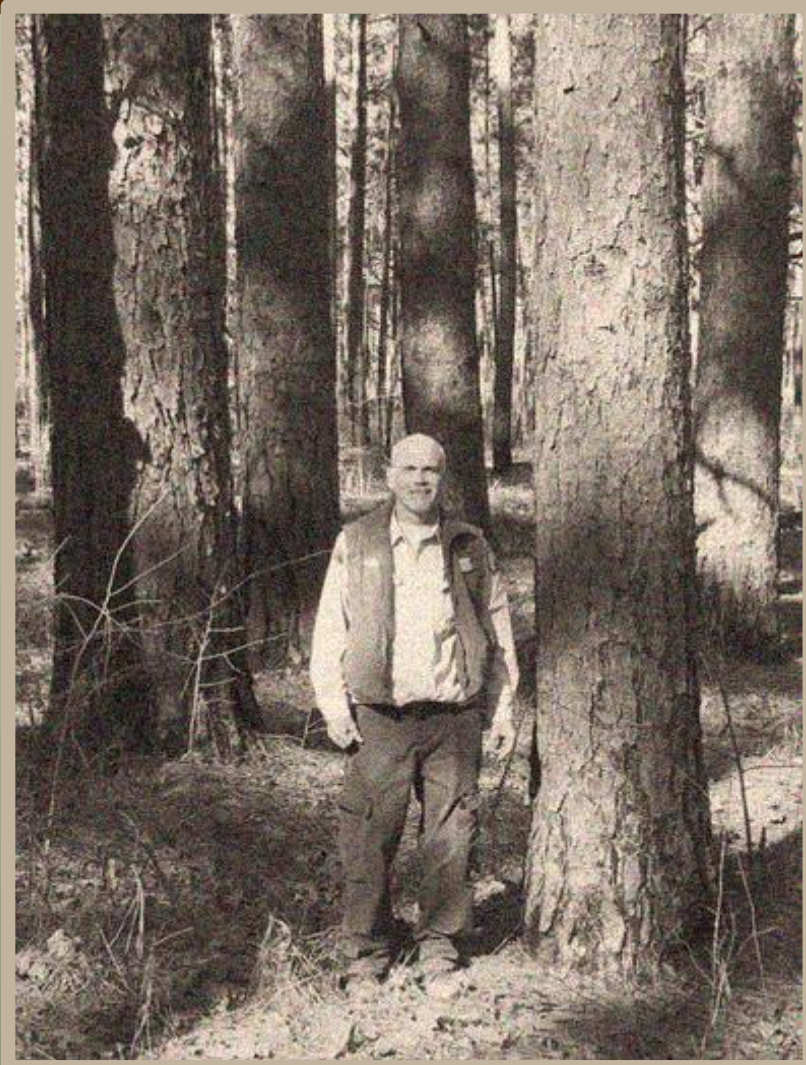


# Use of Herbicides to Improve Wildlife Habitat



Bill Pickens  
Conifer Silviculture  
NC Forest Service  
[bill.pickens@ncagr.gov](mailto:bill.pickens@ncagr.gov)



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*





# Overall goal is a forest like this



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# We can use herbicides to:

- Ensure survival
- Control of plants with little wildlife value
- Favor desirable plants
- Create snags

Photo courtesy of TNC



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# But there are consequences to herbicides use

## Negative effects

- Control or elimination of valuable or desirable plants
  - Grasses for burning
  - Many seed producers
- Residual activity which might hamper re-establishment of desirable plants

Photo courtesy of TNC



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# We can use herbicides to get to our restoration goal. But, the foothold gained must be maintained, usually with fire.



Control loblolly



Control hardwoods



Stimulate grasses and herbs



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*

# Lot's of things determine which plants are killed and which are not.

- Herbicide
- Rate
- Mode of action
- Season
- Method
- Adjuvants
- Plant physiology
- Weather



