

Herbicides for Weed Control in Turfgrass

James McAfee, Ph.D.,
Extension Turfgrass Specialist, Dallas, Texas
and
Paul A. Baumann, Ph.D.,
Professor and Extension Weed Specialist, College Station, Texas

Herbicides for Weed Management in Turf

Integrated weed management (IWM) is a component of integrated pest management (IPM). Homeowners and turf grass professionals alike can benefit by employing an integrated approach to weed management. These approaches should consider; 1) Preventative, 2) Biological, 3) Cultural, 4) Mechanical and 5) Chemical control measures. Chemical weed control demands precision and judicious use of herbicides. This publication provides information to make an informed decision regarding the use of herbicides but is not a substitute for a product label. Herbicides can injure or kill weeds **and** turf grass. Therefore, the individual product label should be consulted prior to use, especially regarding weeds controlled, application timing, and tolerant turf species.

Preemergence & Postemergence Herbicides

Preemergence herbicides are applied before the weeds sprout through the soil surface. Generally speaking, to control warm-season annual weeds, apply a pre-emergence herbicide in early spring (January to March) before the soil temperature has warmed to 55 degrees F. For weeds that tend to sprout throughout the summer, a second application may be required in June or July. To control cool-season annual weeds, apply a pre-emergence herbicide in early fall (August to September). It is difficult to target a particular calendar date for preemergence applications due to variable soil temperature and moisture conditions from year to year.

Postemergence herbicides are applied after weeds have sprouted. They are most effective when weeds are still small: less than 4 inches high. Some herbicides (ex.; atrazine, simazine, dithiopyr) have both postemergence and preemergence activity if they reach the soil through direct contact or by washing off the foliage.

Contact and Systemic Herbicides

Contact herbicides (ex.; paraquat, diquat) cause damage wherever they touch a plant. To work well, a contact herbicide should thoroughly cover the leaves and stems. Contact herbicides work best on small annual weeds. They have little effect on perennial weeds unless applications are repeated. Most contact herbicides work very quickly (1-3 days).

Systemic herbicides (ex.; 2,4-D, glyphosate) are absorbed and moved throughout the plant. They are sometimes applied to the foliage and sometimes to the soil although some systemic herbicides such as glyphosate are inactivated by contact with clay particles in the soil. They can be absorbed and translocated (moved) from the foliage, roots or stems to other parts of the plant. Systemic herbicides work well on perennial weeds because the herbicide is moved to parts of the plant other than where it was applied. This feature is particularly valuable for killing root, tuber and rhizome growth on perennial weeds.

Selective and Non-Selective Herbicides

Selective herbicides kill one type of plant but not another—for example, grass weeds but not broad-leaved weeds. This selectivity may be due to differences in herbicide absorption, translocation or physiological differences between weeds and the turfgrass.

Nonselective herbicides kill almost all kinds of plants. Use them very carefully in lawns, and be sure to keep them away from shrubs and bedding plants. Some of these (ex.; glyphosate and paraquat) are “inactivated” once they come in contact with the soil and are therefore useful when applied prior to establishing a new turf stand.

Broadleaf Weeds, Grasses and Sedges

Broadleaf weeds have two seed leaves (first leaves) as they emerge through the soil. Their leaves are generally wider than those of grass weeds. Veins on the leaves are branched or net-like. Their stems are oval, round or square and are often branched. They may have showy flowers.

Grass weeds have only one seed leaf. Their leaf blades are narrow and have parallel veins. Stems are round or oval. They may develop seed heads at the ends of the stems, but if they have flowers they will be inconspicuous.

Sedges look a lot like grasses but their stems are triangular. Their leaves are usually shiny and smooth. Sedges often have “nuts” or tubers attached to their roots. In purple nutsedge, several tubers can be connected in a “chain”.

