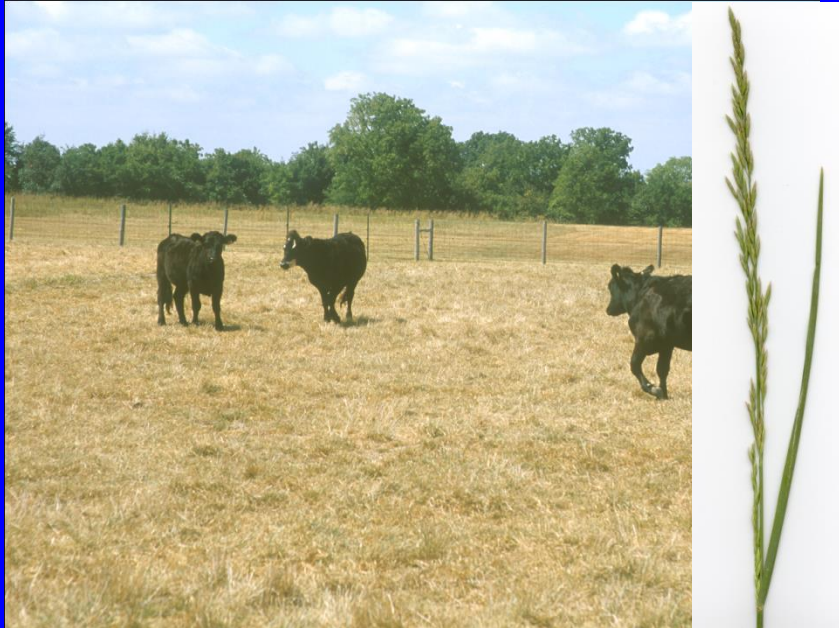


# **What to do when Pasture runs Short**

**Robert Kallenbach  
Division of Plant Sciences  
University of Missouri**

# How Drought Changes the Pasture



**Obviously, less growth**

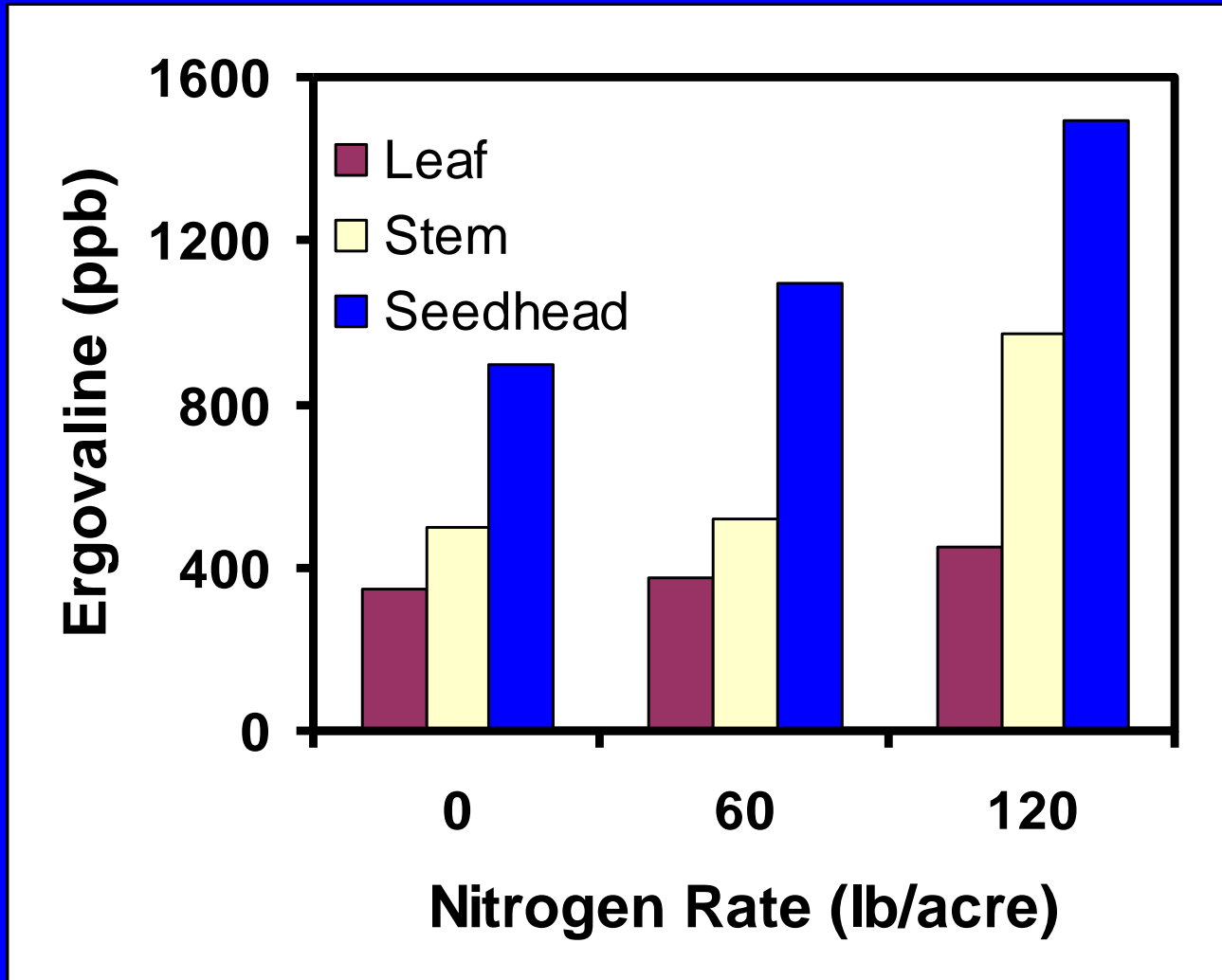
**Seedheads develop early**

**Leaf quality usually good  
but grasses are stemmy**

**Nitrates tend to  
accumulate in plants**

**Endophyte infected tall  
fescue becomes more  
dominate**

# Ergovaline Concentration



**What can I plant that will  
grow in a total drought?**

**Nothing**

# Managing Pasture During a Drought

## Short term

**Monitor pasture supply closely – Avoid overgrazing**

**Catch it early – Best results with supplement are by extending limited pasture**

**Reduce stocking rate if conditions are severe**

## Long term

**Include more deep-root legumes in pastures**

**Convert about 25 to 30% of acres to a warm-season grass**

**Purchase (or keep) a reserve supply of feed when prices are favorable**

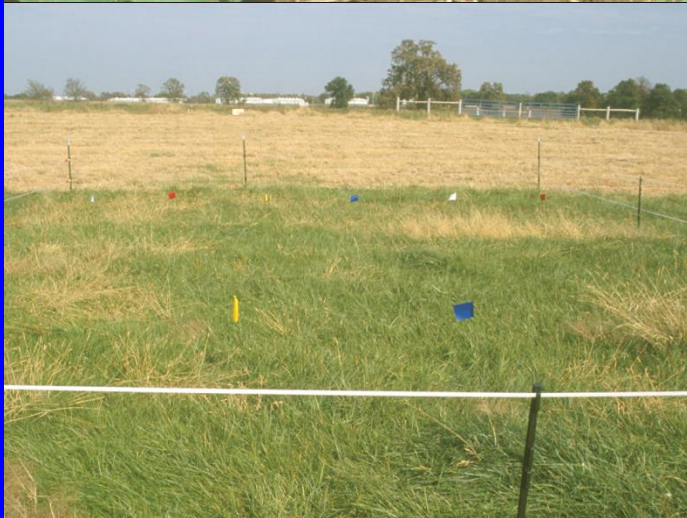
