Minimizing Weeds Through Cultural Controls & The Use of Herbicides During Turf Establishment

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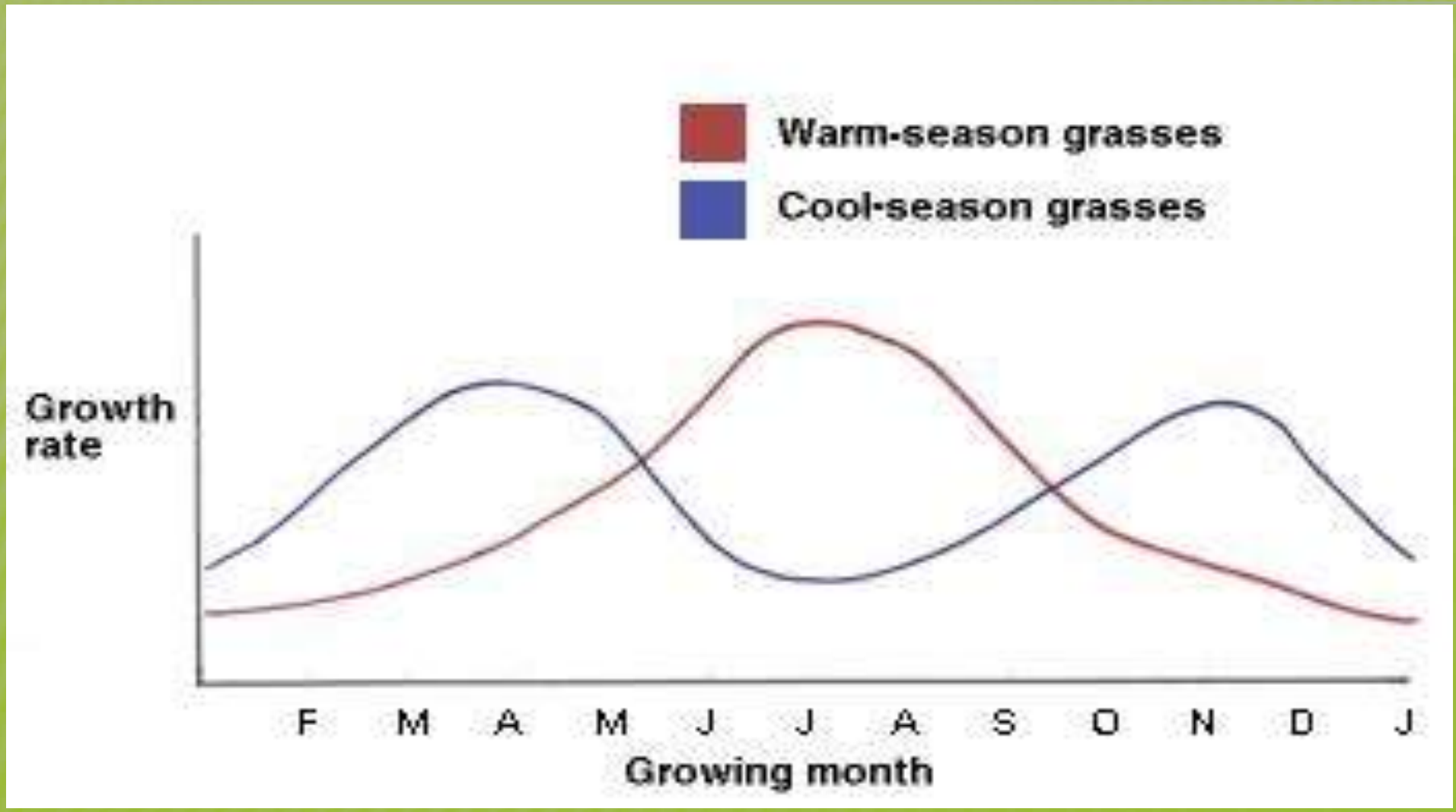
University of California
Agriculture and Natural Resources
Making a Difference for California

GOOD CULTURAL PRACTICES FOR MINIMIZING WEED INVASION

- Proper Turf Species Selection for Site and Use


Thin spots and bare areas caused by shade


Warm-season grasses
Cool-season grasses
Growth rate
F
M
A
M
J
J
A
S
O
N
D
J
Growing month

COOL SEASON TURFGRASSES

- Colonial B*entgrass*
- Creeping Bentgrass
- Kentucky Bluegrass
- Perennial Ryegrass
- Annual Ryegrass
- Tall Fescue
- Fine Fescue

