicides are available for sedge control, but proper herbicide use and application timing is critical to optimize control.

For best results, apply herbicides prior to tuber production. The most common mistake is to apply herbicides too late in the season after sedges are big, spreading by rhizomes, and producing tubers. To be effective, you will need to implement a sedge control program early in the season and continue for consecutive years to reduce tuber populations in the soil and prevent the spread of this problematic weed.

References

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