

**RECOMMENDATIONS FOR
CONTROL AND ERADICATION
OF EXOTIC INVASIVE
TERRESTRIAL PLANTS**



Prepared by

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INTRODUCTION:

Many exotic invasive plant species were introduced to the United States with the best of intentions: for food, forage, fiber, erosion control, or ornamental use. The USDA and various state agencies promoted some of these species as panaceas (i.e. USDA Farmers Bulletin No. 1923 “Kudzu As A Farm Crop” (FB 1023)), and USDA Farmers Bulletin No. 1840 “Kudzu for Erosion Control in the Southeast” (FB 1840). Today, it is difficult to fathom USDA’s award for “Best Kudzu Planting”.

Some exotic invasive plants truly arrived by mistake; as undigested seeds in the gut of livestock, or as seed caught in an animal’s hair. One has a romantic story: *Royal Paulownia seed pods served as the original “packing peanut” for Chinese porcelain.*

My friend, the late Dr. John Creech of USDA’s Plant Introduction Section regretted his role in releasing Callery Pear cultivars to the nursery trade. He would be aghast to see what a scourge Callery Pear has become; infesting roadsides and abandoned fields.

Not only do exotic plants pose the risk of proliferating out of control to the detriment of native ecosystems, but they can also bring disease. Chestnut Blight, the single worst man-caused ecological disaster to strike the Appalachian Mountains, came to America by way of imported Chinese/Japanese Chestnut trees.

Dogwood Anthracnose, likely imported with Chinese Dogwood (*Cornus kousa*) has absolutely devastated our once-abundant native Flowering Dogwood (*Cornus florida*). The lesson that we all -- from government agencies, to the nurseryman and farmer, to the suburban homeowner

-- need to heed is that we needn't import another single new plant from abroad.

Whereas the task of extirpating trillions of exotic invasive plants from American soil is monumental, it is altogether a worthy goal.

As a former nurseryman and landscape contractor, I propagated and installed Liriope, English Ivy, and Periwinkle. I have spent years eradicating my mistakes.

Correct past mistakes. Do your part to control or eradicate exotic invasives on your own property. Encourage your neighbors to do likewise. Urge your government authorities as well.

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Above: Broadcast spraying of Multiflora Rose (*Rosa multiflora*)

Cover Photo: Broadcast spraying of Bigleaf Periwinkle (*Vinca major*)

OVERVIEW

Technology has produced mechanical and chemical tools which enable a single individual to accomplish that which formerly would have required an army of persons; if it could have been done at all. The combination of mechanical tools and chemical herbicides* has proven to be an eminently effective means of controlling and eradicating exotic invasive plants.

Certainly, a small patch of invasive plants can be dealt with by simple hand-weeding.

Goats can control yet seldom eradicate an invasive plant infestation. If they truly rid an area of invasives, it is likely that, with few exceptions, desirable plant species will also disappear.

If you eschew herbicides, you are resigned to the arduous tasks of hand-weeding, digging out, smothering, or continual cutting and mowing, generally for many years, if not indefinitely.

Such efforts are admirable and, at times, as part of an Integrated Pest Management plan, the best or only option, yet the time and labor required to rid even a small plot of noxious growth proves to defeat most people. Thus, exotic invasive species continue to proliferate.

Would you use a pair of scissors to fell a tree? -Certainly not if you had access to a chainsaw. Herbicides are a powerful tool which, when carefully chosen and used judiciously, exponentially multiply your control and eradication potential.

Targeted application of herbicide does not disturb soil. A Chinese Privet can be killed without harming a Rhododendron though their trunks are touching. None of

these recommendations involve digging-out or bulldozing. These activities can make fertile ground for invasive seed to germinate, destroy desirable plants, or cause soil erosion.

Before treating exotic invasive plants, carefully observe and identify the native plants in association with, entwined with, or overtopped by the invaders. Formulate your strategy so as to do little or no harm to the natives. For example, in a woodland where Bloodroot, Trillium, and Mayapple are struggling to co-exist with a mass of Japanese Honeysuckle and Chinese Privet, employ a late summer, fall, or winter treatment strategy. The native spring wildflowers will be dormant, below ground, and unaffected by broadcast spray at those times of year.

Remember that the object is to destroy the invaders without harming desirable species. Never be cavalier or careless when using herbicide.

The herbicides recommended herein are proven to masterfully destroy their targets, be they in a backyard or on a mountain hillside. The herbicides recommended herein are non-restricted, which means you do not need to have a special license to purchase or apply them.

Agricultural supply stores generally sell at prices lower than other sources.

Prior to purchasing any herbicide, do your homework. Go online and search specimen labels for Crossbow®, Element 4®, Garlon 4 Ultra®, Relegate®, Pathfinder II®, Roundup PRO®, and Credit 41 Extra®. These are trade names of herbicides, just as 'Kleenex' is a trade name for facial tissue.

More important than a trade name is the active ingredient.