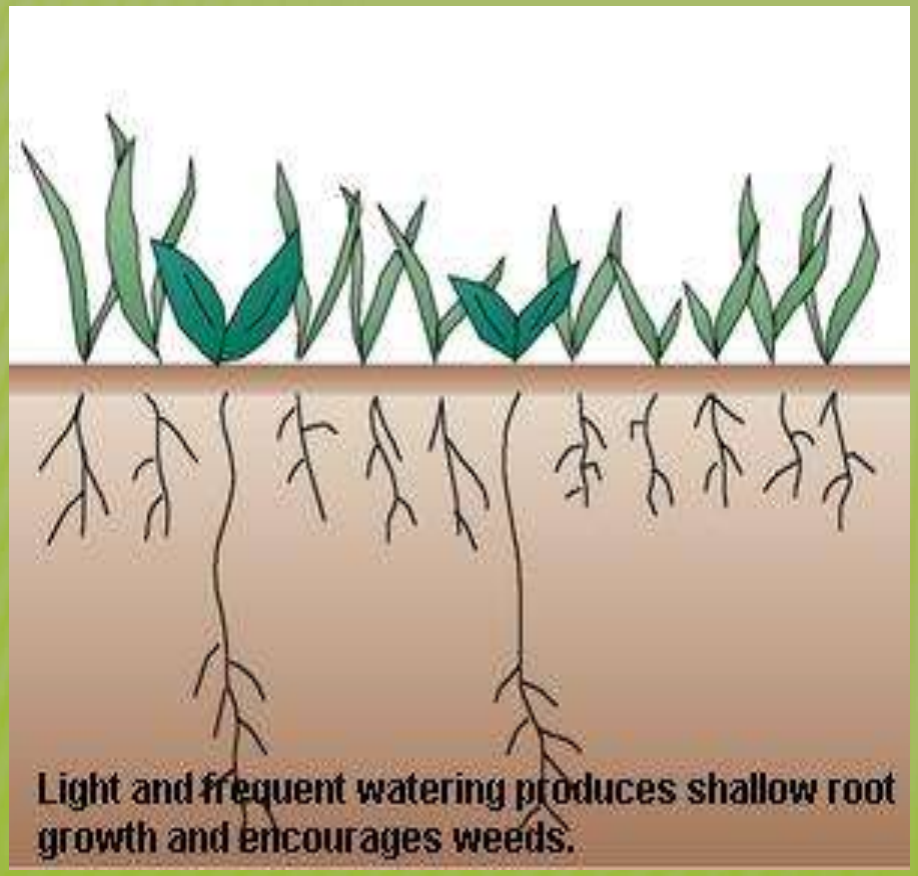
WARM SEASON TURFGRASSES

- Common Bermudagrass
- Hybrid Bermudagrass
- Kikuyugrass
- ST. Augustinegrass
- Zoysiagrass
- Buffalograss

GOOD CULTURAL PRACTICES FOR MINIMIZING WEED INVASION

- Proper Turf Species Selection for Site and Use
- Optimum Fertility, pH, and Irrigation Management for the Turfgrass and Soil

LAWN WATERING



- Water to wet deep roots
- Shallow watering

  = shallow roots

  = no drought tolerance

  = more weeds


Irregular sprinklers

WEEDS AS INDICATORS

COMPACTED SOILS

knotweed (Polygonum aviculare)

mouse-ear chickweed (Cerastium vulgatum)

prostrate spurge (Euphorbia supina)

annual bluegrass (Poa annua)

common chickweed (Stellaria media)

goosegrass (Elusine indica)

MOIST OR POORLY DRAINED SOILS

Annual bluegrass (Poa annua)

Annual sedges (Cyperus spp)

Mouse-ear chickweed (Cerastium vulgatum)

Common chickweed (Stellaria media)

Crabgrasses (Digitaria spp.)

Green Kyllinga(*Kyllinga brevifolia)*

Curly Dock (*Rumex crispus)*

Plantains (Plantago spp)

Ranunculus -buttercup(Ranunculus)

High Fertility

annual bluegrass (Poa annua)

bentgrasses (Agrostis palustris)

crabgrasses (Digitaria spp.)

mallow (Malva neglecta)

purslane(Portulaca oleracea)

Low Fertility

Bur Clover(*Medicago polymorpha)*

White Clover (Trifolium repens)

Birdsfoot trefoil (*Lotus corniculatus L.)*

GOOD CULTURAL PRACTICES FOR MINIMIZING WEED INVASION

- Proper Turf Species Selection for Site and Use
- Optimum Fertility, pH, and Irrigation Management for the Turfgrass and Soil
- Correct Mowing Height and Timing

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- Traffic and Compaction Management

Damaged area caused by item left on the lawn

GOOD CULTURAL PRACTICES FOR MINIMIZING WEED INVASION

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- Optimum Fertility, pH, and Irrigation Management for the Turfgrass and Soil
- Correct Mowing Height and Timing
- Traffic and Compaction Management
- Effective Management of Other Pests

Turfgrass killed by dog urine; note dark green ring


Lawn damaged by masked chafer larvae

Weak areas

ALTERNATIVES TO LAWN GRASS EXAMPLES

ALTERNATIVES TO LAWN GRASS EXAMPLES

(continued)

Fertilization

After installation is complete, saturate each plug with Miracle Gro general purpose fertilizer or fertilize the area with a sod/seed starter fertilizer. Both are available at your local garden center. Read and follow the directions on the label for proper rates and application.

Weed Control

Immediately after planting, apply a fertilizer with pre-emergent weed control following the label directions. Scotts makes Halts Crabgrass Preventer® or Turfbuilder with Halts®. Most garden centers will have these products or similar herbicides. Repeat this application at 1/2 rate in 8 weeks.

In poor soil conditions or Southern climates a third fertilizer application, without pre-emergent, may be done in mid-summer and a fourth application can be applied in early fall.

Throughout the summer, Broadleaf weeds such as dandelions, clover or pigweeds can be controlled after they emerge using broadleaf weed herbicides without 2-4D or a granular weed and feed. Products like Scotts Turfbuilder Plus2® , which contain 2-4D, can be applied when the temperature is below 85 degrees Fahrenheit.

Caution: Never use a product which contains 2-4D when the temperatures are above 85 degrees. This will harm your buffalograss. ALWAYS READ THE LABEL BEFORE APPLYING!

Broadleaf weeds may also be controlled at any temperature with "Spotlight", "Momentum" or "Confront". Annual grassy weeds that are present like crabgrass or foxtail may be controlled with "DRIVE". Consult a professional lawn care company for application of these chemicals.

Hard to kill perennials and unwanted perennial grasses like bluegrass and fescue can be eliminated in the late fall or early spring by spraying round-up on your lawn while the buffalograss is dormant and when the unwanted weeds or grasses are still green and growing. Buffalograss is dormant when no green shows in the foliage; a small amount of green at the base of the plant is okay. Mowing can also be used to control weeds, but is not as effective as herbicides. New herbicides are being developed for buffalograss.

Without Herbicides

If you wish to avoid the use of chemicals, hand eradication of weeds and mowing at 1 - 1 1/2 inches during establishment will benefit your new planting. When using this method, your establishing buffalograss plugs will still benefit from fertilizer applications.

Mowing

Mowing is important during the establishment period to encourage the buffalograss to spread and to control weed growth. Mow the area at 1 1/2 to 3 inches as frequently as necessary to control weed growth. If left un-mowed, your grass will reach a height of 3 to 6 inches.

General Care Guidelines After Establishment

Mowing

If left un-mowed, the buffalograss will reach a height of 3 to 6 inches. There is no set mowing height. Just mow to the look you desire. You may choose to maintain your lawn at 1 inch, allow it to go un-mowed or any height in between.

In early Spring, mow to a height of 1 inch to remove the dormant grass. This will allow the sun to hit and warm the soil, which will cause the buffalograss to green up earlier.

In preparation for winter in Zones 6 and below, mow to a height of 2 to 2-1/2 inches in late summer or early fall.

