

Weed Control Suggestions for Professional Turf Managers

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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

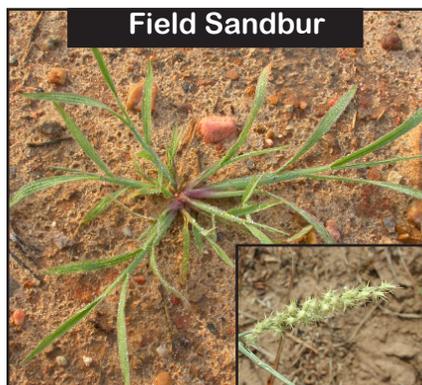
Individual herbicide products have what would be considered three names; trade, common, and chemical. Examples of these names for one product are as follows; *Roundup* (trade name), *glyphosate*

(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.

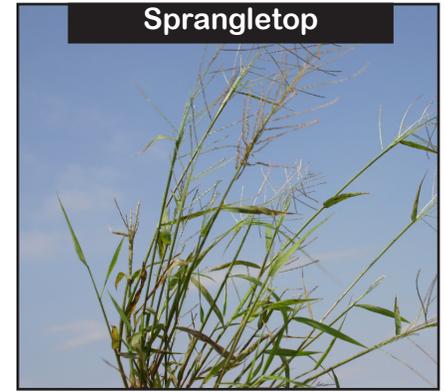
PREEMERGENCE HERBICIDES						
Grass Weed Control (primarily annual grasses)		Labeled Sites*				
Common Name	Trade Name(s)	CS	GC	SF	CL	RL
atrazine	Aatrex 4L, Atrazine 4L	L	L	L	L	L
benefin	Balan 2.5G, Balan 60DF	-	L	L	L	L
benefin, oryzalin	XL2G	L	L	L	L	L
benefin, trifluralin	Team 2G	-	L	L	L	L
bensulide	Bensumec 4LF, Betasan, Pre-San Weedgrass Preventor	-	L	-	-	L
bensulide, oxadiazon	Goosegrass/Crabgrass Control	-	L	-	-	-
dimethenamid	Tower	-	L	L	L	L
dithiopyr	Dimension 2EW, Dimension EC, Dimension Ultra 40 WP	L	L	L	L	L
ethofumesate	Prograss	L	L	L	L	L
mesotrione	Tenacity	L	L	-	-	-
metolachlor	Pennant Magnum	L	L	L	L	L
oryzalin	Surflan AS, Surflan WDG	L	L	L	L	L
oxadiazon	Ronstar 50 WSP, Ronstar Flo, Ronstar G	L	L	L	L	-
oxadiazon, prodiamine	RegalStarG, Regal Star II	L	L	L	L	L
pendimethalin	Pendulum 2G, Pendulum 3.3 EC, Pendulum AquaCap	L	L	L	L	L
pendimethalin	Pre-M	-	L	L	L	L
prodiamine	Barricade 4L, Barricade 65 WG, Endurance, RegalKadeG	L	L	L	L	L
pronamide	Kerb	L	L	L	L	-
siduron	Tupersan	L	L	L	L	L
simazine	Princep, Simazine 4L, Sim-Trol 4L	L	L	L	L	L
sulfentrazone, prodiamine	Echelon	L	L	L	L	L

*CS=Commercial Sod; GC=Golf Courses; SF=Sod Farms; CL=Commercial Lawns; RL=Residential Lawns

Annual Grass Weeds



Annual Grass Weeds



PREEMERGENCE HERBICIDES

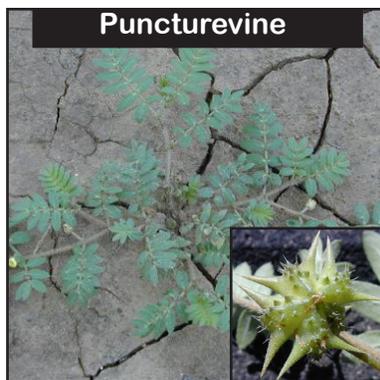
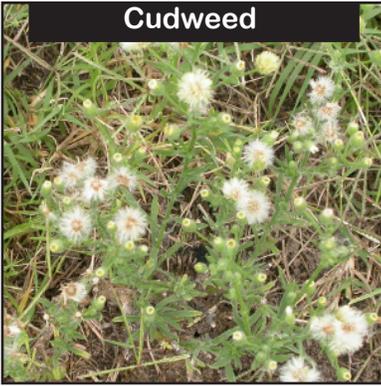
Broadleaf Weed Control (primarily annual broadleaves)		Labeled Sites*				
Common Name	Trade Name(s)	CS	GC	SF	CL	RL
benefin, oryzalin	XL2G	L	L	L	L	L
dimethenamid	Tower	-	L	L	L	L
dithiopyr	Dimension 2EW, Dimension EC, Dimension Ultra 40 WP	L	L	L	L	L
ethofumesate	Prograss	L	L	L	L	L
isoxaben	Gallery	L	L	L	L	L
mesotrione	Tenacity	L	L	-	-	-
metolachlor	Pennant Magnum	L	L	L	L	L
oryzalin	Surflan AS, Surflan WDG	L	L	L	L	L
oxadiazon	Ronstar 50 WSP, Ronstar Flo, Ronstar G	L	L	L	L	-
oxadiazon, prodiamine	RegalStarG, Regal Star II	L	L	L	L	L
pendimethalin	Pendulum 2G, Pendulum 3.3 EC, Pendulum AquaCap	L	L	L	L	L
pendimethalin	Pre-M	-	L	L	L	L
prodiamine	Barricade 4L, Barricade 65 WG, Endurance, RegalKadeG	L	L	L	L	L
pronamide	Kerb	L	L	L	L	-
simazine	Princep, Simazine 4L, Sim-Trol 4L	L	L	L	L	L
sulfentrazone, prodiamine	Echelon	L	L	L	L	L

