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AND ENVIRONMENTAL SCIENCES

Warm-Season Forages for Ohio

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Today's Topics of Interest

- What are “warm-season forages”?
- What are the advantages and disadvantages of using them in Ohio?
- How do you care for stands of warm-season forage?
 - Native Grasses
 - Introduced Grasses
 - Warm-Season Legumes



Defining Warm-Season Forages

- C_4 photosynthesis
- Optimum growth temperatures: 80-95°F
- Quickly maturing
- High water use efficiencies



Disadvantages

Quick to Mature

- Greater accumulation of fiber

Difficult to Establish

- Perennials may be slow to establish

Variety Selection is Limited

- Adapted primarily for southern states



Advantages

Combat Summer Slump

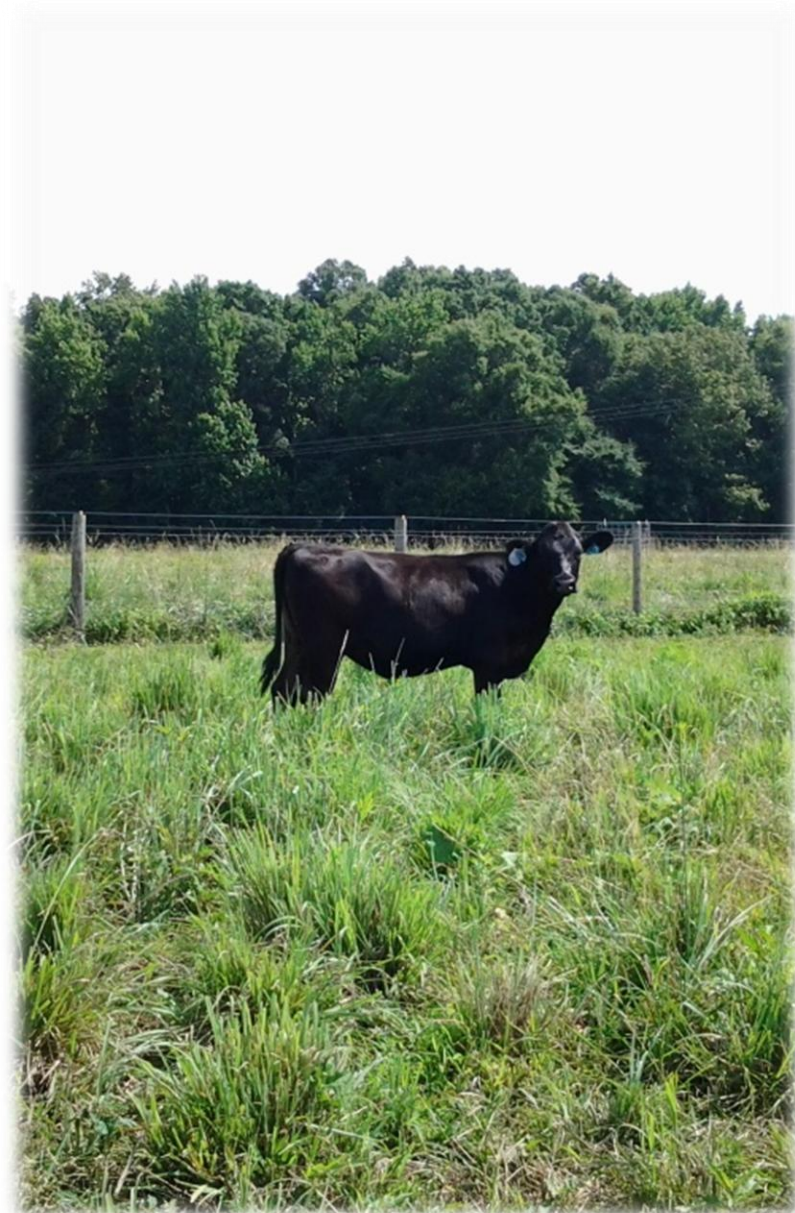
- Active growth while cool-seasons stall

