

Fall Forage Seminar
&
Austin County Hay Show



Austin County Fairgrounds
Bellville, TX
Friday, October 7, 2022



Fall Forage Seminar & Hay Show

Friday, October 7, 2022
Austin County Fair Grounds, Bellville
Registration - 8:30 am – 9:00 am
Program - 9:00 am – 12:00 pm

Speakers and Topics:

9:00 am – 9:05 am	Welcome and Introductions <i>Bradley Rinn</i> <i>Chairman, Austin County Beef & Forage Committee</i>
9:05 am – 10:00 am	Controlling Invasive Grasses in Hay Pastures <i>Dr. Jamie Foster</i> <i>Texas A&M AgriLife Research, Associate Professor & Forage Agronomist</i>
10:00 am – 10:55am	Sandbur Control Methods <i>Dr. Josh McGinty</i> <i>Texas A&M AgriLife Extension, Associate Professor & Forage Agronomist</i>
10:55 am – 11:10 am	Break
11:10 am – 12:00 am	Livestock Health Program <i>Dr. Tom Hairgrove</i> <i>Texas A&M AgriLife Extension, Professor & Extension Veterinarian</i>
12:00 pm	Wrap Up and Evaluation <i>Bradley Rinn</i> <i>Chairman, Austin County Beef & Forage Committee</i>
12:10 pm	Lunch and Hay Show Judging Results <i>Dr. Bobby Lane</i> <i>Professor & Former Department Chair, Sam Houston State University</i>

Program Organizers

Austin County Beef & Forage Committee

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*Thank you for Sponsoring this year's,
Austin County Hay Show!*

*We could not have it without your
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Problematic Grass Weeds of Introduced Pastures in South Texas

- Dr. Jamie L. Foster
- Professor of Forage Agronomy
- Texas A&M AgriLife Research-Beeville Station

1

Objectives

1. Identify common problematic grass weeds in south Texas pastures.
2. Weed prevention options.
3. Herbicide options for weed control.



2

Weeds in Grass Lands

- Less information on the economic impact of weeds in grass lands than crop lands
- <https://foragefax.tamu.edu/publications/herbicide-and-insecticide-cost-per-acre-spreadsheet-updated-2-20-20/>

2019 herbicide and insecticide cost per acre spreadsheet

Product Name	Herbicide's common name	Active Ingredient(s)/Unit	Pricing Unit	Price per Unit	Application Rates, per acre	Herbicide Cost per acre, \$	Active Ingredient	Active Ingredient, Bu/acre	Active Ingredient	Active Ingredient, Bu/acre
Milestone*	aminopyralid 40.6%	aminopyralid 2.0 Bu/gal	quart	\$0.00	3 oz	\$0.00	aminopyralid	0.047		
					4 oz	\$0.00		0.063		
					5 oz	\$0.00		0.078		
					6 oz	\$0.00		0.094		
					7 oz	\$0.00		0.109		
PastureAP HL	aminopyralid 2.0%, 2,4-D 44.43%	aminopyralid 0.1 Bu/gal 2,4-D 3.54 Bu/gal	gallon	\$0.00	1.0 pt	\$0.00	aminopyralid	0.013	2,4-D	0.443
					1.5 pt	\$0.00		0.019		0.664
					4.5 pt	\$0.00		0.056		1.991
BrasconQuest* HL	aminopyralid 8.24%, 2,4-D 41.38%	aminopyralid 0.41 Bu/gal 2,4-D 3.33 Bu/gal	gallon	\$0.00	1.2 pt	\$0.00	aminopyralid	0.062	2,4-D	0.500
					1.5 pt	\$0.00		0.077		0.624
					2.1 pt	\$0.00		0.108		0.874
Chaparral**	aminopyralid 02.13%, metolufuron methyl 9.41%	aminopyralid 0.125 Bu/lb metolufuron methyl 0.0945 Bu/lb	ounces	\$0.00	1.0 oz	\$0.00	aminopyralid	0.033	metolufuron methyl	0.006
					1.5 oz	\$0.00		0.049		0.009
					2.0 oz	\$0.00		0.066		0.012
					2.5 oz	\$0.00		0.082		0.015
					3.0 oz	\$0.00		0.098		0.018
					3.3 oz	\$0.00		0.108		0.019
Sendero**	aminopyralid 0.02%, clopyralid 30.82%	aminopyralid 0.1 Bu/gal clopyralid 2.3 Bu/gal	gallon	\$0.00	0.75 pt	\$0.00	aminopyralid	0.047	clopyralid	0.216
					1.0 pt	\$0.00		0.063		0.288
					1.25 pt	\$0.00		0.078		0.359
					1.5 pt	\$0.00		0.094		0.431
					1.75 pt	\$0.00		0.109		0.503
Clearlate*	clopyralid 40.90%	clopyralid 3 Bu/gal	gallon	\$0.00	0.33 pt	\$0.00	clopyralid	0.124		
(other brands available)					1.00 pt	\$0.00		0.375		
					1.33 pt	\$0.00		0.499		

3

Why should you care about weed and brush control?




- Increase grazable acres
- Increase persistence of target species
- Increase herbage mass of target species
- Some weed species poisonous to livestock



4

Common Weeds

- Johnsongrass
- Vaseygrass
- Smutgrass
- Crabgrass
- Texas panicum
- Sedges (not actually grasses)
- Old World Bluestem
- Brush (brief mention)
- Grassbur/Sandbur (presented by Josh McGinty)

5

Johnsongrass

- Warm-season perennial bunchgrass
- Creeping rhizomes
- White midrib and smooth, glossy, wide leaf
- High biomass and good nutritional profile
- Prussic acid issue





