

VEGETATION MANAGEMENT AND WEED CONTROL IN SPECIALTY TURF AREAS SUCH AS ROADSIDES, INDUSTRIAL SITES, FIELDS, COMMON AREAS¹
Bert McCarty

SITE/WEED	COMMON NAME (lbs ai/acre)	TRADE NAMES (rate of product/acre)	REMARKS AND PRECAUTIONS (Always Use Drift Control as Recommended by Each Herbicide Label)
Annual Grass and Broadleaf Weed Suppression in Dormant Bermudagrass	sulfometuron (0.047 lb)	Oust 75DG (1 oz)	Oust may be applied once in November to early-February <u>while the bermudagrass is dormant</u> for the control of winter annual grass and broadleaf weeds, and fescue suppression. This treatment may delay greenup of the bermudagrass. This treatment should eliminate the need to mow the winter weeds. It also will help to suppress bahiagrass. Sulfonylurea family.
	glyphosate (0.38 to 0.5 lb)	Roundup Pro 4L + others (12 to 16 fl oz)	Glyphosate may be applied once in January to early-March <u>while the bermudagrass is dormant</u> for the control of winter annual grass, tall fescue, and broadleaf weeds. Glyphosate does not provide residual control. Amino Acid Derivative family
	glyphosate (0.25 lb) + sulfometuron (0.012 lb)	glyphosate 4L (8 fl oz) + Oust 75DG (0.25 oz)	Glyphosate and Oust may be tank-mixed to be applied once in December to early-March <u>while the bermudagrass is dormant</u> for the control of winter annual grass and broadleaf weeds. This treatment should eliminate the need to mow the winter weeds. It will also help to suppress bahiagrass. Bermudagrass greenup may be delayed with this treatment.
	glyphosate (0.25 lb) + sulfometuron (0.012 lb) + chlorsulfuron (0.012 lb)	glyphosate 4L (8 fl oz) + Oust 75DG (0.25 oz) + Telar 75DG (0.25 oz)	Glyphosate + Oust + Telar may be applied once in December through early-March <u>while the bermudagrass is dormant</u> for the control of winter annual grasses and broadleaf weeds. This treatment should eliminate the need to mow winter weeds. It will also help to suppress bahiagrass, and control ryegrass, mustards and thistles. Bermudagrass greenup may be delayed by this treatment.
	glyphosate (0.3 to 0.6 lb) + 2,4-D amine (0.48 to 0.95 lb)	Campaign 3.1L (1 to 2 qts)	Campaign may be applied once for the control of winter annual grass and broadleaf weeds before bermudagrass greenup. It may also suppress or control broadleaf weeds tolerant of these other treatments. Refer to the label for rates for particular species. It is not necessary to add a surfactant to Campaign. Since Campaign is a formulation containing 2,4-D, use special precautions when applying in the vicinity of 2,4-D sensitive crops such as vegetables, tobacco, fruit trees, ornamentals and cotton.
	imazapic (0.125 to 0.188 lb)	Plateau 2L (8 to 12 fl.oz.)	Controls tall fescue, annual ryegrass, and winter annuals. Avoid application during bermudagrass greenup. Will injure green bahiagrass at these rates. Do not exceed 12 oz per acre in one year. See labeled for recommended additive. Sold only directly to governmental and educational institutions. Imidazolinone family.
	imazapic (0.091 to 0.183 lb) + glyphosate (0.188 to 0.375 lb)	Journey 2.25 L (16 to 32 fl oz.)	Controls tall fescue, ryegrass, winter annuals and specific perennial weeds (see SPECIAL WEED CONTROL section on label for rate for specific weed). See label for recommended tank mixes for additional weed control. A methylated seed oil concentrate at 1.5 to 2 pints per acre can be added to enhance control of specific weeds. Early spring applications made prior to full green-up may delay bermudagrass green-up.

VEGETATION MANAGEMENT AND WEED CONTROL IN SPECIALTY TURF AREAS SUCH AS ROADSIDES, INDUSTRIAL SITES, FIELDS, COMMON AREAS¹

SITE/WEED	COMMON NAME (lbs ai/acre)	TRADE NAMES (rate of product/acre)	REMARKS AND PRECAUTIONS (Always Use Drift Control as Recommended by Each Herbicide Label)
	aminopyralid (0.06 to 0.11) + glyphosate (0.25)	Milestone 2L (4 to 7 oz) + glyphosate 4L (8 fl oz)	Controls numerous broadleaf weeds such as horseweed, dogfennel, horsenettle, thistles and tropical soda apple. Milestone is non-volatile, but use care when applying in the vicinity of broadleaf crops, fruit trees, and ornamentals. Milestone can be tank-mixed with other herbicides such as Plateau, MSMA, 2,4-D, triclopyr, and numerous other products labeled for use on grass roadsides to increase weed spectrum. Add a nonionic surfactant at 0.25% v/v to the spray mix.
	diflufenzopyr (0.05 to 0.125) + dicamba (0.1 to 0.25)	Overdrive 76DF (4 to 8 oz)	Controls annual and perennial broadleaf weeds. Add a nonionic surfactant at 0.25% v/v or methylated seed oil at 2 pts per acre to the spray mix. Diflufenzopyr often improves the activity of "auxin-like" herbicides such as triclopyr, clopyralid, and picloram. Max be tank-mixed with Garlon 4 and 3A, 2,4-D, Plateau, glyphosate, Escort, Oust, Telar, and MSMA to increase spectrum of weed species controlled. Overdrive is rainfast within 4 hours after application.
Weed Control in Actively Growing Bermudagrass	MSMA (2 lbs) or DSMA (3.6 lbs)	MSMA 6 L (a gal) or DSMA 3.6 L (1 gal)	May be applied during summer months every 4 to 6 weeks for suppression or control of emerged weeds. This treatment will release actively growing bermudagrass and suppress bahiagrass, dallisgrass, broomsedge, johnsongrass, and several broadleaf weeds. Organic Arsenical family.
	diflufenzopyr (0.05 to 0.125) + dicamba (0.1 to 0.25)	Overdrive 76DF (4 to 8 oz)	Controls annual and perennial broadleaf weeds. Add a nonionic surfactant at 0.25% v/v or methylated seed oil at 2 pts per acre to the spray mix. Diflufenzopyr often improves the activity of "auxin-like" herbicides such as triclopyr, clopyralid, and picloram. Max be tank-mixed with Garlon 4 and 3A, 2,4-D, Plateau, glyphosate, Escort, Oust, Telar, and MSMA to increase spectrum of weed species controlled. Overdrive is rainfast within 4 hours after application.
	nicosulfuron (56%) + metsulfuron (15%) (0.044 to 0.067 lb)	Pastora 71DF (1.0 to 2.0 oz)	Especially useful for postemergence sandspur control in bermudagrass. Add a nonionic surfactant at 0.25%v/v. Urea ammonium nitrate at 2 qts/acre may increase weed control and/or reduce bermudagrass injury.
	aminopyralid (0.06 to 0.11)	Milestone 2L (4 to 7 oz)	Controls numerous broadleaf weeds such as horseweed, dogfennel, horsenettle, thistles, and tropical soda apple. Milestone is non-volatile, but use care when applying in the vicinity of broadleaf crops, fruit trees, and ornamentals. Milestone can be tank-mixed with Plateau, glyphosate, MSMA, 2,4-D, triclopyr, and numerous other herbicides labeled for use on grass roadsides to increase weed spectrum. Add a nonionic surfactant at 0.25% v/v to the spray mix. Pyridine family.
	glyphosate (0.19 to 0.3125 lb)	Roundup Pro 4L + others (6 to 10 fl oz)	May be applied during summer months to suppress or control emerged weeds and to release well-established and actively growing bermudagrass. Some discoloration of bermudagrass may occur. Do not exceed recommended rate. For bahiagrass growth and seedhead suppression, apply a second application at 4.0 fl.oz. product/acre 6 to 8 weeks after the initial application. Amino Acid Derivative family.

