



# Growing Season Burns:

A practitioner's perspective on invasive species control with summer prescribed fire

WARNING

# Objectives

- Background of local prairie ecosystem and why fire belongs
- What is a growing season burn and when?
- Why burn in the growing season?
- Positives/Negatives
- Invasive control applications
- Lessons learned
- Observations and suggestions
- Research (OSU/KSU) Serciea, cedar, etc...

# Prairie Ecosystem

- Central KS – Mixed Grass prairie
- Less than 5% of unbroken prairie remains in the US
- Consistent threat of invasives: woody, herbaceous, and human



# Why do we use fire?

- **Natural disturbance that prairie species are adapted too**
- **Very effective tool when used correctly**
- **Cost effective when applied to larger tracts that have lower inputs**

# What is a summer burn?

- Burning when warm season herbaceous material is actively growing
- Typically Summer to early Fall
  - Late May through September



# Why growing season burns?

- Timing:
  - Extends our ability to burn by opening up more available burn days
  - Historically: Lightning & Native American fires occurred throughout the year including the growing season
  - When are most burn bans issued?
  - Smoke Management - spreading smoke impacts out over several months

- John Weir (OSU)

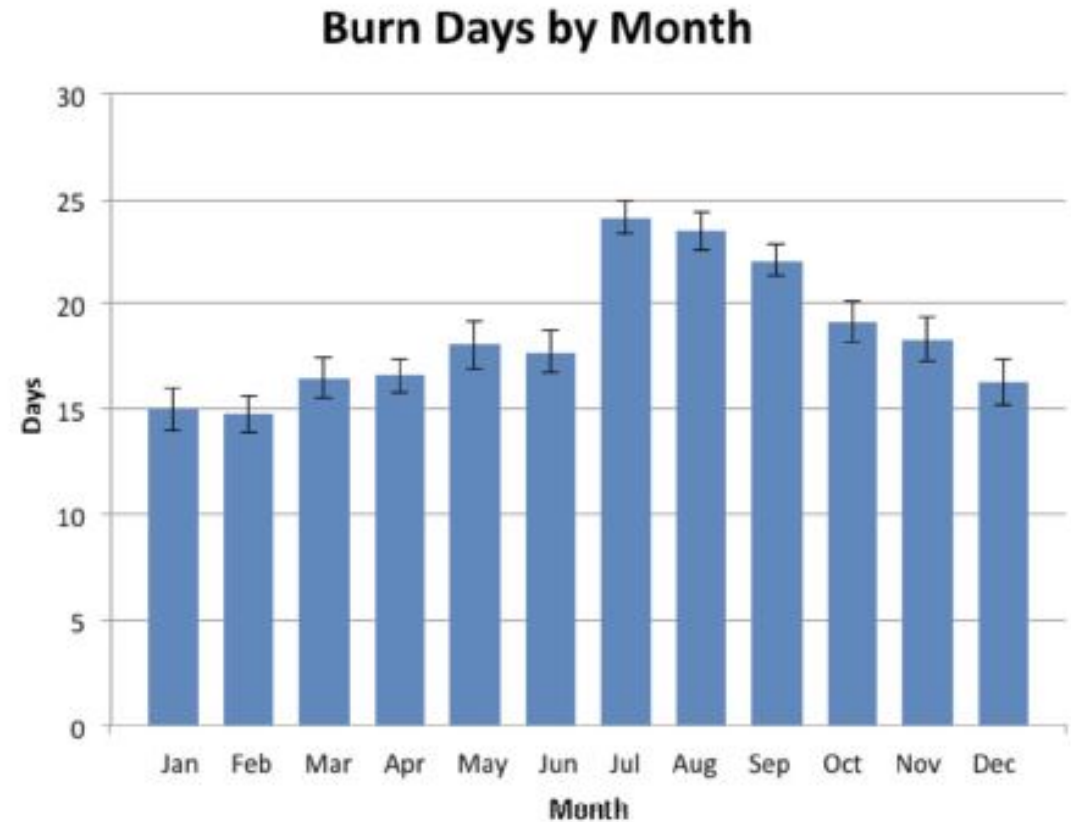


Figure 1. Average number of days from 1994 to 2007 available to conduct prescribed burns by month in Oklahoma. Note that the traditional burn period of February, March, and April had fewer available burn days compared to July, August, and September. If burning was conducted year-around or in more than one season, more days would be available for burning and the most optimum days for achieving goals and minimizing risk could be utilized. For more information about burn times see Oklahoma Cooperative Extension Publication NREM-2885 *The Best Time of Year to Conduct Prescribed Burns*.