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*

# We can SELECT the HERBICIDE to target what we want we don't want

Glyphosate

Imazapyr

Triclopyr

Hexazinone

Sulfometuron

Metsulfuron

2, 4-D



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*

We can SELECT the HERBICIDE to target what we want we don't want

But its just as important to know  
what your Herbicide DOESN'T kill

Glyphosate

pyr

Triclopyr

Hexazinone

Sulfonamide

Metsulfuron

2, 4-D



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# Herbicide Efficacy

Species	Hexazinone	Triclopyr	Imazapyr	Glyphosate	Metuslfuron	Sulfmeturon
Oaks	Red	Yellow	Yellow	Yellow	Yellow	Green
Sweetgum	Yellow	Red	Red	Red	Green	Green
Maple	Yellow	Red	Red	Yellow	Green	Green
Hickory	Green	Red	Yellow	Green	Green	Green
Cherry	Yellow	Yellow	Green	Yellow	Red	Green
Red Bay	Green	Red	Red	Green	Green	Green
Pine	Yellow	Red	Green	Red	Green	Green
Elm	Yellow	Red	Yellow	Yellow	Red	Green
Gallberry	Green	Red	Yellow	Green	Green	Green
Blackberry	Green	Red	Green	Red	Red	Green
Grass	Yellow	Green	Red	Red	Green	Red
Broadleaf Herbaceous	Yellow	Red	Red	Red	Green	Red
Legumes	Yellow	Red	Green	Red	Green	Yellow


©Forest Productivity Cooperative



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*





Longleaf is one of the most diverse ecosystem in the world. Second only to rainforest in species richness



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# Grasses are important fuel source



Wiregrass

Indian grass

Toothache grass

Little bluestem

Big bluestem



**North Carolina Forest Service**

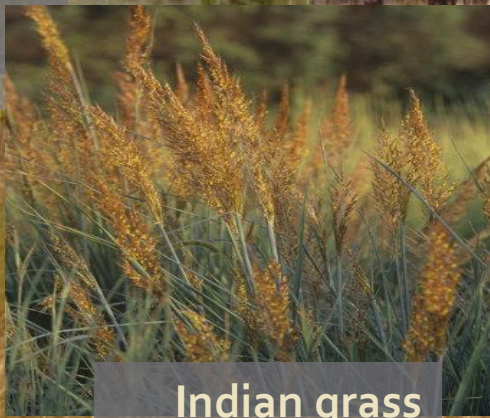
*To protect, manage, and promote forest resources for the citizens of North Carolina*



# Native warm season grasses are tolerant to Hexazinone or Triclopyr



Wiregrass



Indian grass



Toothache grass



Little bluestem



Big bluestem



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# An overlooked treasure - blueberries and huckleberries

- Gamebirds: Bobwhite quail, wild turkey, and ruffed grouse
- Squirrels (fruit) and Deer (browse leaves)
- Songbirds: E. Bluebird, Blue Jay, N. Mockingbird, N. Cardinal, E. Towhee, and Grey Catbird



**North Carolina Forest Service**

To promote **Blueberries and Huckleberries** resources for the citizens of North Carolina



# Hexazinone spares blueberries and huckleberries

- Gamebirds: Bobwhite quail, wild turkey, and ruffed grouse
- Squirrels (fruit) and Deer (browse leaves)
- Songbirds: E. Bluebird, Blue Jay, N. Mockingbird, N. Cardinal, E. Towhee, and Grey Catbird



**North Carolina Forest Service**

To protect **Blueberries and Huckleberries** resources for the citizens of North Carolina

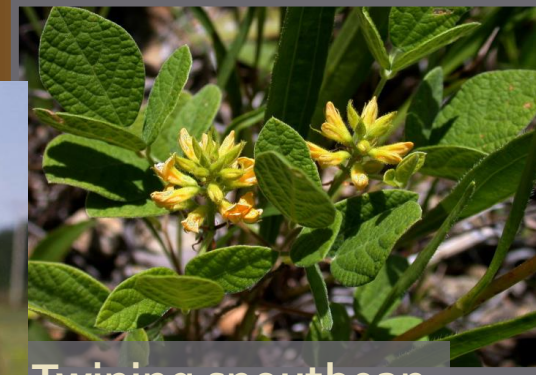


# Native lespedezas & Legumes

- “Likely the most important N. Bobwhite seed producers in the SE.”
- Deer: “Some species are preferred forage, others less so.”