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	imazapic (0.047 to 0.0625 lb)	Plateau 2L (3.0 to 4.0 fl oz)	Apply after full spring green-up of bermudagrass or during the summer months to suppress bahiagrass growth and seedhead development. Controls tall fescue, annual ryegrass, and winter annuals. Add a nonionic surfactant at 0.25% v/v or methylated seed oil at 1.5 to 2.0 pts/acre to the spray mix. Do not apply immediately before or during bermudagrass green-up. A second treatment may be applied 6 to 10 weeks for continued growth suppression. For johnsongrass control, use 8 to 12 oz per acre when plants are 18 to 24 inches tall. Tank mixing with MSMA at 2 lbs ai/acre increases the spectrum and level of weed control and often eliminates a mid-summer application and reduces turf injury. This tank mix increases control of johnsongrass and dallisgrass. Imidazolinone family.
	imazapic (0.047 to 0.125 lb) + glyphosate (0.094 to 0.25 lb)	Journey 2.25 L (8 to 16 fl oz.)	Controls tall fescue, summer annuals and specific perennial weeds (see SPECIAL WEED CONTROL section on label for rate for specific weeds). Apply before weeds reach 6 inches in height. See label for recommended tank mixes for additional weed control. A methylated seed oil concentrate at 1.5 to 2 pints per acre can be added to enhance control of specific weeds. Some yellowing of unimproved common bermudagrass turf may occur with application during the growing season. Yellowing will usually disappear in 2 to 4 weeks under favorable weather conditions. Bahiagrass will be severely injured or controlled at these rates.
	sulfometuron (0.023lb)	Oust 75DG (0.5 oz)	Oust may be applied after full spring green-up of bermudagrass to suppress bahiagrass growth and seedhead development and for the control of certain broadleaf weeds and johnsongrass. A second treatment may be applied about 6 to 10 weeks later for continued suppression. Be certain that no bermudagrass injury is present before applying the second application. Add 2,4-D + dicamba at 1 to 2 qt/acre to increase broadleaf weed control spectrum. Provides poor control of vaseygrass, broomsedge, and dallisgrass. A nonionic surfactant at 0.25% v/v should be added to the spray mix. Sulfonylurea family.
	glyphosate (0.19 lb) + sulfometuron (0.012 lb) or MSMA (2 lb) + sulfometuron (0.012 lb)	Roundup Pro 4L + others (6 fl oz) + Oust 75DG (0.25 oz) or MSMA 6L (a gal) + Oust 75 DG (0.25 oz)	Glyphosate + Oust or MSMA + Oust may be applied to bermudagrass to provide bahiagrass seedhead inhibition, vegetative suppression and johnsongrass control. Apply after full greenup of bermudagrass and bahiagrass or after the bahiagrass has been mowed. Application should be made prior to seedhead emergence. Repeat application of the glyphosate + Oust tank-mix during the growing season are not recommended. A sequential application of MSMA, or DSMA may be needed later in the summer if seedheads or weeds begin to appear. If bermudagrass is present, this treatment allows it to gradually become the dominant grass.
	metsulfuron	Escort 60DF (0.5 to 1 oz)	For bahiagrass, ryegrass, and hemp sesbania control. Add 1 qt. surfactant per 100 gal spray. Common, Argentine, & Paraguayan bahiagrass cultivars are not as susceptible as Pensacola. Also control foxtails and certain broadleaf weeds such as chickweed, clover, dandelion, plantain, purslane, spurge, woodsorrel, wild onion/garlic. Sulfonylurea family.

