Rockbridge Extension Master Gardeners

Native, Non-Native and Invasive Plants

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Welcome to 'Native, Non-Native and Invasive Plants

In this module you will be presented with information on roles and their effects native, non-native and invasive plants have on our environment.

- Read Chapter 19 in the Master Gardener handbook before viewing these slides.
- Become familiar with field guides: *Plant Invaders of Mid-Atlantic Natural areas, Common Native Trees of Virginia, ID Guide & Common Native Shrubs and woody Vines of Virginia* as research tools.
- The Test Your Knowledge section is for fun and review.

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What I Will Learn in This Module (Objectives)

- Define and differentiate native, non-native and invasive plant species
- Describe the relative occurrence of native, non-native and invasive plants in the state of Virginia
- Recognize the connection between native plants and native wildlife
- Describe the importance of native plants in the ecosystem
- Identify several legal guidelines related to noxious weeds

Definition of Native Plants

Native species are those that grow in the region in which they evolved and dispersed. They developed with no human involvement.

These plants evolved for different reasons, including climate (timing of rainfall, drought, frost), soils, and their interaction with other species which inhabit the plant community.

Photo credit: dcr.Virginia.gov



Source: Virginia Department of Conservation and Recreation

https://www.dcr.virginia.gov/natural-heritage/nativeplants

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Native Plant, Invasive Plant…What are the Differences? Does it Matter?

Benefits of Native Plants

- Contribute to the beauty and hardiness of the landscape
- Supply color, form, and texture to landscape designs while providing shelter and food to many other species
- Improve soil fertility through beneficial relationships between plants and the soil biome thus playing a vital role in the health of the ecosystem by supporting animals, fungus, microbes and other plants
- Reduce harmful run-off that threatens streams, rivers, and estuaries as in the creation of a riparian buffer
- Riparian buffer-streamside plantings to prevent erosion and provide habitat to aquatic insects, amphibians, reptiles, mammals and birds

https://dep.wv.gov/WWE/getinvolved/sos/Pages/RiparianMagic.aspx

Riparian Buffer



Photo credit: P. Fevrier, Rockbridge EMG

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And More Benefits

Photo credit P. Turner, EMG



- Native plants provide for native pollinator species by producing nectar, pollen, and seeds that serve as food for **native** birds, butterflies, bees and other wildlife. Many also serve as host plants for the caterpillars that become butterflies.
- Native plants contain long, robust root systems allowing them to purify and filter water and to mitigate soil erosion.

https://www.perkiomenwatershed.org/benefits-of-native-plants

https://www.dcr.virginia.gov/natural-heritage/nativeplants

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Examples of Native Plants in Virginia

- The link below lists many different plants that are native to our region of Virginia, the Mountain region.
- Our area is described as mountain range.
- These documents include recommended uses, minimum light requirements, and moisture requirements

Native Plants: Virginia Mountain Region

Native Plants, non-native plants, and invasive species

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Share the Buzz



"Hoping to pick up some chocolate, apples, lemons, or watermelon during your next outing to the supermarket? What about an iced coffee with a splash of cream? Bees, beetles, butterflies, and their pollinating brethren are essential in the production of nearly 75 percent of our crops, and without them, you could count out all those foods — and many, many others."

"This Is What Your Grocery Store Looks Like Without Bees" by Nick Vasser. Huffington Post online. 06/17/2014/ Updated Dec 06, 2017.

Native Plants Provide Diversity



- Allow a "back-up" food source if one species is affected by weather or pests. *NOTE: If one food source is in short supply, another native can act as a substitute.*
- Offer year round diversity with a natural food supply. *NOTE: Insects need nectar, pollen, and foliage. Bird chicks require insects (protein) early in their development followed by berries (carbohydrates) later in life as they are learning to fly.*

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Definition of Non-Native Plants

A plant species introduced intentionally to provide benefits as agricultural crops or landscape ornamentals, Or, introduced unintentionally in ship ballast, packing material, or as seed contaminants.

While it usually refers to plants from other countries, regions, or continents non-native can also mean plants from another region within the same country

Unfortunately, the terms non-native and invasive are often used interchangeably. If you put the term "non-native" into a computer search engine, you will get many references to invasive species.

