

Invasive Species:

Who, what, where…
and how to deal with them


NC COOPERATIVE EXTENSION

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What's an Invasive?

- Invasives: non-indigenous species (e.g. plants or animals) that adversely effect the habitats they invade economically, environmentally or ecologically

- Exotic: an organism that is not indigenou to a given place or area and instead has been accidentally or deliberately transported to this new location by human activity

Effects of Non-Native Species

- 57% of threatened and endangered species – at risk due to invasives
- Around 360 non-native insects have become established in American forests
- Around 96 plants listed on Federal Invasive Plants List

The Costs of Invasives

- Economic loss ($ treatments, quarantine, direct loss, etc…)
- Invasive nonnative pests cost $137 billion per year
- Damage to ecosystem composition, structure, and function
  - interfere w/ ecosystem functions
  - reduce native habitat for wildlife
  - can alter fire potential
  - can alter wetlands function
  - “biological pollution”
  - Cost of species extinction

Invasives arrive through a number of VECTORS or PATHWAYS:

- infested nursery stock
- wood products from abroad
- pallets (70% of all imported goods arrive in wooden packing material)
- in soil
- boats/air freight
- on purpose…for 'good' reasons

Invasive plants:

- can spread rapidly…no natural predators
- prolific seeders (spread by birds, wind, water)
- form dense plantations that exclude/outcompete other vegetation

Old world climbing-fern in cypress swamp in FL

Cogon grass in pine stand

Invasive trees and shrubs:

- Tree of heaven (ornamental)
- Mimosa (ornamental)
- Paulownia (high-value wood for Japan)
- Burning bush (ornamental)
- Bradford Pear (ornamental)

recent cultivars, bred to reduce the tendency of branch splitting, have produced viable seeds and escaped to invade disturbed areas

- Bush honeysuckle (ornamental/wildlife)
- Privet (for erosion control)
- Autumn olive (for wildlife planting)
- Multiflora rose (ornamental)

Invasive Grasses and Vines

Chinese Silvergrass

- flammable
- planted as an ornamental

Japanese climbing fern

Kudzu

Chemicals

- Milestone (aminopyralid)
- Transline (Clopyralid)
- Vanquish (Dicamba)
- Oust(sulfometuron methyl)
- Escort(metsulfuron methyl)
- Garlon 3a, 4 (Triclopyr)
- Round up(glyphosate)
- Arsenal AC (Imazapyr)
- Spike 20p(tebuthiuron)
- Outrider(Sulfosulfuron)

Kudzu

- In the pea family
- Introduced in the late 1800s for erosion control and forage
- Native to southern Japan and southeast China in eastern Asia
- A climbing, woody or semi-woody vine
- Capable of reaching heights of 100ft in trees
  - but also scrambles extensively over lower vegetation
- Kudzu grows rapidly, extending as much as 60ft per season
  - about 12in per day

- **Each flower is about 0.5in long, purple, and highly fragrant**
  - **Nectar producers**
  - **visited by many species of insects, bees, butterflies, and moths**
- ***Flowering occurs in late summer***

Deciduous leaves, alternate and compound

3 broad leaflets 6–7in long and 4in broad

- **The leaflets may be entire or deeply lobed**
- **Pubescent underneath with hairy margins**

- **Preferred habitat:**
  - Forest edges, abandoned fields, roadsides, and disturbed areas, where sunlight is abundant

- **Control:**
  - Mowing
  - Grazing: By repeatedly grazing the regrowth over successive growing seasons the root reserves will be depleted.

