

# Herbicides for Native Warm-season Grasses

**Matt Booher, Extension Agent**  
**Augusta, Rockingham, Rockbridge Counties**

**Office: 540-564-3080**  
**Cell: 540-325-7503**  
**mrbooher@vt.edu**

**Revised 1/1/2023**

Please check to be sure the herbicide you plan to use is labelled for use in your state. There may be instances where herbicides other than those mentioned may be legal and effective. Virginia Cooperative Extension does not endorse any specific company or product; product names are used when a product represents a unique combination of active ingredients not found elsewhere on the market, or if use of a product name clarifies the recommendation. In some cases, generic herbicides with active ingredients identical to trade-named herbicides exist, and this guide attempts to highlight some of those options. Be sure to read all labels as generics may differ in concentration from the products listed in this guide.

## ***How to use this guide***

- The example applications may be given on both a *per acre* basis for calibrated application equipment, and on a *per gallon* basis for spot spraying.
- The example applications are calculated using label specifications for mid-to-high application rates. Intentionally “doubling up” on the rate when mixing spray, or by accidental overlap when spraying can cause crop injury.
- The *per gallon* herbicide rates were calculated under the assumption that most people, when spot spraying by hand, will apply a total volume of somewhere around 75 gallons/acre. It’s also assumed that weeds will be sprayed until thoroughly wet, but not to the point of runoff. This is a starting point only, your case may vary dramatically depending on weed density, sprayer type, and individual application technique.

## ***General Considerations for Weed Control in Native Warm Season Grasses***



Native warm-season perennial grasses have a reputation for slow establishment when compared to their cool-season counterparts. Some of this is due to the priority which native warm-season grasses put on root development, which will result in a deep-rooted, long lived plant once established. It is therefore critical to be patient during the establishment phase, which may become very weedy. Begin developing a plan well in advance of planting to deal with weed competition during establishment and beyond. The herbicides used in native warm-season plantings may be uncommon, and custom applicators may have little experience with them. It would be wise to communicate your plans early to allow custom applicators time to fit your spray job into their schedule.

Always start with a weed-free seedbed through the use of a chemical “burndown” application to kill all existing vegetation prior to or at planting. Done too far in advance of planting, a field that has been burned down will quickly repopulate with weeds and compete with native warm-season grasses. If possible, use a burndown chemical (or add a tankmix partner) that has persistence in the soil (known as residual) that helps to control germinating weeds for a period of time ranging from weeks to months. This use of residual weed control is called preemergence control. Use caution and follow label guidelines to select only herbicides that are safe to plant into immediately with native warm season grasses; many herbicides have plantback restrictions months in length.

Once your native warm-season stand has germinated and begun to grow, it is likely that weeds will soon threaten to compete with the young seedlings. Before selecting a postemergent herbicide (one sprayed after the crop has emerged) it is important to get an idea of the population of the native warm-season grass stand to determine whether replanting is necessary. Because of replant restrictions, certain herbicides should not be used if replanting is planned. Various postemergent herbicides require that the crop be well-established before it can be safely sprayed, usually indicated by a certain number of mature leaves or as a function of time. In addition to this guide, a herbicide’s label will give important details about all of these considerations and ultimately serves as the authority on legal and safe use of the chemical.