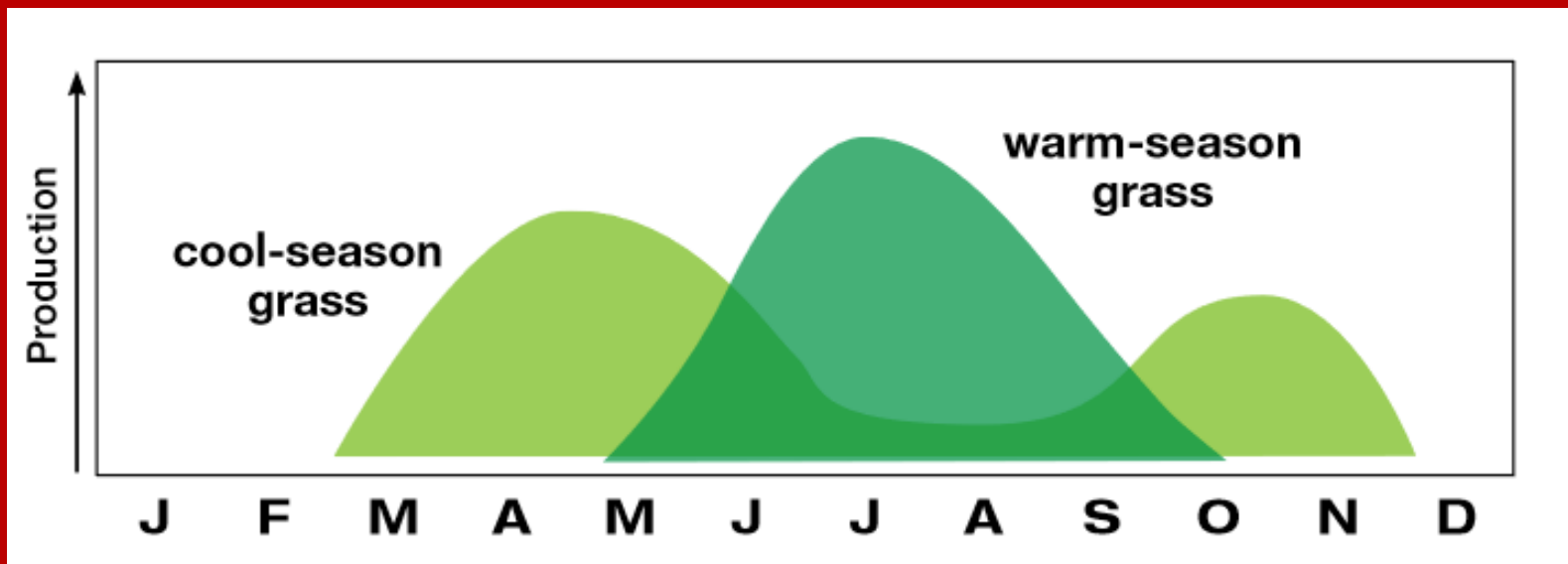
Drought Tolerant

- Can produce more dry matter with less water than cool-seasons

Extend the Grazing Season

- Feed less hay during winter



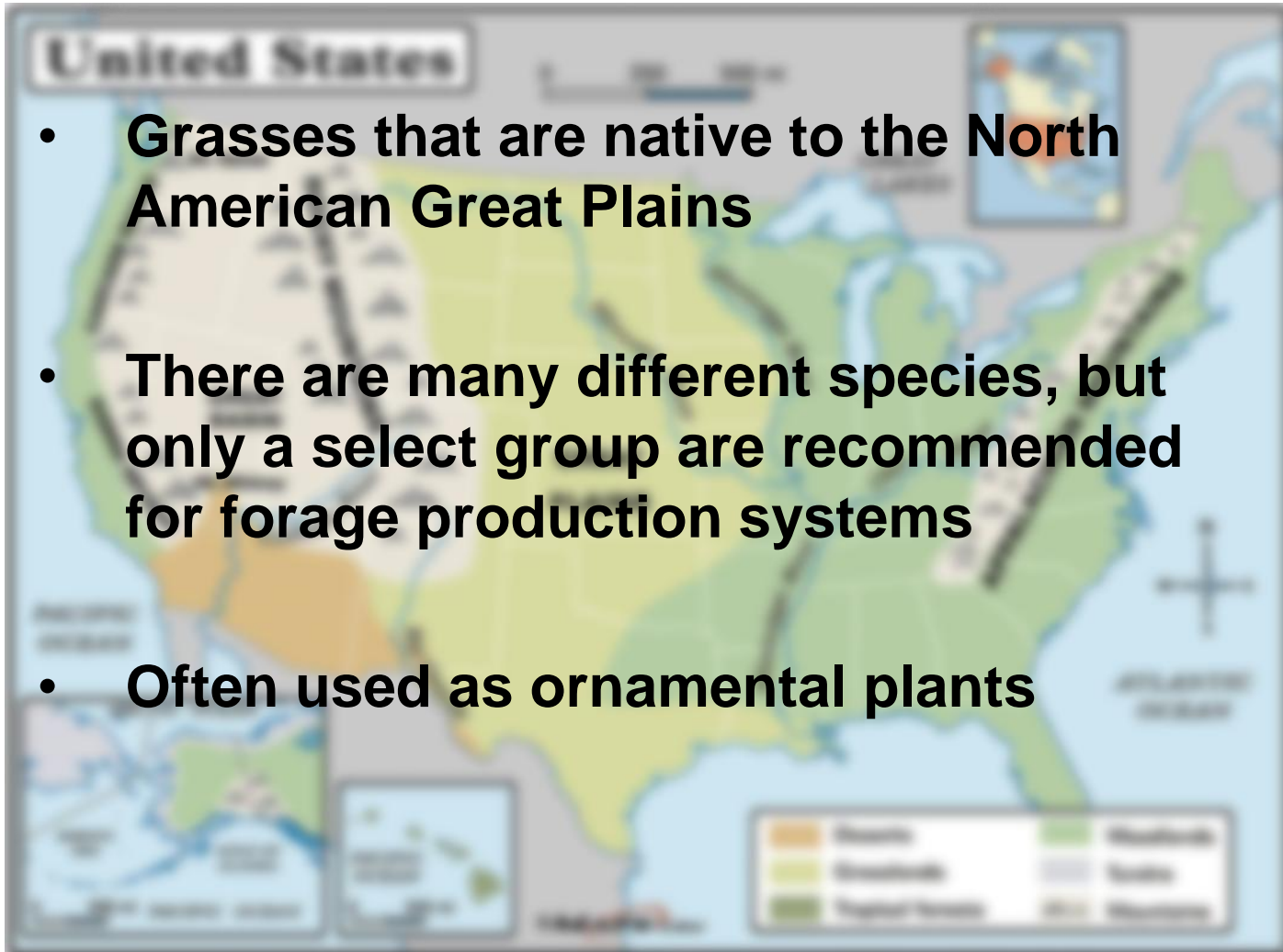


Growth Curve Model of Cool and Warm Season Grasses from UT Ext. Pub. SP731-A by Keyser, 2012.



Defining Native Grasses

- **Grasses that are native to the North American Great Plains**
- **There are many different species, but only a select group are recommended for forage production systems**
- **Often used as ornamental plants**





Advantages

Low inputs

- Require little fertilization
- Require little water

High outputs

- Produce high above ground and below ground biomass

Adapted to the region

- Pests
- Pathogens
- Weather



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WOW!



Lee R. DeHaan



Disadvantages

Limited availability of improved varieties

- Some species are self-incompatible
- Little interest in developing improved breeding lines

Slow to establish

- Small seed
- Bunch type growth habit

Low forage quality

- Plants mature quickly
- Low animal intake

Require more monitoring under grazing

- Cannot tolerate close grazing



Significance-Past

Provided habitat for...

- Birds
- Insects
- Bison
- Elk
- Antelope
- Deer

In turn...

- Providing Native American Indians with sources of dietary protein and animal by-products

When cattle and horses were introduced with the Spanish Inquisition...

- The Indians began managing grazing pastures for domesticated animals
- Colonists brought traditional cattle management to North America

Grasslands eventually were vastly replaced with...