For instance, Element 4 ®, Garlon 4 Ultra®, and Relegate® contain Triclopyr at a 60+% concentration. Pathfinder II® contains Triclopyr at 13.6%. Crossbow® contains 2,4-D at 34.4% and Triclopyr at 16.5%. The combination of 2,4-D and Triclopyr is synergistic, making Crossbow® especially effective. Roundup PRO® and Credit 41 Extra® both contain Glyphosate at a 41% concentration.

Most often, a herbicide concentrate is diluted into a solution by adding water. For example, Roundup PRO® containing a 41% concentration of the active ingredient Glyphosate can be made into a 1½% solution by adding 2 ounces of Roundup Pro® herbicide to a gallon of water.

At times, a herbicide concentrate is used undiluted, at full strength.

Sometimes a “surfactant” should be added to a spray mix. A surfactant is a substance like soap which, when added to a liquid herbicide, aids in spreading the herbicidal solution over a leaf surface, thereby increasing the herbicide’s effectiveness.

Before using a herbicide, read and follow label instructions. Wear the proper clothing. Use common sense.

Keep records of what you did, when you did it, and the condition of your target plant(s), as well as the weather when you applied the herbicide and 24 hours afterward. Written records pay dividends.

*The use of trade names herein does not constitute an exclusive endorsement. Herbicides are listed by trade name for reasons of simplicity, familiarity, and availability to non-professional, non-registered users.

GRASSES

What to use: Glyphosate

How to use quick guide: Spray or wipe a 1.5% - 2% solution on target plants when they are lush and growing. DO NOT cut or mow grasses prior to treatment. The herbicide is absorbed by green foliage.

***Special Note:** If target grasses are growing amongst target broadleaf plants, combine the Glyphosate with Crossbow® at the same dilution in the same solution so as to save time; killing two birds with one stone, if you will.*

HERBS (Annual and Perennial)

What to use: Either Crossbow® or Glyphosate, or a mix of both.

How to use quick guide: When target plants are lush and green in late spring or early summer, thoroughly spray or wipe the target plant foliage and stem with a 1.5% solution of Crossbow® OR a 2% solution of Glyphosate, OR a tank mix of both Crossbow® and Glyphosate.

***Special note:** Crossbow® will not kill grasses, thus it is termed a “selective” herbicide. Use this selectivity to your advantage. If native grasses and exotic invasive broadleaved herbs are growing together, DO NOT use Glyphosate. Glyphosate is “non-selective”; it will kill desirable grasses. Crossbow® will kill herbs but leave the grass unharmed.*

VINES

What to use: Crossbow®

How to use quick guide: For soft vines like Bigleaf Periwinkle (*Vinca major*) and non-woody English Ivy (*Hedera helix*), spray a 1.5 - 2% solution with surfactant added when new foliage is fully expanded in late spring for optimum kill. Spraying through the summer and early fall can also be effective.

For woody vines in small areas, cut the stem(s) of the vine as close to the ground as is practical. Immediately coat the cut stem(s) with undiluted Crossbow®. Use a spray bottle, paintbrush, or dauber. The “Cut Stub” method is effective year-round; especially in early fall.

For woody vines in large areas, sever all the vines attached to or climbing desirable trees and shrubs. Treat the sizeable vines with the Cut Stub method. For the remainder of the infestation, treat with a 2% broadcast spray of Crossbow® plus surfactant during the growing season up to late summer.

Chinese Wisteria (*Wisteria sinensis*), Oriental Bittersweet (*Celastrus orbiculatus*), Japanese Honeysuckle (*Lonicera japonica*), or Kudzu (*Pueraria montana*) infestations can be so dense that only its periphery is spray-accessible. Spray what you can, either on foot or by machine. Then attack the infestation with a chainsaw, mower, mulching head, or trackhoe to cut or shatter the dense growth at or near ground level. Wait for lush regrowth before spraying with a 2% solution of Crossbow® plus surfactant in late summer.

Resprouting from persistent crowns can be spot treated with a 4% solution of Crossbow® with surfactant added. Be vigilant for several years.

Special Note: Non-ionic surfactant, described earlier, is purchased separately from Crossbow® as it is not needed when Crossbow® is used undiluted in other control and eradication strategies

SHRUBS

What to use: Crossbow®

How to use quick guide: For individual plants and small areas, cut the invasive shrub(s) as close to the ground as is practical. Immediately coat the cut stub(s) with undiluted Crossbow® using a spray bottle, paintbrush, or dauber. The Cut Stub method is effective year-round and is usually a once and done process.

For sizeable infestations, treat as many large specimens as is possible with the Cut Stub method. Use chainsaw, pole saw, mower, or mulching head to cut or shatter the remaining stems as close to the ground as is practical.

Wait for lush regrowth before thoroughly spraying with a 2% solution of Crossbow® plus surfactant in late summer or very early fall before deciduous plants exhibit fall color.

Special Note; Although Glyphosate can control or kill woody shrubs, I have found Crossbow® to be much more effective.

TREES (Broad-leaf)

What to use: Crossbow® (preferred by this author) or Triclopyr

How to use quick guide:

- Seedling size trees can be hand-pulled or sprayed with herbicide in the same manner as **herbs**.
- Seedling to sapling size trees are treated in the same manner as **shrubs**.
- Pole size and larger diameter trees can be killed by any of the following methods (and others not mentioned here because they require specialized equipment, or a high degree of skill to prevent overapplication of herbicide.)

