

Invasive Species

Presented by

Joseph Hill

Advanced Master Gardener

West Michigan Green Gardeners

www.WMiGreenGardeners.com

JoeHill@WMiGreenGardeners.com

©2011, West Michigan Green Gardeners

There are many terms used when discussing this subject. Let's clarify what each means before we continue. First of all, exotic, nonnative, nonindigenous, alien all mean the exact same thing: they are not from the area. That may mean they are from Eurasia or it may mean the organism is from southern U.S. It just means that (preEuropean settlement) the plant was not found in Michigan.

Naturalized is an exotic organism that has over time become part of our system and acts like a native (i.e. Queen Anne's Lace). (Someone might ask why don't we let all invasives become naturalized -- because there are a lot of species we would lose with the process.

Invasive means that the organism does not "play nice". It is excessively competitive and spreads quickly, dominating over native species. This puts the entire system out of wack. It is important to remember, native species can be invasive also. When the natural processes are disturbed, native plants, like poison ivy, can become invasive and must also be managed for.

Weed is any plant that is out of place. This is solely through the eyes of the beholder. So for your garden, a native plant like sumac may be a weed, in a natural area a garden plant like money plant is a weed.

Gardeners are an important group for this topic because you better than anyone understand the labor involved with managing weeds. Everyone dreads weeding their personal garden. Imagine a "weeding" a preserve or other natural area that may be 10 acres, 500 acres or even 1000s of acres in size.

Depending on which organization or agency you ask, invasive species are considered either the #1 or #2 threat to biodiversity. The other threat is habitat destruction, which is partially caused by invasive species. (Biodiversity is the concept of having as many different species as possible and as much genetic diversity as possible within those species. This is a desired situation because our planet (and ourselves) are more able to adapt to change with increases in genetic diversity).

What is a Weed?

The term "weed" means different things to different people. In the broadest sense, it is any plant growing where it is not wanted. Weeds can be native or non-native, invasive or non invasive, and noxious or not noxious. Legally, a noxious weed is any plant designated by a Federal, State or county government as injurious to public health, agriculture, recreation, wildlife or property. A noxious weed is also commonly defined as a plant that grows out of place (i.e. a rose can be a weed in a wheat field) and is "competitive, persistent, and pernicious".

Although we all have a general concept as to what a weed is, it is sometimes hard to determine whether a particular plant is a weed or not. Some crop plants, for example, can become weeds when they appear where they are not wanted. On the other hand, a number of plants usually thought of as weeds may actually be useful under some conditions or in some areas. They may help to control soil erosion or may serve as foods for wild animals and birds. Sometimes certain weeds are used as forages for farm animals.

A weed is also defined as any unwanted plants or plants whose negative values outweigh the positive values in a given situation. Weeds impact growers each year in reduced yield and quality of agricultural products. Weeds can harbor deleterious disease organisms and insects that harm crops and livestock. In addition, weeds can cause allergic reactions and serious skin problems (poison ivy), break up pavement, slow or stop water flow in municipal water supplies, interfere with power lines, cause fire hazards around buildings and along railroad tracks, and produce poisonous plant parts.

With these points in mind, we can define a weed as a plant not intentionally sown; whose undesirable qualities outweigh its good points. This definition eliminates the many plants--often native--that grow uncultivated in every locality but seldom have weedy tendencies. They are not aggressive enough to be troublesome in cropland or pastures. Since they do not interfere with agricultural production they should be allowed to grow undisturbed. In fact, many of these plants have such colorful flowers and interesting habits that they are well worth preserving.

Are Invasive Plants the Same as Noxious Weeds?

No. Invasive plants include not only noxious weeds, but also other plants that are not native to this country. The BLM considers plants invasive if they have been introduced into an environment where they did not evolve. As a result, they usually have no natural enemies to limit their reproduction and spread. Some invasive plants can produce significant changes to vegetation, composition, structure, or ecosystem function.

What is an Invasive Plant?

An invasive plant has the ability to thrive and spread aggressively outside its natural range. A naturally aggressive plant may be especially invasive when it is introduced to a new habitat. An invasive species that colonizes a new area may gain an ecological edge since the insects, diseases, and foraging animals that naturally keep its growth in check in its native range are not present in its new habitat.

Some invasive plants are worse than others. Many invasive plants continue to be admired by gardeners who may not be aware of their weedy nature. Others are recognized as weeds but property owners fail to do their part in preventing their spread. Some do not even become invasive until they are neglected for a long time. Invasive plants are not all equally invasive. Some only colonize small areas and do not do so aggressively. Others may spread and come to dominate large areas in just a few years.