# Why Growing season burns?

- **Vegetation**

- Prairie ecosystem being invaded by woody species, best time to damage/kill woody sp is while they are growing (post bud to full leaf out)
  - High moisture content of growing vegetation causes a Low intensity fire behavior with a High residence time (and a lot of smoke!)



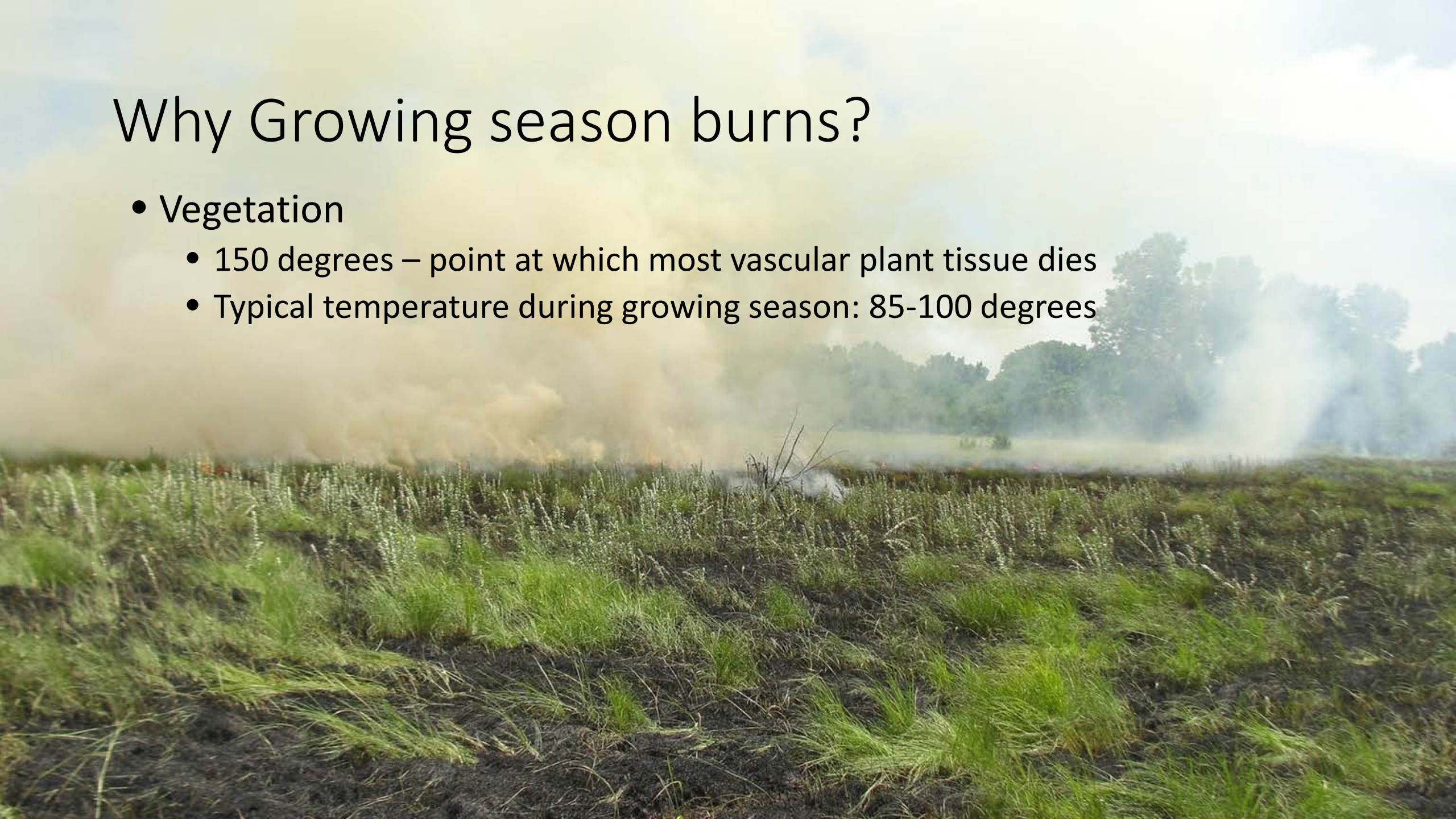




# Why Growing season burns?

- Vegetation

- 150 degrees – point at which most vascular plant tissue dies
- Typical temperature during growing season: 85-100 degrees



# Why Growing season burns?

- **Vegetation**

- Excellent woody top kills
- Expect regrowth from deciduous roots

# Why Growing season burns?

- Vegetation...continued
  - OSU Research shows native plant communities were unaffected by fire season
    - Little Bluestem (a presumed fire sensitive NG), was strongly influenced by precipitation, and unaffected by season of burn
- Grassland Recovery
  - Soil Moisture has been identified as the most critical factor affecting plant recovery following a fire.
  - The later the burn the less warm season regrowth that will occur going into fall/winter. May open a window for cool seasons if they are in the area.



Before



After



January



9/16/15 – 79 days & 8.53" precip after burn

# Why Growing season burns?

- **Vegetation...continued**
  - **Summer burns can use natural fire breaks without much need for prep**
  - **Continuous green mowed areas will also stop summer fire**



# Why Growing Season Burns?

- Conditions

- Winds are more consistent in direction – typically South during summer
  - Can burn with a stronger wind (if needed in the prescription)
- More Smoke due to higher moisture content in Veg
  - Smoke dispersion is typically better during summer
- RH is higher due to plant transpiration = lower fire intensity