Annual, Biennial and Perennial Weeds

Annual weeds germinate from seed each year and live for one growing season. Summer annuals germinate in the spring and die back in the fall. Winter annuals germinate in late summer or early fall and die the following spring or summer. Annual weeds can produce thousands of seeds per plant which can germinate for many years after the seed has been shed by lying “dormant” in the soil until light, temperature and moisture conditions are adequate for germination. Most annual weeds will not germinate below a 1 inch soil depth unless they are large-seeded (>1/8” in diameter).

Biennials have a 2-year life cycle. They germinate, emerge, and usually form a rosette (radial cluster of leaves close to the ground) in the first year. The second year, the plant bolts (produces a flower stalk), flowers, sets seed, matures, then dies.

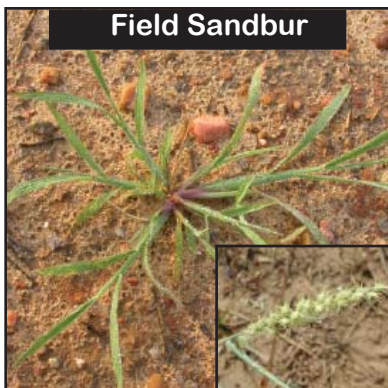
Perennials live 3 years or more. Some reproduce by seed, and some reproduce by creeping stems that can be either above-ground (stolons) or below-ground (rhizomes). Sometimes, as in nutsedges, the rhizomes produce tubers from which new plants grow. Many a homeowner has discovered that what appeared to be individual nutsedge plants in the flower bed were actually a series of plants that have sprouted from these connected tubers. If the stolons, rhizomes, or tubers are broken or separated into pieces, new plants can form from these pieces and spread the weed. Therefore, tillage or hand pulling is discouraged when trying to eradicate most perennial weeds.

Herbicide Names

Individual herbicide products have what would be considered three names; trade, common, and chemical. Examples of these names for one product are as follows; *Roundup* (trade name), *glyphosate*

(common name) and *N-(phosponomethyl) glycine* (chemical name). This publication will focus on the common name, often referred to as the active ingredient on the label. This name could be the same across a number of different trade named products but still perform the same.

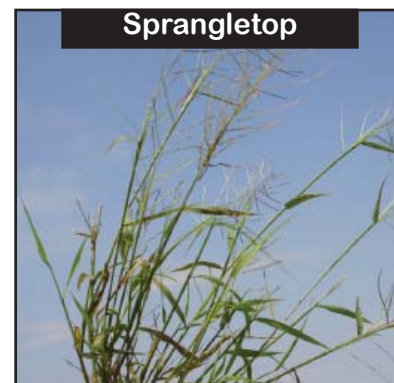
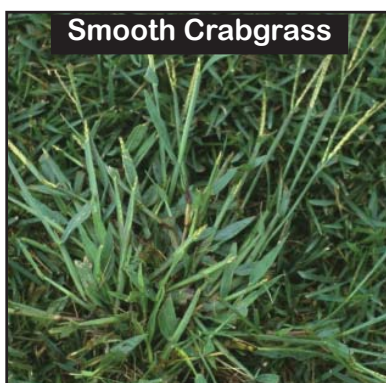
Annual Grass Weeds



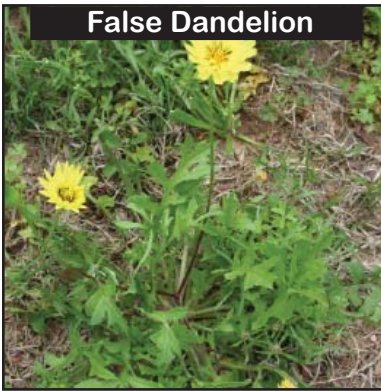
PREEMERGENCE HERBICIDES	
Annual Grass Weed Control	
Common Name	Trade Name(s)
atrazine	Atrazine 4L, Aatrex 4L, Purge 4L
benefin	Balan 2.5G, Balan 60 DF, 2.5 Benefin Granules
benefin + oryzalin	XL 2G, Excel-5 Plus
benefin + oxadiazon	Regal Star
benefin + trifluralin	Team 2G, Team Pro
bensulide	Betasan, Bensumec, PreSan, Weedgrass Preventor
bensulide + oxadiazon	Goose/Crab Control
dithiopyr	Dimension, Ultra WSP
ethofumesate	Prograss 1.5 EC
metolachlor	Pennant Magnum 7.62 EC
oryzalin	Surflan 4 AS
oxadiazon	Ronstar ¹
pendimethalin	Pendulum (several), Pre-M
prodiamine	Barricade, Endurance, Factor, RegalKade G
pronamide	Kerb
simazine	Princep 4L, Simazine 4L, Simtrol 4L
1. Not for use in residential lawns.	

