



Exotic, Invasive Plants 101

Characteristics and Identification

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Controlling Invasive Plants in the Community
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What is an “invasive” species?

- Legally defined as an organism that is not native to the ecosystem under consideration AND whose introduction causes or is likely to cause harm to the environment, economy, and/or human health.

Are all Exotic Plants Bad?

- No, the majority of exotic plants do not cause problems.
 - Most of our agricultural crops are not native to the United States
 - Only about 1% of introduced plant species become invasive

But...

when they are bad, they are **awful!**

How did they get here?

Plants

- Most were intentionally brought here for gardening and landscaping.
- Some were accidentally introduced/transported as “hitchhikers” as global trade expanded.
- Most of our biggest problems have come from Asia and Europe, where climate conditions are similar.

Why are they invasive?

Characteristics

- Fast growth rate
- Seeds that germinate quickly, in high percentage
- Prolific seed production, which begins within the first few years of the plant's life
- Easy seed dispersal by animals, water, and wind

Characteristics

- Ability to reproduce by seed as well as vegetatively, through suckering for instance
- Longer flowering and fruiting periods
- Adaptability to a wide range of soil and growing conditions
- **No major pest or disease problems**

Characteristics of invasive plants

- **Rapid growth allows invasive exotics to take advantage of uninhabited patches of the landscape, often caused by disturbance. It also means that the plant might be a great groundcover or a quick way to fill gaps in a garden.**



Kudzu vines growing 15 m (50 ft) in a single season are not uncommon. Roots can penetrate the soil to depths of 3 m (9 ft).

Newberry County, South Carolina. CCC enrollees planting kudzu on gully bank on C. C. Spoon's farm. This area which was grown up in scrubby trees has been cleared. Within three or four years a cover of luxuriant vegetation will not only control erosion but furnish excellent grazing for livestock.



Characteristics of invasive plants

- Invasive plants often produce large quantities of seeds and fruits early in their life, which germinate quickly.
- They can produce a large number of offspring.
- This is a desirable characteristic for horticultural plants because their seeds or fruits are attractive and easily propagated.



Nandina is widely grown in gardens and used in landscaping

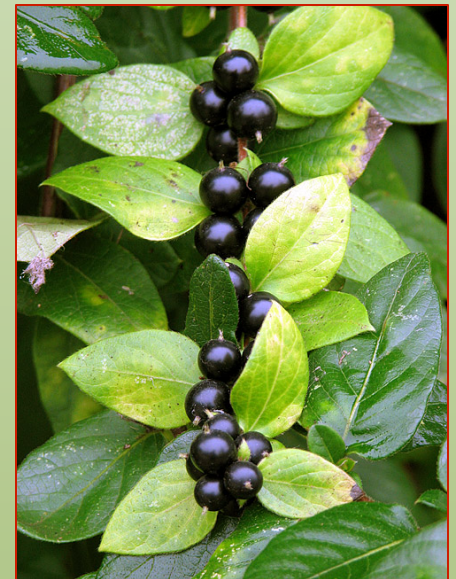
Nandina in the forest



Characteristics of invasive plants

Effective dispersal methods help invasive plants spread over wide ranges.

- Birds are attracted by many woody invasive plants' colorful fruits and disperse the seeds over a great distance.
 - Asian bittersweet
 - Honeysuckles
 - Privets



The “second forest”



Characteristics of invasive plants

- Plants grown in riparian areas tend to be spread by water
 - Japanese knotweed
- Most grass seeds and some woody trees' light seeds are spread by wind.
 - Tree of heaven



Characteristics of invasive plants

Easy vegetative spreading: a desirable trait in the garden because those plants will fill in empty spaces without the need for new seed.

- **Suckering (shoots from roots)**
- **Division from bulbs, underground modified stem organs**
 - **Kudzu**
- **Stolens, runners: many grasses**
- **Layering: woody shoots root from the nodes when touching to soil.**
 - **English ivy, Japanese honeysuckle**



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Characteristics of invasive plants

- The plant flowers after only a short time in the garden, which is desirable by gardeners.
- The plant stays in flower (and in fruit) longer, which is also desirable to gardeners.
- Plants with early maturity dominate the landscape through establishing populations and reseeding before native plants have a chance to produce seeds and spread.