While hosta's, hybrid tea roses, most garden hydrangeas, boxwoods, tulips, daffodils, garden salvias, lilacs, dwarf shrub junipers, and peonies are all non-native to the region, none of them are known to be invasive.

Source: Virginia Department of Conversation and Recreation

Non-Natives

- Many introduced species are well known and economically important in agriculture and horticulture, such as wheat, soybeans and tulips.
- Many plants have been introduced with the intent of aesthetically improving public recreation areas or private properties.
- Most introduced species do not cause problems and are often beneficial. Tens of thousands of plant species have been introduced into North America since the beginning of European colonization. Of these introductions, 5000 species have become naturalized, reproducing outside of cultivation.
- In Virginia, 606 species have been identified as naturalized. Of these, 90 species, or 15 percent of naturalized species (3 percent of the total Virginia flora), have been assessed as invasive in natural communities.
- Source: https://www.dcr.virginia.gov/natural-heritage/invspinfo

Non-Natives

- Non-native plants are fundamental to our lifestyle - most of our food crops are not native to the U.S.
- Many non-native plants support human health and economic interests such as crop production and landscaping
- Some species have been introduced intentionally to combat pests (biocontrols) and may be regarded as beneficial as an alternative to pesticides in agriculture
- Some contribute to regional biodiversity and ecosystem services.
- Ecosystem services include: form soil; cycle nutrients; provide food, fuel, fiber, and medicines; help control floods, diseases, pests and climate; help purify water; link us culturally; provide food and habitat for organisms

[Do non-native species contribute to biodiversity?]

Examples of non-native plants in Virginia gardens

- The majority of plants used in agriculture, forestry and horticulture in North America are not native to the continent.
- Potatoes, tomatoes, chili peppers, peanuts, cotton, turnips, wheat, okra, gooseberry,
- Abelia, Japanese maple (acer palmatum), yarrow (achillea pannonica; agave, Alstroemeria, alyssum, amaranthus, fescue, ficus, forsythia,

Click here for a comprehensive list of Introduced, Invasive, and Noxious Plants by state

Photo cred
Wheat



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Species vs. varieties

It is important to note that while some varieties of a plant species may be native, other varieties may be not be native. For example:

Salvia coccinea (blood sage) is native to Virginia, but salvia glutinosa (sticky sage), salvia hispanica (chia) and Salvia longistyla (Mexican sage) are not native to Virginia.

Of the 36 varieties of Erygium, only two grow in the wild in Virginia (Erygium Yuccifolium and Erygium aquaticum)

Source: BONAP's North American Plant Atlas

Definition of Invasive Plant

"Invasive plants are species intentionally or accidentally introduced by human activity into a region in which they did not evolve and cause harm to natural resources, economic activity or humans."

To be included on the list of invasive plants, there must be demonstrable evidence that a species poses a threat to Virginia's forests, marshes, wetlands and waterways.



Kudzu growing in Bedford, VA Photo credit: P. Turner, EMG

Source: https://www.dcr.virginia.gov/natural-heritage/invsppdflist

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Potential Problems with Invasive Plants

- Interfere, at a greater rate, with agriculture, forestry, transportation, utility infrastructure, and natural ecosystems than native plants
- Proliferate and displace native plant species, reduce wildlife habitat and alter natural processes.
- Degradation of rangelands, clogging of important waterways and increased effort to maintaining open power line rights-of-way.

Source:

- https://www.dcr.virginia.gov/nat

Photo credit: ufl.edu



Submersed hydrilla covering swimming area at Wakulla Springs

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Characteristics of Invasive Plants Species

- Rapid growth and maturity
- Prolific seed production and rampant spread
- Highly successful seed dispersal, germination, and colonization
- Ability to out-compete native species
- High cost to remove or control