## Pre-plant Herbicides for Establishing Native Warm Season Grasses

Establishment Pre-plant													
Herbicide active ingredients/trade names													
	Atrazine <b>Aatrex 4L</b>	Sulfosulfuron <b>Outrider</b>	Imazapic*** <b>Plateau, Journey</b>	Saflufenacil <b>Sharpen</b>	2,4-D + dicamba	DuraCor	Grazon P+D*	GrazonNext HL	Surmount	Chaparall	Cimarron Plus	Triclopyr <b>Remedy Ultra</b> or	2,4D + triclopyr <b>Crossbow</b>
	Annual broadleaves, partial control of some annual grass weeds	Annual grasses & limited broadleaves	Perennial & annual grasses, select broadleaves	Annual broadleaves, some residual	Broadleaves	Broadleaves, esp. carrot, broadleaf plantain, poison	Broadleaves, esp. milkweed & dogbane	Broadleaves	Broadleaves, esp. milkweed & dogbane	Broadleaves, esp. mullein, suppresses fescue	Broadleaves, esp. mullein, suppresses fescue	Broadleaves, woody spp.	Broadleaves, woody spp.
	Weeds controlled												
	Labeled for use?												
Switchgrass	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Big bluestem	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Indiangrass	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Eastern gamagrass	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Little bluestem	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Plantback restriction for labeled NWSGs	0	14 days	0	0	30 days	15 days	21 days	3 mo.	21 days	6 mo.	6 mo.	21 days	30 days
* Label states "after vigorous growth resumes in spring"													
**May cause suppression or thinning of the stand													
***Safe on select wildflowers, see label													

## Post-emergent Herbicides for Maintenance of Native Warm Season Grasses

Maintenance Postemergence on established NWSG														
Herbicide active ingredients/trade names														
	Atrazine <b>Aatrex 4L</b>	Saflufenacil <b>Sharpen</b>	2,4-D + dicamba	Quinclorac <b>Facet L</b> or <b>Quinstar 4L</b>	Sulfosulfuron <b>Outrider</b>	Imazapic*** <b>Plateau, Journey</b>	<b>DuraCor</b>	<b>Grazon P+D*</b>	<b>GrazonNext HL</b>	<b>Surmount</b>	<b>Chaparall</b>	<b>Cimarron Plus</b>	Triclopyr <b>Remedy Ultra</b> or <b>Garlon</b>	2,4D + triclopyr <b>Crossbow</b>
	Weeds controlled													
	Broadleaves	Annual broadleaves, some residual	Broadleaves	Select annual and perennnial grass weeds, select broadleaves	Annual grasses & some broadleaves	Perennial & annual grasses, select broadleaves	Broadleaves, esp. carrot, broadleaf plantain, poison hemlock	Broadleaves, esp. milkweed & dogbane	Broadleaves	Broadleaves, esp. milkweed & dogbane	Broadleaves, esp. mullein, suppresses fescue	Broadleaves, esp. mullein, suppresses fescue	Broadleaves, woody spp.	Broadleaves, woody spp.
	Labeled for use?													
Switchgrass	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Big bluestem	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Indiangrass	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Eastern gamagrass	No	Yes	Yes	Yes	No	Yes**	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Little bluestem	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Safe stage for spraying labeled NWSGs	1 year	5-leaf	5-leaf	1 year	5-leaf	anytime	5-leaf	5-leaf	5-leaf	5-leaf	5-leaf	5-leaf	5-leaf	5-leaf

\* Label states "after vigorous growth resumes in spring"

\*\*May cause suppression or thinning of the stand

\*\*\*Safe on select wildflowers, see label

## Herbicide Notes

**Glyphosate** can be used as a burndown prior to or at planting. It can also be used during the dormant season prior to green-up of NWSGs. It will non-selectively control any actively growing plant. It possesses no residual activity. The addition of a non-ionic surfactant may be required depending on the glyphosate product you select.

Per acre (broadcast)  
2 quarts glyphosate (4 lbs. ai/gal)

Per gallon of water (spot spray)  
30 mL (1 oz) glyphosate

**Sulfosulfuron** ('Outrider') can be used prior to planting switchgrass, big bluestem, little bluestem, and Indiangrass as a burndown to control selected broadleaf and grass weeds including downy brome, horseweed, chickweed, mustards, Johnsongrass, etc. There is a 14 day plant-back restriction.

It can also be used postemergence on established switchgrass, big bluestem, little bluestem, and Indiangrass that have 5 or more fully-collared leaves.