Fertilization / Weed Control

After mowing in early spring, apply a fertilizer with pre-emergent weed control following the label directions. Scotts makes Halts Crabgrass Preventer® or Turfbuilder with Halts®. Most garden centers will have these products or similar herbicides. Repeat this application at 1/2 rate in 8 weeks. Follow before mentioned weed control advice.

Watering

Buffalograss has a very deep root system and uses only about 1/4 inch of water per week. Most areas of the world will not need to water their Buffalograss except in times of extreme drought. If this occurs, deep water (1 to 2 inches) once every 4 to 6 weeks in clay soil. In sandy soils you will need to water about 3/4 inch every 10 to 14 days. This will keep your lawn looking lush. If you choose not to water or do not have the resources to water, this will not harm the grass, but you may notice a slight browning of the blade tips. You may need to adjust your watering to match your soil type and current weather conditions. Do not waste water by over watering.

HERBICIDES REGISTERED ON BUFFALOGRASS

BARRICADE Prodiamine

CERTAINTY Sulfosulfuron

CONFRONT Clopyralid, Triclopyr, triethylamine salt

GALLERY Isoxaben

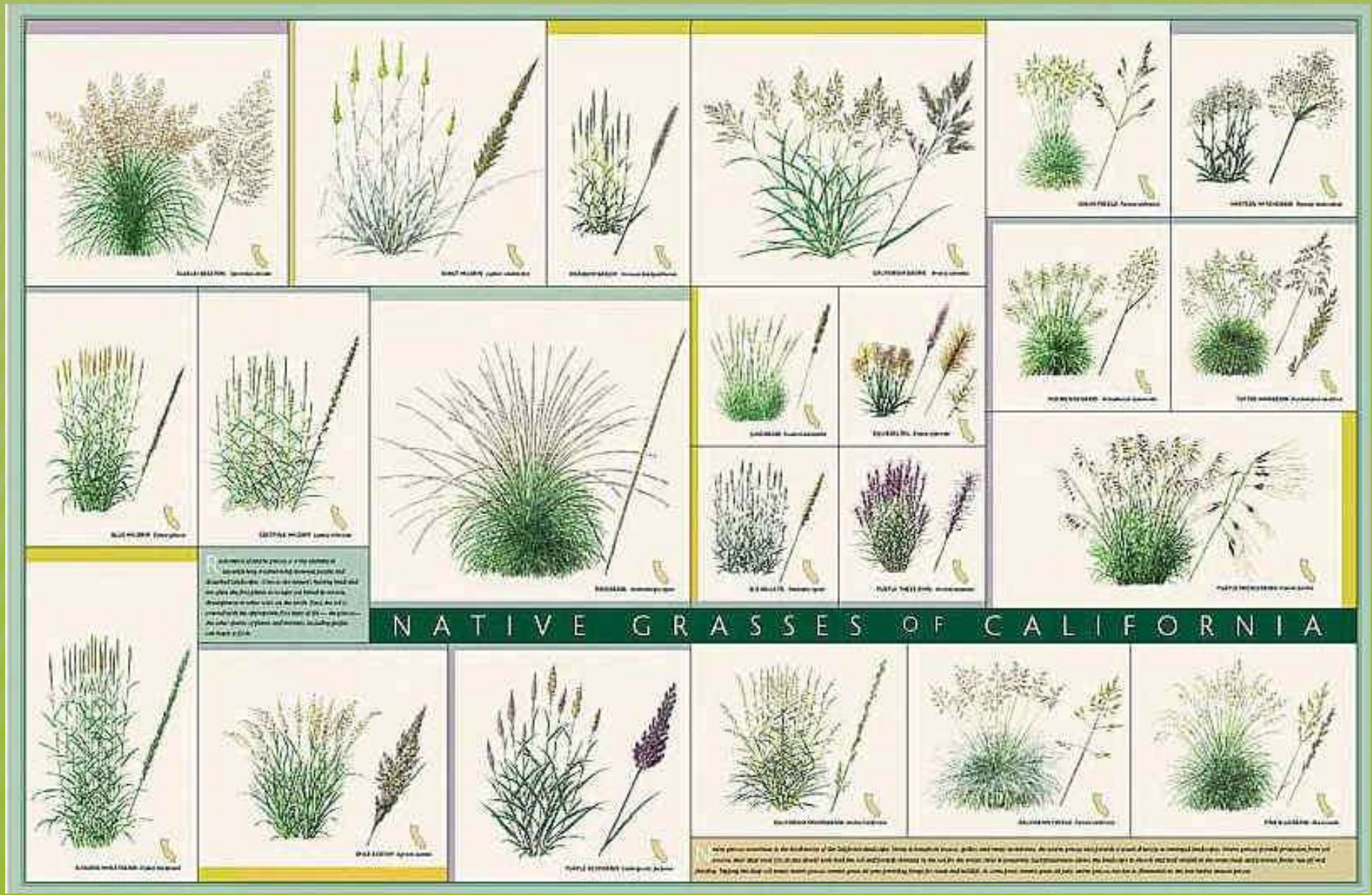
PENDULUM Pendimethalin

RONSTAR Oxadiazon

SURFLAN Oryzalin

TRIMEC BENTGRASS
2,4-D, dimethylamine salt; Dicamba, dimethylamine salt; MCPP-p, dimethylamine salt

Drive-Quinclorac


NATIVE GRASSES OF CALIFORNIA

Bouteloua gracilis-Blue grama


Big Bluestem-Andropogon gerardii

CERTAINTY REGISTRATIONS

- Big bluestem-Andropogon geradii
- Little bluestem- Schizachyrium scoparium
- Bushy bluestem-Glomeraturs
- Blue grama- Bouteloua gracilis
-
- Buffalograss
- Indiangrass- Sorghastrum nutans
- Lovegrass-Eragrosits curvula
- Switchgrass- Panicum virgatum

NATIVE GRASSES

- *Agrostis exarata* - Spike Bentgrass
- *Bromus carinatus* - California Brome
- *Deschampsia caespitosa* - Tufted Hairgrass
- *Deschampsia elongata* - Slender Hairgrass
- *Elymus elymoides* - Squirreltail
- *Elymus glaucus* - Blue Wildrye
- *Elymus trachycaulus* –Slender Wheatgrass
- *Festuca idahoensis* - Idaho Fescue