  - Risk of escape or spot fire is reduced.

# Spot fire risk

- Lower fire intensity – easier to extinguish in most flashy fuels
- Dead fuels are easier to ignite thus air born embers can cause problems















# Crew impacts

- Usually a lower stress environment (low activity)
- Lower burn risks = might be able to safely accomplish with fewer crew
- More opportunity for pictures and water breaks!
- Increased crew monitoring and awareness
- Rotate duties (igniter)
- Hydrate!
- Lengthy days – crew and managers need to be on board OT can be expected



# Public perception





# Wildlife Impacts

- Increased forage quality and extend quality in late season
- Patchy burns create a diverse area of plant composition and structure
  - Great for quail needing dense cover for nesting in close proximity to forb rich areas with some bare ground





# Wildlife Impacts

- Impromptu Food plots – pollinators, forage quality



# Wildlife Impacts

- Mortality rates can be high for certain reptiles, i.e. glass lizards



# Wildlife Impacts

- Can impact certain species, however, weigh consequences of not burning vs. the possibility of a small amount of mortality.
  - Is the habitat loss more detrimental than the possible mortality of a few individuals. OSU research claims minimal, if any mortality









# Invasive Controls

- Eastern Red Cedar (full kill)
  - Summer is the best time to kill cedars
  - Usually fully engulfs with minimal head/flank fire
  - Cedar groves can often result in a prairie “crown fire”
  - Can cause spot fires
  - Tough to save cedar windbreak plantings no matter the size



















# John Weir (Oklahoma State University)

- Fire science dept has done extensive research on cedar controll with summer prescribed fire.
- OSU has numerous fire publication on fire impact studies from barb wire to reptiles.