- Row crops
- Planted pastures



Significance-Present

Forage Management

- Alternative options for grazing systems with
 - Low-water availability
 - Poor-soil quality

Wildlife Preservation

- Attractive to native birds, butterflies, and mammals

Biofuel

- Switchgrass has potential for ethanol production
 - Research is continually investigating varieties suited for ethanol
 - Local processing facilities and markets are lacking, stalling the adoption of these biofuels



Significance-Future

Increasing Population

- More Food
 - Can provide forage for meat animals
- More Fuel
 - Can be used to produce biofuel
- Urban Sprawl
 - Can be grown on less than desirable soils

Climate Changes

- Extreme temperature changes
 - Hardy in both extreme cold and extreme heat
 - High Water Use Efficiency



Big Bluestem- *Andropogon gerardii*



Height: 3-9 ft.

Drought Tolerance: Excellent

Seeds per Pound: 150,000

Seeding Rate: 5-10 lb/ac

Seeding Depth: ¼- ½ in.

Begin Grazing: 15-20 in.

Stop Grazing: 10-12 in.

Rest Period: 30-45 days

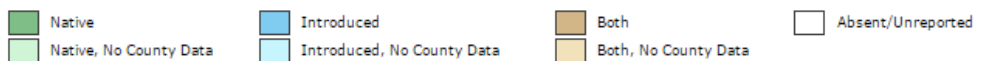
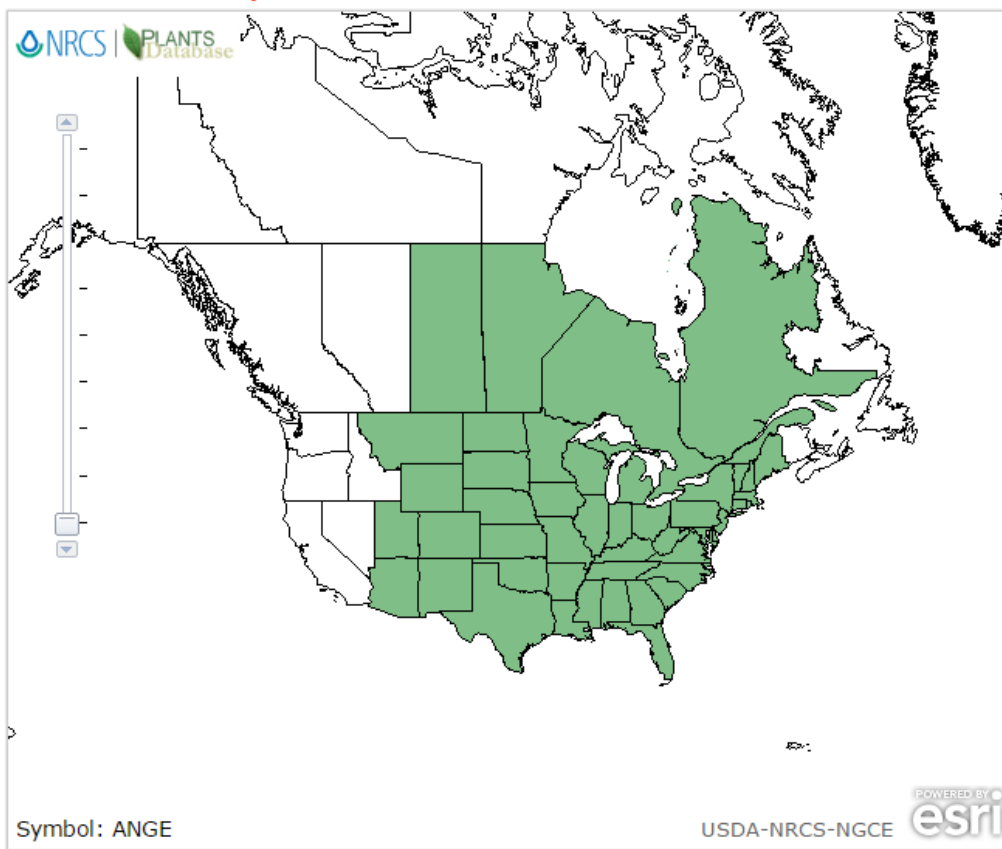
Animal Intake: Good