Characteristics of invasive plants

- Exotic invasive plants are adaptable to a wide range of environmental conditions



Characteristics of invasive plants

- Invasive plants often are able to utilize local pollinators or attract pollinators so that they can produce seed in foreign environments.
- Many do not require specific pollinators
- The spread of nonindigenous insects (and other pollinators), like the European honeybee, also allows nonindigenous plants to spread.



Eastern tailed blue butterfly on dead nettle, a non-native, invasive plant

Characteristics of invasive plants

- Invasive plants often have different phenology (difference in timing of growth and development) from other plants
 - bloom at an earlier or later time of year than natives, meaning that they can shade out natives or take advantage of pollinators with no native food sources at that time of year.



Bradford pear

Why does native matter?

- No two plant species have the same leaf chemistry
- Leaf chemistry gives each plant species a particular and unique taste, digestibility, and toxicity- probably related to protection
- Most insects are adapted to feed or lay eggs on certain plant species
- Native insects have adapted over the years to certain native plants
- if native plants are replaced by non-native plants, the insects cannot eat



Butterfly bush provides nectar for butterflies, but because native butterflies have not adapted to this non-native shrub, butterfly larvae cannot eat it so they die.

Characteristics of invasive plants

- **Generation of dense shade is a characteristic of a good groundcover in the landscaping sense.**
- **This can be a trait of invasive plants that allows them to reduce competition from other plants.**
- **Dense root mass also allows invasive plants to become dominant by preventing other plants from establishing roots.**



Microstegium vimineum, Japanese stilt grass

Characteristics of invasive plants

- Invasive plants often produce chemicals that inhibit the growth of other plants



Characteristics of invasive plants

- **Disease and insect resistances**
 - **Pest-free plants are clearly advantageous to gardeners because they don't require pesticides and have a better chance of survival.**
 - **Exotic plants often are pest-free because they have managed to migrate to a new environment without the natural predators, competitors, and pests to keep them in check from their home environment.**

Indicators of Invasability

- **No set of characteristics covers all invasive, exotic plants**
- **No one plant has all of the characteristics - there are always exceptions**

Tennessee Exotic Pest Plant Council (TNEPPC) Ranking

- Severe Threat – Spreads easily into native plant communities and displaces native vegetation.
- Significant Threat – Not presently considered to spread as easily into native plant communities as Rank 1 species.
- Lesser Threat – Spread in or near disturbed areas and are not presently considered a threat to native plant communities.
- Alert – Invasiveness in TN undetermined; known invasive in similar habitats, severe threat in adjacent states, or substantial management difficulty.

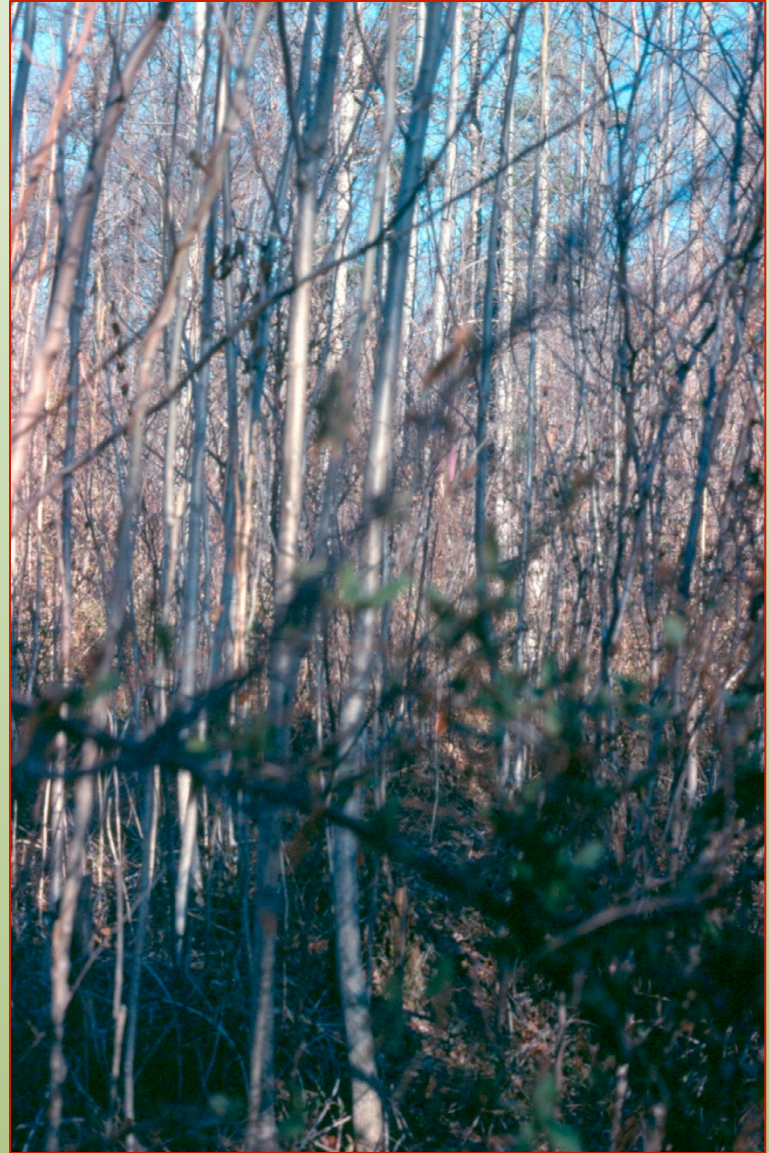
Identification – Severe Threat Trees and Shrubs