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Annual Broadleaf Weeds



Annual Broadleaf Weeds



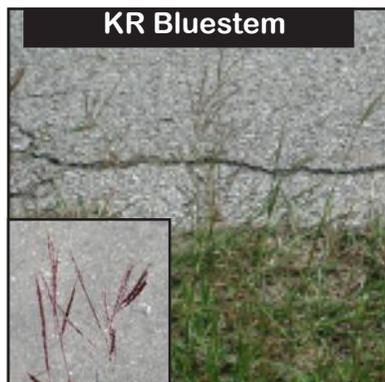
Annual Broadleaf Weeds



PREEMERGENCE HERBICIDES						
Sedge Control or Suppression (consult label to determine)		Labeled Sites*				
Common Name	Trade Name(s)	CS	GC	SF	CL	RL
dimethenamid	Tower	-	L	L	L	L
ethofumesate	Prograss	L	L	L	L	L
metolachlor	Pennant Magnum	L	L	L	L	L
sulfentrazone, prodiamine	Echelon	L	L	L	L	L

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Perennial Grass Weeds



POSTEMERGENCE HERBICIDES

Broadleaf Weed Control		Labeled Sites*				
Common Name	Trade Name(s)	CS	GC	SF	CL	RL
2,4-D	2,4-D Amine, Dymec, HardBall, WEEDestroy	L	L	L	L	L
2,4-D, 2,4-DP	Patron 170	L	L	L	L	L
2,4-D, clopyralid, dicamba	Millennium Ultra2	L	L	L	L	L
2,4-D, fluroxypyr, dicamba	Escalade2	L	L	L	L	L
2,4-D, MCPP, 2,4-DP	Triamine	-	L	L	L	L
2,4-D, MCPP, dicamba	Three-Way Selective, Trimec Classic, Trimec Turf, TruPower2, Triplet SF	L	L	L	L	L
2,4-D, MCPP, dicamba	Trimec Bentgrass, Trimec Southern, Triplet HI-D, Triplet Selective, Triplet Sensitive	-	L	L	L	L
2,4-D, triclopyr	Chaser, Turflon II Amine	L	L	L	L	L
2,4-D, triclopyr, clopyralid	Momentum	-	L	L	L	L
atrazine	Aatrex 4L, Atrazine 4L	L	L	L	L	L
bentazon	Basagran T/O, LESCOGran	L	L	L	L	L
bromoxynil	Buctril	L	L	L	L	-
carfentrazone	QuickSilver, QuickSilver T&O	L	L	L	L	L
carfentrazone, 2,4-D, MCPP, dicamba	SpeedZone, SpeedZone Southern	L	L	L	L	L
carfentrazone, MCPA, MCPP, dicamba	Power Zone	L	L	L	L	L
chlorsulfuron	Corsair	L	L	L	L	L
clopyralid	Lontrel	L	L	L	L	-
dicamba	Vanquish	L	L	L	L	L
diquat	Reward	-	L	L	L	L
ethofumesate	Prograss	L	L	L	L	L
flazasulfuron	Katana	L	L	L	L	-
fluroxypyr	Spotlight	L	L	L	L	L
imazaquin	Image	L	L	L	L	L
MCPA	MCPA L.V. 4 Ester	L	L	L	L	L
MCPA, MCPP, 2,4-DP	Triamine II	-	L	L	L	L
MCPA, MCPP, dicamba	Trimec Encore	L	L	L	L	L
MCPA, MCPP, dicamba	Tri-Power	-	L	L	L	L
MCPA, triclopyr, dicamba	Cool Power, Eliminate, Horsepower, Three-Way Ester II Selective	-	L	L	L	L
MCPPP	Mecomec	L	L	L	L	L
MCPPP	MCPPP-p 4 Amine	-	L	L	L	L
mesotrione	Tenacity	L	L	-	-	-
metribuzin	Sencor	L	L	L	L	L
metsulfuron-methyl	Blade, Manor	L	L	L	L	L
penoxsulam	LockUp, LockUp plus fertilizer	L	L	L	L	L
penoxsulam, dicamba, 2,4-D	LockUp Extra II with fertilizer	L	L	L	L	L
pyraflufen ethyl	Octane	L	L	L	L	L