**Develop a simple rotational grazing program**

# What Happens to the Pasture Once it Rains?



## Summer annual plants jump

- Growth of crabgrass, barnyardgrass, annual lespedeza and foxtails is rapid
- Crabgrass and lespedeza forage quality best of this bunch
- Forage quality can be good if grazed hard
- Seedheads develop quickly foxtails



**Nitrate content initially high — then declines**

**Deep-rooted legumes come back more quickly than cool-season grasses**

# What to Do Once it Rains

Check for nitrates on heavily fertilized pastures

Mow seedheads

Look for long-term pasture damage

- Summer annual weeds are a good indicator
- *Note: many "dead" pastures recover*

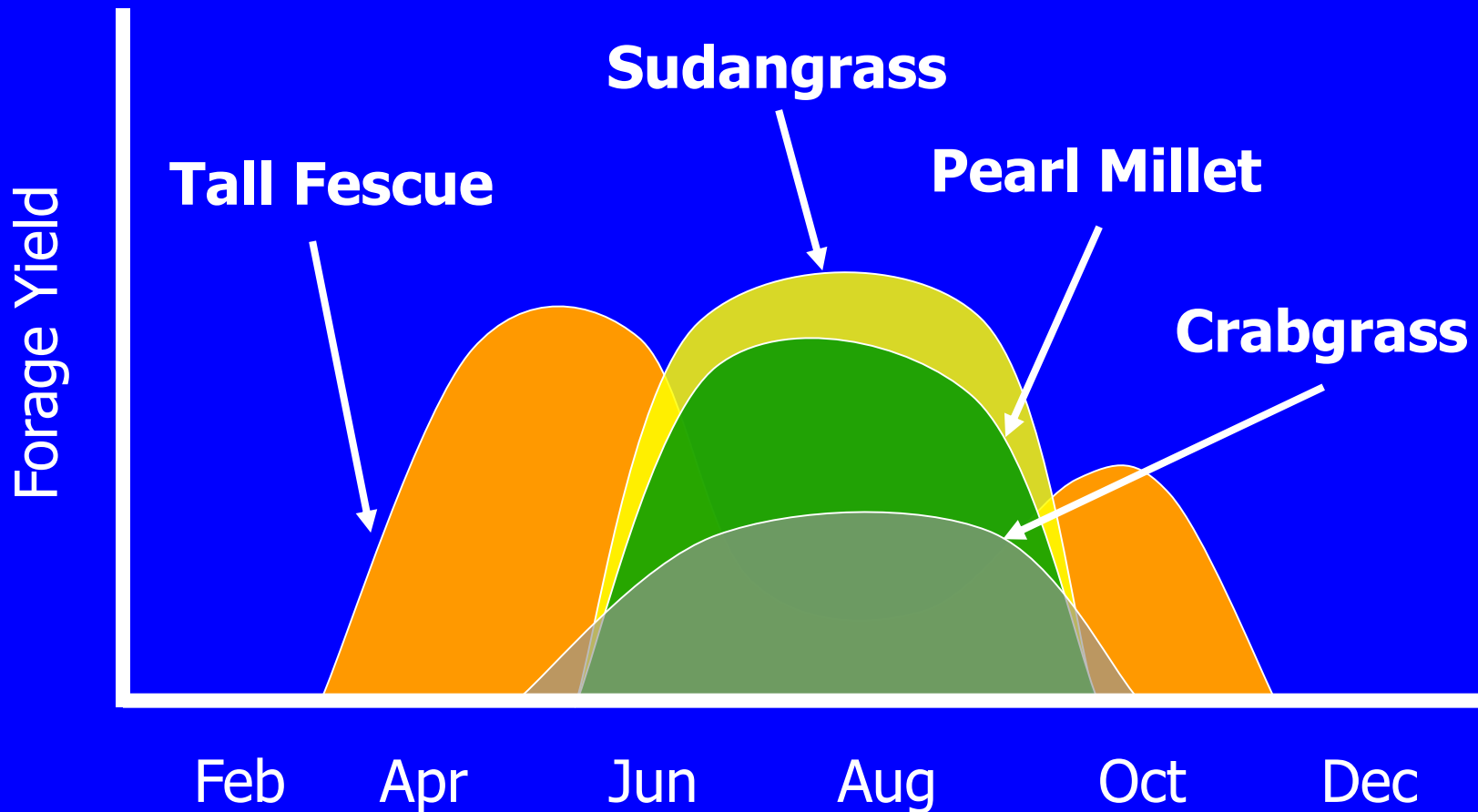
Use it as an opportunity to renovate weak pastures or highly infected K-31 tall fescue