The Federal Executive Order on Invasive Species defines an **invasive species** as "an alien species (plant, animal, insect, bacteria, and fungi) whose introduction does or is likely to cause economic or environmental harm or harm to human health". In turn, an **alien species** is defined with respect to a particular ecosystem and is considered any species "that is not native to that ecosystem" (Executive Order 13112, 1999). Alien species are also known as exotic, non-native, or introduced, however the term alien also applies to native species outside their natural range or ecological boundaries. The terms noxious, nuisance, or invasive characterize alien species when these organisms cause harm.

Since the time of settlement, plants, animals, and other organisms have traveled to places far beyond their likely natural dispersal ranges. The vast majority of these species transported to a place other than their native ecosystem, whether intentionally or accidentally, do not survive. Some scientists estimate that approximately 10% of those plants will survive and of those, 1 out of 10 plants will become invasive to the environment. The species that become invasive do succeed, in part, because the new ecosystem in which they find themselves offer favorable environmental conditions and lack the natural predators, competitors, and diseases that would normally keep their populations in check.

Listing of some categories to illustrate degrees of invasiveness.

Danger! Don't plant it...

Purple Loosestrife (*Lythrum salicaria*), has long been a prized perennial. Its pinkish-purple flowers appear over a long period in summer. The seeds of this plant easily wash into waterways, and can be carried in the mud on the feet of waterfowl. Stands of loosestrife spread exponentially in wetlands and along stream beds. This plant should be removed by hand only if it is very young. Attempts to dig it out usually backfire because purple loosestrife resprouts from root fragments; disturbing the soil just provides more room for it to spread. Cut established plants to the ground periodically to prevent flowering. Other invasive plants such as Tartarian Honeysuckle (*Lonicera tartaric*), Russian Olive (*Elaeagnus angustifoli*), Autumn Olive (*Elaeagnus umbellata*), and Japanese Barberry (*Berberis thunbergii*), are still available for planting even though they have become invasive over large areas. This category is threatening because gardeners who are unaware of problems with these plants may still be planting them in areas that have not yet been colonized.

Warning: If you see it, remove it...

Tree-of-heaven (*Ailanthus altissima*), is one of the few trees that can grow in abandoned alleys, gutters, and broken sidewalks, or just about anywhere that is not in shade. It grows very quickly, and competes aggressively for sunlight in newly developing forests. Disturbed sites are often dominated by tree-of-heaven. Pull these seedlings whenever you see them; once they have grown for a few years they are extremely difficult to get rid of. Reducing the number of trees will reduce the yearly output of seeds. Other common weeds which are invasive plants are Multiflora Rose (*Rosa multiflora*), Garlic Mustard, (*Allaria petiolata*), and Babys Breath (*Gypsophila paniculata*). Although these plants are not often planted intentionally in gardens or offered for sale, they have the ability to spread if not controlled.

Caution: It's not a problem if you manage it wisely...

English Ivy (*Hedera helix*), is one of the most popular ground covers in North America. However, its potential for escape is notorious. In the Pacific Northwest, English ivy invades the forest floors. Its evergreen leaves smother other native forest plants by denying them light. Interestingly, English Ivy only reaches maturity and goes to seed after it has grown up a vertical surface. If you are willing to prune it regularly to contain it, it does not pose a threat. English Ivy is not a good choice, though, if you want a low maintenance garden. You may want to replace it with native plants such as Lowbush Blueberry (*Vaccinium angustifolium*), Alum Root (*Heuchera americana*), or Partridge Berry (*Mitchella repens*). Some other invasive exotics aside from English Ivy that fit this category are Common Daylily (*Hemerocallis fulva*), Butterfly Bush (*Buddleia* spp.), Wintercreeper (*Euonymus fortunei*), and Lilyturf (*Liriope muscari*).

Although these plants are invasive, they can still be enjoyed by gardeners who want to grow them if they are willing to devote the time and effort to careful stewardship to prevent their spread.

Where are they a problem?

Invasive plants disrupt many natural habitats. They are most threatening in ecosystems such as wetlands, sand dunes, fire prone areas, and serpentine barrens where rare native plants are found. Invasive plant species thrive where the continuity of a natural ecosystem is breached and are abundant on disturbed sites like construction areas and road cuts. Even foot traffic can create a temporary void that is quickly invaded—some national parks have restricted the areas where visitors are allowed to walk with the warning, “we can watch purple loosestrife grow from people's footsteps”.

Why are they a problem?

It's a matter of ecology. In many cases, plants from other parts of the world are welcomed, manageable additions to our gardens. However, in some situations these non-native species cause serious ecological disturbances. In the worst cases, invasive plants like mile-a-minute, purple loosestrife, and kudzu ruthlessly choke out other plant life. This puts extreme pressure on native plants and animals, and threatened species may succumb to this pressure. Ultimately, invasive plants alter habitats and reduce biodiversity.