Quality: Good

Some Rhizomes



About our new maps

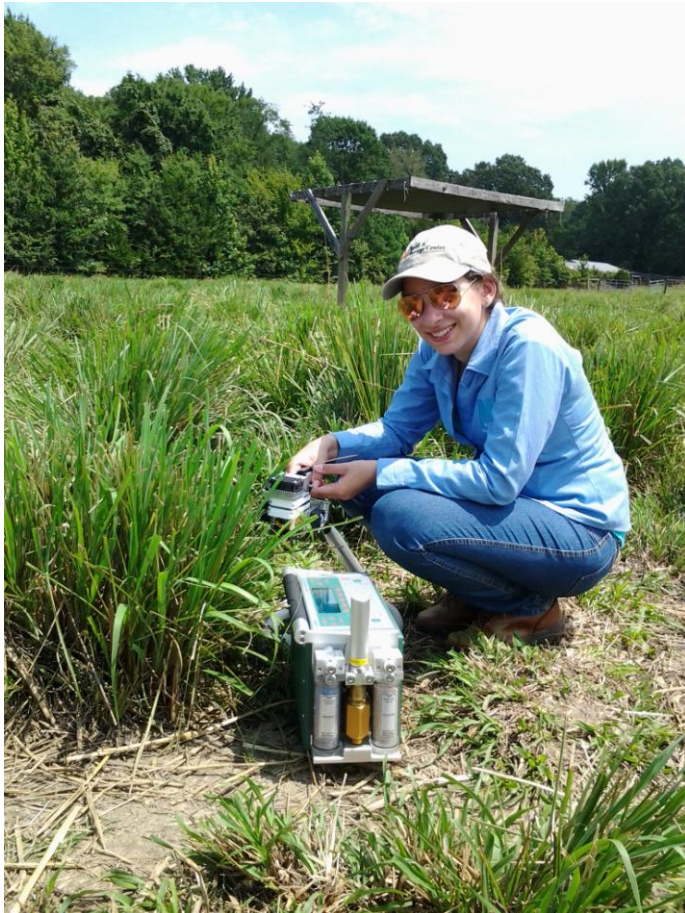


Native Status:





Eastern Gamagrass- *Tripsacum dactyloides*



Height: 3-8 ft.

Drought Tolerance: Excellent

Seeds per Pound: 7,200

Seeding Rate: 8-10 lb/ac

Seeding Depth: ½- 1 in.

Begin Grazing: 18-22 in.

Stop Grazing: 10-12 in.