Per acre (broadcast)  
2 oz 'Outrider'  
8 oz non-ionic surfactant

**Aminopyralid + 2,4-D** ('GrazonNext HL') is a residual herbicide that can be used during the dormant or growing season to control broadleaf weeds in well-established native warm season grasses. It is a good option for buckbrush or horsenettle. Tryclopypyr (e.g. 'Remedy Ultra' or 'Garlon 3A') can be added at 1 pint/acre for additional control on woody species).

Per acre  
2.1 pints GrazonNext HL  
8 oz non-ionic surfactant

Per gallon of water (spot treatment)  
13 mL (1/2 oz) GrazonNext HL  
3 mL (1/10 oz) non-ionic surfactant

**Saflufenacil** ('Sharpen') can be used prior to or at planting as a burndown that controls broadleaf weeds only. It also has residual activity on emerging broadleaf weeds. It can be used postemergence on established grasses (5 fully-collard leaves) during the dormant season ONLY to provide post-emergence and some pre-emergence control of broadleaf weeds. For good control, most weeds should be sprayed before they exceed 4" in height.

Per acre (broadcast)  
25 gal water (less volume requires recalculation of adjuvants)  
2 oz 'Sharpen'  
1 quart MSO (methylated seed oil)  
No AMS or UAN

Per gallon of water (spot spray)  
0.75 mL 'Sharpen'  
12 mL (1/2 oz) MSO

## Herbicide Notes Continued

**2,4-D and Triclopyr** (also commonly available as the pre-mix ‘Crossbow’) can be used up to 30 days prior to planting native warm season grasses. It can also be used during the dormant or growing season to control broadleaf weeds (especially woody species like blackberry) in established grasses, as defined by the presence of 5 fully-collared leaves. ‘Garlon 3A’ is an amine formulation of triclopyr, which is generally regarded as safer to wildlife than ester formulations such as ‘Remedy Ultra’.

Per acre

3 pints 2,4-D ester (3.8 lbs. ai/gal)  
1.5 pints Remedy Ultra  
8 oz non-ionic surfactant

Per gallon of water (spot treatment)

19 mL (2/3 oz) 2,4-D ester  
9.5 mL (1/3 oz) Remedy Ultra  
3 mL (1/10 oz) non-ionic surfactant

OR

3 pints 2,4-D ester (3.8 lbs. ai/gal)  
2 pints Garlon 3A  
8 oz non-ionic surfactant

19 mL (2/3 oz) 2,4-D ester  
12.5 mL (1/2 oz) Garlon 3A  
3 mL (1/10 oz) non-ionic surfactant

**Quinclorac** (‘Facet L’) can be used in-season on established native season grasses as a postemergence product with residual control. Quinclorac will control selected broadleaf and annual grass weeds (including foxtail) when applied to weeds under 4” tall.

Per acre

1 quart ‘Facet L’  
2 pints crop oil concentrate (COC) or 1-2 pints methylated seed oil (MSO)

**Aminopyralid + Flopyrauxifen** (‘DuraCor’) is a residual herbicide that can be used during the dormant or growing season to control broadleaf weeds in well-established grasses. It is the best option for controlling wild carrot, poison hemlock, and broadleaf plantain. Triclopyr (e.g. ‘Remedy Ultra’ or ‘Garlon 3A’ can be added at 1 pint/acre for additional control on woody species. DuraCor is one of the safest options around aquatic and terrestrial wildlife.

Per acre

16 oz DuraCor  
8 oz non-ionic surfactant

Per gallon of water (spot treatment)

6 mL (2/10 oz) DuraCor  
3 mL (1/10 oz) non-ionic surfactant



## Herbicide Notes Continued

**Atrazine** can be used prior to or at planting as a burndown and to provide residual control on a variety of grass and broadleaf weeds in Eastern gamagrass ONLY. Controlled weeds include: barnyardgrass, foxtail, crabgrass, ragweed, pigweed, and lambsquarters, etc. See the label for a detailed list. Atrazine may be tankmixed with glyphosate for better burndown activity. Eastern Gamagrass must be seeded at least ½” deep to avoid damage from atrazine. Atrazine is not labeled for use in Virginia.