Kudzu chemicals

- Milestone (aminopyralid) 7oz per acre applied during active growth
- Transline (Clopyralid) 1-3 qt per 100 gallons applied during active growth(targets legumes)
- Vanquish (Dicamba) .5 gallon per 100 gallons applied to root zone in mid march prior to bud break
- Oust(sulfometuron methyl) 12 oz per 100 gallons when actively growing

Kudzu Chemicals

- Escort(metsulfuron methyl) 3-4 oz per acre when actively growing
- Garlon 3A – 2 gallons per 100 gallons applied mid season
- Spike 20p (tebuthiuron) 10-20 pounds/acre

Oriental bittersweet

- Eastern Asia, Korea, China and Japan
- Introduced ornamental
- A deciduous woody perennial plant which grows as a climbing vine and a trailing shrub

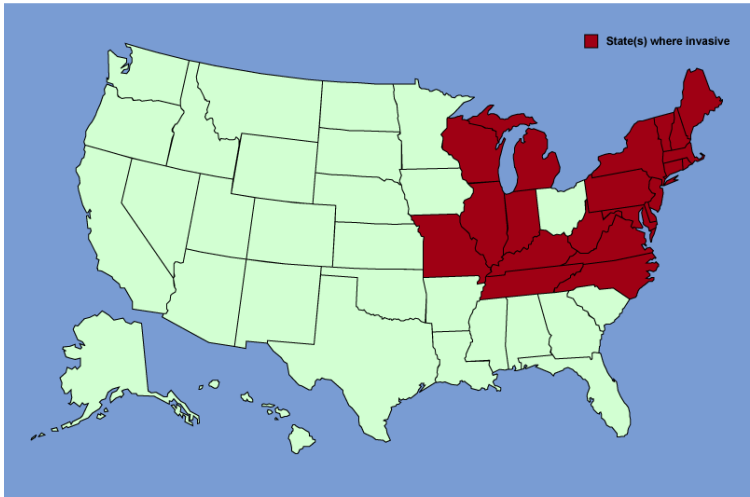
Identification

- **The leaves are alternate, glossy, nearly as wide as they are long (round), with finely toothed margins**
- **Fruits are yellow, round capsules that at maturity split open to reveal 3 red-orange fleshy fruits**
- **The abundance of showy fruits have made Oriental bittersweet extremely popular for use in floral arrangements**

ECOLOGICAL THREAT

- A vigorously growing vine that climbs over and smothers vegetation
- When bittersweet climbs high up on trees the increased weight can lead to uprooting and blow-over during high winds and heavy snowfalls
- Displacing our native American bittersweet through competition and hybridization

Infests forest edges, woodlands, fields, hedgerows, coastal areas and salt marsh edges



BITTERSWEET

- **Reproduces prolifically by seed**
  - **readily dispersed to new areas by many species of birds and mammals**
- **The seeds germinate in late spring**

Oriental Bittersweet Control

- **Biological – eaten by goats but seed dispersal can be problematic**
- **Chemical- Garlon 3A, Garlon 4, or Glyphosate applied in mid to late summer or early fall with surfactant to leaf surfaces; stump treatment to larger vines with 25% solution; trunk injections with Garlon 4 or Glyphosate anytime except March-April.**

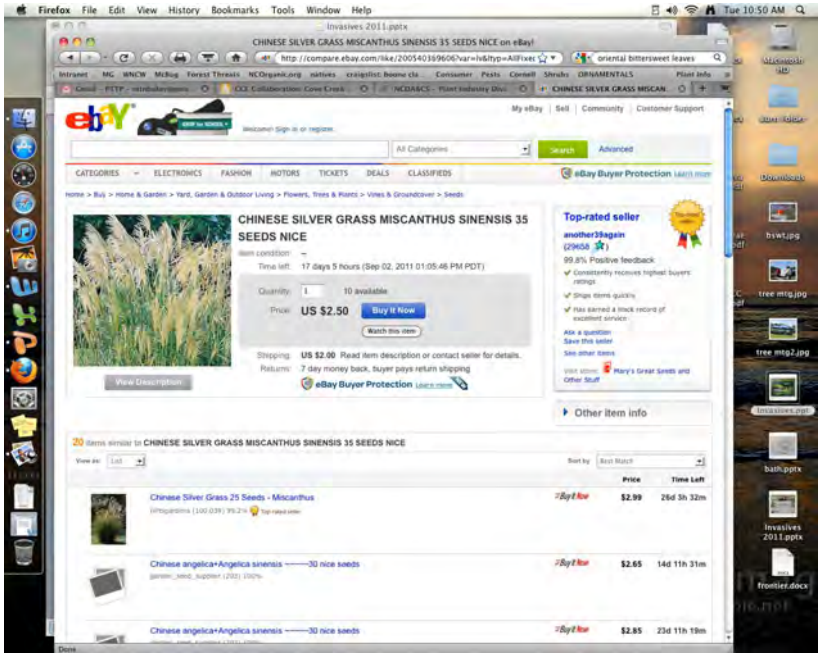
Chinese silvergrass

- Tall, densely bunched, perennial grass, 5 to 10 feet in height
- Many loosely plumed panicles in late summer turning silvery to pinkish in fall
- Dried grass standing with some seed heads during winter