## Burning in the Growing Season



**E-1025**

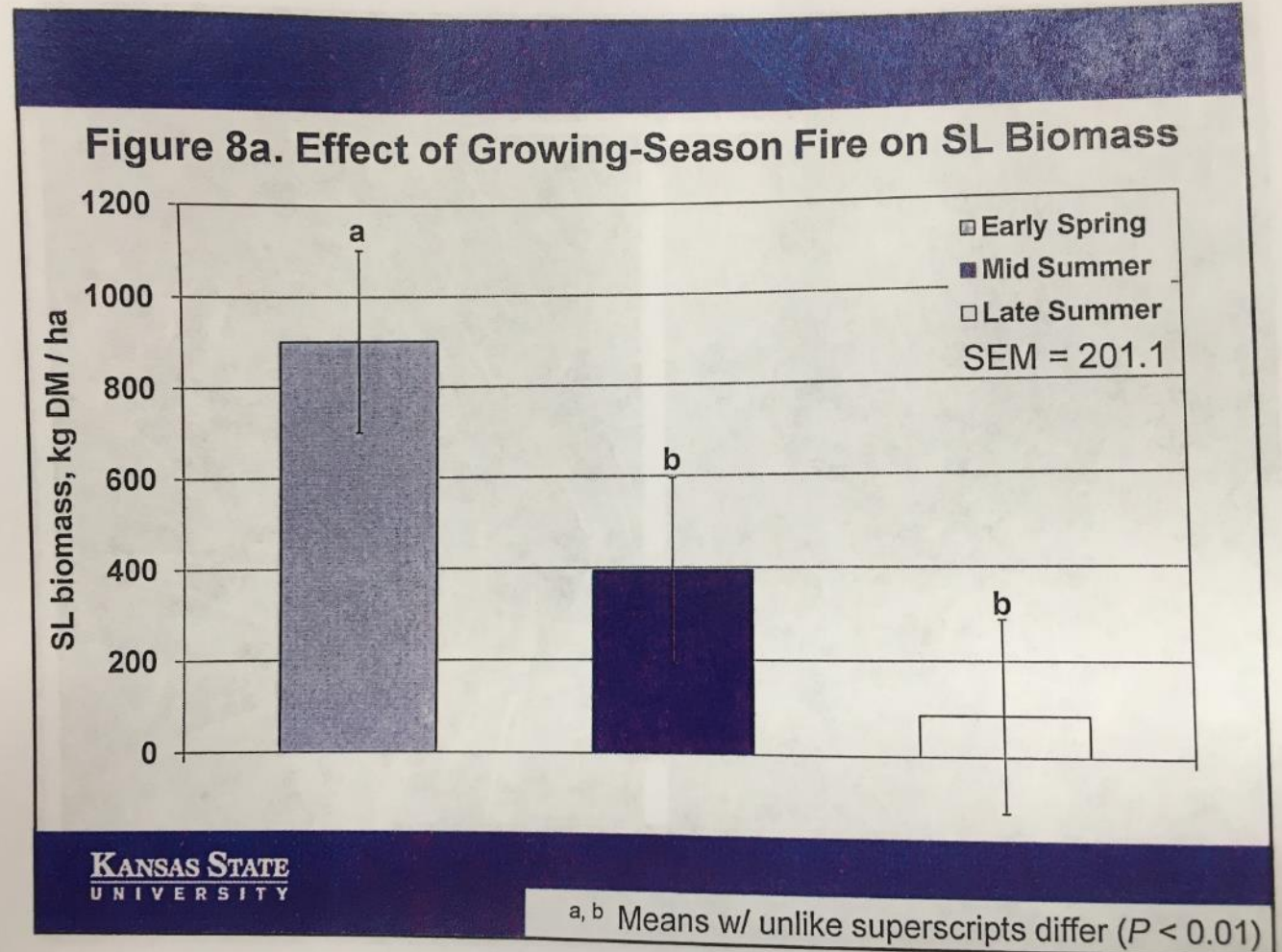
Oklahoma Cooperative Extension Service  
Division of Agricultural Sciences and Natural Resources  
Oklahoma State University

# Invasive Controls

- Sericea Lespedeza
  - Late blooming species
  - KC Olson – Kansas State University research
    - Promotes July – September fire for SL control

