



Purple Nutsedge Control in Turf and Ornamentals

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Purple nutsedge (*Cyperus rotundus*), commonly known as nutgrass in Hawai'i, is a common weed in both turf and ornamental areas. The plant is found in locations receiving full sunlight that provide enough water and nutrients to sustain its growth. Its growth is severely restricted by shade.

The plant has slender leaves that are connected to a network of underground stems (rhizomes), roots, and tubers. Although purple nutsedge flowers profusely if not mowed, very few seeds are formed, and few of them can reproduce. Thus seeds are not often the source of new purple nutsedge plants. The underground tubers and corms (the "nuts" or "nutlets") are the primary source of purple nutsedge infestations. Some tubers are linked to aboveground growth, but other tubers may not be connected to leaves aboveground (Photo 1). Left undisturbed, purple nutsedge will spread by growing laterally underground, spreading several yards each year.

Some other weedy plants can be mistaken for purple nutsedge, including yellow nutsedge (*Cyperus esculentus* L.), green kyllinga (*Kyllinga brevifolia*), and white kyllinga (*Kyllinga nemoralis*) (Photo 2), which have leaves resembling those of purple nutsedge. Purple nutsedge has brownish flowers, and its tubers occur in chains. Yellow nutsedge, which is primarily found in the Hāmākua coast region of the island of Hawai'i, has straw-yellow flowers, and its tubers occur at the end of rhizomes. The kyllingas have no tubers, and their round flower heads have a green or white globe-shaped structure.

New infestations of purple nutsedge occur when tubers are moved from one area to another in soil, plant containers, or on equipment. Under optimum conditions, a network of nutsedge plants arising from one tuber can produce 100 or more tubers in about 100 days. About



1. Purple nutsedge plant with multiple stems (connected by rhizomes), leaves, seeds, roots, and tubers; the ruler is 6 inches long.

*This publication revises *Nutgrass control in the lawn, landscape, and garden* by R.K. Nishimoto, J. DeFrank, and D.L. Hensley, 1998.



2. White kyllinga flowers

80–95 percent of the tubers are located within the top 6 inches of soil. However, tubers have been reported to be present as deep as 18 inches.

Once tubers form, they can remain viable in soils for at least two years if they retain moisture. They can survive even when soils are very dry for short periods. However, if tubers are brought to the soil surface for about 1 week under sunny conditions, they dry out and die. Populations of viable purple nutsedge tubers can be dramatically reduced by repeatedly turning the soil at 1–2-week intervals to expose the tubers to the sun.

Tuber dormancy is perhaps the most important adaptation that enables purple nutsedge to persist in turf and ornamental areas. Dormancy prevents tubers in the soil from sprouting all at once, so a potential reservoir for new plants is maintained. This is the reason purple nutsedge will emerge after herbicide applications or hand-weeding.

Cultural control methods

Hand-weeding

When hand-weeding, the wiry connections between tubers make them easier to remove than if the connections have been severed by soil cultivation. The tuber, or basal bulb, of an emerged shoot must be removed to control purple nutsedge. Simply removing the topgrowth is ineffective, and an inch or so of new growth will



3. Purple nutsedge flowers

emerge the following day. Patient gardeners can dig up and remove tubers from the soil to greatly reduce purple nutsedge populations; however, a few missed tubers will maintain the infestation, and another weeding cycle will be required in a few years.

Mulching ornamental areas

Purple nutsedge will not be controlled with organic mulches. Sheet mulches also are ineffective against this species. Black plastic sheet mulch is not effective because the sharp, pointed shoot tip of the purple nutsedge plant can easily penetrate it. The thin mulch used in pineapple fields is a barrier to water evaporation but not to purple nutsedge. Even thicker sheet plastic mulch materials are readily penetrated. Likelihood of penetration increases when the plastic mulch materials are spread tightly over the soil surface or settled against the soil surface by rain puddles, additional soil, or other some other object.

Weed cloth, or woven black polypropylene weed mat, can be effective in suppressing purple nutsedge when used properly. It is porous to air and water and can be an effective tool for reducing underground tubers without the use of chemicals or tedious hand-weeding. It is a very durable material that can be re-used many times if handled carefully to avoid making holes by tearing.

Using weed cloth against purple nutsedge requires that the garden area be fallow (not planted or tilled) for a period of 2–4 months. After the last crop is harvested, remove all plant residues by mowing or rototilling, and cover the planting area with the weed cloth. The method of securing the cloth to the soil is crucial in preventing purple nutsedge penetration through the weed cloth. The preferred securing method is to use long (10–12 inch) spikes fitted with a large flat washer. These spikes secure the weed mat to the ground but should not be used to pull the weed mat too tight. There should be enough slack to allow some air space between the soil and the weed mat. The worst way to secure the weed mat is to use rocks, soil, or other heavy objects. When the weed mat is held tightly to the ground, purple nutsedge shoots can push through the fabric.

With the weed mat properly in place, purple nutsedge is induced to sprout by generous and frequent watering. A new weed mat tends to repel water, but after a 2–3-week exposure to full sunlight, shrinkage occurs and water can pass through the material. As the purple nutsedge germinates, it pushes the weed mat upward, as if it was inflating it. The purple nutsedge grows so fast that when the pointed tip of the leaf blade gets caught in the weave of fabric, the rapidly elongating leaf blade starts to crinkle up behind it, and penetration of the cloth is thus prevented.