- Tree-of-heaven (*Ailanthus altissima*)
- Mimosa (*Albizia julibrissin*)
- Princess tree (*Paulownia tomentosa*)
- Autumn Olive/Thorny Olive (*Elaeagnus umbellata*)
- Chinese privet (*Ligustrum sinense*)
- Common privet (*Ligustrum vulgare*)
- Multiflora rose (*Rosa multiflora*)

Tree of Heaven

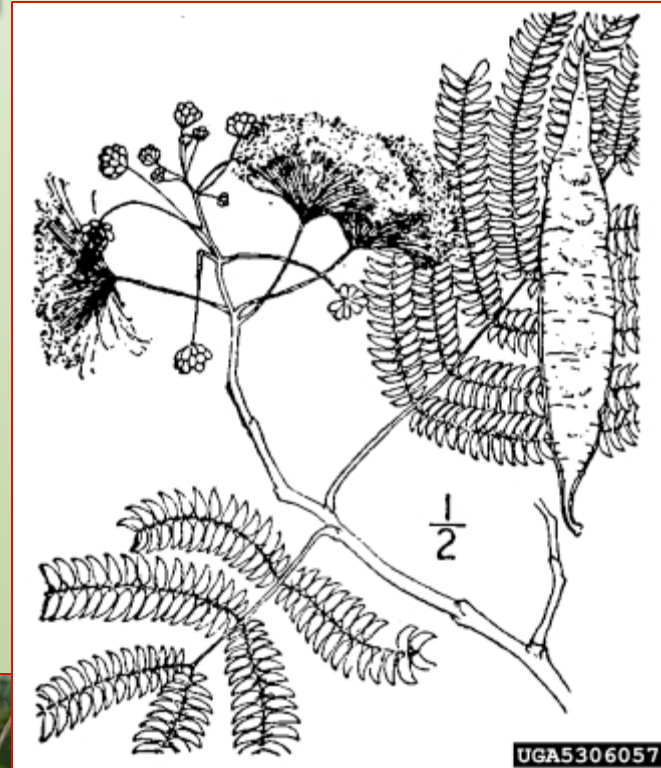
- Broad, flat compound leaves
- 1 – 2 teeth on each side of leaf base
- Showy seed clusters
- Offensive odor (leaves)
- Often grows in clusters





Mimosa

- Small tree (10 – 50')
- Often has multiple trunks
- Bi-pinnate compound leaves that resemble ferns
- Showy pink flowers at the end of branches
- Commonly found most