Plant an emergency forage?





# Emergency Annual Warm Season Grasses





# **Sudangrass and Pearl Millet**



**Maximum growth  
from June through  
August**

**Forage yields of 5 to 7  
tons/acre possible**

**Drought tolerant**

**Nice transitional  
crops or emergency  
pastures**



# Over mature Sudangrass





# Sudangrass Stubble after Grazing





# Sudangrass Ready for Grazing





# Sudangrass Clipped Too Closely



# Grazing and/or Clipping Height Critical

Stubble height	Yield	Leaf	Stem
inches	-- tons per acre --		
1	5.4	4.3	1.2
6	6.0	4.8	1.2
10	6.7	6.4	0.3

# Prussic Acid Poisoning



**Caused by cyanide in  
immature or frost  
damaged leaves**

**Avoid grazing until  
plant reaches 24"**

**Avoid for 14 days  
after killing frost**

**Present only in sorghums - No problem for pearl millet**



# **Sudangrass**

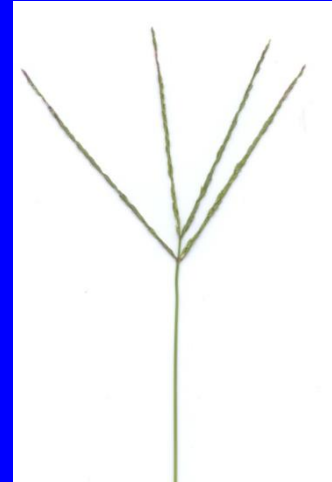
- **Seeding rate: 30 to 40 lb/a broadcast – 20 to 25 lb/a drilled**
- **Seeding date: May**
- **N fertilization: 60 to 90 lb/a at planting. 50 to 75 lb/a/cutting thereafter**
- **Harvest management: Graze or clip when the forage is 2.5 to 3.5 ft. tall. Leave a 8 to 10 inch stubble.**
- **DO NOT GRAZE IF LESS THAN 24 INCHES TALL or AFTER FROST**

# Pearl Millet

- **Seeding rate: 20 to 30 lb/a broadcast – 15 lb/a drilled**
- **Seeding date: May**
- **N fertilization: 60 to 90 lb/a at planting. 50 to 75 lb/a/cutting thereafter**
- **Harvest management: Graze or clip when the forage is 2.5 to 3.5 ft. tall. Leave a 8 inch stubble.**

# Crabgrass

- Medium yield potential
- Good persistence if reseeding is managed properly
- Good tolerance to:
  - heat stress
  - poor drainage
  - poor soil fertility
- Fair tolerance to:
  - drought
- Forage quality good if managed