Rest Period: 30-45 days

Animal Intake: Poor

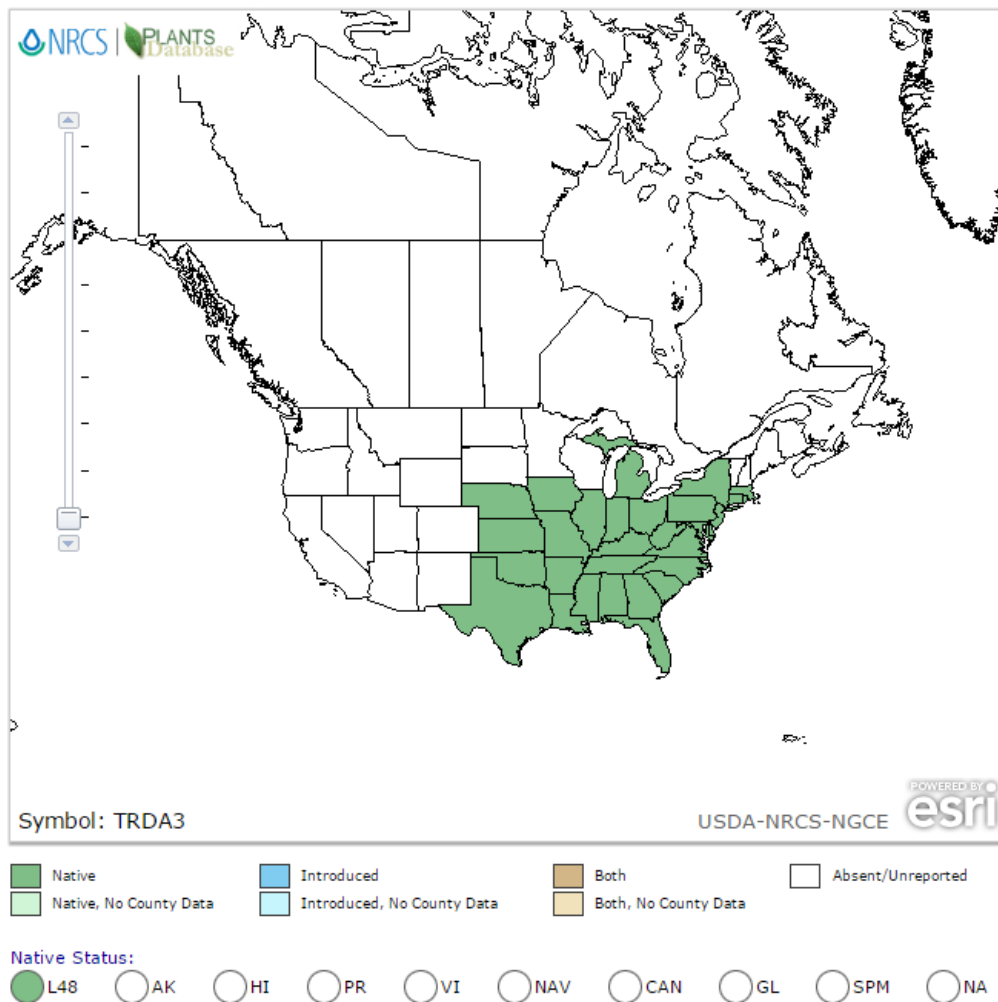
Quality: Good

Rhizomatous





About our new maps





Indiangrass- *Sorghastrum nutans*



Height: 3-7 ft.

Drought Tolerance: Excellent

Seeds per Pound: 180,000

Seeding Rate: 5-10 lb/ac

Seeding Depth: ¼- ½ in.

Begin Grazing: 12-16 in.

Stop Grazing: 6-10 in.

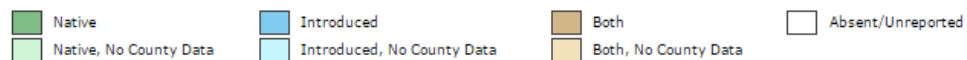
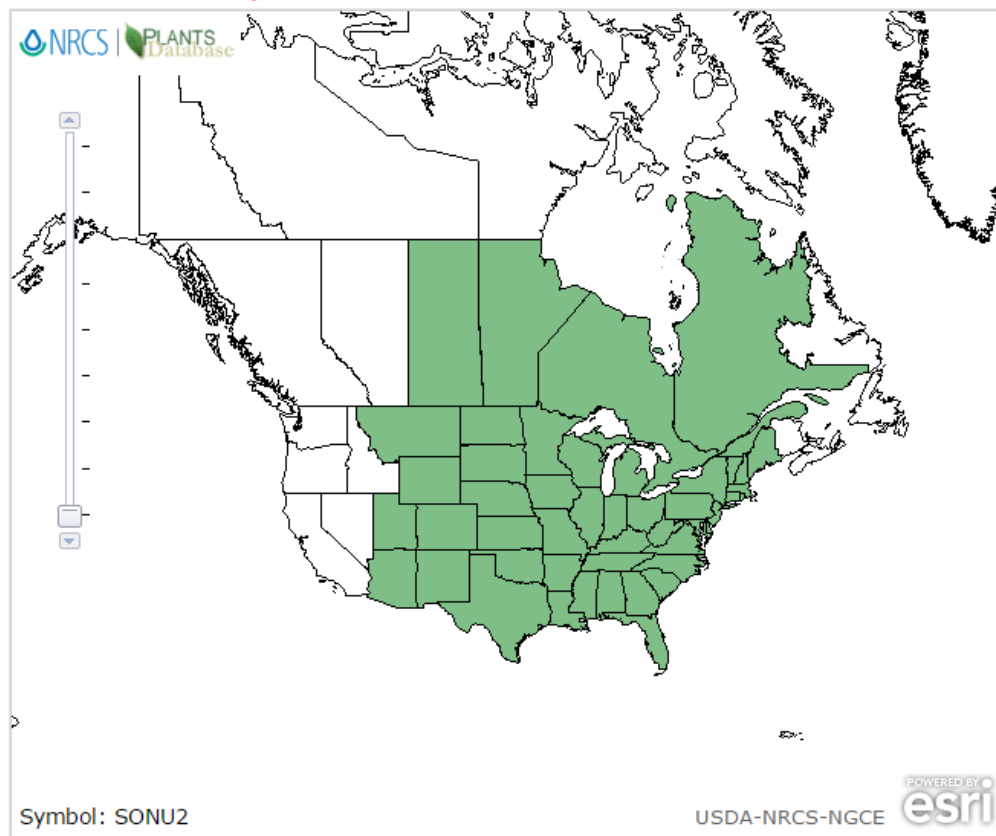
Rest Period: 30-40 days