Annual Broadleaf Weed Control	
Common Name	Trade Name(s)
isoxaben	Gallery
ethofumesate	Prograss 1.5 EC

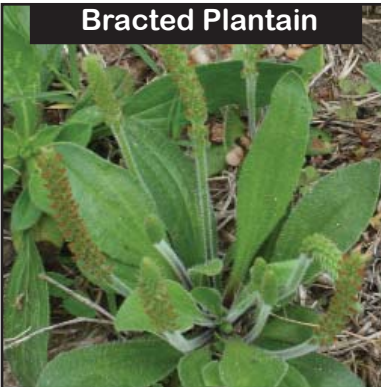
Sedge Control or Suppression	
metolachlor	Pennant Magnum 7.62 EC



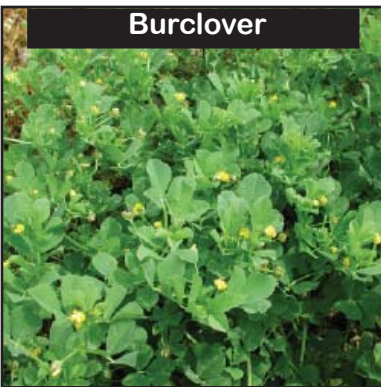
Annual Broadleaf Weeds



False Dandelion



Bracted Plantain



Burdock



Carolina Geranium



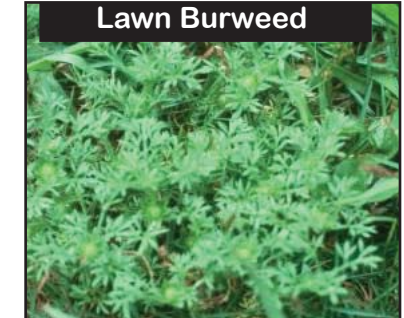
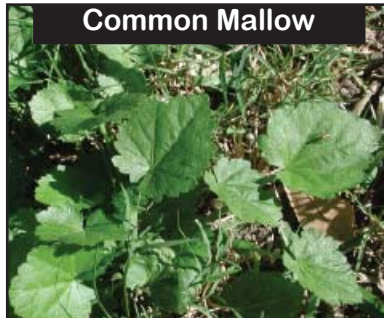
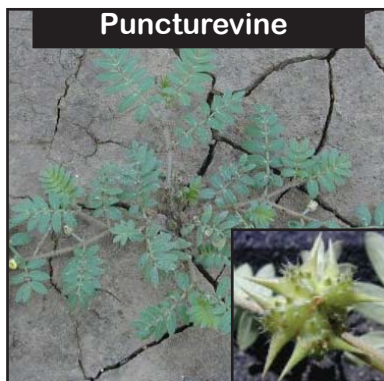
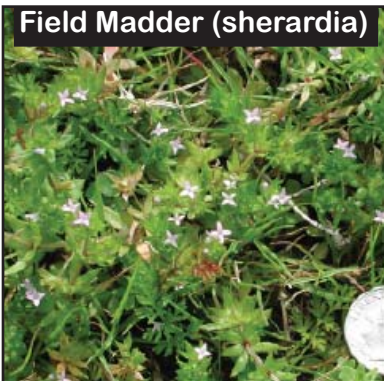
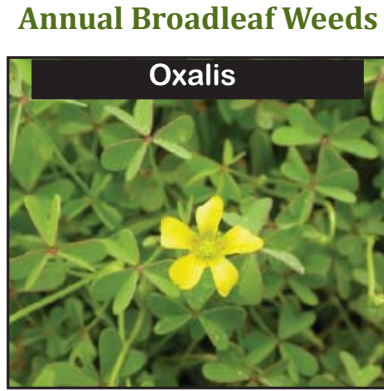
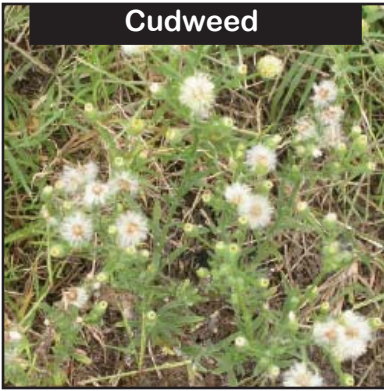
Carpenterweed