Ecology

- Escapes from older ornamental plantings to roadsides, forest margins, and adjacent disturbed sites, especially after burning
- Shade tolerant
- Highly flammable and a fire hazard

Widely sold as an ornamental, though some varieties are sterile



Control

- **Mow when there are no seed heads present**
- **Spray in the Fall**
- **Arsenal AC (Imazapyr) as a 2.5 percent solution (4 ounces per 3-gallon mix)**
- **A glyphosate herbicide as a 2-percent solution (8 ounces per 3-gallon mix)**
- **Or, *a combination of the two herbicides***

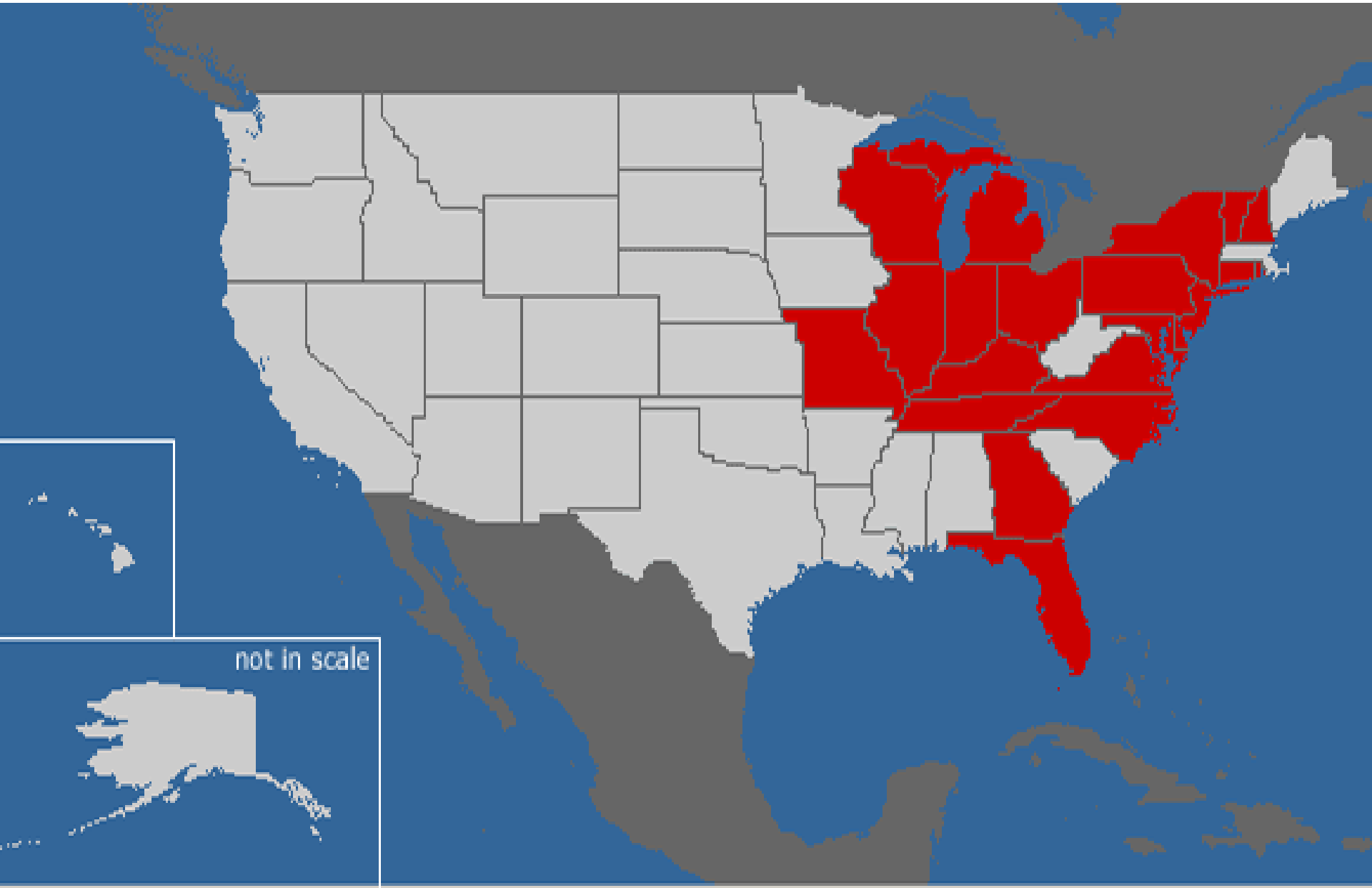
Autumn Olive

Elaeagnus umbellata

- **Native To: Asia**
- **Date of U.S. Introduction: 1830**
- **Means of Introduction: Ornamental; cultivated for wildlife habitat and erosion control**
- **Impact: Crowds out native species**

Autumn olive

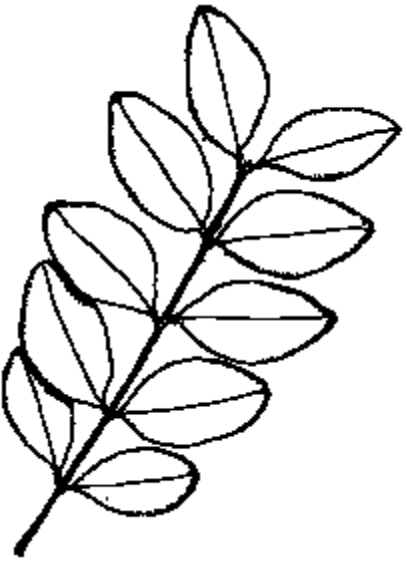
Autumn Olive Range



Control

- **Biological- Goats**
- **Chemical – Garlon 4, Garlon 3A, and Arsenal can be used as either basal stump sprays or applied to foliage**

Chinese privet



Chinese privet

- Introduced from China for ornamental planting
- Evergreen shrub up to 30 feet
- Opposite oblong leaves
- Small white flower April-June
- Prolific seed producer
- Spread by birds and humans

Control Options

- **Biological- Goats will consume this plant quite readily but avoid browsing when fruit is ripe**
- **Cultural- Avoid using in landscapes**
- **Chemical- Arsenal and Glyphosate as sprays with thorough foliage coverage. Stem injections with Arsenal AC or Garlon. Basal applications of Garlon or Pathfinder also effective**