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POSTEMERGENCE HERBICIDES *(continued)*

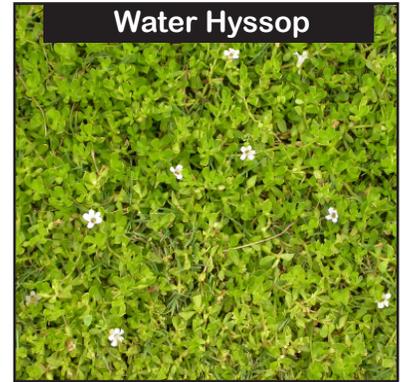
Broadleaf Weed Control		Labeled Sites*				
Common Name	Trade Name(s)	CS	GC	SF	CL	RL
quinclorac	Drive, Drive XLR8	L	L	L	L	L
quinclorac, MCPP, dicamba	Onetime	-	L	L	L	L
quinclorac, sulfentrazone, 2,4-D, dicamba	Q4	L	L	L	L	L
simazine	Princep, Simazine 4L, Sim-Trol 4L	L	L	L	L	L
sulfentrazone	Dismiss	L	L	L	L	L
sulfentrazone, 2,4-D, MCPP, dicamba	Surge	L	L	L	L	L
sulfentrazone, imazethapyr	Dismiss South	L	L	L	L	L
sulfentrazone, proflam	Echelon	L	L	L	L	L
sulfentrazone, quinclorac	Solitare	L	L	L	L	L
sulfosulfuron	Certainty	L	L	L	L	L
thiencarbazone, iodosulfuron, dicamba	Celsius	L	L	L	L	L
triclopyr	Turflon Ester	L	L	L	L	L
triclopyr, clopyralid	Confront	L	L	L	L	-
triclopyr, sulfentrazone, 2,4-D, dicamba	T-Zone	L	L	L	L	L
trifloxysulfuron	Monument	L	L	L	L	L

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Perennial Broadleaf Weeds



Perennial Broadleaf Weeds



POSTEMERGENCE HERBICIDES						
Grass Weed Control - Consult label for tolerant turfgrasses!		Labeled Sites*				
Common Name	Trade Name(s)	CS	GC	SF	CL	RL
diclofop-methyl	Illoxan	-	L	-	-	-
chlorsulfuron	Corsair	L	L	L	L	L
ethofumesate	Prograss	L	L	L	L	L
fenoxaprop	Acclaim Extra	L	L	L	L	L
flazasulfuron	Katana	L	L	L	L	-
fluazifop-P-butyl	Fusilade II	L	L	L	L	L
foramsulfuron	Revolver	L	L	L	L	L
imazaquin	Image	L	L	L	L	L
mesotrione	Tenacity	L	L	-	-	-
metribuzin	Sencor	L	L	L	L	L
metsulfuron-methyl	Manor	L	L	L	L	L
quinclorac	Drive, Drive XLR8	L	L	L	L	L
quinclorac, MCP, dicamba	Onetime	-	L	L	L	L
quinclorac, sulfentrazone, 2,4-D, dicamba	Q4	L	L	L	L	L
rimsulfuron	TranXit	L	L	L	L	-
sethoxydim	Sethoxydim E-Pro	L	L	L	L	L
simazine	Princep, Simazine 4L, Sim-Trol 4L	L	L	L	L	L
sulfentrazone	Dismiss	L	L	L	L	L
sulfentrazone, imazethapyr	Dismiss South	L	L	L	L	L
sulfentrazone, prodiamine	Echelon	L	L	L	L	L
sulfentrazone, quinclorac	Solitare	L	L	L	L	L
sulfosulfuron	Certainty	L	L	L	L	L
thiencarbazone, iodosulfuron, dicamba	Celsius	L	L	L	L	L
trifloxysulfuron	Monument	L	L	L	L	L