Photo credit

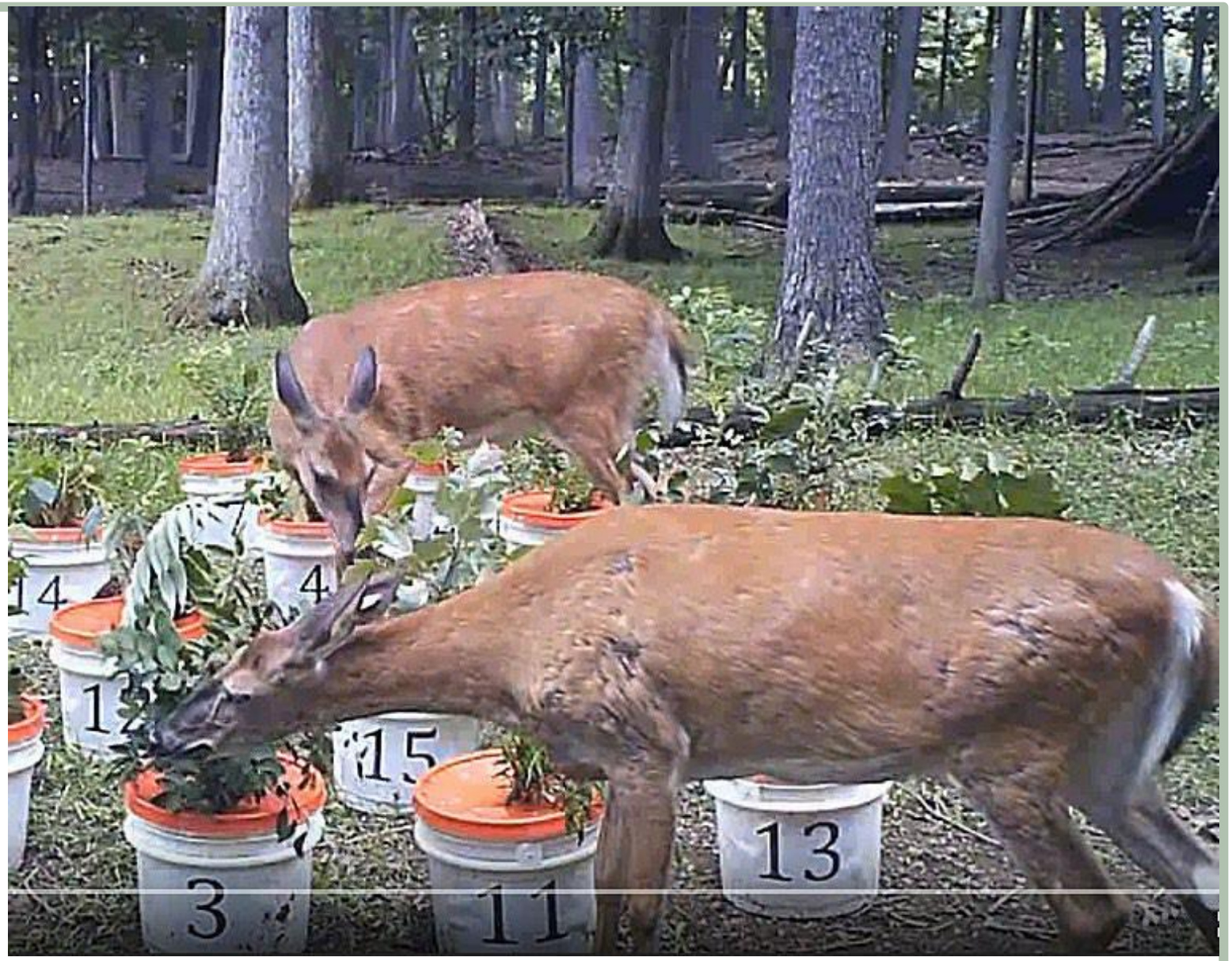


Source: Virginia Department of Conservation and Recreation

Invasive plants apparently don't taste very good. Deer preferences seem to help invasive plants spread.

They don't like to eat the invasive plants, so they are allowed to continue to spread

https://news.psu.edu/story/406166/2016/04/25/research/taste-test-deer-preferences-seem-help-non-native-invasive-plants



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Examples of Invasive Species in Virginia

- The link below provides information on invasive plant species found in Virginia

Virginia Invasive Plant Species List

Japanese Stiltgrass

Kudzu

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Can Plants be Native and Invasive? Native and Noxious? Noxious and Useful?