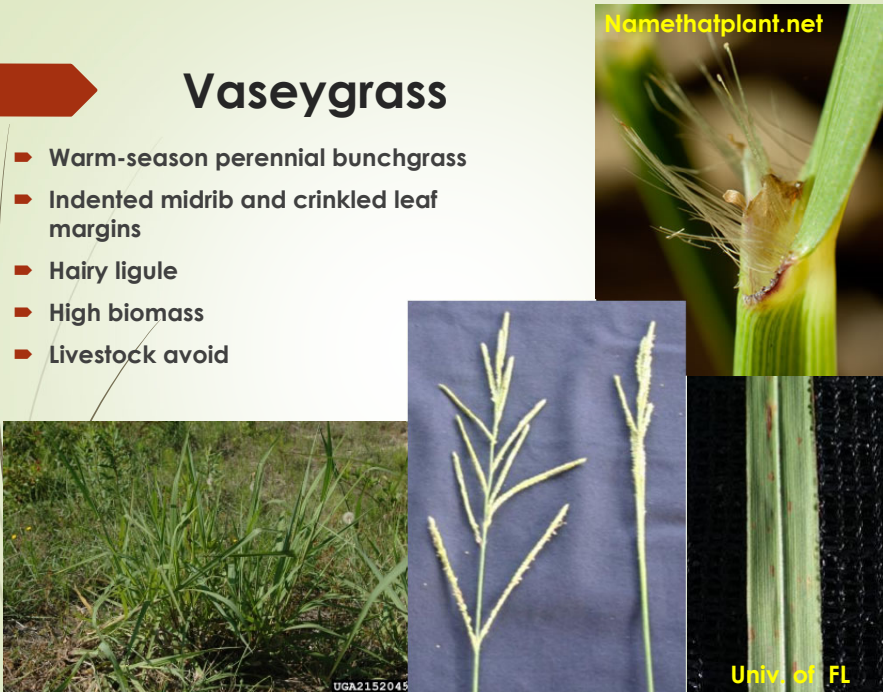

Univ. of AR Extension

Photo by Casey Reardon, PhD

6

Vaseygrass

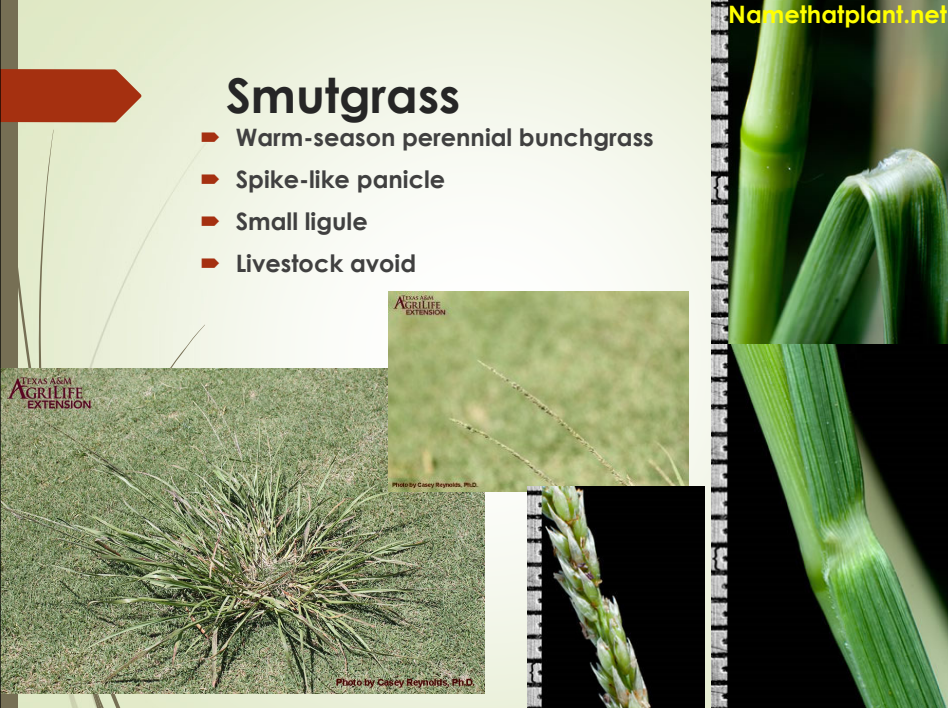
- Warm-season perennial bunchgrass
- Indented midrib and crinkled leaf margins
- Hairy ligule
- High biomass
- Livestock avoid



7

Smutgrass

- Warm-season perennial bunchgrass
- Spike-like panicle
- Small ligule
- Livestock avoid



8

Crabgrass

- Warm-season annual, creeps by stolons
- Finger-like spike panicle like common bermudagrass
- Ligule and leaf shape different from bermudagrass
- Good nutritional profile

NCSU crabgrass

NCSU common bermudagrass

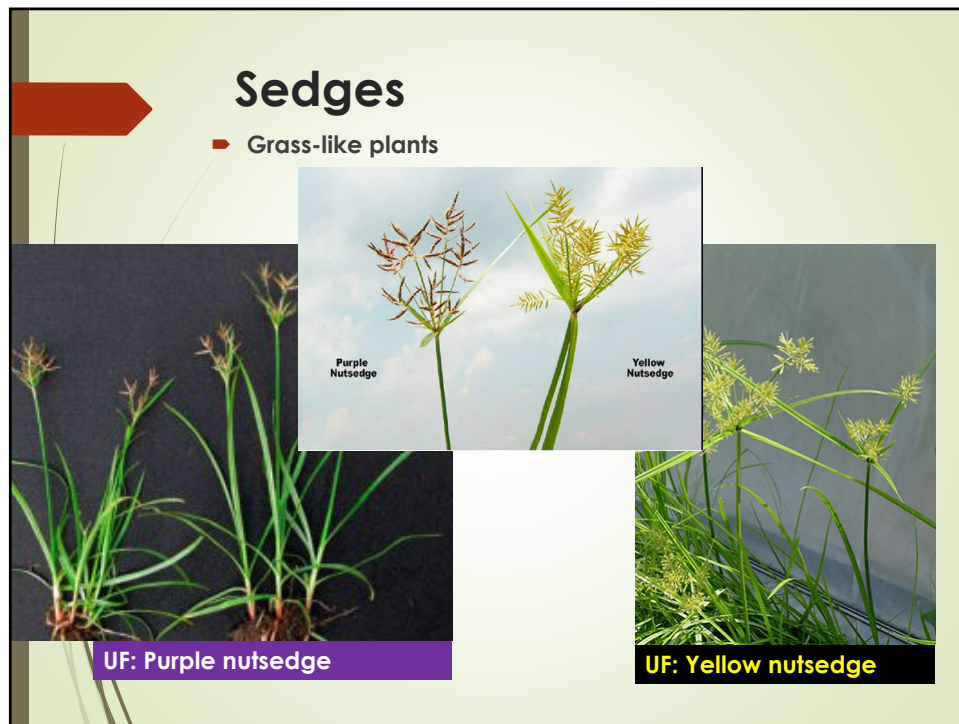
9

Texas panicum

- Warm-season annual spreading
- Red at base
- Fine hairs on leaves
- Ligule shorter than crabgrass with fine hairs
- Good nutritional profile

Mississippi State

10



11

Old World Bluestem

- Warm-season, perennial, bunchgrasses
- Referred to as OWB because they were introduced throughout the world from Africa, Asia, and Europe
- NOT closely related to Big (*Andropogon*) and Little (*Schizachyrium*) bluestems which are native to rangelands in the USA
- Naturalized in USA, Australia, Mexico, Central America, and West Indies

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12

OWB Forage Quality

Measure	Dormant season	Growing season	Total
Daily gain, lb/steer	0.4	1.7	1.2
Seasonal gain, lb/steer	42	220	260
Gain, lb/ac	30	150	180
Stocking rate, ac/steer	1.5	1.5	1.5

McCollum et al., 2000

13

Genra of OWB

- **Bothriochloa (KR)**
 - Bothros, meaning trench, and chloe meaning grass
 - Distinctive discolored groove in the joints and pedicels
- **Dichanthium (Kleberg's)**
 - Inflorescence a single, paired, or digitate raceme
 - Upper lemma awned



Chris Gardiner ©

14

General OWB Summary

- Tolerate dense soils
 - Primarily loam or clay-loam soils, though will grow in sandy-loam sites
- Extremely drought hardy and cold-tolerant
- Respond to fertilizer though persist under stress
- Drought tolerant
- Withstand close grazing
- High seed production



15

Invasive

- The qualities of good forages are the same as good weeds
- Encroaches and becomes monoculture rapidly
 - Poor grazing and wildlife habitat, reduced biodiversity
- Tend to not be highly palatable
- Selective grazing
- Suggest using stocking rate to maintain 4-inch stubble height

Table 1. Nutritive value of *B. bladhii* that was avoided by steers or repeatedly grazed, and harvested at the standard cutting height or by taking only the tops of plants.

Grazing	Sampling method	ADF, %	NDF, %	Cellulose, %	Lignin, %	NEm, Mcal/lb	CP, %
Avoided	Standard	46 a	78 a	35 a	6.5 a	0.49 a	4.1 a
Avoided	Top only	43 b	74 b	32 b	5.6 b	0.53 b	5.4 b
Repeatedly grazed	Top only	43 b	74 b	33 b	5.7 b	0.52 b	7.5 c

Within a column, values followed by the same lowercase letter do not differ ($p > 0.05$).