Method 1: Girdling (without herbicide)

Prior to the advent of machinery, trees not felled for building material or firewood were often killed by girdling, which is the beating or chopping off of a band of outer bark and cambium around a tree's circumference. Countless acres of forest were made arable by girdling; the trees left to die, standing until decay or need for firewood brought them down. Sometimes girdling will kill the standing portion of a tree while it resprouts near ground level. Resprouting of exotic invasive trees is intolerable, thus the following methods are recommended.

Method 2: Frill Cut (Hack-and-Squirt)

Use a hatchet or machete to make a series of downward slanting cuts through the bark, cambium, and outer sapwood. As cuts are made, slightly pry the peripheral tissues outward to create a slit into which undiluted herbicide is sprayed or squirted. Make cuts no more than

a few inches apart. Although it can be done at any time of year, late summer and early fall are the best time to employ the Frill Cut (Hack-and-Squirt) method because at those times a tree is translocating sap to its roots, carrying the herbicide along with it.



Frill cut (Hack-and-Squirt)

Root kill is critical to eradicating those exotic invasives which readily sprout from roots. Chinaberry, Royal Paulownia (Princess tree), Tree of Heaven (Ailanthus), and Callery Pear are notorious root sprouters. Without the use of herbicide, control and eradication of these species is essentially hopeless.

Method 3: Chainsaw Girdling Plus Herbicide

Use a chainsaw to make a downward slanting shallow cut into the outer sapwood and completely encircling the tree trunk relatively close to its base. Spray or squirt undiluted herbicide into the cut, being sure to soak the entire cut.

Special Note: *Girdling, Frill Cut (Hack-and-Squirt), and Chainsaw Girdling Plus Herbicide methods are ideal for*

killing exotic invasive species found alone or within stands of desirable native species.

Dead, standing “snags” are left in place to slowly decay and fall apart. Snags provide a banquet of insects for various birds. Snags also serve as perches for raptors and nest cavities for bluebirds, tree nesting ducks, flickers, chickadees, nuthatches, bats, woodpeckers, and owls. Standing dead trees can become den trees for squirrels, opossum and racoons. Once fallen to the ground a dead tree becomes valuable habitat for Ruffed Grouse, Eastern Towhee, snakes, turtles, shrews, salamanders, mice, chipmunks, lizards and frogs.

Decaying trees provide mushrooms, ants, and beetle larvae which feed bear and others.

For wildlife, a dead tree is arguably worth more than a living one. Ecologists believe dead wood is one of the greatest resources for animal species in the forest.

Killing of exotic invasive species standing in place provides an added benefit of allowing neighboring desirable native trees, shrubs, and herbs to slowly acclimate to increased sunlight, and to escape being damaged or crushed as may be the case with felling.

In situations where felling of an invasive tree is prudent, use:

Method 4: Cut Stump

Saw the stump low; preferably to the ground. Blow or brush the stump free of sawdust or wood chips. Immediately coat the stump with undiluted Crossbow®. The cut stump method is another once and done process that is effective at any time of year.



Cut stump treatment of Bradford Pear (*Pryus calleryana* 'Bradford')

Special Note: A flush-cut, herbicide treated stump insures against root sprouts. It also alleviates the need for stump removal; saving expense and possible damage to underground utilities. Simply cover it with soil, stone, mulch, or plant matter.

Final Note:

These recommendations stem from nearly 50 years of practical experience in killing exotic invasive plants located in residential yards, on entire mountainsides, and in sensitive wetlands. I have studied publications produced by respected universities which, in my opinion, too often lack detail or avoid recommending herbicides, thus denying the public of needed education on that which has proven time and again to arguably be the best tool for the task.

For example, advice to, “bulldoze” is senseless. Bulldozing is very expensive, will destroy nearby desirable plants, cannot operate in a small area, cannot negotiate steep slopes or wetlands, will not eliminate all invasive plant roots, allows for germination of existing invasive plant seeds, can cause soil compaction, and opens the soil to erosion. Advice to, “Treat when plants are young” is of limited value. What to do when plants are no longer “young”? Advice to, “Mow and cover (Kudzu) with plastic sheeting for 2 years”. Honestly? On the 2-acre mountainside? Advice to, “Minimize disturbance”? Not in the “bulldoze” area, I suppose!

It is my frustration with such advice that spawned this publication. There is no better basis for recommendations than repetitive, successful real-world experience. My recommendations provide a time-tested formula for successful control and eradication of exotic invasive terrestrial plants.

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About the Author:

In addition to his 47 years of experience as a SC Forester, Fred owned Mountain View Nursery in Northern Greenville County from 1982 to 2000, Fred R. Kissling Landscape Construction Co. from 1997 to 2015, and Kissling's Christmas Tree Farm from 1981 to 2000. He is a lifetime organic gardener and resides in Tigerville, SC.



The author, in a tangle of massive Oriental Bittersweet ([Celastrus orbiculatus](#)). A chainsaw will sever the vines near shoulder level and again near ground level. Cut stubs will immediately be coated with undiluted herbicide.