# Invasive Controls

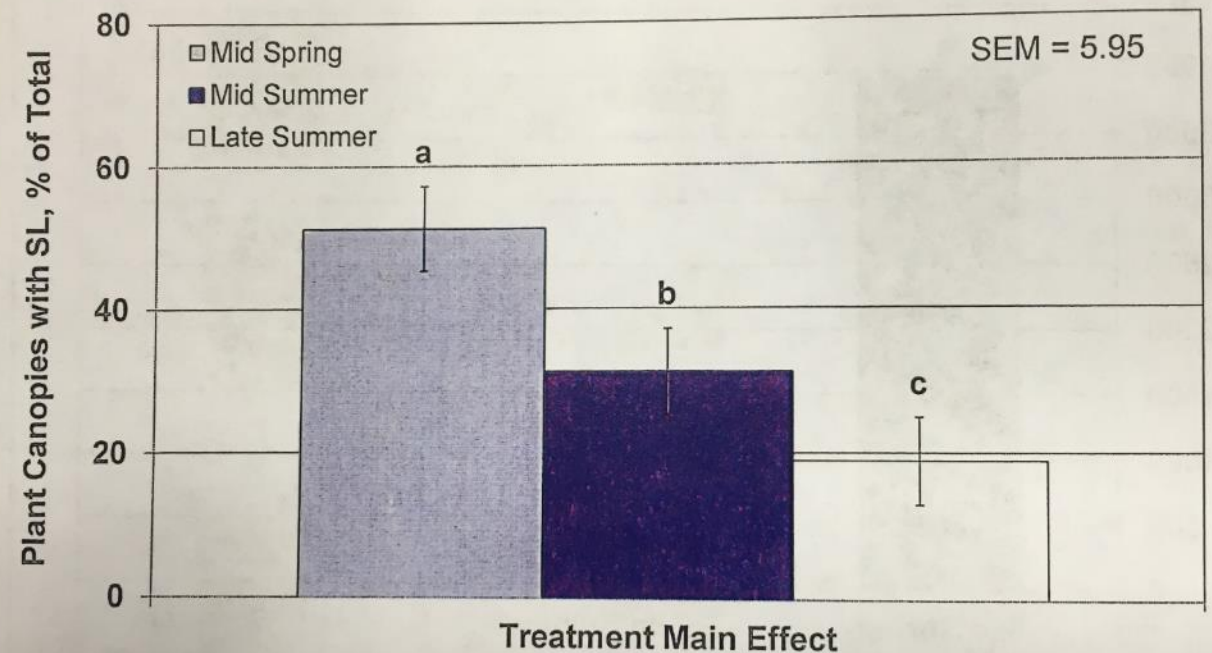
- Sericea Lespedeza
  - KC Olson – Kansas State University research