POSTEMERGENCE HERBICIDES

Broadleaf Weed Control

Common Name	Trade Name(s)
atrazine	Atrazine, Aatrex 4L, Purge 4L
carfentrazone	Quicksilver
chlorosulfuron	Corsair
clopyralid	Lontrel ¹
diquat	Reward Landscape & Aquatic Herbicide
ethofumesate	Prograss 1.5 EC
fluroxypyr	Spotlight
foramsulfuron	Revolver
imazaquin	Image
MCPA	MCPA L.V. 4 Ester
MCPA, MCPP, dicamba	TriPower Selective, Encore
MCPA, MCPP, dicamba, carfentrazone	Powerzone
MCPA, triclopyr, dicamba	TruPower
MCPA, fluroxypyr, dicamba	TruPower 2
Mecroprop (MCP)	MCP-4 amine, Mecomec 2.5 EC
MCP, 2,4-D, dicamba	Trimec Southern, Lesco Three Way Selective, Bentgrass Selective, Triplet SF
MCPA, triclopyr, dicamba	Cool Power Ester, Lesco Eliminate, Three Way Ester II Sensitive, Horsepower
metsulfuron-methyl	Blade, Manor
pyraflufen ethyl	Octane ¹
quinclorac	Drive
triclopyr	Turflon Ester
triclopyr, clopyralid	Confront ¹
2,4-D	Dymec, WEEDestroy AM-40 Amine, Hardball, Lesco A-4D
2,4-D, 2,4-DP	Patron 170 Ester
2,4-D, clopyralid, dicamba	Millennium Ultra
2,4-D, clopyralid, dicamba, MSMA	Millennium Ultra Plus
2,4-D, dicamba	Lesco Eight-One
2,4-D, MCP, dicamba	Three-Way Selective, Trimec Southern, Trimec Bentgrass, Trimec Classic, Trimec Turf Herbicide
2,4-D, MCP-p, dicamba	Triplet HI-D, Triplet Selective
2,4-D, MCP, dicamba, carfentrazone	Speedzone, Speedzone Southern
2,4-D, MCP, dicamba, sulfentrazone	Surge
2,4-D, MCP, 2,4-DP	Dissolve, Triamine
2,4-D, triclopyr, clopyralid	Momentum
2,4-D, triclopyr	Chaser
MSMA, 2,4-D, MCP, dicamba	Trimec Plus
trifloxysulfuron	Monument

1. Not for use in residential lawns.



Perennial Grass Weeds



Grass Weed Control	
Common Name	Trade Name(s)
chlorsulfuron	Corsair
diquat	Reward Landscape & Aquatic Herbicide
ethofumesate	Prograss 1.5 EC
fenoxaprop	Acclaim ¹
flazasulfuron	Katana
foramsulfuron	Revolver ³
fluazifop-p-butyl	Fusilade II ²
metribuzin	Sencor 75W
metsulfuron-methyl	Blade, Manor
MSMA	MSMA 6 Plus, Bueno 6, Target 6.6, MSMA Plus HC, TurfMax 6 Plus, MSMA Turf Herbicide, Lesco Soluble MSMA Granules
MSMA, 2,4-D, MCPP, dicamba	Trimec Plus
rimsulfuron	TranXit ³
trifloxysulfuron	Monument ³

1. For grassy weed control in cool season turfgrasses.
 2. For control of grassy weeds in zoysiagrasses.
 3. Primarily used for poa annua control and as ryegrass transition aid.