NATIVE GRASSES

- *Hordeum brachyantherum - M*eadow Barley
- *Hordeum californicum*- California Barley
- *Koeleria macrantha* - Prairie Junegrass
- *Leymus triticoides* – Creeping or Beardless Wildrye
- *Melica californica* - California Melica
- *Nasella cernua* - Nodding Needlegrass
- *Nasella lepida*- Foothill Needlegrass
- *Nasella pulchra* -Purple Needlegrass
- *Poa secunda* –Pine or Sandberg Bluegrass

DUPONT – TELAR (CHORSULFURON)

- Registered on Industrial Turf (Unimproved only)
- Registered on:
- Blue gramma, Meadow bromegrass,Wheatgrass, Bluestems, Sheep Fescue, Buffalograss, Needlegrass, Wildryes, and others

Native spp	Treatment	Telar								Plateau			
		M	V	M	V	M	V	M	V	M	V	M	V
Agrostis	exarata	95	4	100	0	93	13	95	8	100	0	100	0
Bromus	carinatus	25	50	15	33	0	92	0	100	25	54	70	21
Deschampsia	caespitosa	90	17	100	0	95	8	95	4	100	0	100	0
Deschampsia	elongata	100	0	100	0	93	13	93	13	78	29	83	17
Elymus	elymoides	0	67	0	67	0	88	0	92	20	58	30	38
Elymus	glaucus	0	67	0	54	0	92	0	92	68	25	88	21
Elymus	trachycaulus	0	75	0	58	0	92	0	92	30	50	70	29
Festuca	idahoensis	45	50	55	42	5	83	20	63	25	42	80	29
Hordeum	brachyantherum	50	33	70	25	10	83	20	83	78	38	85	13
Hordeum	californicum	0	71	5	50	0	100	0	92	5	63	53	42
Koeleria	macrantha	60	25	95	4	78	29	80	25	88	63	100	0
Leymus	triticoides	25	46	28	42	15	75	0	75	55	33	80	21
Melica	californica	20	44	20	33	0	83	0	58	53	22	63	28
Nasella	cernua	33	44	40	42	0	100	0	100	100	0	93	11
Nasella	lepida	33	56	0	42	0	100	0	100	87	28	93	6
Nasella	pulchra	40	56	20	58	10	83	40	100	93	6	100	0
Poa	secunda	35	50	65	29	15	67	15	67	35	50	35	42

SPECIMEN

PLATEAU®

herbicide

FOR WEED CONTROL, NATIVE GRASS ESTABLISHMENT AND TURF GROWTH SUPPRESSION ON PASTURES, RANGELAND AND NONCROP AREAS AND CONIFER PLANTATION SITE PREPARATION

Active Ingredient:

Ammonium salt of imazapic (±)-2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1*H*-imidazol-2-yl]-5-methyl-3-pyridinecarboxylic acid* 23.6%

Other Ingredients: 76.4%

Total: 100.0%

*Equivalent to 22.2% (±)-2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1*H*-imidazol-2-yl]-5-methyl-3-pyridinecarboxylic acid (1 gallon contains 2.0 pounds of active ingredient as the free acid)

EPA Reg. No. 241-365
U.S. Patent No. 4,798,619

EPA Est. No.

KEEP OUT OF REACH OF CHILDREN

CAUTION/PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)

See inside for complete **First Aid**, **Precautionary Statements**, **Directions for Use**, **Conditions of Sale and Warranty**, and state-specific crop and/or use site restrictions.

In case of an emergency endangering life or property involving this product, call day or night 1-800-832-HELP (4357).

Net Contents:

BASF Corporation
26 Davis Drive
Research Triangle Park, NC 27709

BASF
The Chemical Company

TOLERANCE OF ESTABLISHED GRASSES TO 8 TO 12 OZ/A OF PLATEAU® HERBICIDE APPLIED IN THE FALL

Grass Species[1]	Tolerant	Suppressed[2]	Not Tolerant	Tolerance Unknown
Bermudagrass	X			
Bluegrass, Kentucky		X		
Bluegrass, Sandberg's	X			
Bluestem, big	X			
Bluestem, bushy	X			
Bluestem, King Ranch	X			
Bluestem, little	X			
Bluestem, silver beard	X			
Bromegrass, meadow		X	X	
Bromegrass, smooth		X		
Broomsedge	X			
Buffalograss	X	X		
Cheatgrass			X	
Creeping foxtail, Garrison				X
Downy brome			X	
Fescue, Idaho	X			
Fescue, tall			X	
Gamagrass, eastern		X		
Grama, blue	X	X		
Grama, sideoats	X	X		
Indiangrass	X			
Meadowhead			X	
Needleandthread	X			
Needlegrass, green	X			
Orchardgrass		X		
Prairie cordgrass		X		
Prairie dropseed				X
Prairie sandreed	X			
Prairie threeawn	X			
Quackgrass		X		
Redtop		X	X	
Reed canarygrass		X	X	
Rhodes grass/Fingergrass	X			
Ryegrass, annual or Italian			X	
Ryegrass, perennial		X	X	
Squirreltail, bottlebrush	X			
Switchgrass		X	X	
Timothy			X	
Wheatgrass, bluebunch	X	X		
Wheatgrass, crested	X	X		
Wheatgrass, intermediate	X	X		
Wheatgrass, pubescent	X	X		
Wheatgrass, siberian	X			
Wheatgrass, slender	X	X		
Wheatgrass, streambank	X	X		
Wheatgrass, western	X	X		
Wild ryegrass, Basin	X			
Wild ryegrass, Canada		X		
Wild ryegrass, Russian	X			
Wild ryegrass, Virginia		X		

[1] Species with an X in more than one column means tolerance will vary depending on variety, use rate and environmental conditions.

[2] Suppression may be expressed as reduction in number of seedheads, seedhead height suppression or foliage height reduction; however, full recovery of the grass can be expected.