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	glyphosate (0.3 + 0.48lb) + 2,4-D (0.45 + 0.72 lb)	Campaign 3.1L (1 to 1½ qts)	Campaign may be applied to actively growing well established bermudagrass and bahiagrass to suppress or control emerged weeds and to allow the release of the bermudagrass. Use the low rate on bahiagrass. This treatment will control many broadleaf weeds tolerant of MSMA, DSMA, glyphosate, or glyphosate + Oust due to the 2,4-D. Rate of application should be based on the weed species most common on the roadside (Refer to label). It is not necessary to add a surfactant to Campaign. Since Campaign is a formulation containing 2,4-D, use care when applying in the vicinity of 2,4-D sensitive crops such as vegetables, cotton, tobacco, fruit trees, and ornamentals.
Grass Weed Control in Centipede grass	imazapic (0.0625 lb)	Plateau 2L (4 fl oz)	Apply after greenup. Do not apply to drought stressed centipede grass. Add 0.25% nonionic surfactant. Will provide suppression of many broadleaves. Imidazolinone family.
	sethoxydim (0.19 to 0.28 lb)	Vantage 1.0L (1½ to 2¼ pt)	Vantage may be applied to centipede grass roadsides to suppress most annual and perennial grasses except dallisgrass. Repeat applications will be needed to suppress bahiagrass or bermudagrass. Apply in 30 to 40 gallons of water per acre. Vantage will not suppress or control broadleaf plants which may be released due to the suppression of grassy weeds. Cyclohexendione family.
	metsulfuron (0.01 to 0.02 lb)	Escort 60DF (¼ to 1 oz)	Note the low use rate. Best control for bahiagrass. A nonionic surfactant at 0.25% by volume (1 qt/100 gal) increases control. Common, Argentine, & Paraguayan bahiagrass cultivars are not as susceptible as Pensacola. Also control foxtails and certain broadleaf weeds such as chickweed, clover, dandelion, plantain, purslane, spurge, woodsorrel, wild onion/garlic. Sulfonylurea family.
General Broadleaf Weed Control including thistles	dicamba (0.5 to 1.0 lb)	Vanquish 4S or Banvel 4S (1 to 2 pts)	Add 1 to 2 qts nonionic surfactant per 100 gal of water. Apply March through July in 20 to 40 gal water per acre as a broadcast application or 100 gal per acre as a handgun or backpack application. Add a tracker dye and drift control agent. Avoid drift especially near sensitive crops. Do not apply within the rootzone of ornamentals. Controls many broadleaf weeds including white clover, spurge, thistles, and woodsorrel. Treat small (3-in) tall weeds for best control. May be tank mixed with 2,4-D, Princep, Garlon and other herbicides to broaden weed and brush control spectrum. See label for instruction. Synthetic Auxin family.
	diflufenzopyr (0.05 to 0.1) + dicamba (0.125 to 0.25)	Overdrive 70 WG 4 to 8 oz	Controls many annual, biennial broadleaf weeds and controls or suppresses many perennial broadleaf weeds. For effective thistle control, apply when in the rosette stage in spring, to early summer but before bud stage. Also controls ragweed, marehail, kochia, and prickly lettuce. A maximum of 10 oz can be applied per season per treated acre in railroad, utility, pipeline, highway right-of-ways, and other noncropland sites. Use higher rate when treating large annuals/biennials and perennial weeds. An 80% active nonionic surfactant at 1 qt/100 gals or MSO at 1.5 to 2 pt/acre must be used to achieve consistent weed control. To complement weed spectrum or increase weed control, Overdrive can be tank mixed with various herbicides (see label for tank mix options).
	aminopyralid (0.06 to 0.11)	Milestone 2L (4 to 7 oz)	Controls numerous broadleaf weeds such as horseweed, dogfennel, horsenettle, thistles and tropical soda apple. Milestone is non-volatile, but use care when applying in the vicinity of broadleaf crops, fruit trees, and ornamentals. Milestone can be tank-mixed with Plateau, glyphosate, MSMA, 2,4-D, triclopyr, and numerous other herbicides labeled for use on grass roadsides to increase weed spectrum. Add a nonionic surfactant at 0.25% v/v to the spray mix. Pyridine family.

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	triclopyr (1.5 lbs)	Garlon 3A (2 qts) or Garlon 4 (1.5 qts)	Apply to actively growing plants. Add 2 to 4 qts. nonionic surfactant per 100 gals of spray. May be tank mixed with 2,4-D or fluroxypyr to broaden spectrum of weed control. Synthetic Auxin family.
	2,4-D amine (1 to 4 lb)	2,4-D amine (1 to 4 qts)	Controls most annual and perennial broadleaf weeds. Apply as a foliar spray in 30 gal water per acre to young, actively growing vegetation as a broadcast application. Add a drift control agent and be aware of nearby susceptible crops and other desirable vegetation. Synthetic Auxin family.
	glyphosate (0.3 to 0.6 lb) + 2,4-D amine (0.48 to 0.95 lb)	Campaign 3.1L (1 to 2 qts) LandmasterII 2.2L (27 to 80 oz)	Apply prior to green-up for non-selective control of winter weeds, tall fescue, and some weeds resistant to sulfonyleurea herbicides. Add a drift control agent and be aware of nearby sensitive crops and desirable vegetation.
	clopyralid (0.28 to 0.5 lb)	Transline 3L (12 to 21 oz) Stinger 3L (12 to 21 oz)	Add 1 to 2 qts of nonionic surfactant to 100 gal of solution. Apply March through early May for winter broadleaf weeds and late June to early October for summer broadleaf weeds. Apply in 20 to 40 gal water per acre as a broadcast application or 100 gal per acre as a handgun or backpack application. Add a tracker dye and drift control agent. Controls kudzu, locust, redbud, mimosa, clover, sericea lespedeza. Synthetic Auxin family.
	fluroxypyr (0.12 to 0.5)	Vista 1.5L (10 to 43 oz) Vista XRT 2.8L (5.5 to 23 oz)	Especially useful for lespedeza control as well as ragweed, goldenrod, blackberry, kochia, dandelion, thistles and others. Tank mix with 2,4-D or triclopyr to broaden spectrum of weed control
	foramsulfuron (0.016 to 0.033) + iodosulfuron (0.002 to 0.004) + thiencarbazone (0.007 to 0.014)	Derigo 36.4WDG (3 to 6 oz)	For control of vaseygrass, dallisgrass, and johnsongrass plus a number of broadleaf weeds in bermudagrass, centipedegrass, and zoysiagrass. No for use on desirable cool-season grasses. For bahiagrass seedhead control, apply at 1.5 to 3 oz product per acre prior to summer heat/drought stress. A total of 6 oz/acre is allowed yearly. Use a NIS at 0.25 to 0.5% v/v and a minimum of 10 GPA. The additional of ammonium sulfate (1.5 to 3 lbs/a) or urea ammonium nitrate (1.5 to 2 qts/a) may improve control of some difficult-to-control weeds in areas of high relative humidity for ammonium sulfate and areas of low relative humidity for urea ammonium nitrate.
Kudzu	aminopyralid (0.11)	Milestone 2L (7 oz)	Used as a broadcast or spot treatment. Apply during periods of active Kudzu growth. Add a nonionic surfactant at 0.25% V/V to the spray mixture. Do not use this product on areas where broadleaf plants, including legumes, are desired. Total application rate should not exceed 7 oz/acre per year.
	clopyralid (0.5 lb)	Transline 3L (21 oz)	Used as a broadcast or spot treatment. Add 1 pt nonionic surfactant in 50 to 100 gal water. Apply during periods of active growth from June to Sept. Will also kill locust, redbud, mimosa trees, clover, and sericea lespedeza. Synthetic Auxin family.
	triclopyr (see trade name rates)	Garlon 3A (1.5 to 2 gal)	Amine formulation. Used as a spot or broadcast treatment. Add 1 to 2 pts surfactant per acre. Coverage should be to wet all leaves, stems, and root collars. Best control is with mid- to late-summer treatments (June to Sept).