# Invasive Controls

- Sericea Lespedeza
  - KC Olson – Kansas State University research

Figure 11. Effect of Growing-Season Fire on SL Canopy Frequency

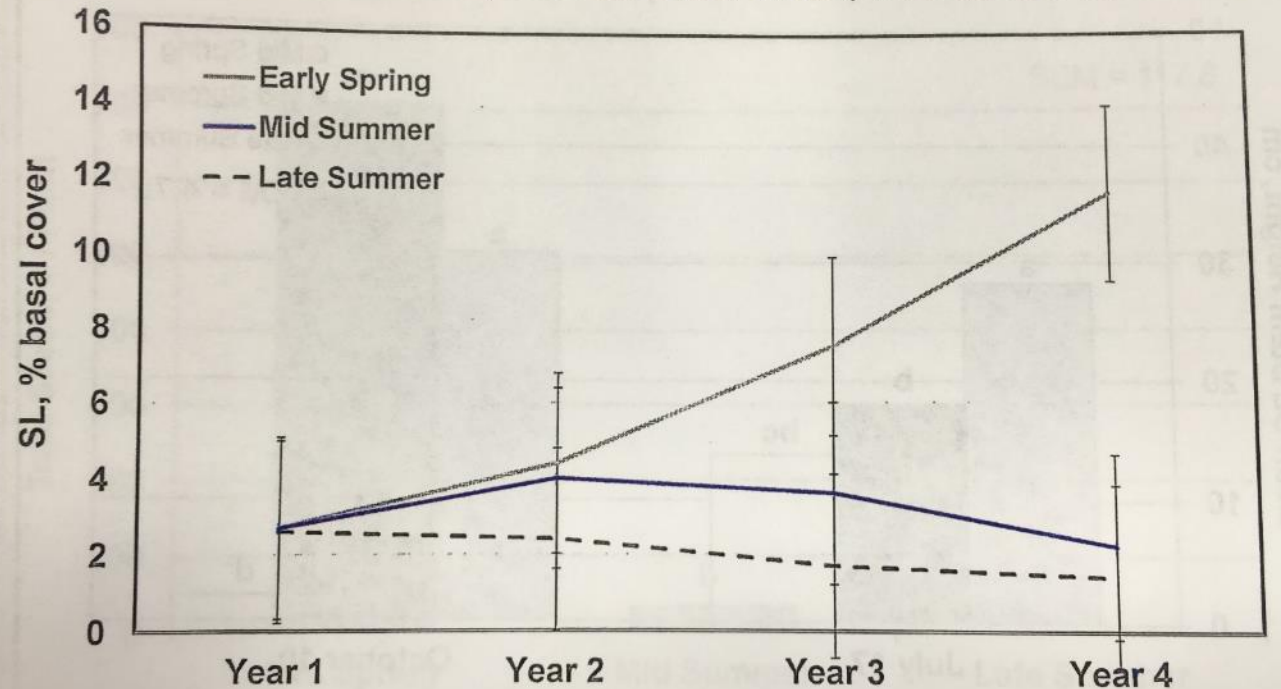




# Invasive Controls

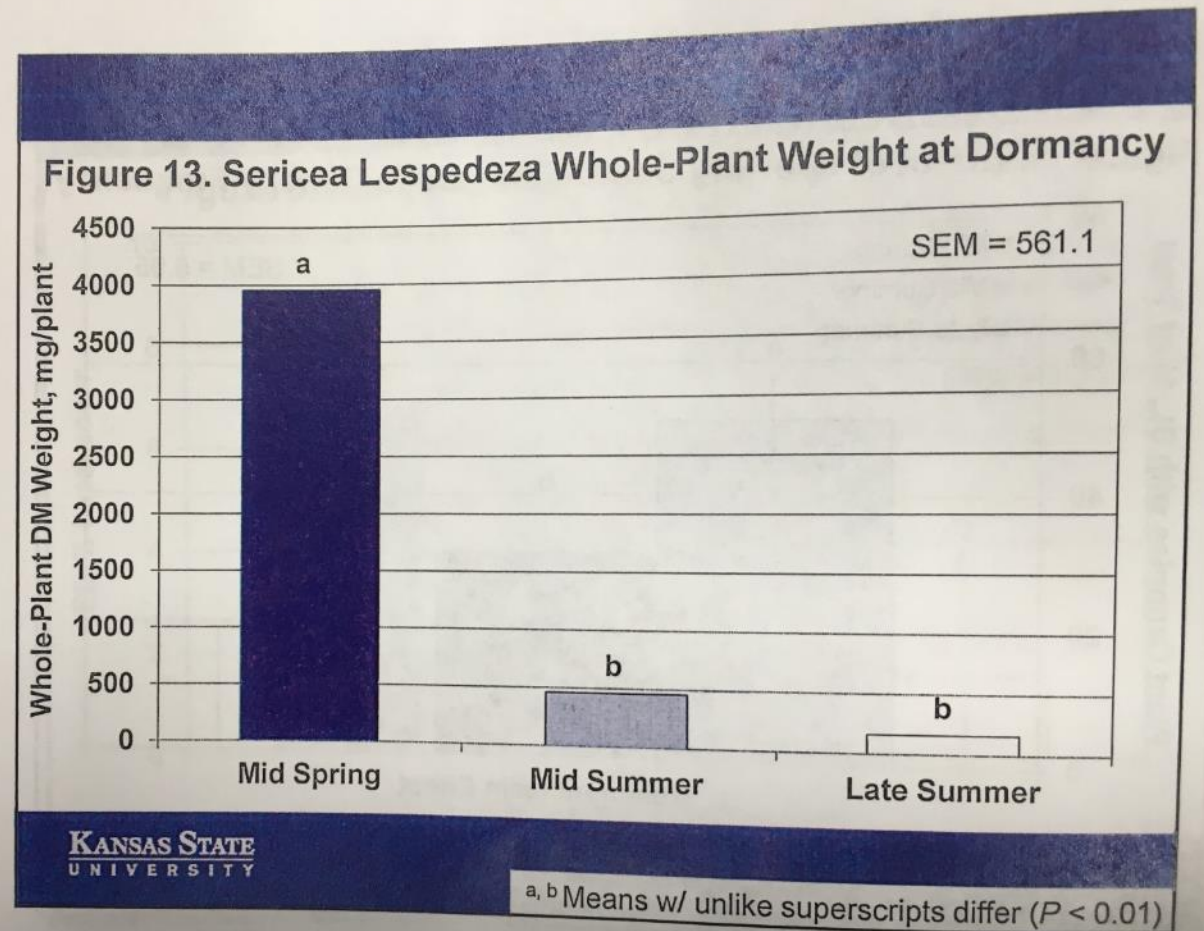
- Sericea Lespedeza
  - KC Olson – Kansas State University research