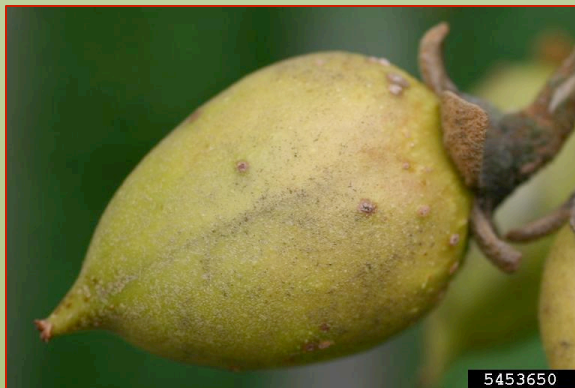


Mimosa



Princess tree

- Opposite, heart-shaped leaves, fuzzy on both sides
- Showy purple flowers in early spring before leaves
- Fruits are egg-shaped capsules, divided into 4 compartments that contain the seed



Princess tree



Autumn olive

- Deciduous shrub with thorny branches
- Leaves with silvery, dotted underside
- Small, yellowish tubular flowers
- Fruit are round, red juicy drupes which are finely dotted with silvery to silvery-brown scales



Autumn olive

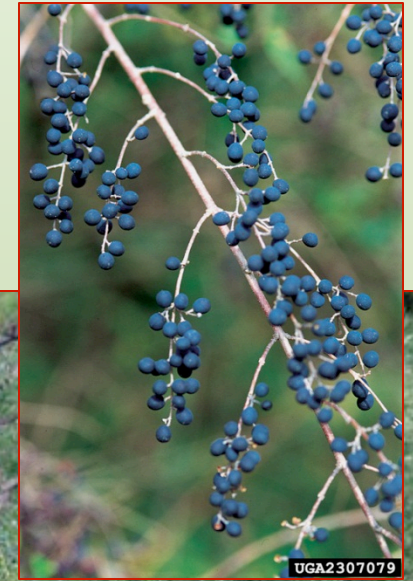


Chinese privet

- Semi-evergreen shrub or small tree
- Usually multiple stems
- Leaves opposite, oblong
- Flowers are white to cream and develop in axillary clusters.
- Fruit is abundant and spread by wildlife
- Several exotic privets occur and can be difficult to distinguish



Chinese privet



Multiflora rose

- Clump forming – Erect climbing, arching, or trailing shrubs to 10'
- Alternate, odd-pinnately compound leaves with 3-9 leaflets
- Flowers with five, white petals
- Bristled leafstalk bases



Identification – Severe Threat Vines, Herbs and Grasses

- Asian bitterweet (*Celastrus orbiculatus*)
- Japanese honeysuckle (*Lonicera japonica*)
- Shrubby bushclover (*Lespedeza bicolor*)
- Purple loosestrife (*Lythrum salicaria*)
- Japanese knotweed (*Polygonum cuspidatum*)
- Cogon Grass (*Imperata cylindrica*)

Asian bittersweet

- Perennial deciduous, climbing woody vine
- Leaves are alternate and elliptical/circular
- Flowers in the axils of the leaves (American bittersweet has flowers and fruits at the end of branches)



Japanese honeysuckle

- Semievergreen to evergreen woody vine with woody rhizomes that sprout frequently
- Leaves hairy, opposite, base rounded, tips blunt-pointed to round
- Flowers in axillary pairs



Japanese honeysuckle



Shrubby bushclover

- Perennial much branched leguminous forb or ascending shrub (3 – 10')
- Alternate, three-leaflet leaves. Lower surface lighter green than upper
- Flowers in clusters; pealike
- Fruit a flat legume pod, broadly elliptic with pointed, hairlike tip



Purple loosestrife

- Wetland plant
- Individual flowers have five or six pink-purple petals surrounding small, yellow centers. Each spike has several flowers
- Leaves downy with smooth edges, usually opposite
- Stalks are square
- Plant is tall and multistemmed



Japanese knotweed

- A perennial that spreads primarily through vegetative means and forms large thick colonies
- Thick hollow stems (6 – 10' tall)
- Ocrea often short to missing, leaves a red ring
- Greenish-white/cream flowers
- Leaves 4" – 6" long



Cogongrass

- Flower/Seed head silvery white in color with light, fluffy dandelion-like seeds
- Leaf blades up to 6' long with a whitish, prominent midrib that is often off center
- No apparent stem
- Densely growing patches, circular infestations, plants often turn brown in winter

Circular flowering



http://www.tneppc.org/pages/report_invasive_plants

Japanese stilt grass



Hydrilla



Johnson grass



Chinese yam