# Tillage Enhances Crabgrass Establishment



**Good crabgrass stands start with light tillage in early May**

# Livestock Gains from Crabgrass Pasture

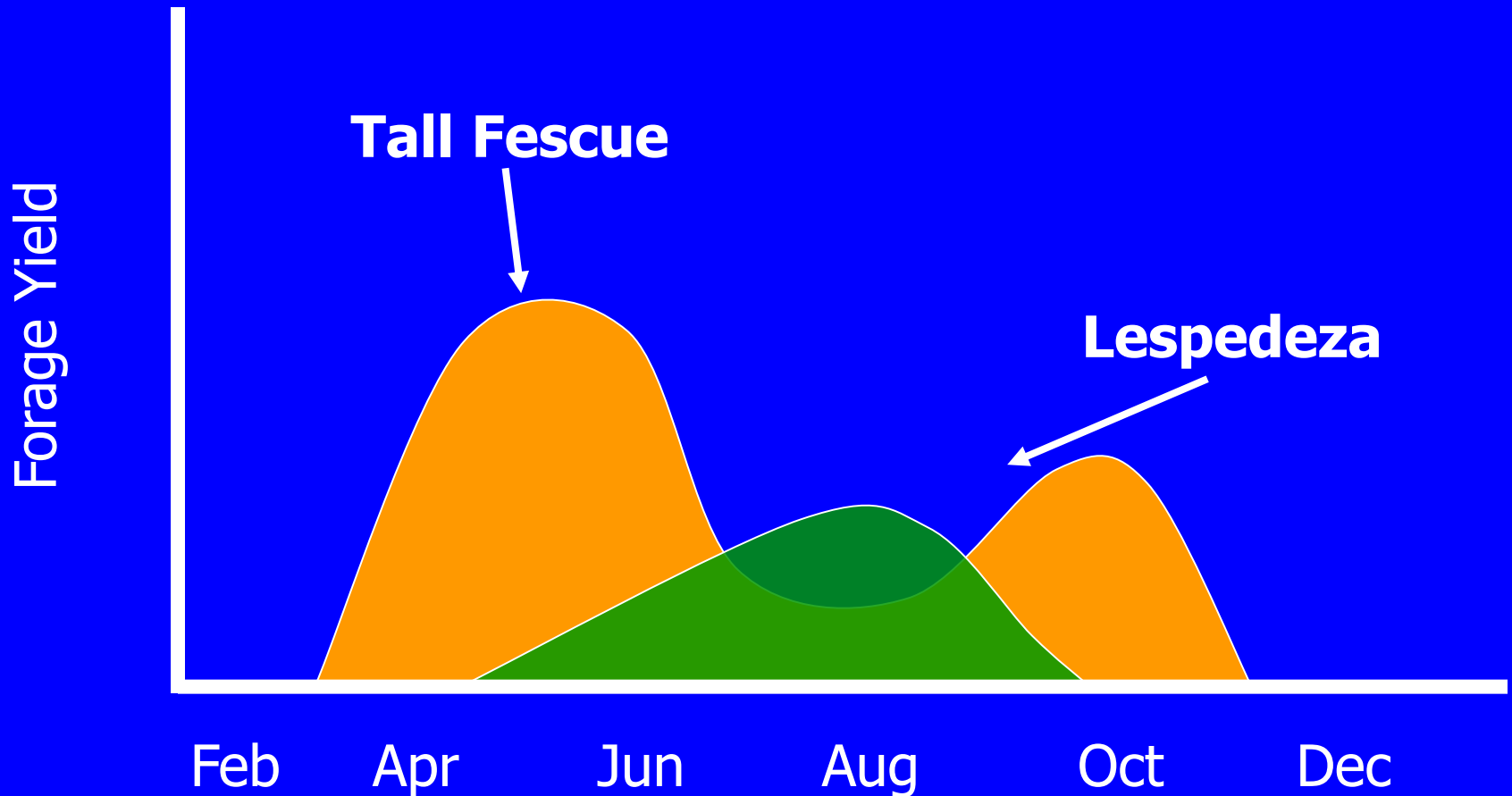
Crop	ADG	Gain
	lb/d	lb/a
Tall Fescue	0.8	76
Crabgrass	1.6	264

Grazing period from 17 June to 31 August

# Crabgrass

- Capable of producing 3 to 4 tons of feed/acre in mid to late summer
- Seeding rate: 4 lb/a broadcast – 3 lb/a drilled
- Seeding date: Anytime except Aug. to Dec.
- Fertilization: 40 lb/a N at planting followed by 60 lb/a after the first grazing. P and K to test.
- Harvest management: Begin grazing when it reaches 8 to 10 inches in height. Leave a 3 inch stubble for maximum regrowth.
- Remove livestock 3 to 4 weeks before frost to allow reseeding or let first crop go to seed.