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		Garlon 4 (1 gal/100 gal solution)	Ester formulation. Used as a spot treatment in 20 to 100 gal water per acre. Add 1 to 2 qts surfactant. Best control is with mid- to late-summer treatments (June to Sept). Refer to label for application guidelines. Synthetic Auxin family.
	metsulfuron (0.045 lb)	Escort 60DF (3 to 4 oz)	Note the low use rate. Add 1 to 2 qt surfactant per 100 gal spray mix. Do not treat desirable bahiagrass. For handgun application, use 100 to 150 gal of spray mix per acre. Use 20 to 40 gal per acre for broadcast application. Thoroughly spray foliage and stems without excessive runoff. Sulfonylurea family.
Bahiagrass Seedhead Suppression	imazapic (0.03135 to 0.0625 lb)	Plateau 2L (2 to 4 oz)	Foliar (primarily) and root absorbed. Add 1 qt/100 gal nonionic surfactant. Apply to bahiagrass in spring before seedhead formation or 7 days after mowing. Provides some broadleaf weed and nutsedge control. Do not apply to wetlands or to turf less than 3 years old. The 2 oz rate will provide partial control and minimal injury. At the 4 oz rate, treated areas may appear less dense and temporarily discolored, thus, raise the mowing height prior to this treatment. Do not use on St. Augustinegrass or drought- stress bahiagrass. Read and follow label directions before use. Imidazolinone family.
	glyphosate (0.18-0.22 lb)	Roundup Pro 4L (4 to 8 fl oz/10-25 gal water)	Foliar absorbed. Apply to bahiagrass only. Add 2 qts nonionic surfactant per 100 gals spray. Note: Glyphosate is a nonselective herbicide if applications exceed these recommended rates. Make application after full greenup of bahiagrass (timing will vary across the state). Treated areas may appear less dense and temporarily discolored. Initial application of Roundup 4L or generic glyphosate (4L) at 8 oz/A followed by 4 to 6 oz/A 6 weeks later has provided good results. Read and follow label recommendations prior to use. Amino Acid Derivative family.
	glyphosate + 2,4-D	Campaign 3.1L (16 to 24 oz/A)	
	sulfometuron (0.023 lb)	Oust 75 DG (½ oz/a)	Foliar absorbed. Applied after full spring green-up or 7 to 14 days after first mowing to suppress bahiagrass growth and seedhead development and for the control of certain broadleaf weeds. A second treatment may be applied about 6 to 10 weeks later for continued suppression. Often tank-mixed with Roundup or Campaign. Treated areas may appear less dense and temporarily discolored. Sulfonylurea family.
Bahiagrass and Weed Suppression in Actively Growing Fescue	MSMA (2 lbs) or DSMA (3.6 lbs)	MSMA 6 L (1/3 gal) or DSMA 3.6 L (1 gal)	Mow roadsides, if needed, when bahiagrass or dallisgrass seedheads begin to appear (usually in early June). Begin treatment when grasses begin to send up new seedheads. Air temperature in afternoons should be 80 degrees or above. Apply as needed when new seedheads or other weeds emerge usually at 4 to 6 week intervals. Two or three applications during the summer will be needed. This treatment suppresses bahiagrass, dallisgrass, johnsongrass and broadleaf weeds and allows fescue to remain with little injury. If bermudagrass is in the roadside, fescue may be gradually replaced. Organic Arsenical family.
Tall Fescue Seedhead Suppression and Weed Control	glyphosate (0.19 to 0.25 lb) + sulfometuron (0.012 lb)	Roundup Pro 4L + others (6 to 8 fl oz) + Oust 75DG (0.25 oz)	Glyphosate + Oust may be applied to tall fescue roadsides to suppress tall fescue seedhead production. Apply to established, actively growing tall fescue in the spring <u>prior to seedhead emergence</u> (usually between March 1 and April 1). Slight discoloration of the fescue may occur. Glyphosate + Oust will also help to suppress many broadleaf weeds and grasses. This treatment may eliminate the need for mowing prior to the application of summer fescue treatments that are normally made in May or June. Add 2,4-D &/or dicamba plus 1 qt/acre surfactant to improve broadleaf weed control.
	imazapic (0.0313 to 0.0625 lb)	Plateau 2L (2 to 4 oz)	Add 1 qt/100 gal nonionic surfactant to the 2 oz rate. Surfactant is not needed for the 4 oz rate. May cause temporary injury to turf and thinning of stand. Read and follow label directions before use. Imidazolinone family.