Where do they come from?

In some cases, invasive plants arrive purely by accident, as seed in agricultural products, or on shipments from overseas. In other cases, invasive plants are selected for their horticultural attributes. Beautiful, unusual, exceptionally hardy, drought-tolerant, or fast-growing plants are sought by gardeners the world over. Unfortunately, plants selected for their resilience may be invasive because of their adaptable nature. Plants selected for their aesthetic value may be hard to banish from your garden even after their invasive tendencies are revealed.

Why are invasive plants successful?

- Many invasive plant species produce large quantities of seed.
- Many invasives thrive on disturbed soil.
- Invasive plant seeds are often distributed by birds, wind, or unknowingly humans allowing seed to moving great distances.
- Some invasives have aggressive root systems that spread long distances from a single plant.
- These root systems often grow so densely that they smother the root systems of surrounding vegetation.
- Invasive plants may have a longer photosynthetic period (leaves grow earlier and remain on the plant later in the season), produces fruits early, and grows quickly.
- Some plant species produce chemicals in their leaves or root systems which inhibit the growth of other plants around them.

A very simple phrase to use would be: **Establishes quickly!**

What are the impacts of invasive plant species?

- Invasive species have contributed to the decline of **42%** of U.S. endangered and threatened species, and for **18%** of U.S. endangered or threatened species, invasives are the main cause of their decline.
- Invasive species compete directly with native species for moisture, sunlight, nutrients, and space.
- Overall plant diversity can be decreased.
- Establishment and spread of invasive species can degrade wildlife habitat.
- Results in poor quality agriculture lands.
- Degraded water quality.
- Increased soil erosion.
- Decreased recreation opportunities.
- Altering fire intensity and frequency.
- Competing for pollinators.
- Poisoning or repelling native plants.
- Displacing rare plant species.
- Increasing predation on nesting birds.
- Serving as reservoirs of plant pathogens.
- Diluting the genetic composition of native species through hybridization.
- Being difficult and/or costly to control.
- Impeding industries and threatening agriculture.
- Endangering human health.
- Posing a significant drain on the economy.

These impacts change nature's balance on which all species depend.

What Can You Do?

- Don't pick the flowers of noxious weeds and take them home.
- Drive only on established roads and trails away from weed infested areas.
- When using pack animals, carry only feed that is certified weed free.
- Removed weed seeds from pack animals.
- Don't pick and transport wild flowers that you can't identify.
- Do not camp or drive in weed infested areas.
- Contact your local native plant society or Michigan DNRE to find out which plants are invasive in your area.
- Learn to identify locally important invasive plants.
- Remove invasive plants on your property or prevent their spread.
- Only use non-invasive plants when landscaping your property.
- If your property borders a natural area, consider using only native plants in your landscape.
- Find non-invasive or native alternatives for invasive landscape plants.
- Use systemic herbicides carefully as a last resort to remove invasive plants.
- Make others in your neighborhood aware of invasive plants.

EPA's Green Landscaping Wild Ones Handbook

"Where flowers degenerate man cannot live." - Napoleon Bonaparte

SPECIES THAT ARE PESTS IN MIDWEST NATURAL AREAS

ALIEN TREES	
Norway Maple	<i>Acer platanoides</i>
Tree-of-Heaven	<i>Ailanthus altissima</i>
White Poplar	<i>Populus alba</i>
Siberian Elm	<i>Ulmus pumila</i>
Wayfaring Tree	<i>Viburnum lantana</i>
ALIEN SHRUBS	
Japanese Barberry	<i>Berberis thunbergii</i>
Autumn Olive	<i>Elaeagnus umbellata</i>
Russian Olive	<i>Elaeagnus angustifoli</i>
Winged Euonymus	<i>Euonymus alatus</i>
Common Privet	<i>Ligustrum vulgare</i>
Amur Honeysuckle	<i>Lonicera maackii</i>
Morrow's Honeysuckle	<i>Lonicera morrowii</i>
Tartarian Honeysuckle	<i>Lonicera tatarica</i>
Hybrid Honeysuckle	<i>Lonicera x-bella</i>
White Mulberry	<i>Morus alba</i>
Red Mulberry	<i>Morus rubra</i>
Common Buckthorn	<i>Rhamnus cathartica</i>
Glossy Buckthorn	<i>Rhamnus frangula</i>
Multiflora Rose	<i>Rosa multiflora</i>
European Highbush Cranberry	<i>Viburnum opulus</i>
ALIEN VINES	
Oriental Bittersweet	<i>Celastrus orbiculatus</i>
Wintercreeper	<i>Euonymous fortunei</i>
Japanese Honeysuckle	<i>Lonicera japonica</i>
Kudzu	<i>Pueraria lobata</i>