Zilverberg and Allen, 2014

16

Honey Mesquite and Huisache

- Native legume trees
- Produce abundant seed that is long-lived in the soil
- Honey mesquite impacts ~23 million acres
- Huisache impacts ~2.5 million acres



17

General Weed Prevention

■ Prevent bare ground

- Adapted species
- Stocking rate & method
- Fertilization

■ Out compete



18

Select an Adapted Species

- The better adapted a forage species is, the fewer inputs and less management required to maintain the forage

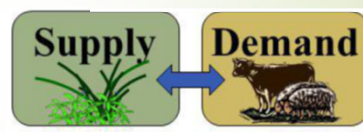


19

Stocking Rate & Method

- Determine through experience...
 - But how are animals different compared to in the past?
 - But how has forage productivity changed?
- It's a good idea to measure and put pen to paper for long-term planning
 - Avoid over- or under-grazing
 - Be prepared in a drought
 - Equals \$\$\$\$
- Rotational stocking provides flexibility

**FORAGE
ANIMAL
REQUIREMENT**



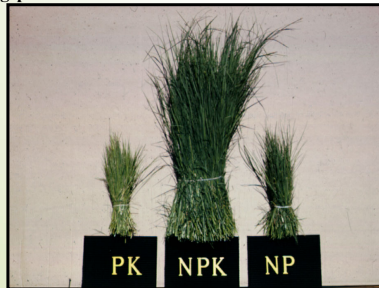
**CALCULATE
STOCKING RATE**

20

Soil Testing and Fertilization



<http://hsny.blogspot.com>



- Management area
 - Web Soil Survey
- Proper fertilization & pH ensures forage will persist
- Obtain optimum return for nutrient input
 - For hay fields every year
 - For grazing fields every 3-4 years
- Fertilize according to soil test
- Balance nutrients applied

21

Winter Overseeding (Evers et al.)

	Grass + N	Grass + N & clover	No input
150 lb N/ac (50¢/lb)	75.00		
60 lb P/ac (26¢/lb)	15.60	15.60	
Herbicide	11.00		
Mowing		8.00	
Rent	20.00	20.00	20.00
TOTAL LAND EXPENSE	121.60	43.60	20.00
Winter feeding (d)	141	106	141
\$1.79/d	252.39	189.74	252.39
Mineral	15.00	15.00	15.00
Bloat Guard Block		17.22	
Vaccines	12.00	12.00	12.00
TOTAL ANIMAL EXPENSE	279.39	233.96	279.39

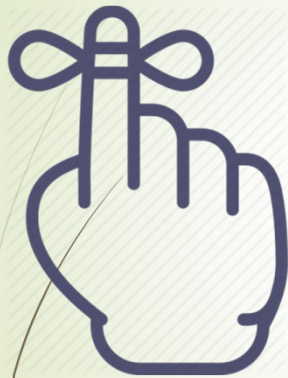
22

Winter Overseeding (Evers et al.)

	Grass + N	Grass + N & clover	No input
TOTAL LAND EXPENSE	121.60	43.60	20.00
Acres/cow-calf	1.0	1.5	2.9
Pasture expenses/cow-calf	121.60	65.40	58.00
TOTAL ANIMAL EXPENSE	279.39	233.96	279.39
TOTAL EXPENSES	400.99	299.36	357.39
Calf gain (lb)	340	470	369
Cost/lb calf gain	1.18	0.64	0.97

23

Other reminders of cultural practices



- ▀ Prevention is your most important tool
- ▀ Clean equipment between fields
 - ▀ AND have custom hay harvesters do the same
- ▀ Check seed tags of any species planted
- ▀ Mixed animal species can be an option for management of weeds that are not poisonous

24

Herbicides for Weed Control

- Weed ID determines the chemical and timing
- Scout regularly
 - In general, herbicide most effective on younger weeds
- Calibrate your sprayer
 - If too little, weed will not die
 - If too much, may be more than label allows = illegal
- The label is the law



25

Why Not Just Mow?

Table 2. Economic comparison: mechanical and chemical weed control¹

Item	40-hp tractor w/6' rotary mower	40-hp tractor w/30' boom sprayer
Labor cost/hour	\$10.00	\$10.00
Acres/hour	2.73	14.18
Costs		
Fixed cost/acre	\$5.58	\$1.43
Operating cost/acre	\$6.00	\$1.33
Labor cost/acre	\$3.66	\$0.71
Herbicide cost/acre	-0-	\$8.10
Total Cost/acre	\$15.24	\$11.57

Redmon 2012

- ESC-0406: Quick Reference for Common Rangeland and Pasture Herbicides
 - <https://cdn-ext.agnet.tamu.edu/wp-content/uploads/2019/02/ESC-046-Quick-Reference-for-Common-Rangeland-and-Pasture-Herbicide.pdf>
 - https://foragefax.tamu.edu/files/2017/12/GrassyWeeds_Debbie.pdf

26

Pre-Emergent is Prevention

- Difficult to treat grass weeds in grass pasture after they establish
- There are options in bermudagrass and bahiagrass pastures
- Pendimethalin
- Winter dormant bermudagrass
 - Late-winter or early-spring
- Prevent germination of johnsongrass, crabgrass, Texas panicum, sedges
 - Not labeled for vaseygrass or smutgrass, though some research indicates it is effective
- Old World Bluestem
- No grazing or harvest restrictions
- Rainfall is critical for effective control with Prowl H₂O
- Need 1.5" rainfall/moisture within 2 weeks of application

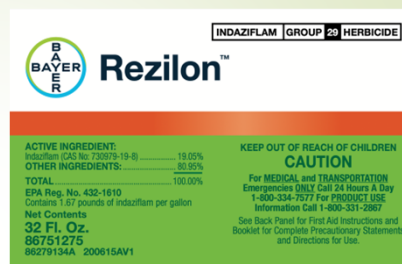
BASF
The Chemical Company

PROWL H₂O
herbicide

27

Another Option for Pre-Emergent

- Pre-emergent
- Rezilon (Indaziflam)
- 3 fl oz/ac prior to germination (Dec/Jan) followed by 3 fl oz/ac mid-season (May/June)
- Consistent weed control in Bermudagrass, Bahiagrass, and other warm-season forages
- Target species: crabgrass and sedges
 - Not labeled for johnsongrass, vaseygrass, smutgrass, Texas panicum
- Should be applied well before expected weed germination...**Early is on time!**
- No grazing restrictions
- No haying restrictions @ 3 oz/acre
- If rates > 3 oz/acre, hay may not be harvested for 40 days
- 18-month restriction on planting of cool season grasses, 22 months for other crops



Overall much longer residual control on all grass weeds

Research in progress to evaluate activity on weedy perennial grass species and other annual species

28

Post-Emergent Options

- Roundup (glyphosate)
- Dormant pastures can broadcast
 - Only treat cool-season weeds
- Spot spray
 - Follow label of formula and brand for rate and percentage of field, haying grazing restrictions
 - Johnsongrass, vaseygrass, smutgrass, crabgrass, Texas panicum, sedges, OWB
 - Regrow from crown



29

Post-Emergent Options

- Pastora (nicosulfuron & metsulfuron methyl)
 - Bermudagrass pastures
 - No grazing or haying restrictions
 - Johnsongrass, crabgrass, Texas panicum
 - Supplemental label suppression of Old World Bluestem
- Impose or Plateau (imazapic)
 - CRP, hay and grazinglands
 - Injury to bermudagrass reported
 - 7 day haying interval; 9 day grazing interval
 - Johnsongrass, vaseygrass, smutgrass, crabgrass, Texas panicum, sedges, OWB



30

Post-Emergent Johnsongrass

- 18-24 inches tall up to heading stage
- Do not mow or graze 2 weeks before or after spraying
- 2 week haying restriction
- 4 weeks total recommended