WILDFLOWER ESTABLISHMENT AND MAINTENANCE

Due to high degree of variation in genotypes, ecotypes and varieties of wildflowers, tolerances to **Plateau** can vary dramatically and may be reduced under certain soil types and environmental conditions. Apply **Plateau** only if some stand thinning or loss can be tolerated. Preemergence applications of low use rates (2 oz/A) to tolerant species, result in the least amount of injury, but may not eliminate it. Postemergence applications of **Plateau** can result in injury or death of some genotypes, and should be used only as a rescue treatment when weed competition threatens the stand. Use of certain spray adjuvants can also increase wildflower injury and loss of stand. Although most legumes listed in the tolerance table are tolerant to 4 oz/A of **Plateau** preemergence, some stand thinning may occur. Legumes are more tolerant to post applications, but chlorosis or stunting is possible. Recommendations listed in the tables below are designed for mixed grass/wildflower stands. Less than satisfactory results may occur from applications to monoculture stands. It is recommended to try on a small scale to determine degree of satisfaction on monoculture stands.

For prairiegrass/wildflower mixtures: Where some wildflower injury (phytotoxicity, height suppression) can be tolerated, apply **Plateau** at the rate to achieve desired weed control, but not to exceed tolerance rate listed in the table below. Wildflower injury can be reduced or eliminated with preemergence applications. To minimize injury, apply **Plateau** at 2 to 4 oz per acre at planting to tolerant species listed below. Use the 2 oz per acre rate under cool dry conditions and in low rainfall areas. If postemergence application is made to established prairiegrass/wildflower mixtures, use the lowest rate of **Plateau** necessary to achieve desired weed control (see "WEEDS CONTROLLED" section). Postemergence application can result in stand thinning or death due to vast variation in seed sources, varieties and genotypes. It is recommended that a small area be tested prior to full application for tolerance of desired species. The rates listed below are for those species in which acceptable tolerance has been confirmed on the varieties/genotypes being treated.

Application of **Plateau** in conjunction with an organophosphate insecticide may cause an increase in wildflower injury.

Seedling Wildflower and Legume Tolerance to Plateau (4 oz/A)[1] in Mixed Grass/Forb Stands.

Common Name	Genus Species	PRE	POST
Alfalfa	*Medicago sativa*	No	Yes
Aster, New England	*Aster novae angliae*	No	Yes
Aster, Prairie	*Aster laevisMalus*	No	Yes
Baby Blue Eyes	*Nemophila menziesii*	No	Yes
Beggar ticks	*Bidens frondosa*	No	Yes
Bird's Eyes	*Gilia tricolor*	No	Yes
Bishop's Flower	*Ammi majus*	No	Yes
Blackeyed Susan	*Rudbeckia hirta*	Yes	Yes
Blanketflower	*Gaillardia aristata*	No	Yes
Bundleflower, Illinois	*Desmanthus illinoisis*	Yes	Yes
Catchfly	*Silene armeria*	No	Yes
Chicory	*Cichorium intybus*	Yes	Yes
Clover, Crimson	*Trifolium incarnatum*	Yes	Yes
Clover, White	*Trifolium repens*	No	Yes
Coneflower, Purple	*Echinacea purpurea*	Yes	Yes
Coneflower, Upright Prairie	*Ratibida columnifera*	Yes	Yes
Coreopsis, Dwarf Red Plains	*Coreopsis tinctoria var. Gay Feather*	Yes	Yes
Coreopsis, Lance Leaved	*Coreopsis lanceolata*	Yes	Yes
Coreopsis, Plains	*Coreopsis tinctoria*	Yes	Yes
Cornflower	*Centaurea cyanus*	No	Yes
Cosmos, Garden	*Cosmos bipinnatus*	Yes	Yes
Cosmos, Yellow	*Cosmos sulphureus*	Yes	Yes
Daisy, Ox-eye	*Chrysanthemum leucanthemum*	Yes	Yes
Daisy, Shasta	*Chrysanthemum maximum*	Yes	Yes
Five Spot	*Nemophila maculata*	No	Yes
Flax, Blue	*Linum perenne*	No	Yes
Indian Blanket	*Gaillardia pulchella*	No	Yes
Indigo, Blue False	*Baptisia australis*	Yes	No
Johnny Jump-ups	*Viola cornuta*	Yes	Yes
Lemon Mint	*Monarda citriodora*	No	Yes

Big Bluestem, Little Bluestem and Indiangrass: Plateau® herbicide may be applied at the rate of 2 to 12 oz per acre at planting, or any time thereafter, including after seedling grasses have emerged or to perennial stands (dormant or actively growing). See "WEEDS CONTROLLED" section for desired rate. Use the lower rates in Wisconsin, Michigan, Minnesota, South Dakota, North Dakota, Kansas, Oklahoma, Texas and Nebraska and higher rates as rainfall and/or growing season increases.

Switchgrass (Panicum virgatum): Plateau is not recommended for the establishment of pure switchgrass stands as severe injury or death may result. **Plateau** may be applied at a rate of 2 to 4 oz per acre if switchgrass is planted in mixed stands with tolerant species, but only if some stand thinning or loss of stand can be tolerated. Mature switchgrass planting can be reclaimed from certain perennial weeds such as tall fescue, leafy spurge, johnsongrass, etc., with **Plateau** at rates of 10 to 12 oz per acre. However, severe stunting and injury is imminent. **DO NOT** apply **Plateau** to switchgrass if such severe injury can not be tolerated.

Sideoats and Blue Grama: Apply **Plateau** to monoculture stands of sideoats and blue grama only if some stand thinning or loss of stand can be tolerated. **Plateau** may be applied at the rate of 2 to 4 oz/A plus an adjuvant to aid in the establishment of sideoats and blue grama after new seedings have emerged and reached the five (5) leaf stage. When using **Plateau** at 4 oz per acre it is not recommended to use in combination with a methylated seed oil adjuvant as stand thinning may occur. The lower rates may provide adequate weed suppression in early summer plantings in the states of Wisconsin, Michigan, Minnesota, South Dakota, North Dakota, Kansas, Oklahoma, Texas and Nebraska and other states where growing degree days are short. Sideoats and blue grama have shown tolerance to **Plateau** at 2 to 4 oz/A, applied preemergence at planting, however, some stand thinning may occur. For weed control in established stands use 4 to 10 oz/A of **Plateau**. Up to 12 oz/A of **Plateau** may be applied, but may result in foliar and/or seedhead suppression, or in the injury of sideoats and blue grama, depending on surfactant choice, soil type, variety, weed pressure and environmental conditions.