Figure 10. Sericea Lespedeza Over Time, % Basal Plant Cover



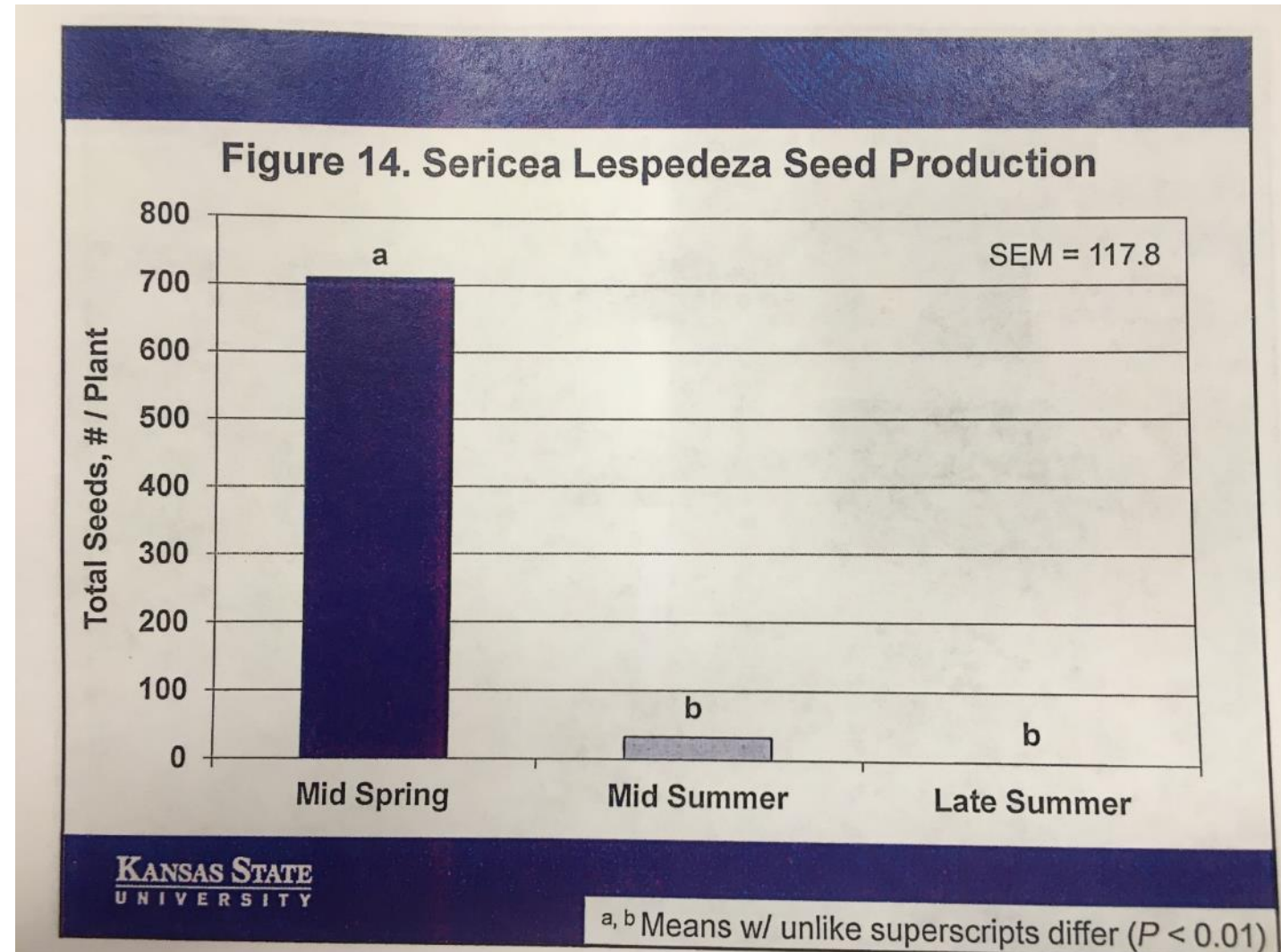
# Invasive Controls

- Sericea Lespedeza
  - KC Olson – Kansas State University research



# Invasive Controls

- Sericea Lespedeza
  - KC Olson – Kansas State University research
  - Summer burns – No change in native plant communities



# Invasive Controls

- Deciduous woody species invaders (locust sp, shurbs, etc)
  - Top Kill
  - Reduces woody canopy cover allowing suppressed species to grow
  - Repeat fire applications can control without herbicide
  - Herbicide can be easier to apply on smaller regrowth with less canopy interference.



Before



During



After





25 days later







# Invasive Controls

- **Brome**

- Great fuel source mid-late summer, old growth burns well even early summer
- target mid summer if you want to improve warm season populations by opening ground coverage and allowing suppressed warm seasons the opportunity to grow.
- Avoid late summer burns in brome/warm season border areas as it may open a window for brome to gain ground in the spring











# Invasive Controls

- Johnson grass–
  - Burn late spring to early summer – burn old thick growth off allowing better herbicide contact for emerging plants.
  - Mid summer seed production – target burns shortly before
  - Thick stands need moderate wind to burn well
  - Will quickly regrow even with a summer burn, but that makes it easier to target and spot spray.
  - Herbicide after action is a must for control
  - Reduces plant and old growth coverage which may allow other plants to compete for ground space

# Invasive Controls

- Musk Thistle
  - Target late spring/early summer before or during flowering stage.
  - Spring Burns prior to bolt can be problematic

# Old world bluestem

- Quick regrowth response after summer burn making it easy to identify
- Will likely open potential for OWB to spread further if not treated with herbicide. Will set seed even when burned in August.