- Some states are including indigenous plants on their "noxious weed" and prohibited plant lists
- Japanese Knotweed, considered an invasive, is said to be a great nectar plant for honey bees (also non-native)
- Some plants that are considered desirable natives in part of the country may be considered invasive in another part of the country. Example: Smooth cordgrass (Spartina alterniflora) is a desirable native in the U.S. Atlantic coast, but an invasive on the Pacific coast, covering oyster beds and other vital habitat.
- Some plant and animal species have become extinct in their native homes, but are thriving in areas where they are non-native or even invasive. Should they be eliminated where they are non-native or invasive? Food for thought.

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[Can native plants be invasive?]

How to Select a Plant for your Garden

- Determine whether the plants you are considering will thrive in the place you plan to put them.
- Consider "local genotype." Is the plant or seed coming from a source near where you'll be planting them. (ordering plants from Calif. to be planted in Va. May be risky)
- Is there any possibility that the plant will cause harm to the ecosystem?
- Consider the value to wildlife. Learn what plants are larva hosts, pollinator friendly, and provide seed and shelter.

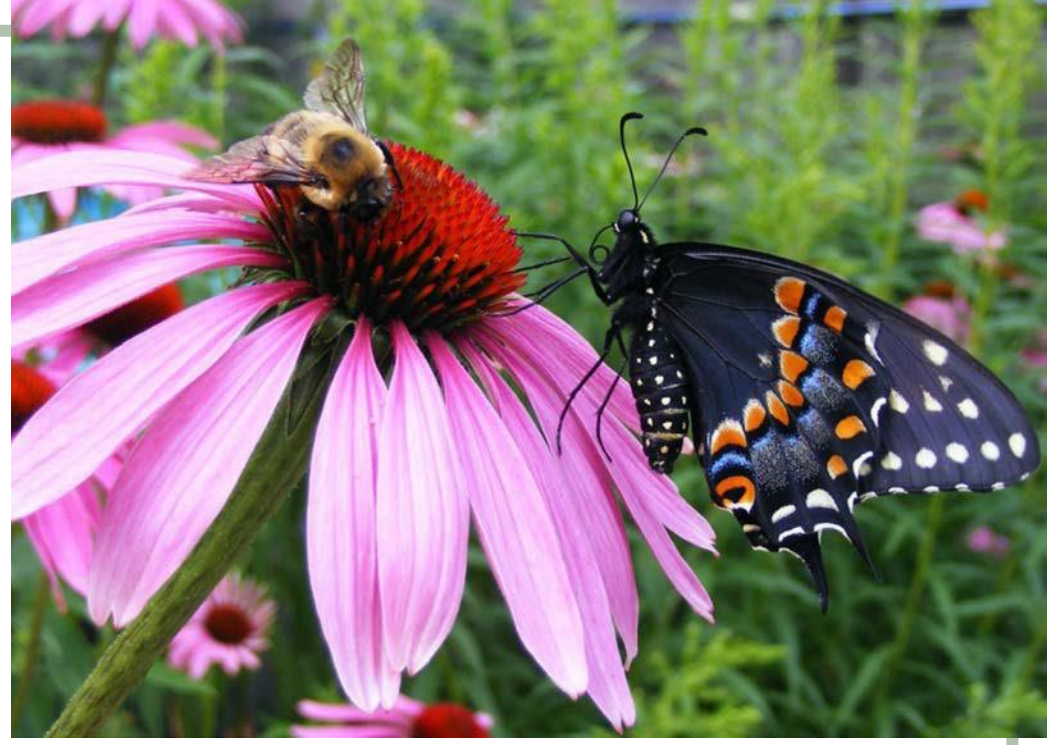

Photo credit:

Choosing Plants

Only You Can



- Help prevent economic and ecological harm
- Support Virginia flora and fauna
- Become an educated consumer

Websites to explore (check which species are native to your part of the state)

National Park Service

Mid-Atlantic Invasive Plant Council

The Nature Conservancy

Digital Atlas of Virginia Flora

Xerces Pollination Conservation Resource Center

Ladybird Johnson Wildlife Center

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Bringing Nature Home



" Like it or not, gardeners have become important players in the management of our nation's wildlife. It is now within the power of individual gardeners to do something that we all dream of doing: to make a difference. In this case, the "difference" will be to the future of biodiversity, to the native plants and animals of North America and the ecosystems that sustain them." Douglas Tallamy

Source: Bringing Nature Home, How You Can Sustain Wildlife with Native Plants. **Douglas W. Tallamy. Timber Press. 2017.**

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The following website provides multiple sites regional information about plant lists, habitat conservation guides, and more.

