

Reproductive Potential and Control Strategies for Deeprooted Sedge

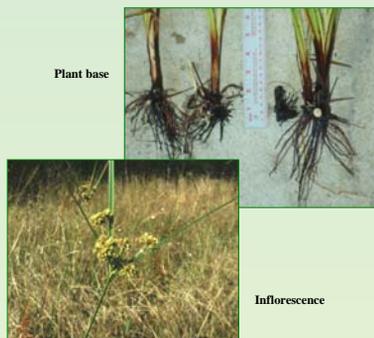
(*Cyperus enterianus*)

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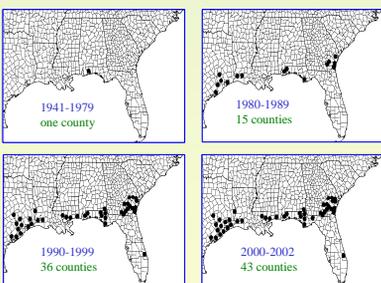
Four of the world's worst weeds are in the genus *Cyperus*. These include *C. difformis* L., *C. esculentus* L., *C. iria* L., and the world's worst weed, *C. rotundus* L. (Holm et al. 1977). *Cyperus* is in the sedge family (Cyperaceae) and consists of about 600 species of mostly tropical and warm-temperate regions around the world (Mabberley 1987). Deeprooted sedge (*Cyperus enterianus* Böckeler) is an aggressive, tenacious pest apparently introduced into the southeastern United States from temperate South America or Mexico (Carter 1990; Carter and Bryson 1996). It is native to temperate South America (Argentina, Brazil, and Paraguay) (Kükenthal 1935-1936; Barros 1938; Tucker 1994).



Deeprooted sedge has been observed in open, disturbed habitats including roadsides, ditches, fallow fields, pastures, edges of rice fields, and edges of salt marshes, where it is typically found in poorly drained, mucky, loamy or clayey soils and is a primary invader of disturbed soil at construction sites, new road construction, land fills, and dredge spoil areas (Carter 1990; Carter and Bryson 1996). Although in the southern United States it is presently known only from low elevations in the coastal plain, deeprooted sedge has been observed for inland and at elevations to 410 m in temperate South America, and it is a weed associated with rice in Paraguay (Carter 1990). Deeprooted sedge is often locally abundant, and it is an aggressive weed in the rice belt of southwestern Louisiana and eastern Texas. Its present distribution in rice growing areas of southern United States and its association with high hydroperiod soils indicate that it could become a serious pest of rice in the southeastern United States.



Presently, deeprooted sedge has been recorded from 43 counties from southeastern Texas to northern Florida and southern Georgia. Severe infestations of this weed were observed as early as 1989 in ditches, pastures, and fallow fields in southwestern Louisiana and southeastern Texas (Carter 1990; Carter and Jones 1991). Although many of the earlier known populations were along or within a few miles of Interstate Highway 10, populations are being found elsewhere with increasing frequency. Our surveys seem to indicate that deeprooted sedge is being dispersed along Interstate 10 and other major highways, by mowing, road construction equipment, and usual traffic.



Deeprooted sedge is in the section *Luzuloides* of subgenus *Cyperus* (Kükenthal 1935-1936) and is characterized by Kranz anatomy and C4 photosynthesis. A comprehensive treatment of the *Luzuloides* was compiled by Denton (1978), but deeprooted sedge was not recognized then from the United States. Of the related species, deeprooted sedge closely resembles Surinam sedge, *C. surinamensis* Roth., and green sedge, *C. vires* Michx. Tables and keys distinguishing deeprooted sedge from related species in the United States are found in Carter (1990) and Carter and Bryson (1996). Deeprooted sedge can be identified by its robust growth form, deeply set thick rhizomes, dark purplish black leaf bases, and glossy leaves. In the southern United States, this perennial species reproduces by seeds and vegetative growth from short, woody rhizomes. Plants of deeprooted sedge are robust, fast growing, aggressive, weedy, and produce copious numbers of seed.