Per acre (broadcast)

2 quarts atrazine (4 lbs. ai/gal)

1 qt. COC (crop oil concentrate)—only if killing existing weeds

Atrazine can be also be used in-season on established switchgrass, big bluestem, little bluestem, and Indiangrass to control broadleaf and grass weeds including: ragweed, barnyard grass, downy brome, cocklebur, fall panicum, foxtail, Kentucky bluegrass, marestalk, pigweed, and smooth brome, etc. Spray in spring prior to weed emergence. Atrazine is not labeled for use in Virginia.

Per acre (broadcast)

2 quarts atrazine (4 lbs. ai/gal)

**Imazapic** (‘Plateau’) can be used at planting or during establishment at a rate of 4 oz/acre. After establishment, up to 12 oz may be used to control broadleaf and grass weeds, including tall fescue. Imazapic has some residual activity. Depending on the species, imazapic can be used at lower rates safely for the establishment and maintenance of wildflowers and legumes. Weed and crop tolerance is highly species specific, check the label for details.

Per acre (broadcast)

4 oz ‘Plateau’ (during establishment)

1.5 pints MSO (methylated seed oil)

30 gal water or less preferred

Per gallon of water (spot spray)

1.5 mL ‘Plateau’

9 mL (1/3 oz) MSO

Per acre (broadcast)

12 oz ‘Plateau’ (after establishment)

1.5 pints MSO (methylated seed oil)

30 gal water or less preferred

Per gallon of water (spot spray)

4.5 mL ‘Plateau’

9 mL (1/3 oz) MSO

**Picloram + 2,4-D** (‘Grazon P+D’) is a residual herbicide that can be used during the dormant or growing season to control broadleaf weeds in well-established native warm season grasses. It is the best option for controlling cedar or horsenettle. Tryclopypyr (e.g. ‘Remedy Ultra’ or ‘Garlon 3A’ can be added at 1 pint/acre for additional control on woody species).

Per acre

3 pints Grazon P+D

8 oz non-ionic surfactant

Per gallon of water (spot treatment)

19 mL (2/3 oz) Grazon P+D

3 mL (1/10 oz) non-ionic surfactant

## Herbicide Notes Continued

**Picloram + Fluroxypyr** ('Surmount') is a residual herbicide that can be used during the dormant or growing season to control broadleaf weeds in well-established native warm season grasses. It is a good option for controlling dogfennel or horsenettle. Triclopyr (e.g. 'Remedy Ultra' or 'Garlon 3A' can be added at 1 pint/acre for additional control on woody species).

Per acre

3 pints Surmount

8 oz non-ionic surfactant

Per gallon of water (spot treatment)

19 mL (2/3 oz) Surmount

3 mL (1/10 oz) non-ionic surfactant

**Metsulfuron + Clorsulfuron** ('Cimarron Plus') is a non-residual herbicide that can be used during the dormant or growing season to control broadleaf weeds in well-established native warm season grasses. It is a good option for controlling common mullein. It can injure tall fescue. Triclopyr (e.g. 'Remedy Ultra' or 'Garlon 3A' can be added at 1 pint/acre for additional control on woody species).

Per acre

0.5 oz Cimarron Plus

8 oz non-ionic surfactant

**Aminopyralid + Metsulfuron** ('Chaparral') is a residual herbicide that can be used during the dormant or growing season to control broadleaf weeds in well-established grasses. It is a good option for controlling common mullein or horsenettle. It can injure tall fescue. Triclopyr (e.g. 'Remedy Ultra' or 'Garlon 3A' can be added at 1 pint/acre for additional control on woody species. DuraCor is one of the safest options around aquatic and terrestrial wildlife.