[Pollination Conservation Resource Center]

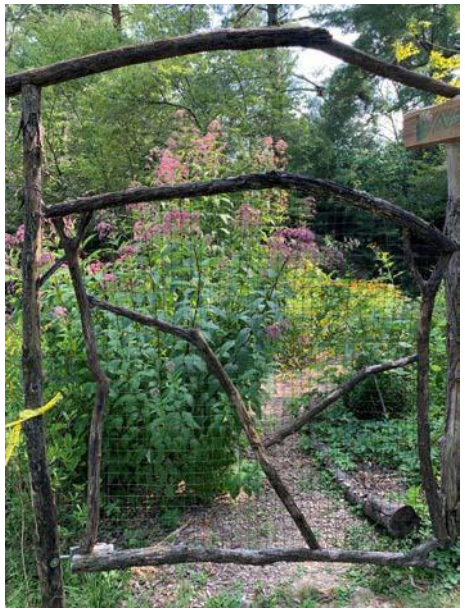



Photo credits: P. Fevrier, Rockbridge EMG

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Invasive Plants and the Law

The Commonwealth of Virginia and the Federal Government have laws related to noxious weeds.

Federal Regulations:

- Executive Order 13751 - Safeguarding the Nation from the Impacts of Invasive Species (2016)
- Executive Order 13112 - Invasive Species (1999)
- Executive Order 11987 - Exotic Organisms (1977)

Virginia Regulations:

- 2009 Invasive Species amendment to the *Code of Virginia* (20kb PDF)
- Virginia Noxious Weed Law, §§ 3.2-800 through 3.2-809
- Virginia invasive species management plan 2018

End of Slide Set

This is the end of the slides on Native, Non-Native and Invasive Plants. We hope that we have raised your interest level in this topic

You can continue to next slide "Suggested Readings"

OR

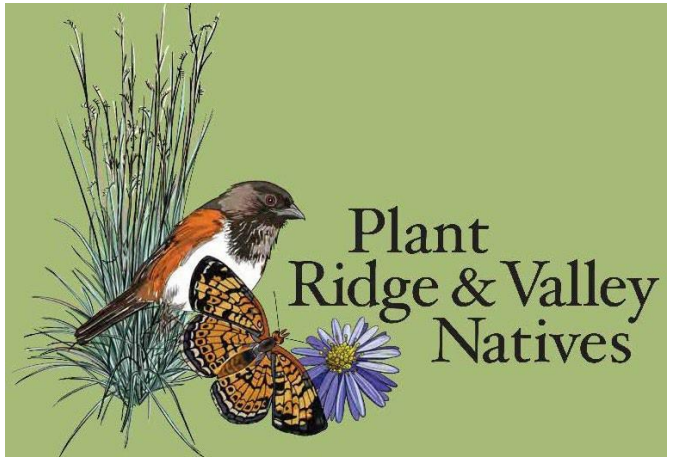
Click on the house in the lower right corner below to return to the Navigation Page

Suggested Readings

- Native, Invasive, and Other Plant-Related Definitions
- Alien Species Reconsidered: Finding a Value in Non-Natives
- Yards with Non-native Plants Create 'Food Deserts' for Bugs and Birds'
- Invasive Plant Atlas
- The Biota of North America Program

Recommended Reading

Photo credit:



Published in 2023, Plant Ridge and Valley Natives, a Gardener's Guide to Virginia Ridge and Valley Native Plants is a full-color, spiral-bound book that contains 144 pages off beautiful native plants suitable to using in a home garden, to provide not only beauty but high ecological value to the local ecosystem. It also includes six garden designs created specifically for this guide by ecologist Lara Lacher and garden designer Anne Elise Lintelman. You may purchase it by using the link below.

https://www.plantvirginianatives.org/new-page-4

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Test Your Knowledge
Click on the Knowledge Test you want to try