Multiflora Rose

- Widely planted for fencerows and wildlife
- Deciduous rose up to 10 ft
- Thorned stems with alternated compound leaves
- Small white flowers (April – June)
- Spreads by rooting stems and birds

Control Options

- Biological- Goats and Sheep but avoid browse when in fruit
- Chemical- sprays with Escort or Arsenal AC; Glyphosate product in August to October may provide control. Repeat applications are advised. Basal applications of Garlon 4 with an oil carrier or Pathfinder II works on larger plants. Apply in mid winter or in the summer.

Japanese honeysuckle

Wisteria

Control Measures

		If too tall, or very large:
Japanese Honeysuckle	2% glyphosate OR 3-5% Garlon 3A or 4, July - October	Cut large stems and stump spray with glyphosate, OR 20% Garlon 3A (both need surfactant): July – Oct.
Wisteria	4% glyphosate with repeated applications Sept – Oct (surfactant needed)	

Sericea Lespedeza

- Perennial upright forb
- Leaves are alternate and composed of numerous 3-leaflet clusters
- White pea-like flowers (July-Sep)
- Legume pods around stem (Oct – March)
- Seeds remain viable for decades
- Spreads from planting for soil stabilization

Control Options

- Biological- Goats
- Spray plants with a 5% glyphosate and surfactant solution in late summer.
- Mowing 1 to 3 months before herbicide application can assist control.
- If glyphosate is not effective, try spraying with a triclopyr-based product such as Garlon.