L. capitata



Twining snoutbean



L. virginiana



Butterfly pea



Sensitive pea



Small Partridge Pea



Native Vetches



Native Trefoils



**North Carolina Forest Service**

To protect, manage, and promote forest resources for the citizens of North Carolina

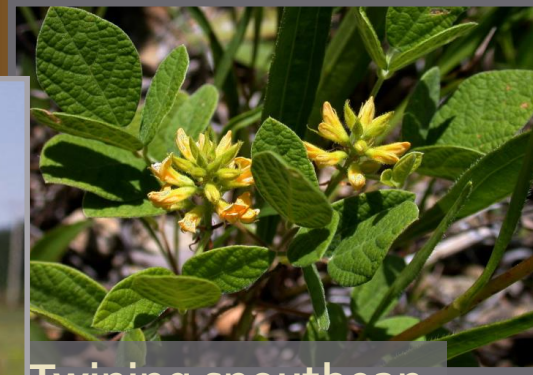


# Native lespedezas & Legumes are tolerant of imazapyr and hexazinone

- “Likely the most important N. Bobwhite seed producers in the SE.”
- Deer: “Some species are preferred forage, others less so.”



L. capitata



Twining snoutbean



L. virginiana



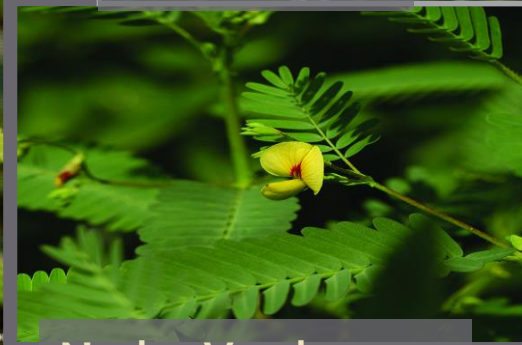
Butterfly pea



Sensitive pea



Small Partridge Pea



Native Vetches



Native Trefoils



**North Carolina Forest Service**

To protect, manage, and promote forest resources for the citizens of North Carolina



# Blackberries and dewberries....More than a thorn in your side



“Collectively, the various species of *Rubus* arguably are the most important group of plants for wildlife in the southeast.” Miller & Miller

“Users include more than 100 species of songbirds, game birds, and game mammals. Leaves...a most-important source of browse for deer & rabbits.”

Kammermeyer & Thackston



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# Blackberries and dewberries are tolerant of Imazapyr



“Collectively, the various species of Rubus arguably are the most important group of plants for wildlife in the southeast.” Miller & Miller

“Users include more than 100 species of songbirds, game birds, and game mammals. Leaves...a most-important source of browse for deer & rabbits.” Kammermeyer & Thackston



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



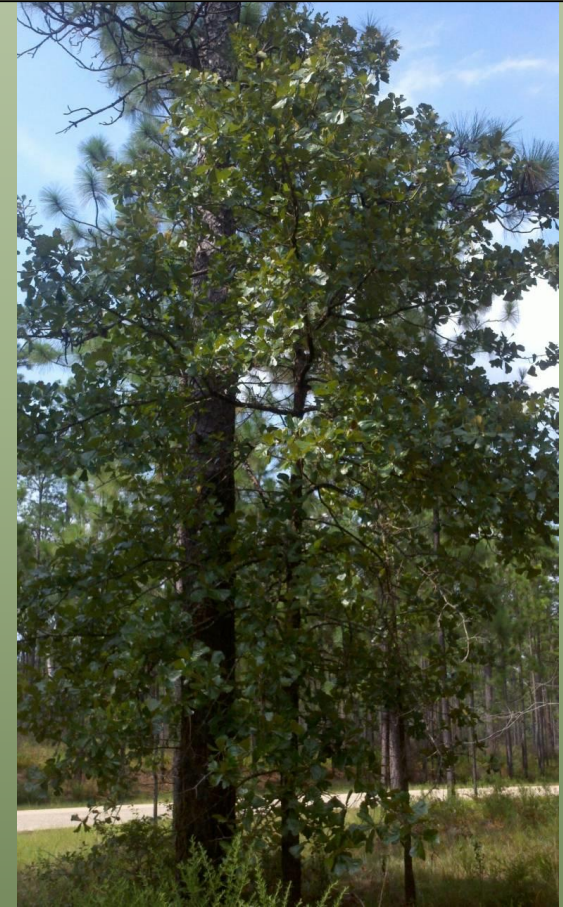
# Scrub oaks are natural components of upland longleaf ecosystems

## Post oak



- sand post, post oak, turkey, bluejack, blackjack, sand live, southern red, etc.
- share similar fire adaptations
- Acorns are energy rich
- Fox squirrels, deer, turkeys
- facilitate LL natural regeneration establishment

## Blackjack oaks



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# Oust and Escort spare oaks

- Acorns readily used by deer, turkey, black bear, squirrel, and numerous other wildlife species.
- Runner oak acorns are available before most other tree oaks