Animal Intake: Good

Quality: Good



About our new maps



Native Status:





Switchgrass- *Panicum virgatum*



Height: 3-10 ft.

Drought Tolerance: Excellent

Seeds per Pound: 280,000

Seeding Rate: 5-8 lb/ac

Seeding Depth: ¼- ½ in.

Begin Grazing: 18-22 in.

Stop Grazing: 8-12 in.

Rest Period: 30-45 days

Animal Intake: Poor

Quality: Good

Rhizomatous

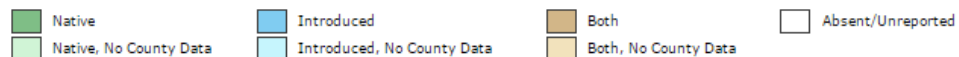
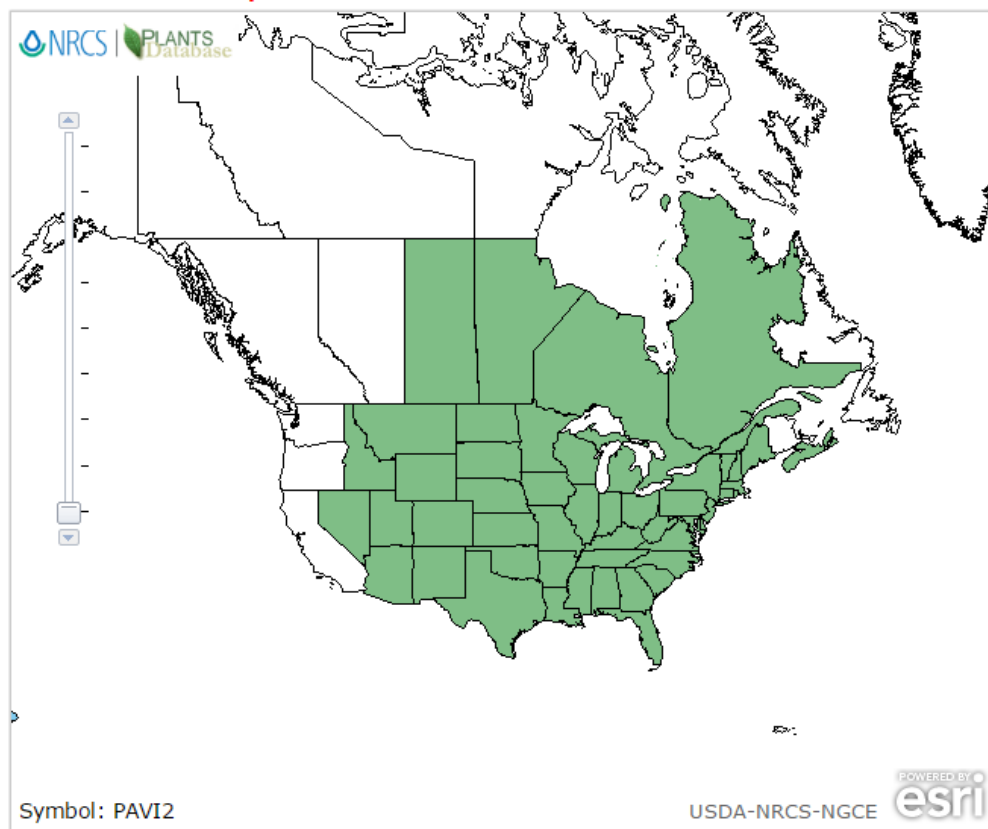
Also used for ethanol



<https://www.prairiemoon.com/seeds/grasses-sedges-rushes/panicum-virgatum-switch-grass.html>



About our new maps



Native Status:





Considerations

All of these species...