Buffalograss: Apply **Plateau** at the rate of 2 to 4 oz/A for control or suppression of labeled weeds and to aid in the establishment of newly sprigged buffalograss. Apply **Plateau** immediately after planting prior to spring growth or seed germination. New growth and small seedlings can be severely injured or killed. If applying after emergence it is best to wait until buffalograss has at least five true leaves and use a nonionic or silicone surfactant. **DO NOT** use a methylated seed oil. For established stands, **Plateau** may be applied at the rate of 2 to 8 oz/A for weed control. Higher rates may cause some turf discoloration and stunting. **Plateau** may be applied to dormant buffalograss to control winter annual weeds. Turf type buffalograss may express different tolerance level to **Plateau** than wild type buffalograss. Some turf types can tolerate low rates of **Plateau** at seeding. Consult seed dealer for details.

Eastern Gamagrass: Plateau should only be used for the establishment or maintenance of eastern gamagrass if some stand thinning or loss can be tolerated. Apply **Plateau** at 2 to 8 oz per acre at planting prior to gamagrass emergence. Stand thinning and stunting is imminent. Adverse conditions, poor soils, or added stress to the gamagrass could result in stand mortality. Postemergence application to seedlings will cause mortality. On established eastern gamagrass, apply **Plateau** at 2 to 8 oz per acre prior to gamagrass breaking dormancy. Some stunting will occur and increases as the **Plateau** rate increases. Applications made during or after green-up may result in foliar and seedhead suppression and possible mortality of weak plants.

Tall Fescue Control: (Not for use in California unless directed otherwise in supplemental labeling.) Tall fescue can be controlled by using **Plateau** at the rate of 12 oz per acre plus methylated seed oil at 2 pints per acre in established stands of or to prepare a seed bed for big bluestem, little bluestem, and indiangrass. The addition of nitrogen fertilizer (see "SPRAY ADJUVANTS FOR POSTEMERGENCE APPLICATIONS" section) to the above mix will aid in control. Tall fescue must be actively growing for optimum control. If tall fescue has reached the boot stage or has reached summer dormancy, control may be poor. For improved control of tall fescue, **Plateau** may be tank mixed with ACCORD® ROUNDUP® PRO, or glyphosate. Fall applications of **Plateau** at 8 to12 oz/A plus 24 to 64 oz/A ACCORD® or ROUNDUP® PRO will result in best control of existing tall fescue and new germinating seedlings. With spring applications of **Plateau** at 6 to 12 oz/A, plus a ACCORD® or ROUNDUP® PRO at 32 to 64 oz/A, use higher rates for older, mature fescue stands and lower **Plateau** rates when planting forbs. When using 6 oz/A of **Plateau** in the fall with a glyphosate product, it is recommended to apply 4 oz/A **Plateau** in the spring at planting for annual weed and seedling fescue control. Burning the fescue stand, where permitted, the following spring, just prior to green-up, will aid in control and provide a better seedbed for planting. Mowing the fescue several times the summer before fall application will weaken the fescue root system, making it more susceptible to herbicides. Always allow for at least 10 inches of regrowth, following the last mowing before spraying, as both **Plateau** and glyphosate products need foliage present for herbicide uptake and satisfactory control.

TOLERANT GRASS SPECIES[1]

Prairiegrass		Plateau Rate (oz/A)[2]	
Common Name	Genus Species	New Seeding	Established
Big Bluestem	*Andropogon gerardii*	2-12	2-12
Little Bluestem	*Schizachyrium scoparium*	2-12	2-12
Indiangrass	*Sorghastrum nutans*	2-12	2-12
Bushy Bluestem	*Andropogon glomeratus*	—*	2-12
King Ranch Bluestem	*Bothriochloa ischaemum*	—	2-12
Silver Beard Bluestem	*Bothriochloa saccharoides*	—	2-12
Broomsedge	*Andropogon virginicus*	—	2-12
Fingergrass, Rhodes grass	*Chloris spp.*	—	2-12
Needlegrass	*Stipa spp.*	—	2-12
Needleandthread	*Stipa comata*	—	2-12
Swamp (Prairie) Threeawn	*Aristida longespica*	—	2-12
Prairie Threeawn	*Aristida oligantha*	—	2-12
Prairie Sandreed	*Calamovilfa longifolia*	—	2-12
Smooth Bromegrass	*Bromus inermis*	—	2-12
Kentucky Bluegrass	*Poa pratensa*	—	2-12*
Sandberg's Bluegrass	*Poa sandbergii*	—	2-12
Wheatgrasses	*Agropyron spp.*	—	2-12
Bottlebrush Squirreltail	*Sitanion hystrix*	—	2-12
Russian Wild Ryegrass	*Elymus junceus*	2-6[3]	2-12
Sideoats Grama	*Bouteloua curtipendula*	2-8[3]	2-8
Blue Grama	*Bouteloua gracilis*	2-8[3]	2-8
Buffalograss	*Buchloe dactyloides*	2-4	2-8
Eastern Gamagrass	*Tripsacum dactyloides*	2-6[3]	2-8

[1] See individual grass sections for application timing.

[2] High rates may result in stunting and growth suppression.

[3] **Plateau** preemergence applications to newly seeded sideoats, blue grama and Eastern gamagrass may result in thinning or loss of stand.

[4] Some bluegrass varieties are sensitive to **Plateau**. Drought can delay recovery and may result in overgrazing of treated area.

[5] Tolerance unknown

TOLERANCE OF ESTABLISHED GRASSES TO 8 TO 12 OZ/A OF PLATEAU® HERBICIDE APPLIED IN THE FALL

Grass Species[1]	Tolerant	Suppressed[2]	Not Tolerant	Tolerance Unknown
Bermudagrass	X			
Bluegrass, Kentucky		X		
Bluegrass, Sandberg's	X			
Bluestem, big	X			
Bluestem, bushy	X			
Bluestem, King Ranch	X			
Bluestem, little	X			
Bluestem, silver beard	X			
Bromegrass, meadow		X	X	
Bromegrass, smooth		X		
Broomsedge	X			
Buffalograss	X	X		
Cheatgrass			X	
Creeping foxtail, Garrison				X
Downey brome			X	
Fescue, Idaho	X			
Fescue, tall			X	
Gamagrass, eastern		X		
Grama, blue	X	X		
Grama, sideoats	X	X		
Indiangrass	X			
Medusahead			X	
Needleandthread	X			
Needlegrass, green	X			
Orchardgrass		X		
Prairie cordgrass		X		
Prairie dropseed				X
Praire sandreed	X			
Praire threeawn	X			
Quackgrass		X		
Redtop		X	X	
Reed canarygrass		X	X	
Rhodes grass/Fingergrass	X			
Ryegrass, annual or Italian			X	
Ryegrass, perennial		X	X	
Squirreltail, bottlebrush	X			
Switchgrass		X	X	
Timothy			X	
Wheatgrass, bluebunch	X	X		
Wheatgrass, crested	X	X		
Wheatgrass, intermediate	X	X		
Wheatgrass, pubescent	X	X		
Wheatgrass, siberian	X			
Wheatgrass, slender	X	X		
Wheatgrass, stream-bank	X	X		
Wheatgrass, western	X	X		
Wild ryegrass, Basin	X			
Wild ryegrass, Canada		X		
Wild ryegrass, Russian	X			
Wild ryegrass, Virginia		X		