Native / Non-Native / Invasive Crossword Puzzle

Which Invasive am I

Help Desk Quiz

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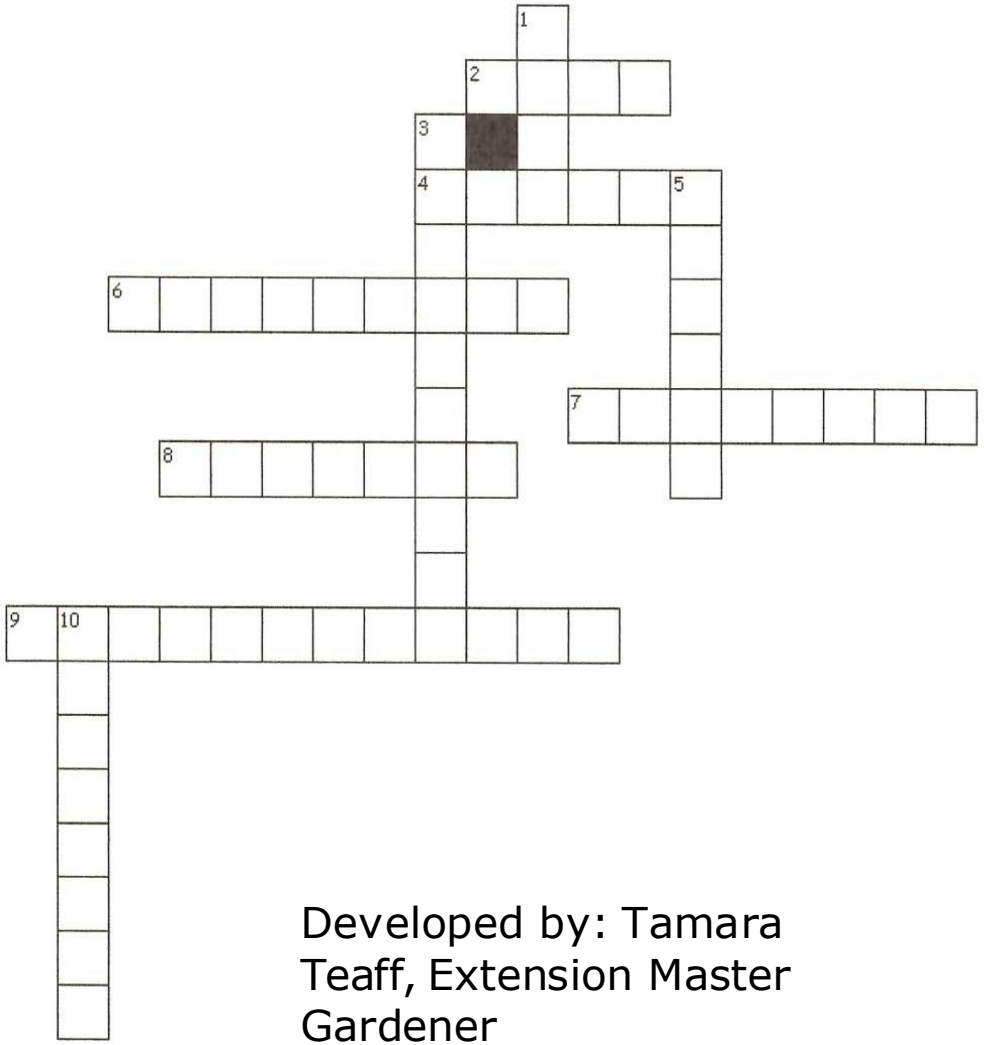
Native /Non-Native, Invasive Crossword Puzzle

WORDS TO USE

invasive
pest
weed
biodivsersity
stolons
nonnative
indigenous
rhizomes
exotic
native

Plant Invaders



Across
2. Used to describe any plant growing wherever someone wishes it did not
4. A species that naturally; occurs in a particular region ecosystem, or habitat
6. Refers to species from another continent, region,
7. Underground stems
8. Above ground stems
9. The sum of all plants, animals and other organisms living on earth

Down
1. A plant, animal or other organism considered harmful
3. native to an area
5. non-native plant
10. A species that grows and spreads rapidly

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Developed by: Tamara Teaff, Extension Master Gardener