# Annual Lespedeza





# Annual Lespedeza

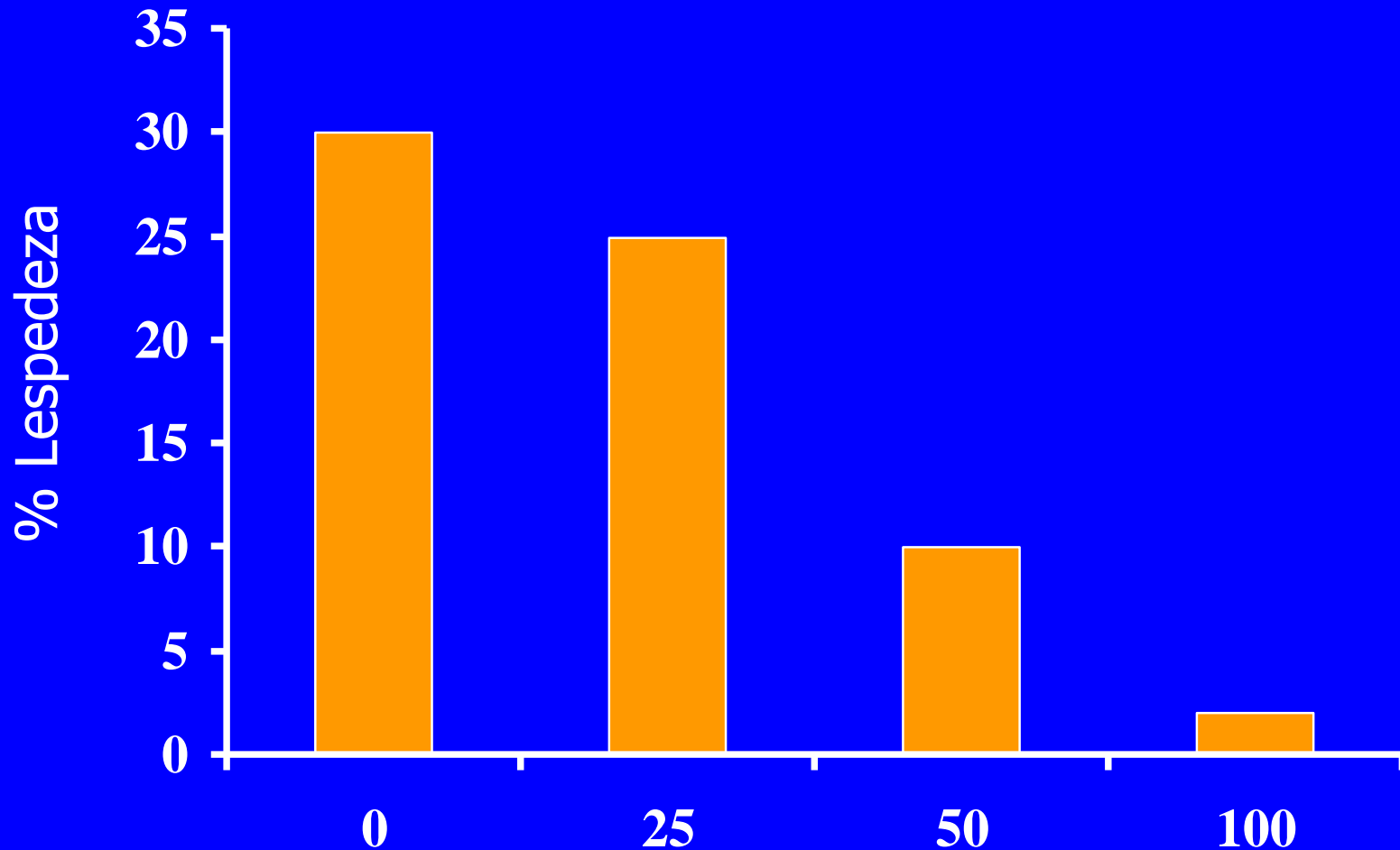
- Medium to low yield potential
- Good persistence if reseeding is managed properly
- Good tolerance to:
  - poor drainage
  - low soil fertility (+)
  - heat stress
  - drought
- Forage quality good to excellent if managed



# Lespedeza Establishment



# Nitrogen Fertilization of Annual Lespedeza/Tall Fescue Mix





# Annual Lespedeza





# Early Season Grazing Important



# Grazing and/or Clipping Height Matters

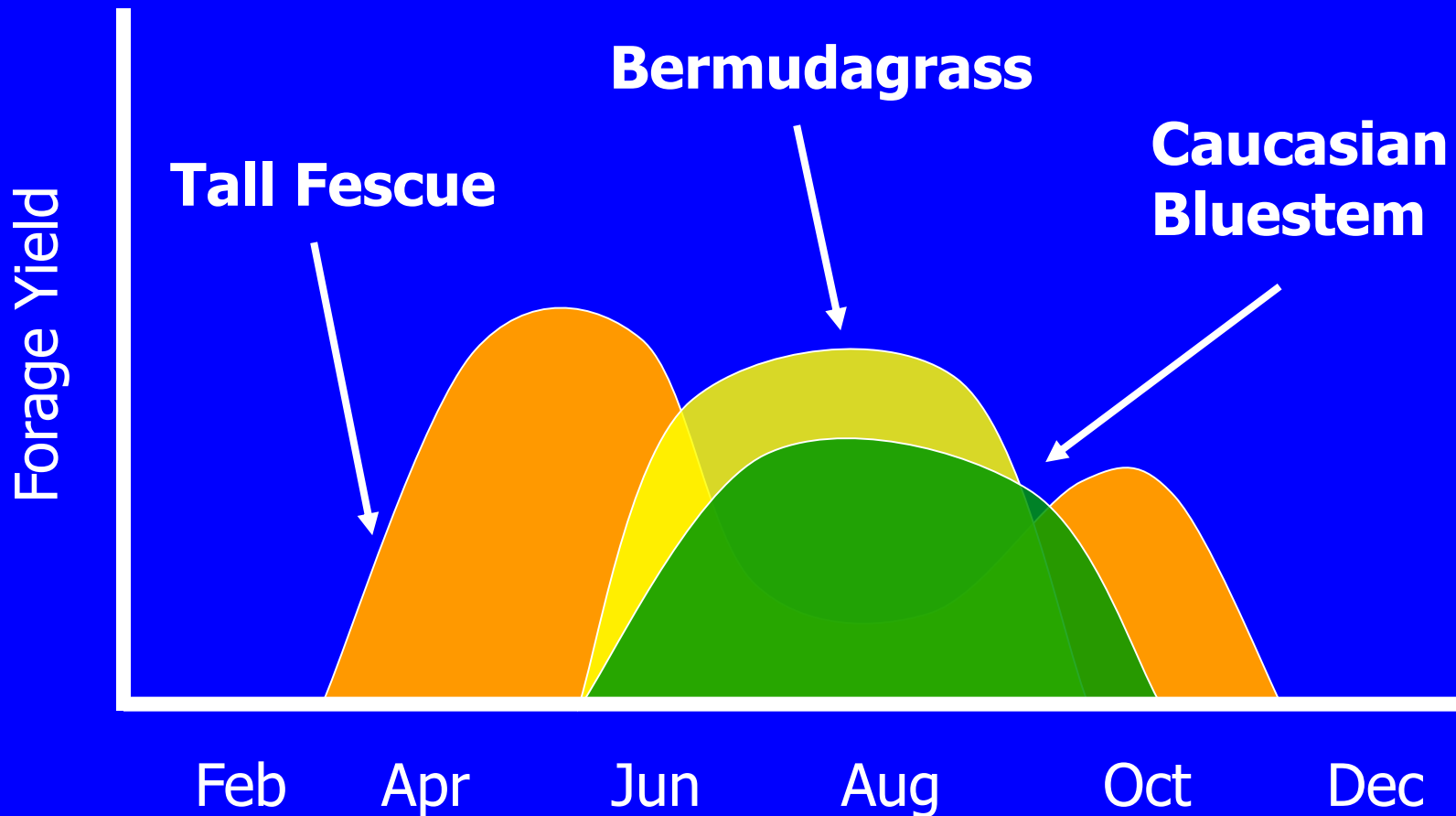
Stubble height	Yield
inches	tons/acre
2.5	1.9
5	2.4