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# Beauty Berry

- Songbirds: Consumed by more than 40 species!
- Deer: Moderate browse preference
- Other: Bobwhite quail, raccoons and opossums



*Callicarpa americana*, American beauty berry



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# Beauty Berry is tolerant of hexazinone

- Songbirds: Consumed by more than 40 species!
- Deer: Moderate browse preference
- Other: Bobwhite quail, raccoons and opossums



*Callicarpa americana*, American beauty berry



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# Wild Plum are important soft mast producers

- Quail: excellent escape and nesting cover
- Songbirds – Several including: mockingbird, brown thrasher, and gray catbird
- Also: deer, black bear, gray fox, raccoon, and opossum



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# Wild Plum is tolerant of Triclopyr, Glyphosate

- Quail: excellent escape and nesting cover
- Songbirds – Several including: mockingbird, brown thrasher, and gray catbird
- Also: deer, black bear, gray fox, raccoon, and opossum



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# Ragweed Wildlife Use

There is no shame in weedy food plots. Ragweed and many other “weeds” provide good wildlife food and cover

- Important seed and cover-producing plants for Bobwhite Quail
- Seeds readily consumed by numerous songbirds
- Important browse for deer



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# We can SELECT the APPLICATION METHOD to target what we want we don't want

- Hand-held Techniques
  - Backpack Foliar
  - Basal Stem
  - Hack & Squirt
  - Cut Stump
  - Soil Spot



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# Backpack Foliar Spray or Basal Stem

- A late September or early October with Garlon 4 will control woody shrubs them while sparing dormant grasses and forbs
- Common Herbicides:
  - Arsenal® AC, Chopper®
  - Garlon® 4, Garlon® 3A
  - Accord® XRT



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*

*Personal Protective Equipment*



# Cut Stump

- Best done during active growth-
  - June 1 –Nov 1
- Prevents re sprouting
  - Chopper<sup>®</sup>, Stalker<sup>®</sup>
  - Garlon<sup>®</sup> 4 Ultra (ester),
  - Garlon<sup>®</sup> 3A (amine)
  - Pathfinder<sup>®</sup> II (RTU)
  - Accord<sup>®</sup> XRT II



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# Hack & Squirt (Cut Stem)

- Best done during active growth-
  - June 1 –Nov 1
- Easy but labor intensive
- Common Herbicides:
  - Arsenal® AC
  - Garlon® 3A
  - Weedar® 64 (2,4-D)



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# Site Preparation



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# At a glance

- **Imazapyr**
  - heavy texture soils, sweetgum, water and willow oak, controls most grasses, including bermuda, blueberries;
  - easy on legumes, blackberries
- **Glyphosate**
  - broad spectrum, most grasses and herbaceous
- **Triclopyr**
  - waxy leaf species,
  - easier on grasses and herbaceous layer
- **Hexazinone**
  - Oaks, legumes, sweetgum;
  - easy on wiregrass, blueberry, huckleberry, some legumes
- **Oust and Escort**
  - most broadleaves and grasses;
  - easy on broomsedge, woody plants



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# Typical NC site prep



48 oz. Chopper  
5 quarts Accord  
7 oz. Milestone or  
Detail  
21 oz. Garlon XRT  
1-2 oz. Escort



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*







# A new “plant friendlier” Site Prep

## 48 oz. Garlon XRT + 2 oz. Metsulfuron

- 73% survival – Plum Creek
- 85% survival – Hughes tract
- 45% survival – Fall Line WMA
- 93% survival – Flint River
- Imazapyr
  - 88% survival – Brown Tract
  - 70% survival – Catchmark tract



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# Wildlife Friendly

## Plants beneficial to wildlife

- Warm Season grasses---
- Blueberries, huckleberries
- Lespedeza
- Blackberries, dewberries
- Beauty Berry
- Oaks

## Tolerant to :

- Hexazinone , Triclopyr
- Hexazinone
- Hexazinone, Imazapyr
- Imazapyr
- Hexazinone
- Oust , Escort



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# In summary:

- ✓ Know the plants you want to favor
- ✓ Know the plants you want to control
- ✓ Select the best herbicide
- ✓ Select the best application method
- ✓ Choose the appropriate time of year to apply your treatment
- ✓ Use the right rate
- ✓ Follow the label!



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*



# QUESTIONS?? ....or Comments



**North Carolina Forest Service**

*To protect, manage, and promote forest resources for the citizens of North Carolina*