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	sethoxydim (0.19 lb)	Vantage 1.0L (1.5 pt)	Vantage may be used to suppress tall fescue seedhead production. Apply to established tall fescue that is actively growing in the spring before the emergence of seedheads (usually between March 1 and April 1.) Do not apply to fescue less than one year old. Apply in 30 to 40 gallons of water per acre. Vantage will not suppress or control broadleaf plants which may be released due to the suppression of tall fescue. Discoloration of the fescue will often occur and may sometimes be severe. Cyclohexendione family.
	chlorsulfuron (0.012 lb)	Telar 75DG (0.25 oz)	Telar may be applied to suppress tall fescue seedhead production. Apply to established tall fescue that is actively growing in the spring prior to seedhead emergence (usually between March 1 and April 1). Some suppression of the grass growth may occur. This treatment will also help to suppress or control many broadleaf weeds. This treatment may eliminate the need for mowing prior to the application in the summer of MSMA or DSMA as weed control treatments in fescue. Apply in 20 to 30 gallons of water per acre. Sulfonylurea family.
	glyphosate (0.19 to 0.25 lb) + chlorsulfuron (0.012 lb)	Roundup Pro 4L + others (6 to 8 fl oz) + Telar 75DG 0.25 oz	Glyphosate + Telar may be applied to tall fescue to suppress seedhead production and control some annual weeds. Apply to established tall fescue in the spring prior to seedhead emergence (usually between March 1 and April 1). Make only one application per season. This treatment may eliminate the need for mowing prior to the application of summer fescue treatments that are normally made in May or June. Telar provides better control of thistles and mustards than Oust.
	glyphosate (0.19 to 0.25) + metsulfuron (0.0094 lb)	Roundup Pro 4L + others (6 to 8 fl oz) + Escort 60 DG (0.25 oz)	Glyphosate + Escort may be applied to tall fescue to suppress seedhead production and control some annual weeds. Apply to established tall fescue in the spring prior to seedhead emergence (usually between March 1 and April 1). This treatment may eliminate the need for mowing prior to the application of summer fescue treatments that are normally made in May or June. Do not apply to mixed tall fescue/bahiagrass stands unless bahiagrass control is the desired objective.
	diflufenzopyr (0.05 to 0.125) + dicamba (0.1 to 0.25)	Overdrive 70 WG 4 to 8 oz	Controls many annual and perennial broadleaf weeds. For effective thistle control, apply when in the rosette stage in spring, to early summer but before bud stage. Also controls ragweed, marestail, kochia, and prickly lettuce. A maximum of 10 oz can be applied per season per treated acre in railroad, utility, pipeline, highway right-of-ways, and other noncropland sites. Use higher rate when treating large annuals/biennials and perennial weeds. An 80% active nonionic surfactant at 1 qt/100 gals or MSO at 1.5 to 2 pt/acre must be used to achieve consistent weed control. To complement weed spectrum or increase weed control, Overdrive can be tank mixed with various herbicides (see label for tank mix options) and is rainfast within 4 hours after application.
	aminopyralid (0.06 to 0.11)	Milestone 2L (4 to 7 oz)	Controls numerous broadleaf weeds such as horseweed, dogfennel, horsenettle, and tropical soda apple. Milestone is non-volatile, but use care when applying in the vicinity of broadleaf crops, fruit trees, and ornamentals. Milestone can be tank-mixed with Plateau, glyphosate, MSMA, 2,4-D, and numerous other herbicides labeled for use on grass roadsides. Add a nonionic surfactant at 0.25% v/v to the spray mix.
Limb Trimming (side trimming)	fosamine (6 to 8 lbs)	Krenite 4S (1½ to 2 gal)	Add 1 qt crop oil per 100 gal. spray solution. Only controls treated (sprayed) limbs. Best to treat in late summer (Aug, Sep, Oct). Little foliage brownout occurs after treatment. Leaves drop off the tree in a normal fashion but are not produced the following spring. Use drift control as recommended on label.
	triclopyr (1 to 2 lbs)	Garlon 4 (4 to 8 qts)	This is a dormant application (Feb., Mar., April). Apply within 10 weeks prior to normal bud break. Add 3 gal crop oil per 100 gals spray solution. Only controls treated (sprayed) limbs. Use drift control as recommended on label. Synthetic Auxin family.

VEGETATION MANAGEMENT AND WEED CONTROL IN SPECIALTY TURF AREAS SUCH AS ROADSIDES, INDUSTRIAL SITES, FIELDS, COMMON AREAS¹