31

Post-Emergent Smutgrass

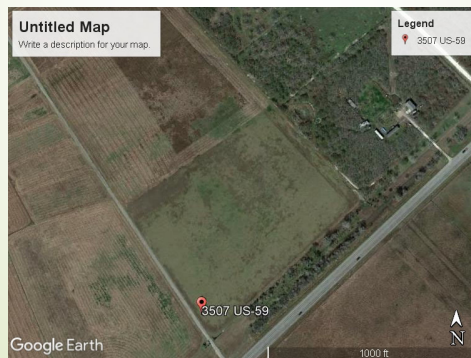
- Velpar L (hexazinone)
- In bermudagrass
- Late-spring or early-summer
- Rainfall to move product into soil crucial
- Likely to need a second application
- Standard recommendation for smutgrass but also effective on Johnsongrass, vaseygrass, crabgrass, Texas panicum, sedges, OWB



32

Herbicides for OWB

- To date no management method, other than tillage will eradicate invasive OWB
 - Destroy natives or introduced species



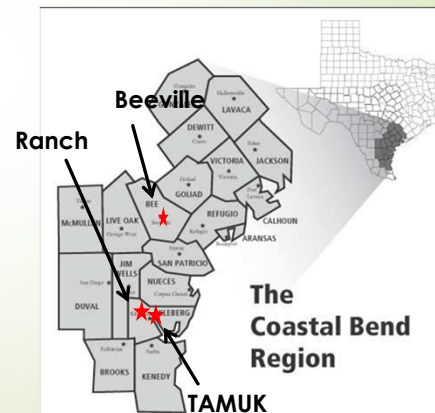
33

Methods

- Study Sites
 - Three locations in two different counties representing different soil types and climatic conditions in south Texas



Lesak et al., 2017



34

Methods

- Primary and secondary treatments in a factorial design (4×5)
- Primary treatments-
 - Summer fire
 - Nicosulfuron 56.2%, Metsulfuron Methyl 15% (Pastora)
 - Glyphosate (Round Up) + Seed
 - No treatment check



35

Methods

- Primary and secondary treatments in a factorial design(4×5)
- Secondary treatments
 - Plow
 - Mow
 - Fertilize
 - Plow + Seed
 - No treatment check



36

Results

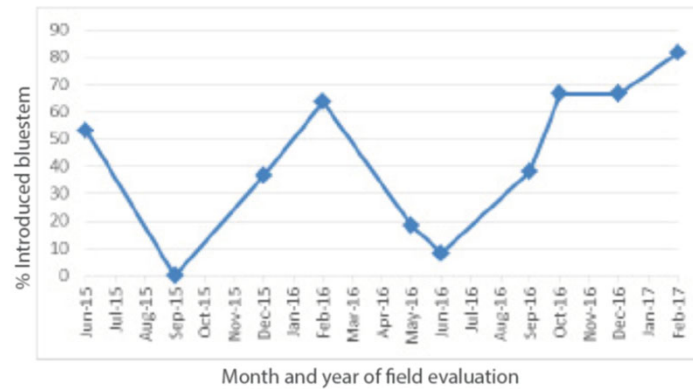


Figure 10. Average percentage of introduced bluestem cover in plots plowed (September 2015), sprayed with glyphosate (June 2016), and reseeded with natives (September 2016) in Kleberg County, Texas. Adapted from Lesak, 2016.

37


Options

- Prevention
- Pendimethalin
- Pastora (mixed results)
 - 1 oz/ac plus NIOS
 - Repeat application in July and September
 - After cutting or baling KR first regrowth
- Wick or Wiper with Roundup
- Tighten up cultural practices
- Fire lanes kept weed free



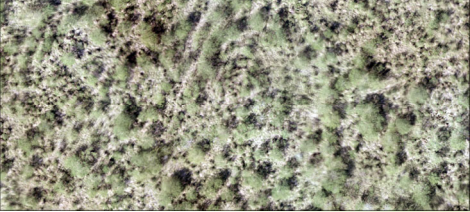
Vogels Wick Weeder

38




Post-Emergent Brush

- Treat huisache September to November
 - Grazeon P+D
 - Gunslinger
 - Sendero
 - Graslan L
- Treat honey mesquite in May to July
 - Sendero
 - Combination of Triclopyr ester + Clopyralid (mesquite)
- IPT (stem spray or cut stump)
 - Remedy 25% plus diesel or crop oil concentrate



3 Years Later



39

Questions?

- jlfoster@ag.tamu.edu
- 361-358-6390

40

Managing Grassy Weeds in a Grass Pasture or Hay Meadow

Vanessa Corriher-Olson

Associate Professor, Forage Extension Specialist
 Texas A&M AgriLife Extension
 Overton, TX

Weed management in warm-season perennial grass hay meadows can be a challenging task. However, grassy weeds such as crabgrass (*Digitaria* spp.), Johnsongrass (*Sorghum halepense*), bahiagrass (*Paspalum notatum*), dallisgrass (*Paspalum dilatatum*) and annual ryegrass (*Lolium multiflorum*) can be even more challenging, due to their similarity to desirable pasture grass species.

Crabgrass is a warm-season annual grass that is commonly found in pastures and hay meadows in parts of Texas. Relative to other warm-season annual grasses, crabgrass has a low- to medium-yield potential but is high in forage quality. As such, it is often a desirable component in pastures and is sometimes planted for forage in pastures. As is the case with many annual grass species, crabgrass is a prolific seed producer which enables new stands to establish in subsequent growing seasons for summer grazing.

Due to its high-volume seed production, crabgrass also has the potential to become a problematic and persistent weed in hay meadows. Its competitive growth among perennial grass hay meadows contributes to stand thinning from spring to late summer; thus, growers are concerned about its economic impact. Crabgrass has a slower drying rate than most hay species, which causes rotting and mold development after baling. Once it is dry, crabgrass often turns a dark brown or black color, which stands in stark contrast to the bright green color of other grass hay crops. This can substantially lower the value of the hay crop, so controlling the growth of crabgrass may be critical for long-term successful production.

So how to manage unwanted crabgrass?

If the hay meadow happens to be fenced as well as have a source of water, grazing can be an excellent way to utilize the high-quality crabgrass forage as well as remove it from the meadow. Grazing pressure can reduce seed production and reduce further spread of crabgrass.

Use of herbicides to control crabgrass is probably the most common method practiced. **Prowl H₂O** (pendimethalin) is a preemergence herbicide labeled for dormant bermudagrass and bahiagrass pastures and hay meadows. Treatments should be applied in late winter/early spring before crabgrass emerges. This herbicide should also be applied prior to rainfall for the herbicide to receive adequate incorporation into the soil. **Glyphosate** (active ingredient in Roundup, etc.) and **Pastora** (nicosulfuron + metsulfuron) are two postemergence herbicide options labeled. Spot treatments of glyphosate are recommended in bahiagrass for control. As with any herbicide application timing is critical along with following label directions. When spot treating with glyphosate, crabgrass needs to be sprayed when plants are less than 6 inches in height in the spring. Unfortunately for bahiagrass growers there are no selective herbicides available for postemergence control of crabgrass. For rates and any restrictions refer to product labels. Pastora

may only be used in bermudagrass, for suppression of large crabgrass (large crabgrass here refers to a species of crabgrass, not the size of crabgrass) only. “Suppression” only means a reduction in weed competition, and does not necessarily guarantee that the weed will be fully controlled. If using Pastora for this purpose, applications should be made to newly emerging crabgrass seedlings less than 2 inches in height.