- Kansas State – Walt Fick – research showing good control of OWB with imazapyr (Arsenal) with limited native warm season damage.

# Dead woody debris

- Hot temperatures usually have the moisture of dead debris extremely low.
  - Brush piles burn exceptionally well, and completely within a few hours
  - Easy eradication of tree skeletons with a some old flashy fuel ignition
- Wood fence posts can be problematic



# Cost

- Cheaper to burn than other treatment methods

# Lessons Learned

- Many factors play a role in every burn, the challenge is to ensure you are prepared for all those factors to get the desired results.
- Wind plays important role, burn with higher winds than a dormant season burn, don't bother with no wind unless it's a brush pile
- Growing season head fire is more like a dormant season backfire
- Recent precip seems to have little effect if you have moderate wind and some old growth
- Live Cedar trees burn great during the summer
- 30+' cedar trees can burn with less than 1' tall vegetation around them
- Groves of Cedars can "crown" fire during a growing season burn

# Lessons Learned

- Check woody kill 20 days after for accurate results
- Consistently mowed areas & moist drainages/creeks make great fire breaks
- Other than heat stress, it seems like stressors on crew are lower (especially burn leader)
- Works great to clear up dead/down debris inside of veg growth
- Prepare to spend some time on ignition and bring plenty of torch fuel
  - Strip firing helps speed the burn up, if needed
- Firebreaks can be natural and/or narrower than spring burns

# Conclusion

- Is growing season burning the answer to all our prairie land manager prayers?  
NO, but it is another very effective tool in our toolbox



# Suggestions

- Tailor your burning to your conditions and objectives to target a successful burn
- Give growing season burns a try
- “Every day is a burn day” - Better to burn, than no burn at all.

# Questions?