SITE/WEED	COMMON NAME (lbs ai/acre)	TRADE NAMES (rate of product/acre)	REMARKS AND PRECAUTIONS (Always Use Drift Control as Recommended by Each Herbicide Label)
Brush Control (foliar)	triclopyr (2 to 3% solution)	Garlon 3A (2 gal/100 gal solution)	Used as a spot or broadcast treatment. Add 0.25% surfactant (1 qt/100 gal). Apply during the growing season (May through Sept). Provides selective control of brush and broadleaf weeds such as blackberry, oaks, pines, sumac, and sweetgum. Tank mix with Tordon K to increase weed control spectrum. Also used under guardrails, fences, signs, and bridge ends. Synthetic Auxin family.
		Garlon 4 (1.5 to 3 gal/100 gal solution)	Used as a spot or if stems are too numerous for cut stump application, use as a broadcast treatment. Add 2 gal crop oil concentrate. Apply as a dormant stem and basal season applications (Feb. through April) at 3 gal/acre rate or during late summer 4 to 8 months after cutting and vegetation is actively growing (1.5 gal/acre rate). Also used under fences, culvert ends, delineators, signs, ditches (no standing water present), and bridge ends. Synthetic Auxin family.
	fosamine (6 to 12 lbs)	Krenite 4S (1.5 to 3 gal)	Used as a spot or broadcast treatment. Add nonionic surfactant at 1 qt/100 gals. Use 50 gal of water per acre as a broadcast application or 100 gal water per acre as a handgun application. Thorough plant coverage is necessary for control. Best results with late summer (Aug to Oct) treatments. May be used in wetlands. Read label for details. Controls kudzu, blackberry, sumac, multiflora rose, pines, and other woody plants.
	glyphosate (2 to 8.1 lb)	Rodeo 5.4L (3 pts to 1.5 gal)	Used as a spot or broadcast treatment. Add 2 to 4 qts nonionic surfactant per 100 gal solution. Best results with late summer (Aug to Oct) treatments. May be used in wetlands. Thorough plant coverage is necessary for control. Also used for trimming, curbs, gutters, rip-rap, and drainage ditches. Amino Acid Derivative family.
	glyphosate (2 to 5 lb)	Roundup Pro 4L (2 to 5 qts) generic glyphosate 4L (3 to 7 pts)	Used as a spot treatment as treated grass will be damaged. Best results with late summer (Aug to Oct) treatments. Controls most annual weeds and many perennials such as johnsongrass, dock, milkweed, horsenettle, lespedeza, brambles, multiflora rose, and trumpet creeper. Apply on a spray-to-wet basis. Grass understory will be killed at the base of the spot treatment. Use a drift control agent as recommended on the label. Add 2 to 4 qts nonionic surfactant per 100 gal solution for generic glyphosate. Amino Acid Derivative family.
	glyphosate (5%) + imazapyr (0.5%)	Roundup Pro 4L (5 gal) + Arsenal 2S (2qt/100 gal)	Apply in a low volume backpack sprayer to the point of leaf wet. Do not spray to drip. Special precaution should be followed to avoid root application in areas of desirable trees and minimize the amount of herbicide to soil contact. Weak on waxy leaf brush.
Brambles	triclopyr (see trade name rates)	Garlon 3A (1.5 to 3 qts)	Used as a spot treatment. Add 1 to 2 pts surfactant. Coverage should be to wet all leaves, stems, and root collars. Best control when applied in the spring immediately following flowering or in late summer (Aug to Nov).
		Garlon 4 (1.5 gal/100 gal solution)	Used as a spot treatment in 20 to 30 gal water per acre. Add 1 to 2 pts surfactant. Treat dormant brush with most of the foliage dropped (Jan through March). Synthetic Auxin family.
	glyphosate (3 to 4 lb) glyphosate (1 to 1.5% solution)	Roundup Pro 4L (3 to 4 qts) Roundup Pro 4L (1 to 1.5 gal/100 gal)	Used as a spot treatment after plants have reached full leaf maturity. Best results with late summer (Aug to Nov) treatments. Generic glyphosate 4L may be used as a 1% solution (1 gal/100 gal spray solution). Add 2 to 4 qts nonionic surfactant per 100 gal spray for generic glyphosate. Amino Acid Derivative family.
	metsulfuron (0.023 lb)	Escort 60DF (2 oz)	Note the low use rate. Add 1 to 2 qt surfactant per 100 gal spray mix. Do not treat desirable bahiagrass. For handgun application, use 100 to 150 gal of spray mix per acre. Use 20 to 40 gal per acre for broadcast application. Controls other plants such as hemp sesbania. Thoroughly spray foliage and stems without excessive runoff. Sulfonylurea family.

VEGETATION MANAGEMENT AND WEED CONTROL IN SPECIALTY TURF AREAS SUCH AS ROADSIDES, INDUSTRIAL SITES, FIELDS, COMMON AREAS¹

SITE/WEED	COMMON NAME (lbs ai/acre)	TRADE NAMES (rate of product/acre)	REMARKS AND PRECAUTIONS (Always Use Drift Control as Recommended by Each Herbicide Label)
	fluroxypyr (0.12 to 0.5)	Vista 1.5L (10 to 43 oz) Vista XRT 2.8L (5.5 to 23 oz)	Especially useful for lespedeza control as well as ragweed, goldenrod, blackberry, kochia, dandelion, thistles and others. Tank mix with 2,4-D or triclopyr to broaden spectrum of weed control
Cut stump/stubble	triclopyr (see trade name rates)	Garlon 3A (4 to 6 qts) Garlon 4 (20% solution = 5 gal/100 gal)	Used as a broadcast treatment. Add ¼ to ½% nonionic surfactant. Best results when application is made 4 to 8 months after mowing or hand cutting and vegetation is actively growing. Use drift control. Apply any time after cutting, including winter months. Used as an individual cut stump treatment. Add 25 gal Basal Oil per 100 gal spray. Used as a spot treatment in a squirt bottle, paint brush, or in a small hand held sprayer. Spray the root collar area, sides of the stump and the outer portion of the cut surface including cambium. Can be used on stumps for several weeks after cutting. Use an oil soluble dye. May be used year-round. May also be used during the dormant season (December through March) instead of Roundup Pro.
	triclopyr (1 lb)	Pathfinder II 1L (100% solution, ready to use)	Apply any time after cutting, including winter months. Use a back-pack, squirt bottle, or small hand-held sprayer to treat individual cut stumps. Wet the area adjacent to the cambium and bark around the entire circle and the sides of cut stumps. Side stumps (suckers) should be thoroughly wetted down to the root collar area, but not to the point of runoff. Do not treat in standing water which prevents spray from reaching the ground. Do not make applications when snow or water prevent spraying to ground level. Synthetic Auxin family.
	imazapyr (1%)	Stalker 2L (2 qt/50 gal basal oil solution)	Add basal oil as the carrier. Treat immediately following mechanical or hand cutting. Only treat cambium region (outside a perimeter of cut stump) in a low volume backpack applicator. Imidazolinone family.
	glyphosate (50% solution)	Roundup Pro 4L (1:1 water to herbicide ratio)	Treat May through Sept immediately following cutting. Apply using a backpack sprayer or squirt bottle. Remove wood chips before application. Treat only an outside perimeter of cut stump. This is the cambium tissue where the herbicide translocates in the plant. Use a water soluble dye. No drift control agent is needed. Controls oak, sweet gum, and willow. Amino Acid Derivative family.
	picloram (3% ae) + 2,4-D (11.2% ae)	Pathway (see remarks)	Treat the stump as soon as possible after cutting. If more than one hour has elapsed since the time of cutting, use one of the oil-based products. Treat only the exposed cambium area next to the bark and around the entire circumference of the tree with undiluted Pathway.
Injection	2,4-D amine (undiluted injection)	2,4-D amine 4EC (1 to 2 ml of concentrate per injection)	Treat May through October by making injections as near to the root collar as possible. Controls elm, popular, sassafras, willow, and many other woody species. Synthetic Auxin family.
	glyphosate (undiluted injection)	Roundup Pro 4L (1 ml of product per injection)	Inject product into base of tree every 2 to 3 inches around the trunk diameter. Applications should be made during periods of active growth. Controls oak, popular, sweetgum, and sycamore. Amino Acid Derivative family.
Bareground (1 year)	imazapyr (1.0 lb) + diuron (2.4 to 4)	Arsenal 2S (2 qts) + Karmex (3 to 5 lb)	Make broadcast applications in 40 to 50 gal of water per acre. Apply in 100 gal water per acre when using handgun. Controls many annual and perennial broadleaf and grass weeds.