Johnsongrass is a warm-season perennial grass that is commonly found along roadsides and ditches but can also be found in hay meadows. Johnsongrass is a relatively high-quality summer forage species that is also fairly drought tolerant. Johnsongrass is rarely a concern in grazing pastures as livestock tend to over graze and eliminate it from the pasture. It is commonly one of the last forages to stop growing in drought-stressed pastures. Johnsongrass also has the potential to be poisonous (i.e., prussic acid and nitrate toxicity) during drought and after early frosts. Johnsongrass can accumulate prussic acid in its leaves and poison livestock. Young, tender, fast-growing plants are more likely to be toxic than mature plants. Once the hay has dried enough to be safely baled, prussic acid will have volatilized to non-toxic levels. Additionally, Johnsongrass has a strong potential for nitrate accumulation when subjected to stress and/or high nitrogen fertilization. Unlike prussic acid, nitrate levels do not decline after cutting or baling. Proper sampling and testing are required to ensure the hay is safe to feed.

So how to manage unwanted Johnsongrass?

If the hay meadow happens to be fenced as well as have a source of water, grazing can be an excellent way to utilize the high-quality forage as well as remove it from the meadow. Be mindful of grazing Johnsongrass during drought and after early frosts due to the potential of prussic acid and/or nitrate toxicity.

Outrider (sulfosulfuron) is an effective herbicide on Johnsongrass found in bermudagrass or bahiagrass pastures and hay meadows. For successful control, Outrider must be applied during active growth that is at least 18 to 24 inches tall and up to the heading stage. Weeds to be treated should not be mowed or grazed for two weeks before or after application. Bermudagrass may be harvested after the two-week period without any effect on Outrider performance. **Glyphosate** (active ingredient in Roundup, etc.) and **Pastora** (nicosulfuron + metsulfuron) are two other postemergence herbicide options in bermudagrass. Glyphosate may be use as a spot treatment or as a wick or wiper application for control of Johnsongrass. With Pastora, applications need to be made to Johnsongrass seedlings before they reach 12 inches in height. If rhizome Johnsongrass is present, applications need to be made to plants between 10 and 18 inches in height. These are very different recommendations compared with Outrider. Therefore, it is critical to always refer to specific product labels for rates, application recommendations and any restrictions.

Bahiagrass is another warm-season perennial grass that is utilized for pasture and can be undesirable in bermudagrass hay meadows in East Texas. Bahiagrass is often a desirable forage due to its persistence under low fertilization and close (heavy grazing pressure) grazing. It grows better on drought-prone soils with relatively low fertility and on sandier soils than do most other forages. Bahiagrass forms a deep, extensive root system which few other plants can encroach after a sod has been developed. Bahiagrass has a reputation as a low-quality forage because the quality of bahiagrass hay tends to be lower than the quality of bermudagrass due to less nitrogen fertilizer

applied to bahiagrass stands. The grass is very tolerant of low-fertility, acid soils, but does respond to nitrogen and potassium. Once bahiagrass grows 10 to 12 inches tall, it produces little new growth and loses nutritive with maturity.

So how to manage unwanted bahiagrass?

Bahiagrass can be grazed if a producer is okay with a mixed stand of forage in their pasture (bermudagrass and bahiagrass). It can also be harvested for hay. It is necessary to harvest every 30 to 35 days to maintain forage nutritive value. Neither grazing nor harvesting will lead to eradication of bahiagrass. Therefore, if it is considered an undesirable species on your property the best method of removal/control will be the use of herbicides.

There are a multitude of herbicides that provide postemergence control of bahiagrass in bermudagrass pastures and hay meadows. Products that contain the active ingredient **metsulfuron-methyl** have activity on bahiagrass. Some trade names include Pastora, Cimarron Plus, Cimarron Xtra, Cimarron Max, MSM 60, Chaparral, etc. Metsulfuron also controls many broadleaf weeds and some brush species. For rates and any restrictions refer to product labels. It is important to follow up the herbicide application with a fertility program to encourage the bermudagrass growth.

Dallisgrass is a warm-season perennial that has grazing potential. Dallisgrass is palatable and has a higher level of nutritive value than bahiagrass and some bermudagrass varieties, and it can retain its nutritive value later into the summer. Dallisgrass, however, produces a lower dry matter yield than some bermudagrass varieties. One concern with dallisgrass is the potential for an “ergot” fungus (*Claviceps* spp.) to infect seedheads and cause dallisgrass poisoning (also known as dallisgrass staggers). The fungus infects the seedheads typically in late summer or fall. The affected animals show neurological symptoms including trembling of major muscles and head, uncoordinated movements and sometimes displays of aggression. Poisoning can be avoided by removing livestock when seed heads are affected or keeping seed heads mowed.

So how to manage unwanted dallisgrass?

Use of herbicides to control dallisgrass is probably the most common method practiced. **Glyphosate** (active ingredient in Roundup, etc.) is the only postemergence herbicide option. As with any herbicide application timing is critical along with following label directions. Ideally, dallisgrass needs to be sprayed when plants are less than 6 inches in height in the spring. Unfortunately for bahiagrass growers there are no selective herbicides available for postemergence control of dallisgrass, thus spot treatments of glyphosate are recommended. For rates and any restrictions refer to product labels. In bermudagrass, there is often an opportunity to selectively control dallisgrass with glyphosate at the end of the season. Often, there is a period in late fall to early winter when bermudagrass becomes dormant while dallisgrass remains green for a short period of time. During this time glyphosate provides fair to good dallisgrass control. Bermudagrass injury varies depending on the stage of dormancy at the time of application. Timing and calibration are important. Once the first frost occurs, bermudagrass should be checked

frequently so that the application can be made as soon as it is completely dormant. If glyphosate products with higher concentrations are used, the rate should be adjusted.

Annual Ryegrass is a cool-season annual grass often planted and utilized by livestock producers for winter grazing. However, it's often deemed an enemy of many a hay producer in East Texas. Volunteer annual ryegrass can be common in hay meadows. Winter rainfalls can promote seed germination and seeds can survive for multiple years in our soils. Later maturity of annual ryegrass can delay or prevent our warm season perennial forages (i.e. bermudagrass or bahiagrass) from breaking dormancy in April/May therefore delaying initial hay cuttings.

So how to manage unwanted ryegrass?

If the hay meadow happens to be fenced as well as have a source of water, grazing can be an excellent way to utilize the high-quality forage as well as remove it from the meadow.

Harvesting ryegrass for baleage or a hay is an option. Baleage or haylage is forage baled at 50 to 60% moisture. It is then preserved in an air-tight plastic wrap (single bales or one long tube). This requires specialized equipment and diligence in maintaining the integrity of the plastic wrap. {See publication for more details} Harvesting for hay can be tricky during years we have ample spring rainfall.

Use of herbicides to control annual ryegrass is probably the most common method practiced. **Prowl H₂O** (pendimethalin) is a preemergence herbicide labeled for dormant bermudagrass and bahiagrass pastures and hay meadows. Treatments should be applied prior to rainfall, to enhance soil incorporation and herbicide activation. **Glyphosate** (active ingredient in Roundup, etc.) and **Pastora** (nicosulfuron + metsulfuron) are two post emergent herbicide options only for use in bermudagrass. **Gramoxone Inteon** (paraquat dichloride) is labeled for dormant bermudagrass or bahiagrass pastures/hay meadows for postemergence control of grass weeds such as ryegrass. As with any herbicide application timing is critical along with following label directions. Ideally, ryegrass needs to be sprayed when plants are less than 6 inches in height in the fall. Annual ryegrass is generally susceptible to postemergence herbicides in early winter prior to freezing temperatures and before seedhead emergence. Spot treatments of glyphosate are recommended in bahiagrass for control if bahiagrass is actively growing. Glyphosate or paraquat dichloride can be used in a broadcast method if bahiagrass is still dormant. For rates and any restrictions refer to product labels.