Japanese stilt grass
Microstegium

Native to temperate and tropical Asia

- Sprawling, dense mat-forming grass
- ½ - 3 feet tall
- Alternate leaf blades
- Seedheads in late summer/fall
- Shade tolerant

Japanese Stiltgrass

- Resembles crabgrass and nimblewill
- Prolific seeding: each plant produces 100-1000
- Seeds viable up to 5 years
- Flourishes in damp, moist soils but can grow just about anywhere
- Spreads on trails and recreational areas by hitchhiking seeds on shoes and clothing

Control Options

- **Mechanical- Mow frequently to prevent seed set; clean clothing, pets, and equipment after being in an infested area to prevent the spread of seeds.**
- **Chemical- Glyphosate at .5-2% solution rates with adequate surfactant applied early summer; Fusilade will also provide some control during the summer.**

Johnsongrass

- Perennial grass up to 9 ft
- Forms thick dense patches
- Flowers in July
- Seeds can remain viable in the soil up to 3 years
- Spreads by seed and rhizomes

Johnsongrass

- Biological- limited use by goats for browse; some level of toxins to many animals particularly horses.

- Chemical- Outrider and Plateau/Arsenal AC will provide some control when wicked on plants that are 18-24” tall; Avoid letting this plant get started on farms or landscapes- older plants are almost impossible to control.

Bamboo

- Perennial grass
- Very difficult to control
- Distinguishable characteristics include woody stems, branched growth, and large size
- 2 basic types clumping and running
- Running bamboo rhizomes

Control Options

- Mechanical – Bull doze and root rake to remove underground rhizomes and crowns- pile and burn
- Biological- “Panda Bears”
- Chemical control- Cut stems and apply Glyphosate at 10% solution to fresh stump;

Royal Paulownia

- Deciduous tree up to 60 feet

- Large heart shaped, opposite, fuzzy leaves

- Pale violet tubular shaped flowers (April-May)

- Pecan shaped capsules and release tiny winged seeds

Control Options

- **Chemical – Make stem injections using Arsenal AC. Use Garlon 3A (except March & April) or a glyphosate herbicide in dilution when safety to surrounding vegetation is a concern. Apply immediately to stumps for felled trees.**