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SITE/WEED	COMMON NAME (lbs ai/acre)	TRADE NAMES (rate of product/acre)	REMARKS AND PRECAUTIONS (Always Use Drift Control as Recommended by Each Herbicide Label)
	imazapyr (0.48 to 1 lb) + diuron (3.73 to 8.09 lb)	Sahara DG (6 to 13 lbs)	Tank mix with Roundup Pro for quicker control of emerged vegetation. Do not apply near roots of desirable plants.
	flumioxazin (0.26 to 0.38 lb)	Payload 51WDG (8 to 12 oz)	Provides control of a wide range of grass and broadleaf weeds. Used for guard rails, railroads, substations, industrial plants, farm buildings, fence rows, and storage areas. Apply before weed emergence or to weeds less than 2 inches tall. Add a nonionic surfactant at 0.25% v/v. Yearly allowed rates are 24 oz/acre.
	diquat + glyphosate + indaziflam (10.5 lb ai/A)	Specticle Total 1.95L (5.4 gal/A)	Mix 16 fl oz/gal of water to cover 1,000 ft ² . Maximum yearly use rate of 32 fl oz/1,000 ft ² . Make a subsequent application 4 months after the initial to extend weed control. For non-selective weed control in ornamental beds, apply only to established plants (\geq 1 yr old) and prior to mulching.
Soil Sterilants (>2 years)	bromacil (6 to 12 lb)	Hyvar X-L (3 to 6 gal)	Apply in 100 to 200 gal of water per acre. Rainfall is required for activation. See label for specific recommendations and weeds controlled.
	bromacil (2.4 to 12 lb) + diuron (2.4 to 12 lb)	Krovar 1 DF (6 to 30 lbs)	Apply prior to weed emergence. If small weeds exist at time of application, add 1 qt nonionic surfactant per 100 gal of spray solution. Rainfall will be needed to carry herbicide into the root zone of weeds. The length of weed control will be extended as rate is increased. See label for specific recommendations and weeds controlled.
	imazapic (0.183 lb) + glyphosate (0.375 lb)	Journey 2.25 L (32 fl oz.)	Excellent control of most grass and broadleaf weeds. Significant soil residual activity for weeks or months after application. May be mixed with glyphosate 1 qt fl oz/A for additional knock down of larger vegetation. For best results, use a MSO at 1.5 to 2 pts/acre.
Johnsongrass in bermudagrass	imazapic (0.188 to 0.375 lb)	Plateau 70DG (4 to 8 oz) or Plateau 2S (8 to 12 oz)	Add 1 qt nonionic surfactant in 100 gals of spray solution. Apply in 20 to 40 gal per acre. Treat from May to Aug when plants are 18 to 24 inches tall. Controls johnsongrass, crabgrass, ragweed, sandspur, ragweed, tall fescue, prickly sida, trumpetcreeper. Use higher rate for later season treatment. To increase control, add MSMA at 2 lbs ai per acre. Do not mow prior to treatment or within 14 days after treatment. Imidazolinone family.
	imazapic (0.123 to 0.183 lb) + glyphosate (0.246 to 0.375 lb)	Journey 2.25 L (21 to 32 fl oz.)	Apply when johnsongrass has reached 18 to 24 inches in height at the whorl. Use higher rate as density increases. Also controls smutgrass, dallisgrass, bahiagrass, vaseygrass and other <i>Paspalum</i> spp. For best results, use a MSO at 1.5 to 2 pts/acre.
	asulam (3.3 to 6.7 lb)	Asulox 3.34L (1 to 2 gal)	Broadcast treatment when grass is 18 inches or taller. Use higher rate in heavy infestations. A nonionic surfactant can be added at 0.25% by volume. DO NOT TREAT DESIRABLE CENTIPEDEGRASS.
	glyphosate (0.25 to 1% solution)	Roundup Pro 4L (0.25 to 1 gal/100 gal)	Used as a spot treatment after plants have reached 12 to 18 inches in height. Best results with summer (June to Aug) treatments. Use higher rate with larger plants. Will cause temporary discoloration and result in turf thinning.