Answers on next slide

Answers to Crossword

Across

2. used to describe any plant growing wherever someone wishes it did not **WEED**
4. a species that naturally occurs in a particular region, ecosystem, or habitat **NATIVE**
6. refers to species from another continent, region, ecosystem, or habitat **NONNATIVE**
7. underground stems **RHIZOMES**
8. above ground stems **STOLONS**
9. the sum of all plants, animals, and other organisms living on Earth **BIODIVERSITY**

Down

1. a plant, animal, or other organism considered harmful **PEST**
3. native to an area **INDIGENOUS**
5. non-native plant **EXOTIC**
10. a species that grows and spreads rapidly **INVASIVE**

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Click to Return to "Tests of Knowledge"

Which Invasive am I?

1. My home of origin is Europe. I came very early to America (around 1868) and may have been introduced for food and medical reasons. Although I have attractive white flowers, I produce chemicals that are toxic to the larvae of native butterflies. If you crush my leaves and stem, I smell like garlic. I produce hundreds of seeds which are carried by wind, wildlife and people. Locate me in the Herbaceous Forbs section. Which Invasive am I?

2. My home of origin is East Asia. I also had an early (1830) introduction into the United States. In the 1950s and 1960s, the state and federal governments encouraged the planting of me to support wildlife habitats. I was planted also as an ornamental shrub, for wind breaks and to restore deforested lands. I can be found from Maine to Florida and as far west as Washington State. I am drought tolerant and can thrive in a variety of soil conditions. I have aromatic yellow flowers which turn into edible red berries in late summer and fall. I can take over entire areas of habitat, leaving no room for anything else to grow. Locate me in the Shrubs and Subshrubs section. Which invasive am I?

3. My home of origin is central China and Taiwan. I am invasive in at least 30 states and Hawaii. I thrive in urban areas and cause damage to sewers. I grow vigorously with an invading root system that forms dense stands and also produce seeds prolifically. I push out natives with a chemical called ailanthone as I grow. I am deciduous and grow to a height of 70 feet. I am a host plant of the Spotted Lanternfly. Locate me in the tree section. Which invasive am I?

Use *Plant Invaders of Mid-Atlantic Natural Areas* to research these plants.

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Continued on next slide

Which Invasive am I (continued)

4. My home of origin is eastern Asia. I was introduced to the United States in 1806 for ornamental reasons. I was also planted for erosion control. I am a fast growing evergreen vine that twines around stems of shrubs and any vertical support available. I kill shrubs and saplings by girdling. My flowers are fragrant. My seeds are dispersed by birds. I am found in the Vines section. Which invasive am I?
5. My home of origin is Europe. I was brought to the United States in the 1700s as an ornamental. I am popular because I display pretty purple blue flowers in the spring. I am commonly sold in nurseries as ground cover. I have escaped from cultivation and invade natural areas. I form dense and extensive mats along the forest floor and choke out native species. I can be found in the Vines section. Which invasive am I?
6. My home of origin is northeastern Asia, Japan and central China. I was introduced to the United States as an ornamental plant for use in landscaping. Even though invasive, I am very popular today for my intense red foliage in the fall. I can be found along roadsides, in parks and in residential landscapes. I threaten natural habitats by displacing native woody and herbaceous plants. I produce hundreds of seeds. I can be found in the Shrubs section. Which invasive am I?
7. Although I am a native of Japan, China, central Asia and India, I can be found almost anywhere in the eastern US. It is believed that I was accidentally introduced to the US in Tennessee in 1919 in packing material. I thrive in moderate-to-densely shaded areas subject to regular soil disturbances, such as flooding, mowing, tilling, and high foot traffic. I am commonly found along roadways and ditches, floodplains, moist woodlands, and power line corridors. I can invade lawns, landscape beds, and vegetable gardens. I do not proliferate in full sunlight or in areas with standing water. I can be found in the Grasses and Sedges section. Which invasive am I?