Tree-of-Heaven

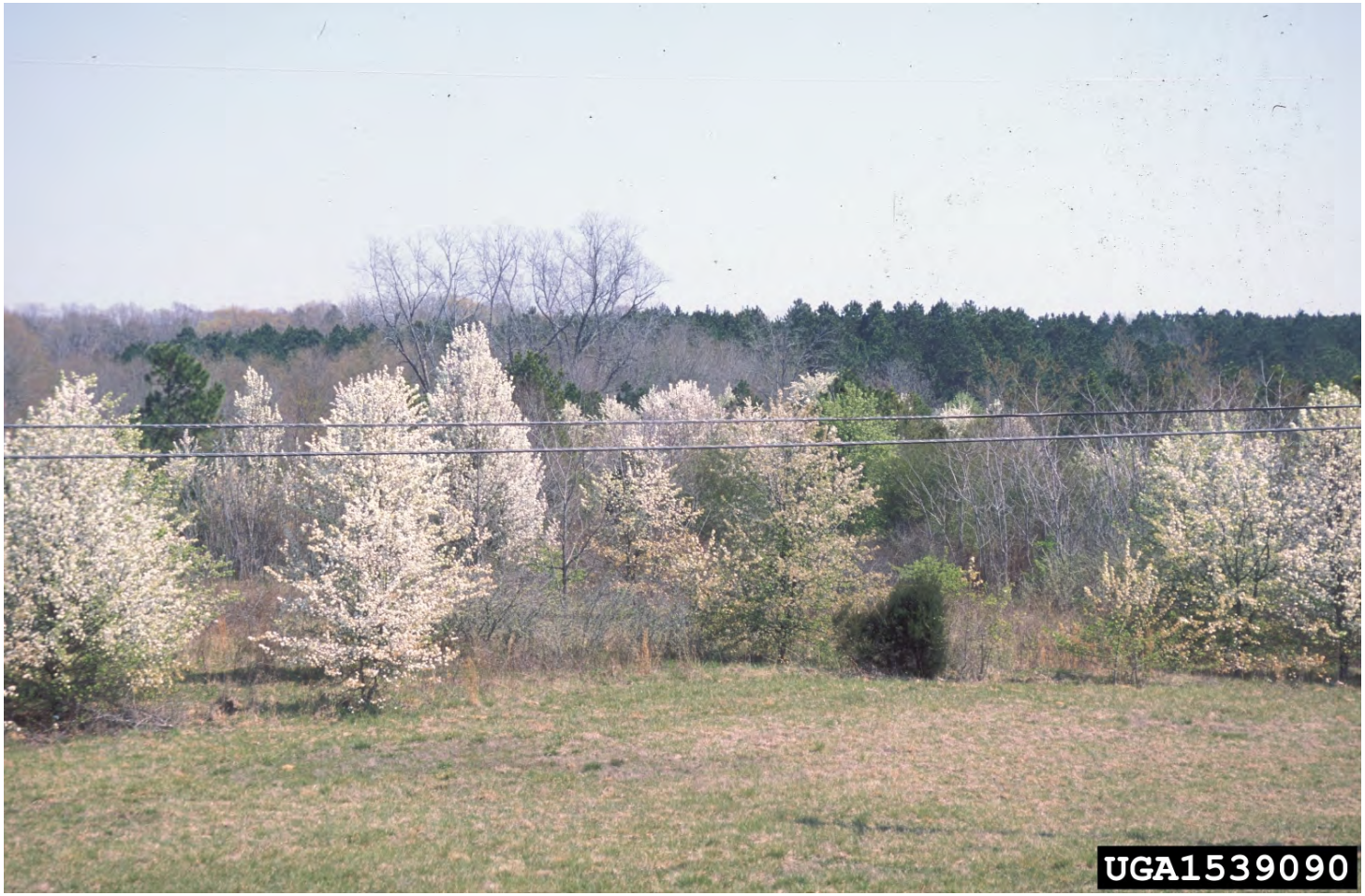
- Introduced as ornamental in 1800s
- Deciduous tree up to 80 ft
- Pinnately compound leaves
- Smell like peanut butter when crushed
- Yellowish flower (April-June)
- Wing shape fruit
- Spreads by wind and water

Control Options

- **Chemical- Stem injections with Garlon 3A, Arsenal or Pathfinder. Basal sprays with Garlon 4 mixed with labeled oils. Arsenal can be used in summer on small saplings or seedlings.**

Callery Pear (Bradford Pear)

- Introduced from China
- Deciduous tree up to 60 ft
- White flowers (blooming right now)
- Round olive brown fruit
- Spreads by animal-dispersed seeds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Control Options

- Chemical - Utilize foliar spray for small stems triclopyr, dicamba, metsulfuron(escort). For larger stems, cut and immediately treat with a glyphosate herbicide at a 25 – 50% solution.
- Goats can be used also be used as a biological control.

Japanese Knotweed

- Introduced as landscape ornamantal
- Dense stands
- Alternate leaves on zig-zagging, hollow stems
- Flowers are white to pink in erect clusters, bloom late summer
- Seeds can be wind or water disseminated
- Spreads primarily by aggres rhizomes

Japanese Knotweed: Management

- Cut it: at least 4 times per year to reduce rhizomes… but this is unlikely to eradicate knotweed
- Don’t cut and throw down as it will take root
- Chemical- Garlon for land applications, Rodeo may be required for those plants in or close to streams. Multiple treatments may be required. Large plants can be cut and stump treated with a Glyphosate product

Invasive Plants Should be Controlled because…

- They are a direct threat to agricultural production and forest biodiversity
- Croplands, rangelands, forests, parks, preserves, wilderness areas, wildlife refuges and urban areas are adversely impacted
- The habitat of nearly 46% of all federally listed threatened and endangered species are threatened by invasive species

The best control against invasive plants is to **AVOID PLANTING** them

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