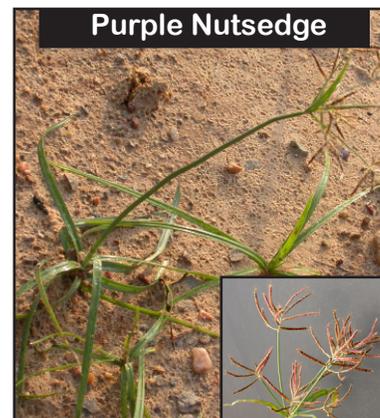
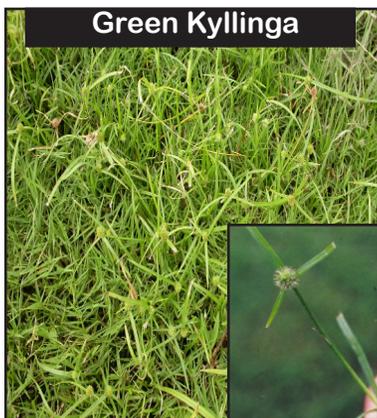
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POSTEMERGENCE HERBICIDES

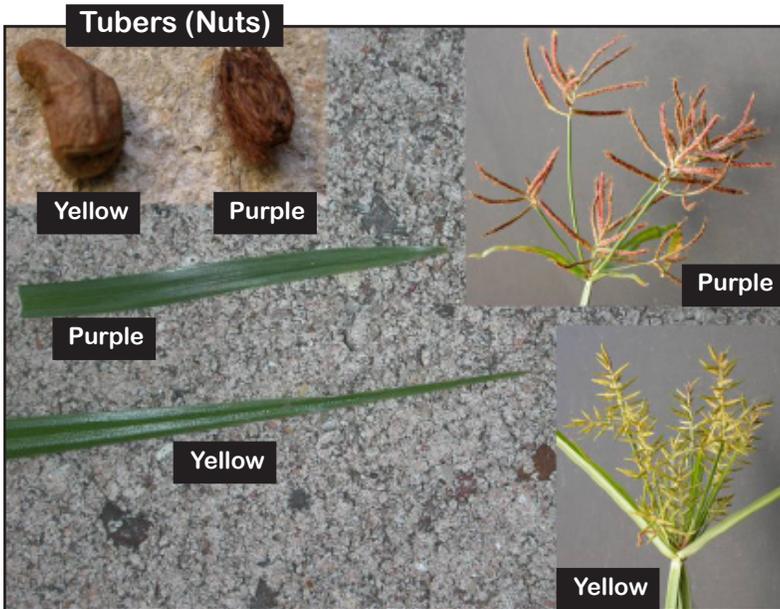
Sedge Control <i>or</i> Suppression (consult label to determine)		Labeled Sites*				
Common Name	Trade Name(s)	CS	GC	SF	CL	RL
2,4-D	WEEDestroy	L	L	L	L	L
2,4-D, MCPP, 2,4-DP	Triamine	-	L	L	L	L
bentazon	Basagran T/O, LESCOGran	L	L	L	L	L
ethofumesate	Prograss	L	L	L	L	L
flazasulfuron	Katana	L	L	L	L	-
halosulfuron	SedgeHammer	L	L	L	L	L
imazaquin	Image	L	L	L	L	L
MCPA, MCPP, 2,4-DP	Triamine II	-	L	L	L	L
mesotrione	Tenacity	L	L	-	-	-
quinclorac, sulfentrazone, 2,4-D, dicamba	Q4	L	L	L	L	L
rimsulfuron	TranXit	L	L	L	L	-
sulfentrazone	Dismiss	L	L	L	L	L
sulfentrazone, 2,4-D, MCPP, dicamba	Surge	L	L	L	L	L
sulfentrazone, imazethapyr	Dismiss South	L	L	L	L	L
sulfentrazone, prodiamine	Echelon	L	L	L	L	L
sulfentrazone, quinclorac	Solitare	L	L	L	L	L
sulfosulfuron	Certainty	L	L	L	L	L
triclopyr, sulfentrazone, 2,4-D, dicamba	T-Zone	L	L	L	L	L
trifloxysulfuron	Monument	L	L	L	L	L

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Sedges



Distinguishing Features of Yellow and Purple Nutsedge



Purple Nutsedge Tuber Chain



Sedges Have a Triangular Stem

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 one or several rhizomes (thickened roots) coming from the parent plant.

NON-SELECTIVE HERBICIDES						
		Labeled Sites*				
Common Name	Trade Name(s)	CS	GC	SF	CL	RL
glufosinate	Finale	L	L	L	L	L
glyphosate	Aqua Master, Roundup, Roundup Pro, Roundup Pro Concentrate, Touchdown Pro	L	L	L	L	L
glyphosate, diquat	Roundup QuikPro, Prosecutor	-	L	L	L	L

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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 to be controlled and that the herbicide is labeled for the turfgrass species in which the weeds are found. Also, registration for these different herbicides could change over time.



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