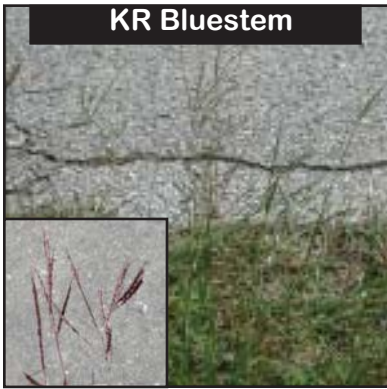
Nutsedge Control	
Common Name	Trade Name(s)
bentazon	Basagran T/O, Lescogran
flazasulfuron	Katana
halosulfuron	Sedgehammer
imazaquin	Image
sulfosulfuron	Certainty
trifloxysulfuron	Monument

NON-SELECTIVE HERBICIDES	
Common Name	Trade Name(s)
glufosinate	Finale
glyphosate	Glypro Plus, Roundup, Roundup Pro, Roundup Pro Dry, Roundup Quick Pro, AquaMaster, Prosecutor, Touchdown Pro

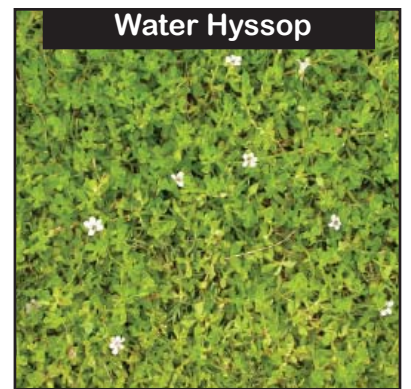
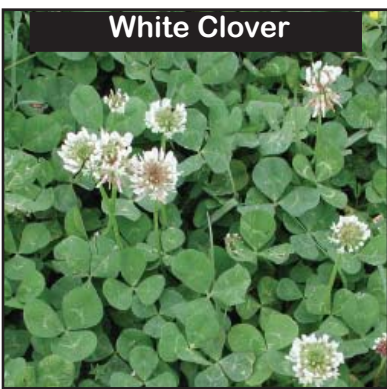
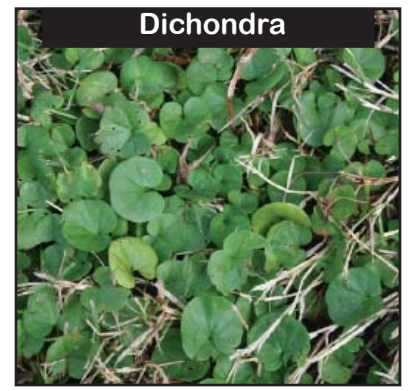
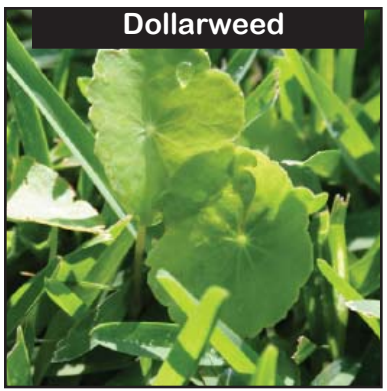
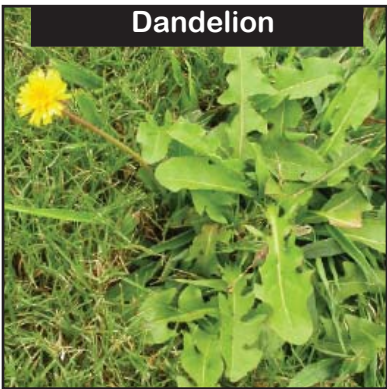
While this is not a complete list of herbicides for weed control in turfgrasses, it does contain the majority of commonly used or found herbicides. This is a working list and will be updated on a regular basis as more herbicides become registered for use in turfgrasses.