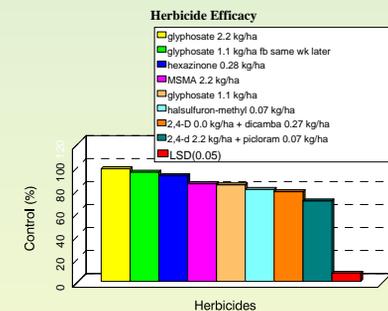


Flooding, construction equipment, mowing, heavy traffic, and soil moving activities, especially along highways, spread its tiny seeds, resulting in infestations in new areas, particularly in disturbed habitats. Deeprooted sedge is displacing native vegetation even in undisturbed habitats. Without widespread control, deeprooted sedge will likely continue to spread rapidly, infesting agricultural, forested, riparian and urban areas. Our objectives are to determine the growth and reproductive potential and develop best management strategies for deeprooted sedge control.

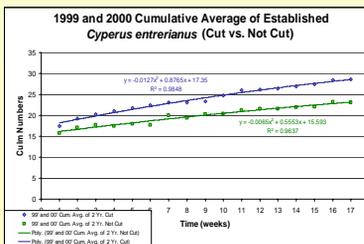
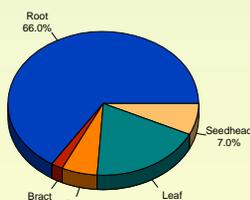


Plants survive (>95%) winters as far north as Stoneville, MS, and, in a single growing season, plants grown from seeds weighed 1 to 1.8 kg/plant by frost. Clipping at 15 cm above soil prevented inflorescence formation and seed maturation. Deeprooted sedge growth was rapid and seed production was only temporarily

suppressed (< one month) following a single tillage operation (disking). Repeated tillage controlled established plants, but seedlings rapidly replaced them following rainfall with no additional tillage. Number of seed per inflorescence ranges from 1,000 to > 20,000 depending on the size and maturity of deeprooted sedge, and mature plants (≥ 1 year old) produced from 10 to over 100 inflorescences per year.



Cyperus enterianus Dry Weight Biomass Partitioning



In field studies, biweekly mowing prevented inflorescence production but did not control vegetative re-growth. Of herbicide treatments tested in field trials, the most effective for deeprooted sedge control were glyphosate at 2.2 kg/ha (98%) or 1.1 kg/ha followed by 1.1 kg/ha (10 days apart) (95%), hexazinone at 0.28 kg/ha (92%), MSMA at 2.2 kg/ha (85%), glyphosate at 1.1 kg/ha (84%), halosulfuron-methyl at 0.07 kg/ha (80%), 2,4-D at 0.8 kg/ha + dicamba at 0.27 kg/ha (78 %), and 2,4-D at 2.2 kg/ha + picloram at 0.07 kg/ha (70%).

Additional spread of deeprooted sedge can be prevented by:
 •Cleaning machinery, vehicles, equipment, clothing and other personal items after use in infested areas to avoid spread.
 •Suppressing seed production by repeated mowing at 2 to 4 weeks intervals.
 •Applying herbicides and/or repeated tillage operations where and when possible.
 Because deeprooted sedge continues to spread at an alarming rate threatening agricultural and natural areas and preliminary studies suggest that populations will potentially spread northward to Arkansas, North Carolina, South Carolina, Tennessee, and Virginia, additional research is needed to determine more effective methods of prevention and control.

ACKNOWLEDGEMENTS

We thank J. Paige Goodlett and Terry Newton (USDA-ARS, Stoneville, MS) for technical assistance; David J. Rosen (USDA, Fish & Wildlife Service, Houston, TX) for providing information on and photographs of infestations in eastern Texas; and Stanley Jones (Botanical Research Center, Bryan, TX) for sharing data on additional records of deeprooted sedge in Texas.

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