ALIEN GRASSES AND HERBACEOUS PLANTS	
Quack Grass	<i>Agropyron repens</i>
Garlic Mustard	<i>Alliaria petiolata</i>
Common Burdock	<i>Arctium minus</i>
Smooth Brome	<i>Bromus inermis</i>
Plumeless Thistle	<i>Carduus acanthoides</i>
Musk Thistle	<i>Carduus nutans</i>
Spotted Knapweed	<i>Centaurea maculosa</i>
Canada Thistle	<i>Cirsium arvense</i>
Lily-of-the-Valley	<i>Convallaria</i>
Field Bindweed	<i>Convolvulus arvensis</i>
Crown Vetch	<i>Coronilla varia</i>
Queen Anne's Lace	<i>Daucus carota</i>
Cut-leaf Teasel	<i>Dipsacus laciniatus</i>
Teasel	<i>Dipsacus sylvestris</i>
Fescue	<i>Festuca pratensis</i>
Leafy Spurge	<i>Euphorbia esula</i>
Creeping Charlie	<i>Glechoma hederacea</i>
Birds-foot Trefoil	<i>Lotus corniculatus</i>
Moneywort	<i>Lysimachia nummularia</i>
Purple Loosestrife	<i>Lythrum salicaria</i>
White Sweetclover	<i>Melilotus alba</i>
Yellow Sweetclover	<i>Melilotus officinalis</i>
Wild Parsnip	<i>Pastinaca sativa</i>
Reed Canary Grass	<i>Phalaris arundinacea</i>
Kentucky Blue Grass	<i>Poa pratensis</i>
Black Bindweed	<i>Polygonum convolvulus</i>
Mexican Bamboo	<i>Polygonum cuspidatum</i>
Johnson Grass	<i>Sorghum halepense</i>
Dandelion	<i>Taraxacum officinale</i>
Periwinkle or Myrtle	<i>Vinca minor</i>

In addition to the invasive aliens listed above, some native plants may become aggressive in your landscape. You can use this to your advantage if you're trying to create a tight hedgerow or massive groundcover planting. But be aware that you may need some means of control (regular weeding or a barricade such as a building, fence, or driveway) if you don't want these to spread outside your site and onto your neighbor's property.

AGGRESSIVE NATIVE TREES AND SHRUBS	
Box Elder	<i>Acer negundo</i>
Red Osier Dogwood	<i>Cornus sericea</i>
Quaking Aspen	<i>Populus tremuloides</i>
Black Cherry	<i>Prunus serotina</i>
Smooth Sumac	<i>Rhus glabra</i>
Staghorn Sumac	<i>Rhus typhina</i>
Black Locust	<i>Robinia pseudoacacia</i>
Prickly Ash	<i>Zanthoxylum americanum</i>
AGGRESSIVE NATIVE GRASSES AND HERBACEOUS PLANTS	
Canada Windflower	<i>Anemone canadensis</i>
Wild Sarsaparilla	<i>Aralia nudicaulis</i>
Wild Ginger	<i>Asarum canadense</i>
New England Aster	<i>Aster novae-angliae</i>
Prairie Coreopsis	<i>Coreopsis palmata</i>
White Snakeroot	<i>Eupatorium rugosum</i>
Wild Strawberry	<i>Fragaria virginiana</i>
Sunflowers	<i>Heliantus sp.</i>
Virginia Waterleaf	<i>Hydrophyllum virginianum</i>
Ostrich Fern	<i>Matteuccia struthiopteris</i>
Switchgrass	<i>Panicum virgatum</i>
Mayapple	<i>Podophyllum peltatum</i>
Smooth Solomon's Seal	<i>Polygonatum biflorum</i>
Downy Solomon's Seal	<i>Polygonatum pubescens</i>
Bracken Fern	<i>Pteridium aquilinum</i>
Stiff Goldenrod	<i>Solidago rigida</i>
Cattail	<i>Typha sp.</i>
Hairy Wood Violet	<i>Viola sororia</i>

Here are some web resources for invasive plants:

Midwest Invasive Species Network:

<http://www.misin.msu.edu>

Midwest Invasive Plant Network:

<http://www.mipn.org>

Michigan Invasive Plant Council:

<http://www.invasiveplantsmi.org>

USDA National Invasive Species Information Center:

<http://www.invasivespeciesinfo.gov/plants/main.shtml>

The Stewardship Network:

<http://www.stewardshipnetwork.org>