Per acre

2.5 oz Chaparral

8 oz non-ionic surfactant

**2,4-D and dicamba** can be used up to 30 days prior to planting native warm season grasses. It can also be used during the dormant or growing season to control broadleaf weeds in established grasses, as defined by the presence of 5 fully-collared leaves.

Per acre

2.5 pints 2,4-D ester (3.8 lbs. ai/gal)

8 oz dicamba

8 oz non-ionic surfactant

Per gallon of water (spot treatment)

16 mL (1/2 oz) 2,4-D ester

3 mL (1/10 oz) dicamba

3 mL (1/10 oz) non-ionic surfactant

## **Identification of Native Warm Season Grasses**

It is important to accurately identify native warm season grasses in their seedling and immature stages in order to evaluate you stand density, as well as to verify that plants are developed enough to survive herbicide application.

The following plant identification information was taken from USDA's *Seedling ID Guide for Native Grasses in the Southeast* (online) and University of Tennessee Extension's guide to *Native Warm Season Grasses* (online publication 1752).

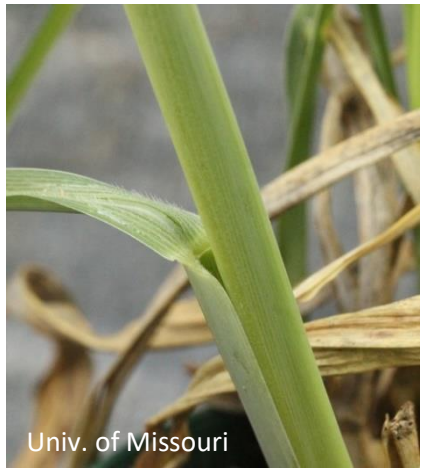
## ***Eastern Gamagrass*** (*Tripsacum dactyloides*)



*Seedling*



Univ. of Missouri



Univ. of Missouri

*Leaf sheath & collar region*

**Warm-season, rhizomatous perennial.**

**Height:** 5 to 9 feet

**Leaf blade:** 12 to 24 inches long; 3/8 to 1/2 inch wide, flat; pronounced midrib

**Leaf sheath:** Flattened; shorter than internodes

**Ligule:** Ring of short hairs



Larry Allain, USGS

*Mature plant*



Cape May Wildlife Guide

*Seedhead*



## **Indiangrass** (*Sorghastrum nutans*)



*Seedling*



*Leaf sheath & collar region*



**Warm-season, rhizomatous perennial.**

**Height:** 3 to 7 feet

**Leaf blade:** flat and narrow at the base, growing 10–24 inches long.

**Leaf sheath:** is round and open and is generally shorter than the internodes.

**Ligule:** is quite prominent (up to ½ inch long) and notched at the tip, making it resemble the rear sight on a rifle—**this is one of the best features used to identify Indiangrass before flowering.**



*Mature plant*



JB Daniel  
*Seedhead*



## ***Little Bluestem*** (*Schizachyrium scoparium*)



*Seedling*



*Leaf sheath & collar region*

**Warm-season, perennial bunch grass.**

**Height:** 2 to 4 feet

**Leave blade:** flat, often folded along the midrib, 6–10 inches long, less than ¼-inch wide, and bluish-green through early summer until stems begin to form.

**Leaf sheath:** is flattened, open and may be purplish at the base. The stem is flattened at base and often red or purplish during early growth. Strongly keeled. Hairy or smooth.

**Ligule:** Small and membranous, resembling a ring of short hairs on some plants;



*Mature plant*



*Seedhead*



# **Big Bluestem** (*Andropogon gerardii*)



Johnston Seed Co.  
*Seedling*



*Collar region*



Katy Chayka

*Leaf sheath & collar region*

**Warm-season, rhizomatous perennial.**

**Height:** 4 to 8 feet

**Leave blade:** long, flat and rough along the margins.

**Leaf sheath:** is somewhat flattened, open and usually hairy.

One of the best features used to identify this grass before flowering is the presence of fine silky hairs on the sheath and widely dispersed on the upper leaf surface. The stem is usually purplish at the base and covered with fine hairs.