Maintaining some substantial bermudagrass/bahiagrass stubble height (>4") could provide shade that could reduce ryegrass seed germination. This may not provide 100% control; however, competition can help to reduce undesired plant growth. Maintaining a higher stubble height can also be beneficial for the warm season perennial future growing season. Higher stubble height means more substantial root structure to capture deeper soil moisture and nutrients.

See Table 1 and 2 for quick reference. For rates and any restrictions refer to herbicide product labels.

Table 1: Permanent bermudagrass pastures and hay meadows

Weedy Grasses to be Controlled	Product (Herbicide common name and active ingredients)	Application Rate per acre (broadcast)	Times to apply	Remarks
Crabgrass	Prowl H ₂ O (pendimethalin)	1.1-4.2 qt/A	Preemergence	Currently a supplemental label. Labeled for dormant bermudagrass and bahiagrass pastures and hay meadows. Treatments should be applied prior to rainfall. Do not exceed 3.2 qt of Prowl H ₂ O per acre per year. Some stunting and chlorosis (pale discoloration of leaves) of bermudagrass may occur with postemergence applications.
	Roundup (glyphosate)	12-16 oz/A	Postemergence	Preventing viable seed production is key to successful control. Do not apply more than 3 quarts per acre per year.
	Pastora (nicosulfuron + metsulfuron)	1-1.5 oz/A	Postemergence when weeds are actively growing.	For <i>suppression</i> of large crabgrass (species of crabgrass) only. Apply in a tank mix with 2.5 to 4.1 oz ai/A glyphosate for best results. Treat crabgrass before it exceeds 2 inches in height. Do not apply more than 2.5 oz of Pastora/A per year. No grazing or hay harvest restrictions. Supplemental label for use of Pastora for suppression of KR bluestem in Texas. A repeat application 4 to 8 weeks after the first application for improved suppression. Do not apply more than 2.5 oz of Pastora/A per year.
Johnsongrass	Outrider (sulfosulfuron)	1.33 oz/A	Postemergence	Make application when Johnsongrass is actively growing, is at least 18 to 24 inches tall and up to the heading stage. Do not mow or harvest the hayfield or pasture to be treated for 2 weeks before or 2 weeks after application.
	Roundup (glyphosate)	1-3 pints in 10 to 40 gallons of spray solution per acre	Postemergence	Preventing viable seed production is key to the successful control. Do not apply more than 3 quarts per acre per year.
	Pastora (nicosulfuron + metsulfuron)	1-1.5 oz/A	Postemergence when weeds are actively growing.	For seedling Johnsongrass: apply before seedlings reach 12 inches in height. For rhizome Johnsongrass: apply to 10 to 18 inch tall plants. Do not apply more

				than 2.5 oz of Pastora/A per year. No grazing or hay harvest restrictions.
Bahiagrass	Roundup (Glyphosate)	1-3 pints in 10 to 40 gallons of spray solution per acre	Postemergence	Preventing viable seed production is key to the successful control. Do not apply more than 3 quarts per acre per year.
	Chaparral (metsulfuron methyl + aminopyralid)	1.0-3.3 oz/A	Postemergence	No grazing or hay harvesting restrictions.
	Pastora (nicosulfuron + metsulfuron)	1.25-1.5/A	Postemergence	Apply after greenup in the spring but before bahiagrass seedheads form. Only for control of Pensacola bahiagrass. Do not apply more than 2.5 oz of Pastora/A per year. No grazing or hay harvest restrictions.
	<p>Cimarron Plus (Metsulfuron + chlorsulfuron)</p> <p>Cimarron Max (metsulfuron + dicamba + 2,4-D)</p> <p>Cimarron Xtra (Metsulfuron Methyl + Chlorsulfuron)</p>	<p>0.125 to 1.25 oz Consult Label</p> <p>Cimarron Max is a 2-part product used in a ratio of 5 oz of Part A to 2.5 gal of Part B which will treat 5 (Rate III), 10 (Rate II), or 20 (Rate I) acres.</p> <p>0.5-2.0 oz/A</p>	Postemergence	<p>No grazing restriction. Has residual soil activity so it may affect the following crops: alfalfa, clover, and ryegrass. Rate for Pensacola bahiagrass control is 0.375 oz/A. Using a surfactant improves the performance of this herbicide.</p> <p>Rate for Pensacola bahiagrass control is the equivalent of Cimarron Max Part A at 0.33 oz/A and Cimarron Max Part B at 1.33 pt/A. Wait at least 4 months before planting some clovers after applying Rate I. Check the label for other rotation restrictions. There is no waiting period between treatment and grazing for non-lactating dairy animals. There is a 37-day harvest restriction for dry hay.</p> <p>No grazing or hay harvest restrictions for Cimarron Xtra. Consult the label for bahiagrass control.</p>
Dallisgrass	Roundup (Glyphosate)	1-3 pints in 10 to 40 gallons of spray solution per acre	Postemergence	Preventing viable seed production is key to the successful control. Do not apply more than 3 quarts per acre per year.

Annual Ryegrass	Prowl H ₂ O (Pendimethalin)	1.1-4.2 qt/A	Preemergence	Currently a supplemental label. Labeled for dormant bermudagrass and bahiagrass pastures and hay meadows. Treatments should be applied prior to rainfall. Do not exceed 4.2 qt of Prowl H ₂ O per acre per year. Some stunting and chlorosis (pale discoloration of leaves) of bermudagrass may occur with postemergence applications.
	Roundup (Glyphosate)	1-3 pints in 10 to 40 gallons of spray solution per acre	Postemergence	Preventing viable seed production is key to the successful control. Do not apply more than 3 quarts per acre per year.
	Pastora (nicosulfuron + metsulfuron)	1-1.5 oz/A	Postemergence	Apply when ryegrass is taller than 2 inches. For best results, apply 1.0 oz and follow up with a second 1.0 oz application 3 to 4 weeks later. Do not apply more than 2.5 oz of Pastora/A per year. No grazing or hay harvest restrictions.
	Gramoxone Inteon (Paraquat dchloride)	1-2.0 pts/A	Postemergence during dormancy	Apply when bermudagrass or bahiagrass is dormant . Do not pasture or mow for hay until 40 days after treatment. Gramoxone Inteon is a restricted-use herbicide and is poisonous. Using a surfactant improves the performance of this herbicide.