The weed mat must remain in place long enough for weeds to germinate below it and die from lack of sunlight. After several cycles of weed growth and die-back during the 2–4-month period, the weed mat can be removed and the garden replanted. Most of the weed propagules (including purple nutsedge tubers) will have tried to emerge and died.

When the plastic is removed, it is important not to disturb the soil unnecessarily. Cultivation brings up lower layers of soil that will likely contain viable weed seeds and purple nutsedge tubers. Mulching the soil surface after removing the weed cloth will help to suppress any weed seeds remaining in the soil and slow nutsedge germination by preventing increases in soil temperature.

Chemical control methods

Non-selective herbicides

Non-selective herbicides are an option for controlling purple nutsedge in ornamental areas. One of the most effective herbicides for non-selective control of purple nutsedge is glyphosate (several products with this active ingredient are commercially available). Glyphosate is translocated throughout the entire plant, allowing it to eradicate the underground tubers connected to the leaves. Timing of glyphosate applications is critical. To obtain maximum control, purple nutsedge flowers should be present before herbicide application (Photo 3). Translocation throughout the plant is limited before floral emergence, and the herbicide will only eradicate top growth and not existing underground tubers. Apply glyphosate 2–3 months *after* the initial emergence of purple nutsedge. This will eradicate all underground tubers connected to the emerged purple nutsedge shoots, as well as the original tubers that sprouted. The purple nutsedge population will be greatly reduced, but it is unlikely that this procedure will eradicate the entire purple nutsedge stand. Tubers that are dormant or not connected to aboveground leaves will not be affected, as glyphosate is de-activated once it comes into contact with the soil. If purple nutsedge continues to be a serious problem, repeat this procedure accordingly.

Glyphosate can also be used as a spot treatment in both turf and ornamental areas. Special care must be taken to avoid getting glyphosate spray or drift on green bark or foliage of any desirable surrounding plants, as it is a non-selective herbicide.

Selective herbicides

There are many selective herbicides that can be used effectively to control purple nutsedge in warm-season turfgrasses. Herbicide applications are most effective when applied to purple nutsedge plants having at least three to eight leaves.

SedgeHammer® (halosulfuron, formerly marketed as Manage®) provides effective control of purple nutsedge and can be safely applied to most warm-season grasses including seashore paspalum and St. Augustinegrass. Applications of Certainty® (sulfosulfuron) and Monument® (trifloxysulfuron sodium) are also effective against purple nutsedge. Monument® can only be applied to common bermudagrass, hybrid bermudagrass, and zoysiagrass, while Certainty can be safely applied most warm-season

Table 1. Herbicides for selective control of purple nutsedge in warm-season turfgrasses.

Product	Active ingredient	Turfgrasses on which the product is safe to use	Application rate
Certainty	Sulfosulfuron	Bahiagrass Buffalograss Common bermudagrass Hybrid bermudagrass Centipedegrass Kikuyugrass Seashore paspalum St. Augustinegrass Zoysiagrass (<i>Zoysia japonica</i>)	1.25 oz per acre
Monument	Trifloxysulfuron sodium	Common bermudagrass Hybrid bermudagrass Zoysiagrass (<i>Zoysia japonica</i>)	20 grams per hectare
MSMA	Monosodium methyl arsenate	Common bermudagrass Hybrid bermudagrass Zoysiagrass (<i>Zoysia japonica</i>)	2.0 lb a.i. per acre
SedgeHammer	Halosulfuron	Bahiagrass Buffalograss Common bermudagrass Hybrid bermudagrass Centipedegrass Kikuyugrass Seashore paspalum St. Augustinegrass Zoysiagrass (<i>Zoysia japonica</i>)	1.333 oz per acre (0.062 lb a.i. per acre)

Caution: Read the pesticide label to ensure that the intended use is included on it, and follow all label directions. Test pesticides on a small area before making large-scale applications.

turfgrasses, including seashore paspalum. Applications of MSMA are effective against purple nutsedge, but do not apply MSMA to St. Augustinegrass, centipedegrass, or seashore paspalum. Consult product labels for specific information on turfgrass tolerance. Suggested application rates for these herbicides are presented in Table 1.

To control an existing stand of purple nutsedge in an actively growing warm-season turfgrass, at least two applications of most herbicides will usually be required. Four to six weeks after making an initial herbicide application, new purple nutsedge shoots will emerge. The plants arise from dormant tubers that were not connected to purple nutsedge shoots when the initial herbicide application was made. This new stand of purple nutsedge must be treated to prevent new tubers from repopulating the soil. If possible, wait 2–3 months between herbicide applications to allow the entire population of purple nutsedge shoots to emerge before reapplication.

In any herbicide control program for purple nutsedge, it is important not to allow the weed to grow untreated for longer than 3 months. Most purple nutsedge shoots die naturally after 3 months, eliminating the living connection to the tubers. Thus, many tubers will escape herbicide treatment and serve as sources of re-infestation. This reserve can last for 2 years or longer. Thus, in order to effectively reduce the purple nutsedge tuber population in the soil, herbicides must be reapplied about every 3 months for about 2 years. Some herbicides have use limitations, and application directions on the label must be followed.

Disclaimer

Mention of a proprietary name does not imply endorsement of the product or its recommendation over others that may also be suitable.