Answers on next slide

Answers to: Which Invasive an I

1. Garlic mustard (*Alliaria petiolata*)
2. Autumn olive (*Elaeagnus umbellate*)
3. Tree of heaven (*Ailanthus altissima*)
4. Japanese honeysuckle (*Lonicera japonica*)
5. Common periwinkle (*Vinca minor*)
6. Winged burning bush (*Euonymus alatus*)
7. Stilt grass *Microstegium vimineum*

Click to Return to "Tests of Knowledge"

Help Desk Quiz

1. I have recently moved into a new house. The former owner has blanketed the backyard with daylilies. They are taking over the entire flower bed and beyond. I would like to remove them and plant a native alternative. Do you have suggestions?
2. My grandmother had a plant called Nodding Star of Bethlehem. I am aware that it is an invasive plant. However, I like the plant for nostalgic reasons. Is there a similar native plant that I could substitute?
3. There is a vine that is choking out all of the other plants in my garden. My neighbor has identified it as Japanese Hop and recommends that I remove it. However, I would like a vining plant, as it adds texture to the flower bed. Is there a less aggressive plant that you would recommend?
4. I am thinking about planting a red maple in my yard. I read an article that they are harmful to sugar maples, I am a bit skeptical about that statement. A tree is just a tree. Can you explain why I should avoid the red maple? They are now on sale at Lowes. If you succeed in talking me out of the red maple, what other trees would you recommend?
5. Bamboo is blocking the side of the road that borders our property. It has become a hazard especially when it is weighed down by snow or ice. Since it is on our property, I have been slowly removing it over the summer and have been successful in eradicating it. However, the road side looks barren without it. I do not want to replant more bamboo as it is invasive. Can you recommend a substitute (looks like bamboo) that will not be as aggressive, but will be attractive an add a border to the property

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Answers on next slide

Answers to Help Desk Quiz

1. I have recently moved into a new house. The former owner has blanketed the backyard with daylilies. They are taking over the entire flower bed and beyond. I would like to remove them and plant a native alternative. Do you have suggestions?
   Answer: Canada lily (*Lilium canadense*), Turk's cap lily (*Lilium superbum*), Ox-eye sunflower (*Heliopsis helianthoides*), Coreopsis 'Jethro Tull'

2. My grandmother had a plant called Nodding Star of Bethlehem. I am aware that it is an invasive plant. However, I like the plant for nostalgic reasons. Is there a similar native plant that I could substitute?
   Answer: Bloodroot (*Sanguinaria canadensis*), Virginia bluebells (*Mertensia virginica*), wild ginger (*Asarum canadense*), May apple (*Podophyllum peltatum*).

3. There is a vine that is choking out all of the other plants in my garden. My neighbor has identified it as Japanese Hop and recommends that I remove it. However, I would like a vining plant, as it adds texture to the flower bed. Is there a less aggressive plant that you would recommend?
   Answer: Native grapes (*Vitis*), Virginia creeper (*Parthenocissus quinquefolia*), coral honeysuckle (*Lonicera sempervirens*), native common hop (*Humulus lupulus*)

Continued on next slide

Answers to Help Desk Quiz Continued

4. I am thinking about planting a red maple in my yard. I read an article that they are harmful to sugar maples, I am a bit skeptical about that statement. A tree is just a tree. Can you explain why I should avoid the red maple? They are now on sale at Lowes. If you succeed in talking me out of the red maple, what other trees would you recommend?
   Answer: Red maple (*Acer rubrum*) is considered a more aggressive native (wind driven seed) and displaces sugar maples. Other trees that you may want to consider planting are Hackberry (*Celtis occidentalis*), black gum (*Nyssa sylvatica*), sassafras (*Sassafras albidum*).
5. Bamboo is blocking the side of the road that borders our property. It has become a hazard especially when it is weighed down by snow or ice. Since it is on our property, I have been slowly removing it over the summer and have been successful in eradicating it. However, the road side looks barren without it. I do not want to replant more bamboo. Can you recommend a substitute (looks like bamboo) that will not be as aggressive, but will be attractive an add a border to the property.
   Answer: Giant reed (*Arundinaria gigantea*), not to be confused with Giant reed (arundo donax), which is an invasive species; Eastern red cedar (Juniperus virginiana)

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Credits

This module was developed by Jan Smith, Phyllis Fevrier, Tamara

Teaff and Peggy Agnor, Extension Master Gardeners, Rockbridge Area Master Gardeners

Modifications were made by Bedford Extension Master Gardener training team

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