Table 2: Permanent bahiagrass pastures and hay meadows

Weedy Grasses to be Controlled	Product (Herbicide common name and active ingredients)	Application Rate per acre (broadcast)	Times to apply	Remarks
Crabgrass	Roundup (Glyphosate)	3 quarts/A or less	Postemergence	Applications may be made in the same area at 30-day intervals
	Prowl H ₂ O (Pendimethalin)	1.1-4.2 qt/A	Preemergence	Currently a supplemental label. Labeled for dormant bermudagrass and bahiagrass pastures and hay meadows. Treatments should be applied prior to rainfall. Do not exceed 4.2 qt of Prowl H ₂ O per acre per year. Some stunting and chlorosis (pale discoloration of leaves) of bermudagrass may occur with postemergence applications.
Johnsongrass	Roundup (Glyphosate)	3 quarts/A or less	Postemergence	Applications may be made in the same area at 30-day intervals
	Outrider (sulfosulfuron)	1.33 oz/A	Postemergence	Make application when the johnsongrass is actively growing, is at least 18 to 24 inches tall and up to the heading stage. Do not mow or harvest the hayfield or pasture to be treated for 2 weeks before or 2 weeks after application.
Dallisgrass	Roundup (Glyphosate)	3 quarts/A or less	Postemergence	Applications may be made in the same area at 30-day intervals
Annual Ryegrass	Roundup (Glyphosate)	3 quarts/A or less	Postemergence	Applications may be made in the same area at 30-day intervals
	Prowl H ₂ O (Pendimethalin)	1.1-4.2 qt/A	Preemergence	Currently a supplemental label. Labeled for dormant bermudagrass and bahiagrass pastures and hay meadows. Treatments should be applied prior to rainfall. Do not exceed 4.2 qt of Prowl H ₂ O per acre per year. Some stunting and chlorosis (pale discoloration of leaves) of bermudagrass may occur with postemergence applications.
	Gramoxone Inteon (Paraquat dchloride)	1-2.0 pts/A	Postemergence during dormancy	Apply when bermudagrass or bahiagrass is dormant . Do not pasture or mow for hay until 40 days after treatment. Gramoxone Inteon is a restricted-use herbicide and is poisonous. Using a surfactant improves the performance of this herbicide.

Produced by the Department of Soil and Crop Sciences
soilcrop.tamu.edu

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The Texas A&M University System, U.S. Department of Agriculture, and the County Commissioners Courts of Texas Cooperating

Sandbur Management in Pastures and Hayfields

Josh McGinty, Ph.D.
Dept of Soil and Crop Sciences
Corpus Christi, TX

1

1

- The bur is not the seed
- 2-3 seed per bur, 2 different sizes
 - Smaller seed highly germinable
 - Larger seed often remains dormant for >1 yr
- Germination starts when soil temps reach low 50's



2

2



3

3

Sandbur Management Strategies – Cultural Methods

- Annual weed, thus bare ground = an opportunity for invasion
- Soil test and fertilize appropriately
- Maintain 2-3" stubble and thatch over the winter
 - Will help suppress sandbur and other opportunistic annuals
- Transport of seed a common issue

4

Sandbur Management Strategies – Prevention



5

Preemergence Herbicide Options

6

Herbicide on Soil



Herbicide in Soil

Weed Seedlings susceptible to
Herbicide

7

Sandbur Management – Preemergence Control

- Prowl H2O
 - Apply to established Bermudagrass or other warm-season perennial grasses
 - Apply in the dormant season or in-season between cuttings
 - Do not apply between greenup and first cutting
 - 1.1 to 4.2 qt/A
 - Do not exceed 4.2 qt/A/year
 - Needs a rainfall or overhead irrigation for activation
 - No preharvest interval for grazing or hay harvest (per supplemental label)

8

Other Grasses Controlled with Prowl H2O

- Many cool-season grasses
- Barnyardgrass
- Crabgrass
- Seedling Johnsongrass
- Panicums

9

Sandbur Management – Preemergence Control

- Rezilon (indaziflam) – registered July 2020
- For control of annual grass and broadleaf weeds in established bermudagrass, bahiagrass, and other warm-season perennial grass pastures and hayfields.

10

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Indaziflam (Rezilon) <ul style="list-style-type: none"> • Preemergence control of annual grass and broadleaf weeds • Cellulose Inhibitor (WSSA group 29) • Half-life > 150 days | <ul style="list-style-type: none"> • Pendimethalin (Prowl H2O) <ul style="list-style-type: none"> • Preemergence control of annual grasses, some small-seeded broadleaf weeds • Mitosis inhibitor (WSSA group 3) • Half-life approx 44 days |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

11

Important items from the Rezilon label

- Use rate – 3 to 5 fl oz/acre
- Do not exceed 5 fl oz/acre in a single application
- Do not exceed 6 fl oz/acre per year
- Do not make more than 2 applications per year
- No grazing restrictions
- If applied at more than 3 fl oz/acre, do not harvest hay for 40 days
- Best activity when 0.25-0.5 in rainfall/irrigation received within 3 wks of application

12

Important items from the Rezilon label

- “For optimum preemergence control of sandbur germinating from seed, apply Rezilon at 3 fl oz/A during the dormant season prior to seed germination (late-December through January) and apply a repeat application of 3 fl oz/A of Rezilon mid-season, immediately after harvest (late-May through June).”

13

Sandbur Management – Postemergence Control

- Glyphosate – in bermudagrass only
 - Apply before greenup, or immediately after cutting before regrowth
 - Expect injury and some yield loss if applied after greenup
- Roundup Weather Max (4.5 lb ae/gal) – 8-11 fl oz/A
- Generic glyphosate products (3.0 lb ae/gal) – 12-16 fl oz/A

14

Sandbur Management – Postemergence Control

- Pastora (nicosulfuron + metsulfuron-methyl)
 - Apply to established bermudagrass
 - Crop injury can occur in stressed bermudagrass
 - 1.0-1.5 oz/A
 - Do not exceed 2.5 oz/A/year
 - Include NIS or COC + UAN or AMS
- Apply to sandbur no larger than 1.5 inches tall, when bermudagrass is less than 4" tall
 - Overwintering sandbur – may add 0.156 to 0.257 lb/A glyphosate
 - 6.6 to 10.9 fl oz (3 lb ae/gal)
 - 4.4 to 7.3 fl oz (4.5 lb ae/gal)

15

Sandbur Control – Robertson Co.



16

Other Weeds Controlled with Pastora

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Grasses • Barnyardgrass • Broadleaf signalgrass • Bahiagrass • Johnsongrass | <ul style="list-style-type: none"> • Broadleaf • Annual marshelder • Cutleaf evening primrose • Dogfennel • Henbit • Morningglory • Shepherd's purse • Wild mustard • Cocklebur |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

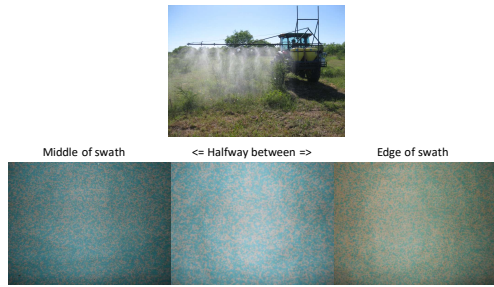
17

If Spraying Pastora for Sandbur...

- Remember, we are spraying a very small seedling. Coverage is critical!
- Use a standard boom-type sprayer instead of a boomless nozzle when possible

18

Boom Sprayer with Flat-Fan Nozzles



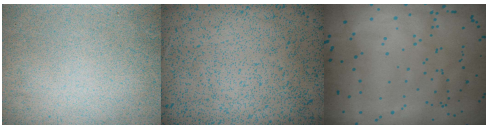
19

TeeJet FieldJet



20

TeeJet FieldJet



21

TeeJet BoomJet Cluster Nozzle



22

TeeJet BoomJet Cluster Nozzle



23

TeeJet BoomJet XP



24

TeeJet BoomJet XP



25

Evergreen Boombuster



26

Evergreen Boombuster



27

Imazapic (Plateau, Impose, Panoramic) for Sandbur Control

28

28

Bermudagrass Tolerance to Imazapic POST

- Complete loss of 1st cutting following rates of 4-14 fl oz/acre at Shiner, TX, 2nd cutting also affected (Grichar et al. 2008)
- Following 12 fl oz/acre, Coastal bermudagrass yields reduced 89-95% in 1st cutting, 50-75% in 2nd cutting, 34-80% in 3rd cutting in Stephenville, TX (Butler and Muir 2006)
- Approximately 50% yield reduction in Tifton 85 following several rates/combinations of imazapic + 2,4-D (Bridges et al. 2001)

29

Sandbur Control with Imazapic?