# **Annual Lespedeza**

- **Capable of producing 1.5 to 2.5 tons of feed/a in mid to late summer**
- **Forage quality 85% of that for alfalfa**
- **Seeding rate: 15 lb/a broadcast – 10 lb/a drilled**
- **Seeding date: Late February through March**
- **Fertilization: P and K to soil test. AVOID NITROGEN**
- **Harvest management: Graze or clip when the forage is in the early bloom stage. Leave a 3 to 4 inch stubble for best regrowth. Allow to reseed by avoiding use after mid-September.**

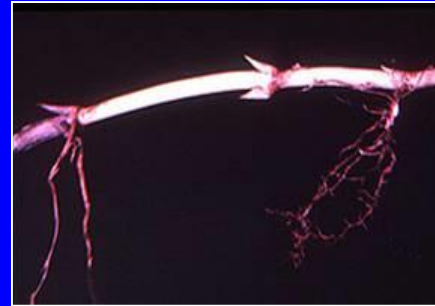


# Introduced Perennial Warm Season Grasses



# Perennial Warm Season Grasses

- Bermudagrass
  - High yield potential
  - Fair to good persistence depending on cultivar
  - Good tolerance to:
    - heat stress
  - Fair tolerance to:
    - drought
    - poor soil fertility
    - poor drainage
    - cold temperatures
  - Forage quality good if managed



# Temperature Requirements

- Many cultivars can not withstand temperatures below 15°F
- Cold tolerance is the main limitation of bermudagrass in Missouri



# Forage Yield

Cultivar	1996	1997	1998	Mean
	----- lb. per acre -----			
Ozark	6,707	11,189	11,704	9,867
Midland 99	5,980	11,005	11,119	9,368
Tifton 44	5,615	10,219	9,931	8,588
Hardie	4,580	7,622	8,366	6,856
Guymon	4,116	7,233	7,048	6,132
LSD (0.05)	1,244	1,059	1,532	992

# Bermudagrass Reproduction

- Most forage types are hybrids that produce few viable seeds
- Most forage types are sprigged not seeded
- Establishment takes about 1 year from sprigging



# What is a “Sprig”?



- Sprigs are pieces of plant crowns, roots, stolons and rhizomes
- Viable sprigs will have a minimum of 4 nodes
- Once in the ground, sprigs develop new plants



# Planting Bermudagrass

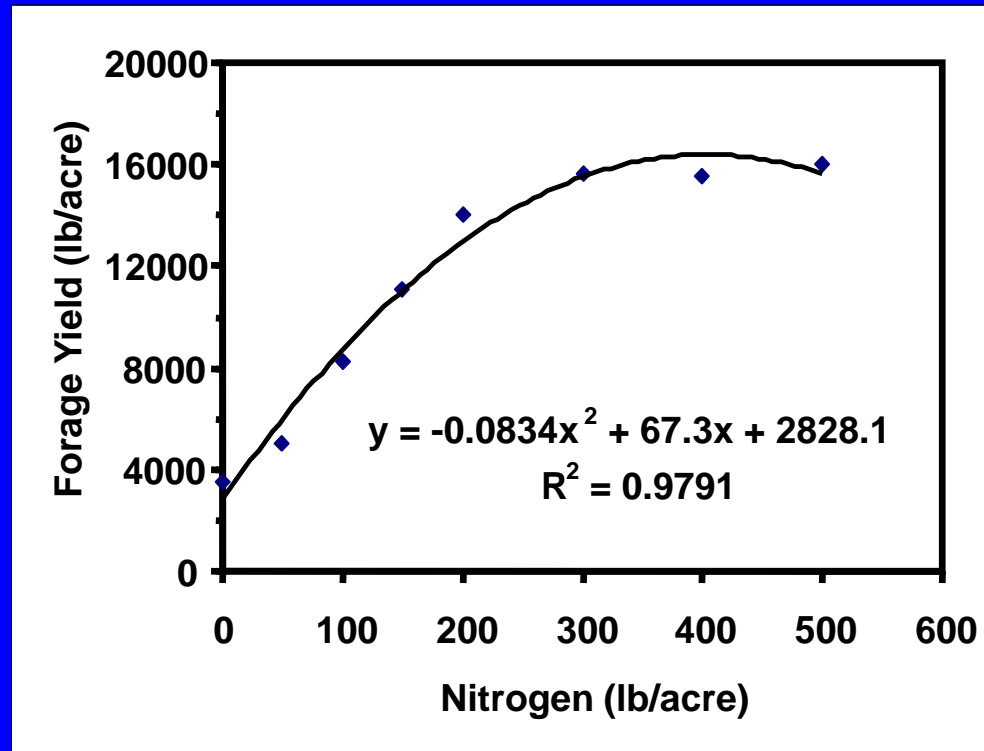


- Typically planted at 25 to 40 bu./acre
- Establishment period longer than many cool-season species
- Weed control at establishment critical
- 30 to 40 lb/acre of N at planting is useful