**Ligule:** The ligule is small and membranous



Peter M. Dziuk

*Mature plant*



JB Daniel

*Seedhead*



# Switchgrass

(*Panicum virgatum*)



Seedhead



Sheath & leaf blade



Collar region & ligule

**Warm- season, rhizomatous perennial**

**Height:** 3 to 6 feet

**Leaf blade:** Flat; ½ inch wide; up to 30 inches long

**Leaf sheath:** Rounded; smooth; as long as or longer than internodes, often purplish or red at the base

**Ligule:** Dense fringe/ring of short hairs (1/8 inch long) with a dense patch of hair extending onto the upper leaf surface. This is one of the best features used to identify switchgrass before flowering.

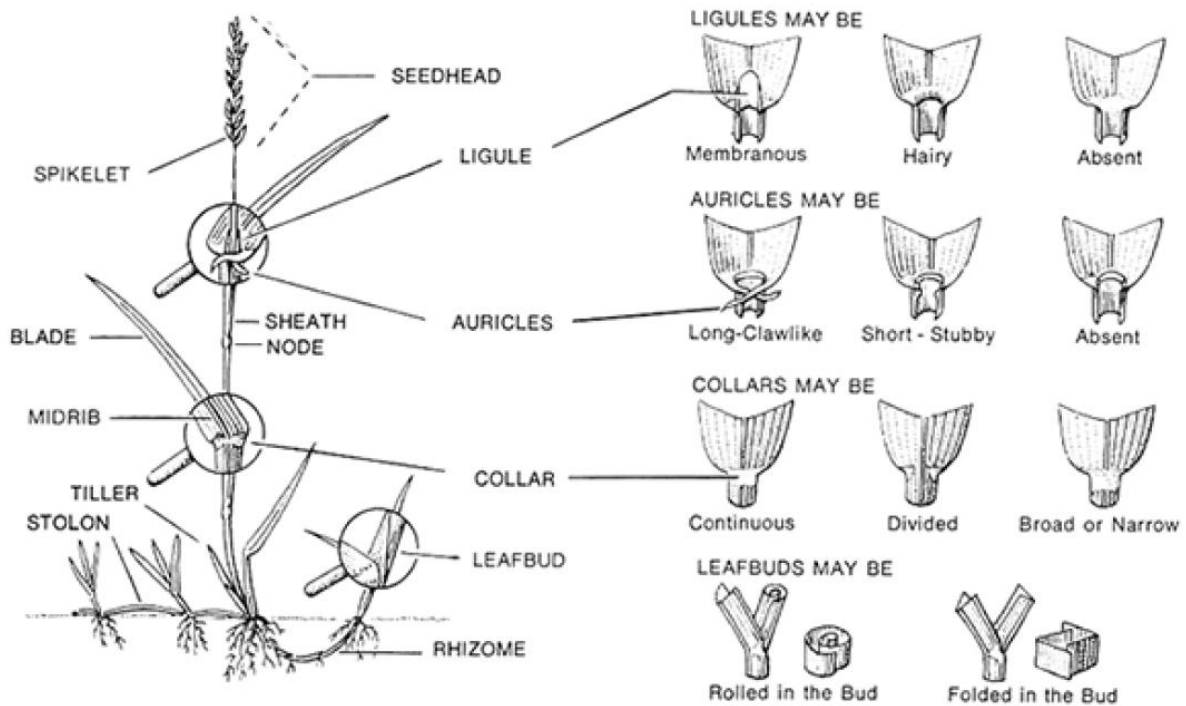


Seedhead



Mature plant

# Parts of a grass plant



*Turfgrass Program,  
University of Georgia*