Always advise individuals to read the label carefully before purchasing and before using to make sure the herbicide is labeled for the weeds needing controlled and that the herbicide is labeled for the turfgrass species the weeds are found. Also, registration for these different herbicides could change over time.

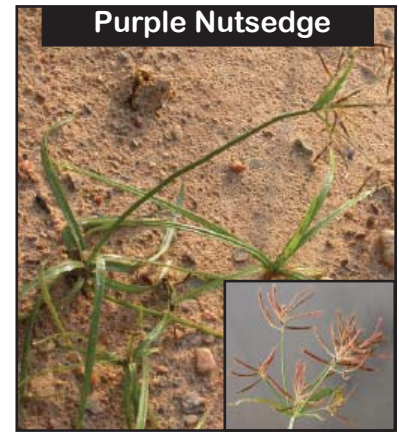
Perennial Grass Weeds



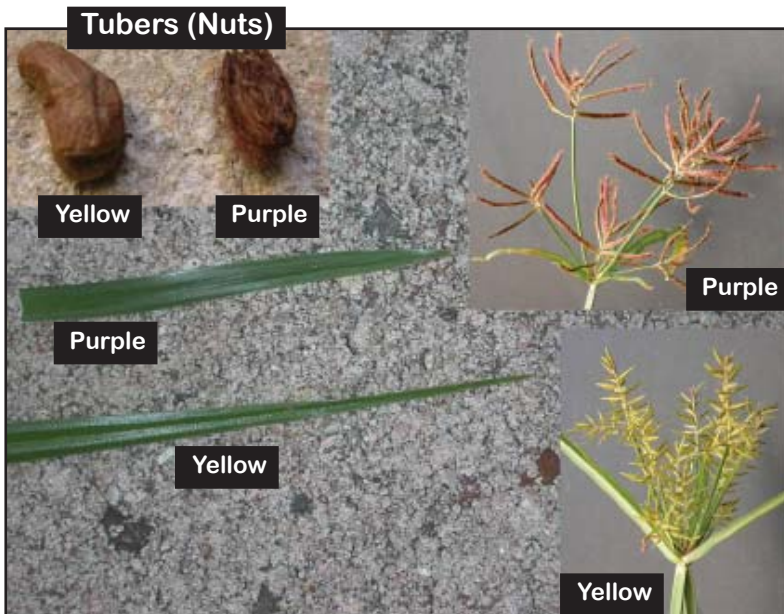
Perennial Broadleaf Weeds



Sedges



Distinguishing Features of Yellow and Purple Nutsedge



Yellow and purple nutsedge can often appear indistinguishable from each other, however, it is important to recognize them in order to choose the appropriate herbicide for control. The flowering parts (seedheads) are often quite different in appearance. Yellow nutsedge flower spikes exhibit an overall yellow appearance and “bottlebrush” look. Purple nutsedge has distinct purple colored flower spikes with more loosely arranged spikelets. The leaves of yellow nutsedge have a gradual, narrow taper to the leaf tip while the leaves on purple nutsedge taper much more abruptly. The tubers (nuts) on yellow nutsedge are usually without hairs while the tubers of purple nutsedge are most often covered with them. In addition, purple nutsedge can have “chains” several tubers long. Yellow nutsedge will only have one tuber connected to a rhizome (thickened root) coming off the parent plant.

Produced by the Department of Soil and Crop Sciences, Texas A&M University, College Station, Texas. For further information go to www.soilcrop.tamu.edu. The authors may be contacted at JMcafee@ag.tamu.edu or PBaumann@ag.tamu.edu.

The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas AgriLife Extension Service is implied.