- 83-99% control with 2-8 fl oz/acre POST (Grichar et al. 2008)
- 96-100% control with 3 fl oz/acre POST in Mulhall, OK (Eytcheson 2009)

Common Name	Species	Weed Height† (Inches)	Rate per Acre‡ (Fluid ounces)
Large crabgrass	<i>Digitaria sanguinalis</i>	>4	6
Southern crabgrass	<i>Digitaria ciliaris</i>	>4	6
Smooth crabgrass	<i>Digitaria ischaemum</i>	>4	6
Green foxtail	<i>Setaria fabryi</i>	>4	6
Green foxtail	<i>Setaria viridis</i>	>4	6
Yellow foxtail	<i>Setaria glauca</i>	>4	6
Texas panicum	<i>Panicum texanum</i>	>4	6
Pail panicum	<i>Panicum dichotomiflorum</i>	>4	6
Brakeleaf signalgrass	<i>Bacharia polyphylla</i>	>4	6
Annual pangloss	<i>Microstegium minus</i>	>4	6
Barnyardgrass	<i>Echinochloa crus-galli</i>	>4	6
Sandbur	<i>Cenchrus spp.</i>	>4	6

*Be sure bermudagrass has completely greened up as an application of Alligare Panoramic 25L could delay green-up and subsequent growth. If application is made too early before full green-up, if delayed green-up will be an issue, do not apply Alligare Panoramic 25L. †Use the higher rate when the summer annual grasses are older, larger or have been subjected to multiple cuttings.

30

Preemergence Imazapic in Bermudagrass?

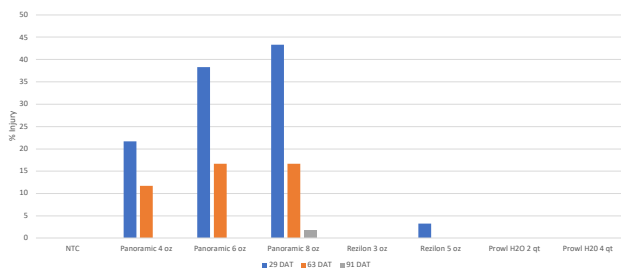
WEEDS CONTROLLED
(With 4 to 6 ounces per acre Alligare Panoramic 2SL)

Common Name	Species	PRE	POST	ANNUAL/ BIENNIAL/ PERENNIAL
Sandbur	<i>Cenchrus</i> spp.	S	C	A/P
Shattercane	<i>Sorghum bicolor</i>	C	12	SA
Signalgrass, Broadleaf	<i>Brachiaria platyphylla</i>	C	C	SA
Stilgrass, Japanese	<i>Microstegium vimineum</i>	C	4	A
Vaseygrass	<i>Paspalum urvillei</i>	---	8	P

Half life – 120 d

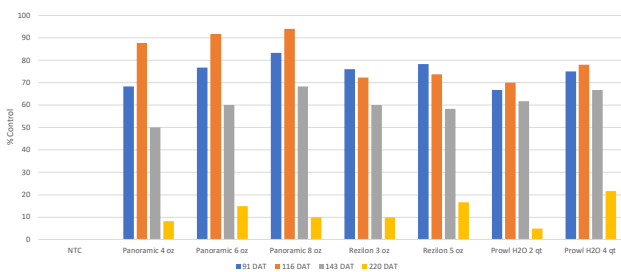
31

Bermudagrass Injury – Leming, TX 2021



32

Sandbur Control – Leming, TX 2021



33

What other grasses does Panoramic control (preemergence)?

- Crabgrass (large, smooth)
- Foxtail (green, giant, yellow)
- Seedling Johnsongrass
- Broadleaf Signalgrass

34

Panoramic For Cool Season Annuals

Treated with 12
oz of Panoramic
in mid-October
Picture taken in
mid April



Untreated

35

- Josh McGinty
- 361-265-9203
- Joshua.mcginity@ag.tamu.edu

36

36

Pest Alert

Veterinary Services

Asian Longhorned Tick (*Haemaphysalis longicornis*)

The Asian longhorned tick (ALHT) is an invasive pest that poses a serious threat to livestock. While not normally found in the Western Hemisphere, this tick was reported for the first time in the United States in 2017. It has since been found in numerous Eastern States. ALHT can reproduce without a male, so a single tick can create a population in a new location; one female can lay up to 2,000 eggs.

Distribution

ALHT is native to eastern China, Japan, the Russian Far East and Korea. It is an introduced and established exotic species in Australia, New Zealand and several island nations in the Western Pacific Region. In late 2017, ALHT was found in New Jersey, marking the first confirmed detection of this pest in the United States. To date, ALHT has been confirmed in the following States: Arkansas, Connecticut, Delaware, Georgia, Kentucky, Maryland, Missouri, New Jersey, New York, North Carolina, Ohio, Rhode Island, South Carolina, Pennsylvania, Tennessee, Virginia, and West Virginia.

The widespread establishment of a new tick species in the United States is rare. After the 2017 detection, animal health officials examined how and when the tick arrived in the United States. It remains unknown how the ALHT first entered the country, but it likely arrived here in or before 2010. Possible routes of entry include imports of domestic pets, horses, or livestock or people unknowingly carrying the tick back to the United States after traveling abroad.

Hosts

ALHT has been found feeding on a number of hosts, including sheep, goats, dogs, cats, horses, cattle, chickens, black bears, foxes (red and grey), coyotes, groundhogs, striped skunks, white-tailed deer, elk, opossums, raccoons, Canada geese, barred owls, great horned owls, brown boobies, *Peromyscus* mice, and red-tailed hawks. The tick has also been found on people.

Description

ALHT is light brown in color. The adult female grows to the size of a pea when full of blood. Male ticks are rare. Other stages of the tick are very small, about the size of a sesame seed or even smaller.



Asian longhorned tick, adult female dorsal view (James Gathany, CDC)



This tick is about the size of a sesame seed. (Michael Greenwood)

Impact

ALHT is mainly a pest of concern in livestock. This tick often forms large infestations on one animal, causing great stress and reducing growth and production. A severe infestation can even kill the animal due to blood loss.

Disease spread is another threat. In other countries, ALHT is known to transmit the agents of several livestock and human diseases, including anaplasmosis, babesiosis, ehrlichiosis, theileriosis, and rickettsiosis.



In the United States, the Ikeda strain of *Theileria orientalis* (an agent of theileriosis) was recently found in ALHT collected in Virginia. Research has shown that the ALHT can give this pathogen to uninfected calves under lab conditions. ALHT can also transmit *Rickettsia rickettsii* (the agent of Rocky Mountain spotted fever) in a lab setting.

What You Can Do

- **Treat your livestock for ticks.** Regular tick treatments should be effective against ALHT. Consult your veterinarian about which products to use.
- **Practice tick prevention** on feedlots and pastures, such as keeping grass and weeds trimmed and clearing away brush.
- **Check your livestock for ticks regularly.** If you spot any unusual-looking ticks or large infestations, report it to your State animal health official (www.usaha.org/saho).
- **Safely remove ticks from people and pets as quickly as possible.** If you think you have found an ALHT, place the tick in a zip-top bag, seal it, and give it to your veterinarian for identification.

Learn More

If you have animal health-related questions, contact the U.S. Department of Agriculture (USDA) at vs.sp.chc.all@usda.gov.

Your county Extension office (www.nifa.usda.gov/extension) is also a great resource for information.

For human health and tick information, including how to safely remove ticks from pets and people, visit www.cdc.gov/ticks.

This image shows a full page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, providing a template for handwriting practice or general writing. There are no margins, text, or other markings on the page.