# Soil Fertility

- Highly responsive to N
  - Needs about 45 lb of N per ton of forage
  - Nearly linear increases in forage production up to 300 lb/acre of N
  - Split applications most effective
- Removes about 13 lb of P per ton of forage removed
- Removes about 50 lb of K per ton of forage removed



# Perennial Warm Season Grasses

- Old World Bluestems (Caucasian)
  - Medium yield potential
  - Good persistence
  - Good tolerance to:
    - heat stress
    - drought
    - poor soil fertility
    - cold temperatures
  - Poor tolerance to:
    - poor drainage
  - Forage quality good if managed



# Establishment of Caucasian Bluestem

- Removal of existing forage, especially E+ tall fescue, is important for success
- Most fields are established using conventional tillage
- Seed are very light and do not flow well through many drills
- Seeding depth should be no deeper than 1/4 inch

# Management of Caucasian Bluestem

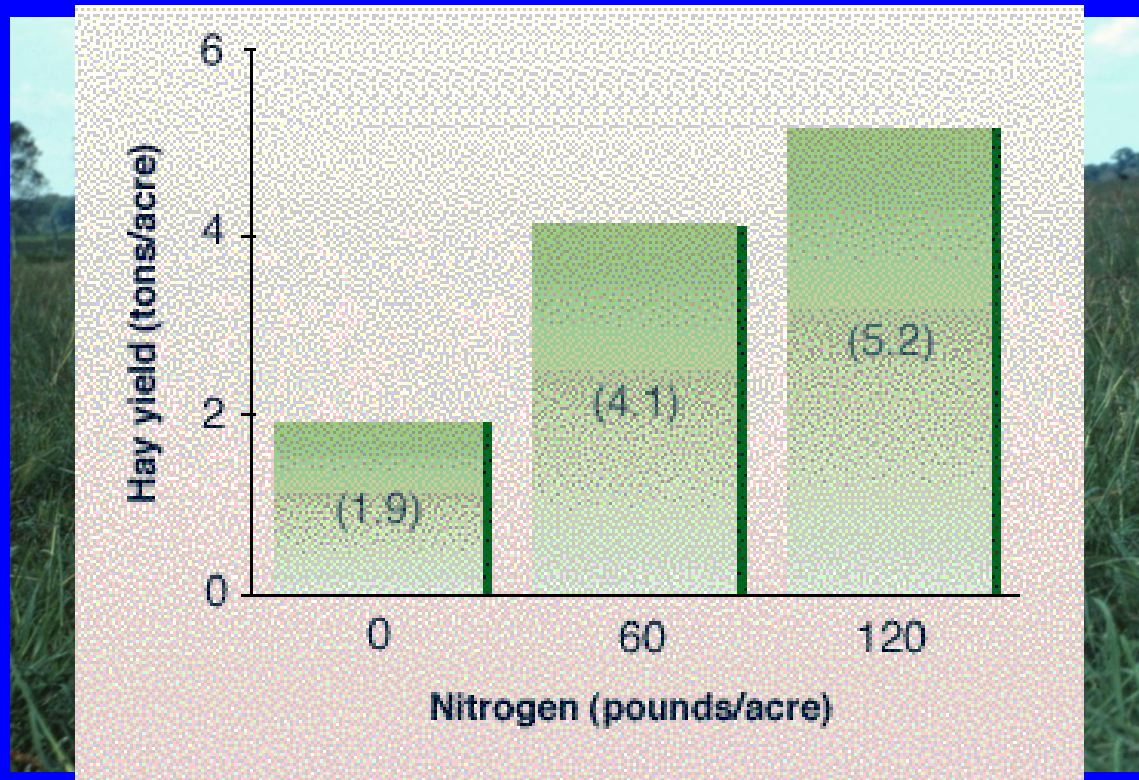
- Initial grazing height of 6 to 8 inches
- Remove stock when 3 inches of existing forage remain
- Use heavy grazing pressure to keep it vegetative