[1] Species with an X in more than one column means tolerance will vary depending on variety, use rate and environmental conditions.

[2] Suppression may be expressed as reduction in number of seedheads, seedhead height suppression or foliage height reduction; however, full recovery of the grass can be expected.

SPECIMEN

Group 4 Herbicide

DRIVE® XLR8

HERBICIDE

Active Ingredients:	
quinclorac: 3,7-dichloro-8-quinolinecarboxylic acid	15.93%
Other Ingredients:	84.07%
Total:	100.00%

Equivalent to:
1.50 lbs quinclorac: 3,7-dichloro-8-quinolinecarboxylic acid equivalent per gallon

EPA Reg. No. 7969-272 **EPA Est. No.**

KEEP OUT OF REACH OF CHILDREN

CAUTION/PRECAUCIÓN

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)

See inside for complete **First Aid**, **Precautionary Statements**, **Directions For Use**, **Conditions of Sale and Warranty**, and state-specific crop and/or use site restrictions.

In case of an emergency endangering life or property involving this product, call day or night 1-800-832-HELP (4357).

Net Contents:

BASF Corporation
26 Davis Drive
Research Triangle Park, NC 27709

BASF
The Chemical Company

Drive

GENERAL INFORMATION

Drive® XLR8 herbicide may be applied postemergence to residential and nonresidential turfgrasses (refer to **Table 1. Turf Tolerance (Established)**) for the control of many broadleaf and grass weeds. Examples of such sites include, but are not limited to:

- Grounds or lawns around residential and commercial establishments
- Multifamily dwellings
- Military and other institutions
- Parks
- Airports
- Roadsides
- Schools
- Picnic grounds
- Athletic fields
- Houses of worship
- Cemeteries
- Golf courses
- Sod farms

Table 4. Seeding/Overseeding/Sprigging Timing Chart[1]

Variety	Before seeding[2]	At seeding	7 days after emergence	14 days after emergence	28 days after emergence
Annual bluegrass	OK	OK	OK	OK	OK
Annual ryegrass	OK	OK	OK	OK	OK
Buffalograss	OK	OK	OK	OK	OK
Common Bermudagrass[3] (for sprigging see footnote 3)	OK	OK	OK	OK	OK
Creeping bentgrass	OK	NO	NO	NO	OK
Fine fescue (in blend)	OK	NO	NO	NO	OK
Hybrid Bermudagrass[3] (for sprigging see footnote 3)	OK	OK	OK	OK	OK
Kentucky bluegrass	OK	NO	NO	NO	OK
Perennial ryegrass	OK	OK	NO	NO	OK
Seashore paspalum[3,4] (for sprigging see footnote 3)	NO	NO	NO	OK	OK
Tall fescue	OK	OK	OK	OK	OK
Zoysiagrass[3] (for sprigging see footnote 3)	OK	OK	OK	OK	OK

[1] **NOTE:** No adjuvant or additive should be used when **Drive® XLR8 herbicide** applications are made on newly emerged turf seedlings until 28 days after emergence; with the exception of seashore paspalum, a **Drive XLR8** application rate of 1.45 fl ozs/1000 sq ft (0.75 lb ae/A) can be made to all other turfgrass species in **Table 4** above.

[2] **Drive XLR8** can be applied 7 days or greater prior to seeding.

[3] **Drive XLR8** can be used anytime prior to, at or after sprigging as indicated by turfgrass species in **Table 4** above.

[4] 0.75 fl oz to 1.45 fl ozs/1000 sq ft (0.37 to 0.75 lb ae/A) application can be made at times indicated in **Table 4** above.

Application of **Drive XLR8** should be timed around the seeding operations using the above chart as a reference point.

HERBICIDES

THE DINITROANILINES

- Trifluralin-Treflan, combinations (Snapshot)
- Oryzalin-Surflan, combinations (XL 2G)
- Prodiamine-Barricade
- Pendimethalin-Pendulum
- Benefin-combinations (XL 2G, Team)

THE DINITROANILINES

Absorption &Translocation

- absorbed by emerging shoots and roots;
- have little to no POST activity
- translocation limited and not necessary because of mode of action