- Are most productive during the mid-summer
 - Good to pair with cool-season species to extend grazing season
- Mature quickly
 - As plants mature, forage quality rapidly decreases
 - Combat this by keeping plants vegetative
- Perform best under rotational stocking rather than continuous stocking
 - To prevent over grazing, which can damage the plants
 - To prevent under grazing, which will lead to quick maturation
- Establish slowly
 - Planting conditions are extremely important for stand success
 - Weed control is necessary for the first few years
 - Nitrogen fertilization can boost establishment
 - Once established, a healthy stand can last many years



Animal Intake

2010 Animal Performance

	Early Season		Full Season	
Grass	ADG (lbs)	Beef/Acre (lbs)	ADG (lbs)	Beef/Acre (lbs)
BB/IG	2.65	196	2.21	299
SG	2.21	189	1.65	289
EG	1.70	162	1.12	249

Waller, John C. "Nutritional Considerations & Herd Management with Native Warm-Season Grasses." Department of Animal Sciences- The University of Tennessee.
<http://www.uky.edu/Ag/Forage/Waller%20Nutritional%20Considerations%20KY%202012.pdf>



Other Species

Broomsedge Bluestem- *Andropogon virginicus*

- Matures very quickly
- Poor forage quality
- Used for wildlife and ornamental purposes



<http://iowawhitetail.com/>

Sideoats Grama- *Bouteloua curtipendula*

- High quality forage
- Erosion Control
- Can be grazed later into the Fall



http://en.wikipedia.org/wiki/Bouteloua_curtipendula

Little Bluestem- *Schizachyrium scoparium*

- Similar quality as Big Bluestem
- Shorter growth habit
- Prefers slightly basic soils





Introduced Warm-Season Grasses

Perennials

- **Caucasian Bluestem (*Bothriochloa bladhii*)**

- Bunch type grass
- Old World origin
- Fine-stemmed
- Propagated by seed
- Adapted below the PA-NY border
- Good yields & quality
- Good for reclaimed sites



https://courses.missouristate.edu/pbtrewatha/caucasian_bluestem.htm

- **Bermudagrass (*Cynodon dactylon*)-**

- creeping perennial grass
- propagated by sprigs
- Good quality
- typically not hardy for Ohio winters



<http://extension.missouri.edu/p/M181-12>



Introduced Warm-Season Grasses

Annuals

- **Forage Sorghum (*Sorghum bicolor*)-** annual upright bunchgrass, propagated by seed, high yielding, often used for silage
- **Sorghum x Sudangrass hybrids (*Sorghum bicolor*)-** annual upright bunchgrass, propagated by seed, rapid growth, high yielding, many uses as feed
- **Sudangrass (*Sorghum bicolor*)-** annual upright bunchgrass, propagated by seed, rapid growth, high yielding, many uses as feed
- **Pearl Millet (*Pennisetum americanum*)-** annual bunchgrass, propagated by seed, high yielding, many uses as feed, grows well in marginal soil
- **Crabgrass (*Digitaria sanguinalis*)-** annual creeping grass, propagates by seed, rapid growth, good for grazing and hay, grows well in marginal soil



Top: Sorghum x Sudangrass
FSG 208 BMR

Bottom: Angus heifers grazing
crabgrass 'Red River'





Warm-Season Legumes

Perennials

- **Sericea Lespedeza (*Lespedeza cuneata*)**- grows well on marginal soils, drought tolerant, can be used for grazing or hay, may help control intestinal parasites

Annuals

- **Annual Lespedeza (*Kummerowia striata*)**-possesses the traits of perennial lespedeza, reseeds each year
- **Cowpea (*Vigna unguiculata*)**- grows well on marginal soils, drought and heat tolerant, good quality forage
- **Soybean (*Glycine max*)**- forage types are available, may be used for rotational grazing, green chop or hay



<http://articles.extension.org/pages/19420/goat-pastures-sericea-lespedeza>

Sericea lezspedeza has high tannin content which may deter cattle,
but goats don't seem to mind.



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Questions?