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	glyphosate (0.5 to 3 lb) See Remarks	Roundup Pro 4L (0.5 to 3 qts) See Remarks	Used as a broadcast treatment. Use 1 pt/acre for burndown of smaller plants up to 12 inches tall. Use 2 to 3 qt/acre for larger plants in the boot to head stage. Best results with summer (June to Aug) treatments. Generic glyphosate 4L may also be used as a 0.75% solution (3 qts/100 gal spray) as a spot treatment. Use 3 to 4.5 pts/acre for broadcast treatment. Add 2 to 4 qts nonionic surfactant per 100 gal spray. Treat only actively growing plants (June through September). Will cause temporary discoloration and result in turf thinning.
	glyphosate (0.5 to 0.75 lb) + sulfometuron (0.047 to 0.09 lb)	Roundup Pro 4L (16 to 24 fl oz) + Oust 75DG (1 to 2 oz)	Apply after full greenup of bermudagrass and is actively growing. Repeat application of this tank-mix during the growing season is not recommended. Expect 2 to 4 weeks damage to the bermudagrass. A sequential application of Roundup Pro, MSMA, or DSMA may be needed later in the summer if weeds begin to appear. If bermudagrass is sporadically present, this treatment allows it to gradually become the dominant grass. Apply in 20 to 40 gal water per acre. Do not mow prior to treatment or within 14 days after treatment. Expected control is 80 to 85 % with low rates and 90 to 95% at the high rate.
	MSMA (2 lb) or DSMA (3.6 lb)	MSMA 6 L (0.33 gal) or DSMA 3.6 L (1 gal)	May be applied April through August every 4 to 6 weeks for suppression or control of emerged weeds. Two to 3 applications may be needed for control. Apply in 40 gal per acre. This treatment will release actively growing bermudagrass and suppress bahiagrass, dallisgrass, johnsongrass, and several broadleaf weeds. Treat when johnsongrass is 12 to 18 in-tall. Tank mixing with Oust at 1 oz/acre during the first treatment will help provide preemergence seedling johnsongrass control. Do not add Oust to subsequent treatments.
	sulfosulfuron (0.035 to 0.062 lb)	Outrider 75 DF (0.75 to 1.33 oz)	Excellent (85 to 95%) for johnsongrass control in bermudagrass. To increase weed control spectrum, add Roundup Pro at 12 to 24 fl oz/acre or MSMA 6L at 3.3 to 4 pts/acre. Add 0.5% nonionic surfactant (2 qts/100 gal spray) or methylated seed oil if Roundup Pro is not used. Treat May through July when plants are small and temperatures above 80F. Sulfonylurea family.
Ryegrass	oryzalin (1.5 to 3 lbs)	Surflan 2AS (3 to 6 qts)	These preemergence herbicides must be applied prior to ryegrass germination, usually by mid-Sept. Tank mix with glyphosate for postemergence control of emerged plants in bahiagrass.
	prodiamine (0.65 to 1.5 lbs)	Endurance 65DF (1 to 2.3 lb)	
	pendimethalin (2 to 4 lb)	Pendulum 60DF (3.3 to 6.6 lb)	
	metsulfuron (0.019 to 0.045 lb)	Escort 60DF (0.5 to 2 oz)	Note the low use rate. Best to apply when ryegrass is immature (Nov. to early Jan.). Do not treat desirable bahiagrass. Sulfonylurea family.
	sulfometuron (0.04 to 0.09 lb)	Oust 75DF (1 to 2 oz)	Do not add surfactant. Controls winter annual broadleaf weeds, ryegrass, fescue, and suppresses early summer annuals. Fall applications compared to later applications, permit earlier spring green-up of bermudagrass. Sulfonylurea family.
	glyphosate (0.3 + 0.6 lb) + 2,4-D (0.48 + 0.95 lb)	Campaign 3.1L (1 to 2 qts)	Apply to dormant bermudagrass before March. High rate is needed unless ammonium sulfate (AMS) is added. With this combination, use Campaign at 1 qt/acre + AMS at 17 lbs per 100 gal of carrier. Apply in 20 to 40 gal water per acre. It is not necessary to add a surfactant to Campaign. Treat small weeds (<6-in tall) for best results. Since Campaign is a formulation containing 2,4-D, use care when applying in the vicinity of 2,4-D sensitive crops such as vegetables, cotton, tobacco, fruit trees, and ornamentals. Control is slow (2 to 4 weeks). Use appropriate drift control agent.

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	glyphosate (0.25 lb) +	Roundup Pro 4L (8 fl oz) +	Do not use on desirable bahiagrass or tall fescue. Should be used from late Dec through early March for control of annual grasses and broadleaf weeds including mustards and thistles. Roundup Pro can be used alone at 16 oz/a or tank mixed with Oust and Telar for better control of broadleaf weeds. Bermudagrass greenup is not extensively delayed by this treatment. If used on dormant bahiagrass, greenup may be temporarily delayed.
	sulfometuron (0.012 lb) +	Oust 75DG (0.25 oz) +	
	chlorsulfuron (0.012 lb)	Telar 75DG (0.25 oz)	
	imazapic (0.091 to 0.183 lb) +	Journey 2.25 L (16 to 32 fl oz.)	Apply when ryegrass is immature and actively growing. A methylated seed oil concentrate at 1.5 to 2 pints per acre can be added to enhance control. Early spring applications made prior to full green-up may significantly delay bermudagrass green-up. Do not apply during transition if delay in growth and greenup cannot be tolerated. Use on bahiagrass must be done on only dormant turf as use rates listed will severely injury or control bahiagrass. Apply on bahiagrass in late Dec to early Feb. and use lower rate of 16 oz/a, as delayed greenup can be expected.
	glyphosate (0.188 to 0.375 lb)		

Note: In portions of the United States, numerous weed species have developed resistance to members of the sulfonyleurea herbicide family (e.g. Telar, Oust, and Escort). Roadside managers are encouraged to follow these weed control practices to prevent sulfonyleurea resistant weeds. (1) Tank mix sulfonyleurea herbicides with herbicides that have a different mode-of action (e.g. Roundup, 2,4-D, etc.). (2) Do not let weed escapes go to seed in areas treated with sulfonyleurea herbicide. (3) Respray problem areas with a herbicide that has a different mode-of-action than a sulfonyleurea. (4) Rotate the use of sulfonyleurea herbicides with herbicides that have a different mode-of-action. Imidazolinone herbicides have the same mode-of-action as sulfonyleureas.

¹Spray equipment must be properly calibrated. A digital speed monitoring device helps maintain the correct ground speed of an application vehicle instead of relying on its stock speedometer. Spray pattern width should be continually monitored throughout the application. Spray pattern bending (distortion) because of excessive ground speeds (≥13 MPH) or wind will shorten spray widths and cause over-application.

²Most herbicides should not be treated to drought stressed turf. Excessive turf damage and reduced weed control often results.