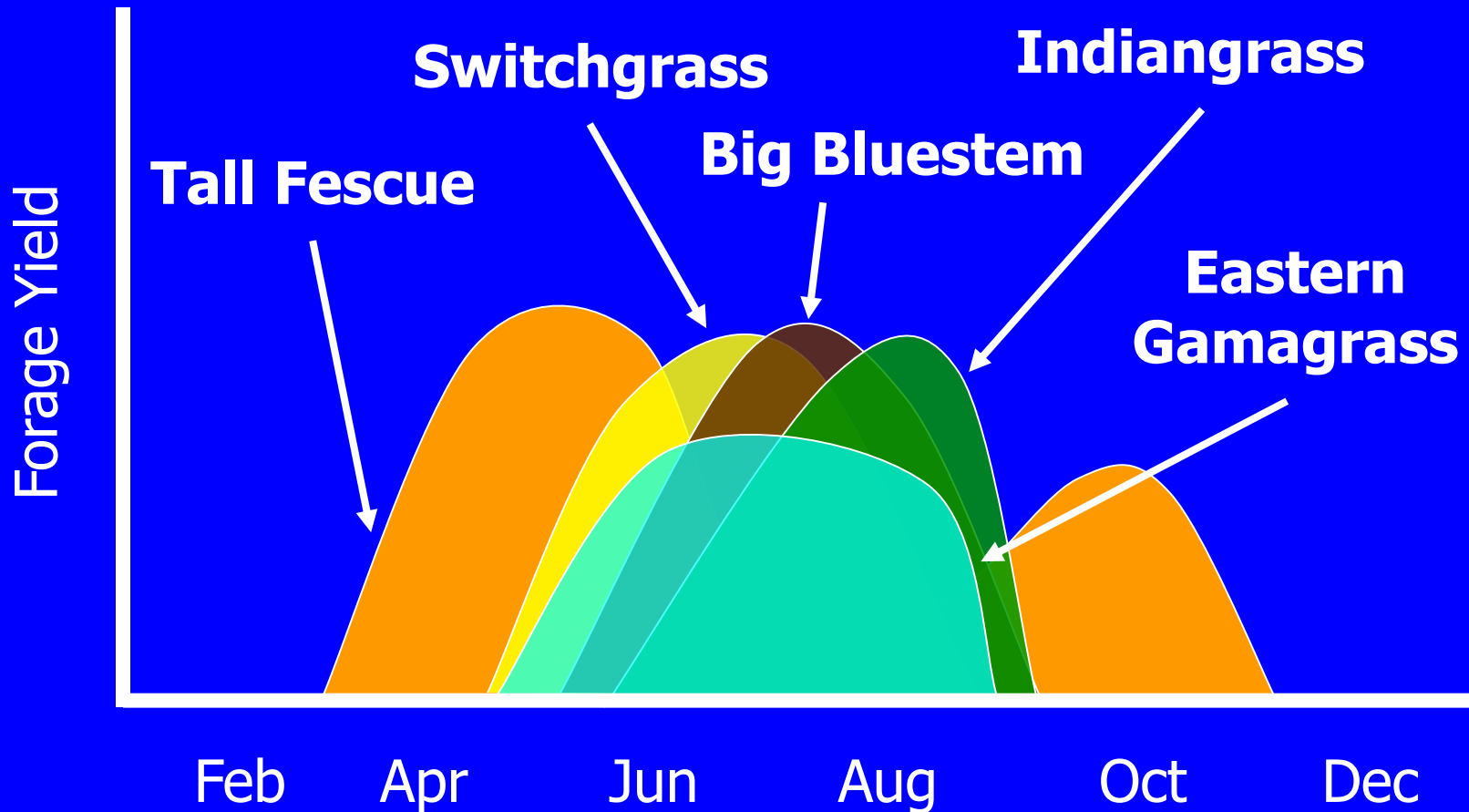


# Management of Caucasian Bluestem

- Forage quality drops quickly if it is allowed to mature
- Keep fields clean to speed up spring growth
- Avoid grazing after 15 Sept
- 60 lb/acre of N applied in early May



# Native Warm Season Grasses



# Perennial Warm Season Grasses

- Switchgrass
  - Medium to high yield potential
  - Good persistence
  - Native bunchgrass
  - Graze no shorter than 6 in.
  - Good tolerance to:
    - heat stress
    - drought
    - poor soil fertility
    - poor drainage
    - cold temperatures
  - Forage quality good if grazed early



# Perennial Warm Season Grasses

- Big Bluestem
  - Medium to high yield potential
  - Good persistence
  - Native bunchgrass
  - Slower to establish
  - Graze no shorter than 6 in.
  - Good tolerance to:
    - heat stress
    - drought
    - poor soil fertility
    - poor drainage
    - cold temperatures
  - Forage quality good if managed





# Perennial Warm Season Grasses

- Indiangrass
  - Medium to high yield potential
  - Good persistence
  - Native bunchgrass
  - Slower to establish
  - Graze no shorter than 6 in.
  - Good tolerance to:
    - heat stress
    - drought
    - poor soil fertility
    - cold temperatures
  - Fair tolerance to:
    - poor drainage
  - Forage quality good if managed



# Perennial Warm Season Grasses

- Eastern Gamagrass
  - High yield potential
  - Good persistence
  - Native bunchgrass
  - Very slow to establish
  - Graze no shorter than 6 in.
  - Good tolerance to:
    - heat stress
    - drought
    - poor drainage
    - cold temperatures
  - Fair tolerance to:
    - low soil fertility
  - Forage quality good to excellent if managed



# Establishment of NWSG

- Removal of existing forage, especially E+ tall fescue, is important for success
- NWSG seeds, except switchgrass, require specialized equipment for planting
- Seed depth critical
- Weed control...Plateau going off the market...replaced by Journey
- Patience needed

# Management of NWSG

- Initial grazing height of 18 inches
- Remove livestock when 6 to 8 inches of existing forage remain
- Avoid grazing after 1 Sept
- 60 lb/a of N applied in early May





# Management of NWSG

- Burning a good tool but can be over utilized
- Idea is to control cool season species
- About 1" of new growth is ideal
- Fuel load "carries" the fire



# Okay...Which one for my farm?

- Where is your farm?
- Is “double cropping” important for you?
- Is wildlife a farm objective?