Selectivity

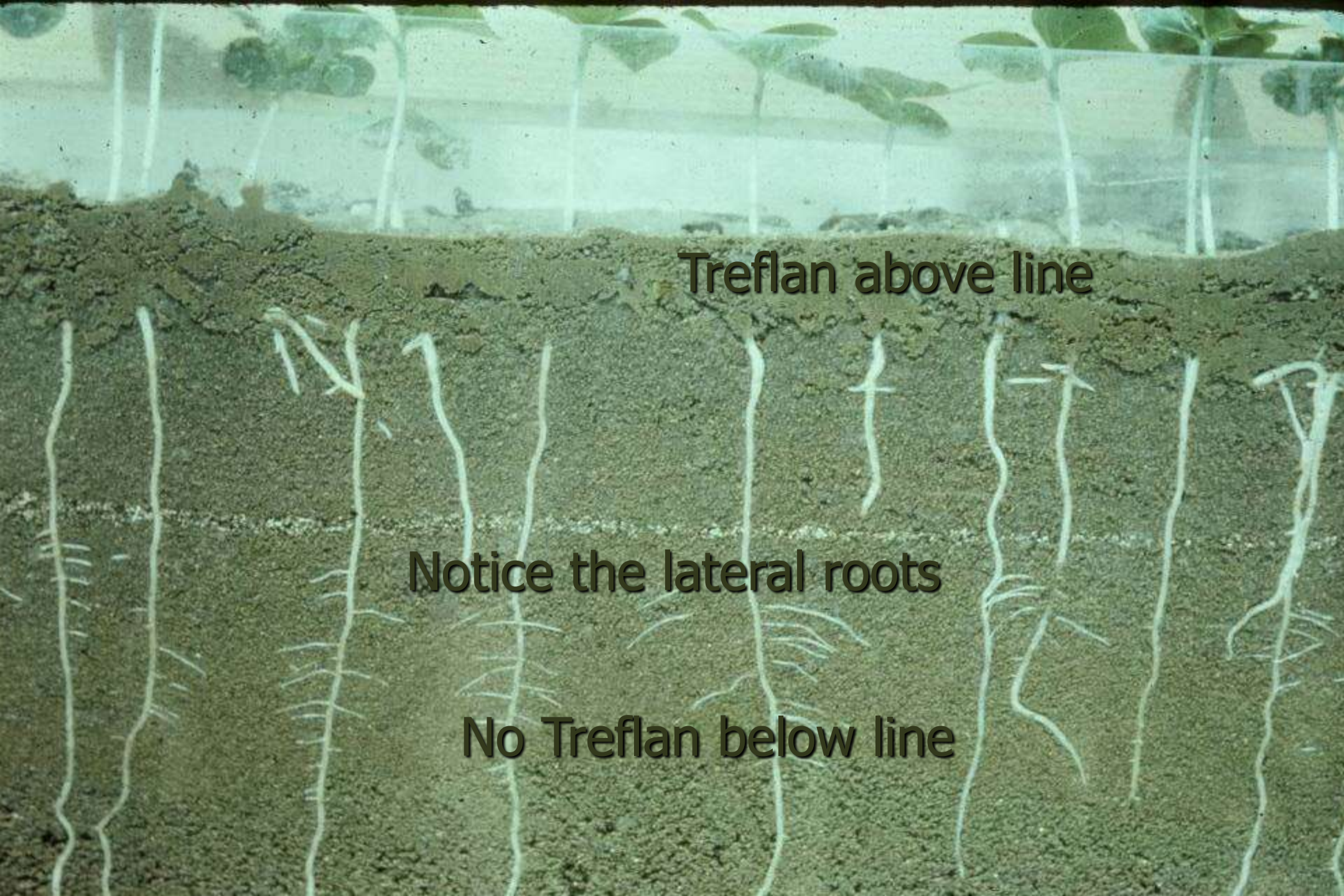
- herbicide placement that avoids contact with roots of desired plants is primary factor;
- taproot growth much less affected than lateral roots
- these herbicides control annual grasses and small-seeded broadleafs

APPROXIMATE RESIDUAL PERSISTENCE OF PREEMERGENCE HERBICIDES

Chemical name	Persistence* (months)
isoxaben, oxyfluorfen	1-4
oxadiazon	4-6
pendimethalin	2-8
oryzalin	6-10
dichlobenil, trifluralin and prodiamine	3-12

* Continue to provide weed control or remain phytotoxic to susceptible crops

From IPM for Floriculture and Nurseries DANR pub 3402


Treflan above line
Notice the lateral roots
No Treflan below line

Isoxaben + oryzalin 2+6 lbs →

PENDIMETHALIN (PENDULUM, PRE M)

- Preemergence control of poa, crabgrass, foxtails, oxalis and spurge
- Turf should not be overseeded for 8 to 12 months depending on rate and conditions
- Highly susceptible plants usually fail to emerge
- Pendimethalin is strongly bound to OM and clay
- Inhibits root growth in susceptible, and occasionally in ‘tolerant’ plants

PRODIAMINE (BARRICADE)

- Controls Poa annua in Turf and Ornamental plantings
- Application rates are less than for most preemergence herbicides-1.5 lbs. max for year in turf
- Prodiamine inhibits root growth in susceptible plants. Thinning of some turf species may occur if misuse occurs.
- Very low water solubility

Monterey Pine Oryzalin (Surflan)

2,4-D

- Auxin type herbicide
- Usually applied in spring to rapidly growing weeds
- Many forms available
- ‘Standard’ for broadleaf weed control for many years.
- Do not use on newly seeded turf

TRICLOPYR (TURFLON)

- Similar in structure to Clopyralid
- Rate: 0.25 to 0.5 lb/A
- Controls: oxalis, spurge, clovers
- Do not use on bentgrass or warm season grasses
- **Caution**: drift or volatility, some soil activity, DO NOT apply high rates or repeated applications around susceptible shrubs and tress.

BRUSH B

POISON IVY, POIS
BRUSH KILLER 1

Concentrate

Also Kills Blackberri
Kudzu, Stumps & Ot
Woody Plants
– Roots & All

Active Ingredient
Triclopyr, triethylamine salt 8%
Other Ingredients 92%
For Home Use Only

TURFLON* ESTER

Controls Annual and Perennial Broadleaf Weeds & Bermudagrass in Ornamental Turf


Bermudagrass


Spurge


Clover

MONTEREY

Active Ingredient:
Triclopyr [3,5,6-trichloro-2-pyridinyloxyacetic acid], butoxyethyl ester 61.6%
Inert Ingredients: 38.4%
Total: 100.0%

Triclopyr acid equivalent:
44.3% (4 lb/gal)
Contains petroleum distillates

Concentrate - Tank Mix & Spray

*TURFLON is a trademark of Dow AgroSciences LLC

EPA Reg No. 62719-54705
EPA Est. No. 70949-CA-1

HALOSULFURON (SEDGEHAMMER)

- Yellow and Purple Nutsedge control and Suppression of Green Kylinga
- Chemical Family: Sulfonylurea
- Can be sprayed around base of established woody perennials
- DO NOT SPRAY OVER ANNUALS

CARFENTRAZONE (QUICKSILVER)

- A contact broadleaf herbicide. Does not control chickweed. Can be used in cool and warm season turfgrasses. It is also labeled for moss control. Often sold as a prepackaged mix (Power Zone, Speedzone) with other systemic, broadleaf weed killers such as 2,4-D, MCPA, MCPP, or dicamba.


THANK YOU,
ANY QUESTIONS?