



Controlling Exotic Plants

In Your Forest

James H. Miller Southern Research Station USDA Forest Service,
Auburn University

Tough forest vegetation problems are caused by non-native plants. These foreign invaders often called exotic, alien or noxious weeds occur as trees, shrubs, forbs, vines and grasses. Some have been introduced into this country accidentally, but most were brought here intentionally as ornamentals or for livestock forage. They arrived without their natural predators of insects and diseases that keep most plants in a natural balance. They are now essentially free to spread without too much opposition, except from control measures applied by landowners and managers trying to defend their property from an "unfriendly takeover."

Most alien plants come to your property from their migration along right-of-ways and stream margins. Some are widely scattered by seeds dispersed by birds and animals, while others are actually planted by unsuspecting or poorly-informed landowners and land managers.

The first line of defense against an alien plant takeover is a constant surveillance of an unwelcomed plant, effective control measures should be started. Early detection and treatment will minimize efforts and costs that come with treating well-established plants or full-blown infestations. Much more effort is required for successful eradication of established infestations, but it can still be accomplished with proper treatments described here.

Effective Herbicide Treatments

If an alien plant infestation is spotted or already occurs on your land, then proper treatment should be started or

spread is inevitable. Continued retreatments will probably be necessary to be successful. Most alien and troublesome plants are perennials, having extensive tough runners or roots. This means that effective herbicide applications offer the best means of control, because herbicides can kill roots.

To be successful, the most effective herbicide for the species should be used, applied using the correct method and during the optimum time period. Only herbicides registered by the Environmental Protection Agency for "forestry use" will be discussed here. Herbicides in other use areas such as non-cropland, right-of-way, pastures and rangeland may be just as effective, or even contain the same active ingredient. Read and understand the herbicide label and its prohibitions before and during use. Forgo applications during periods of severe drought as herbicide effectiveness can be greatly reduced during these times.

How about other treatments besides herbicides?

Overgrazing is a way to reduce the vigor of palatable alien plants like kudzu, but this rarely yields eradication and may spread seeds (now occurring with tropical soda apple). Mechanical treatments and prescribed burning can assist eradication measures, but are limited in effectiveness, providing only temporary above-ground control. Although ineffective by themselves, both mechanical and burning treatments can give additional kill of herbicide-weakened plants and may have a place in an integrated pest management program. Steps must be taken to prevent erosion when using mechanical

and burning treatments.

Exotic Trees and Herbicide Controls

Exotic trees hinder reforestation, as well as forest stand and right-of-way management. Some species are scattered while others occur in dense infestations. Silk tree continually spreads along stream networks, chinaberry appears more in new forests, and tallowtree has extensive infestations in wet forests, replacing native species. All use roadsides for gaining access to your lands, and often occur together.

Silk tree or mimosa (*Albizia julibrissin*)



Mimosa leaves and flower

Nature: Small legume tree, growing 30 to 40 ft. tall, that reproduces by prolific seeding and root sprouts. It has feathery deciduous leaves, showy pink blossoms and smooth light brown bark.

Origin: Native to Tropical America.

Range: Found along roadsides and forest borders from MS to FL and north to KY and VA.

Uses: A traditional ornamental with infestations originating from old home-site plantings.

Herbicide control: Apply Accord™, Roundup™, Garlon 3A™ or Garlon 4™



as 2 % solutions in water (8 ounces in a 3 gal sprayer) with a wetting agent to thoroughly wet all leaves in July to October. Apply Transline™ as a 0.2% solution in water (1 ounce in a 3 gal sprayer) to thoroughly wet all leaves, stems and bark in July to September. Transline controls only legumes and is often safe on surrounding non-leguminous species.

Chinaberry (*Melia azedarach*)



Chinaberry

Nature: Medium tree growing to about 50 ft. tall that spreads by prolific seeding. It has lacy, bipinnate leaves that are dark green and blue flowers that yield sticky yellow fruit.

Origin: Introduced from Asia and traditionally planted at home sites in the Southeast.

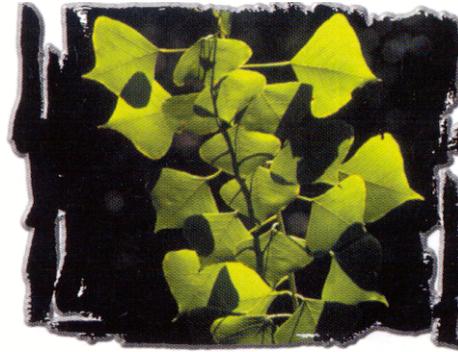
Range: Grows along forest borders, stream banks, and in disturbed habitat throughout the Southeast, but rare at high elevations.

Uses: Traditional ornamental, with potential uses of its extracts for natural pesticides.

Herbicide control: Apply Garlon 3A or Garlon 4 as a 2% solution in water (8 ounces in a 3 gal sprayer) with a wetting agent to thoroughly wet all leaves in July to September.

Popcorn tree or Green Tallow tree

(*Sapium sebiferum*)



Tallow tree

Nature: Shade-tolerant, small trees growing to 40 ft tall that spreads by bird-dispersed seeds. It has light-green heart-shaped leaves that have bright fall colors, long drooping flowers and bundles of white waxy seeds.

Origin: Introduced from China to the U.S. gulf coast in early 1900's.

Range: Occurs in the coastal plain from NC south to FL to TX with severe infestations on wet forest sites and coastal prairies in east TX to FL. Occurs as an ornamental in OK and AR and is spreading into all upland areas.

Uses: Ornamental. Waxy seeds traditionally used to make candles. Honey plant for beekeeping.

Herbicide control: Apply Garlon 4 in diesel, mineral or vegetable oil with a penetrant (check with herbicide distributor) to young bark completely around the trunk up to 16 inches above the ground in spring. Use a 5% solution (18 ounces in 3 gal sprayer) when less than 6 inch DBH, and up to a 20% solution (2 quarts in 3 gal sprayer) when greater than 6 inch dbh. Apply Arsenal AC™ to the foliage of seedlings in July to October as a 1% solution in water (3 ounce in 3 gal sprayer) plus a wetting agent. For large trees, make stem injections using Arsenal AC or Garlon 3A in dilutions and cut spacings specified on the herbicide label (anytime except

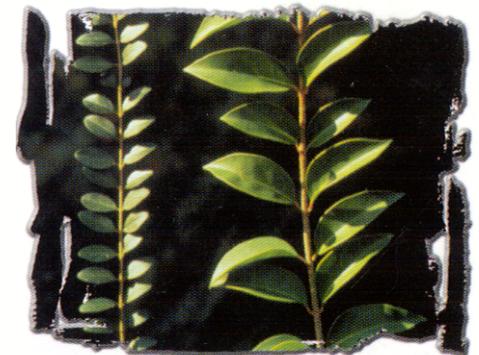
March and April). Apply Velpar L to the soil surface within 3 ft of the stem (one squirt of spotgun per 1 inch DBH).

Exotic Shrubs and Herbicide Controls

Exotic shrubs often occur with exotic tree species and present similar problems. Exotic shrubs have use for wildlife forage and often are established by mis-informed hunter groups.

Chinese privet (*Ligustrum sinense*) and **Japanese privet** (*Ligustrum japonicum*)

Nature: Shade-tolerant, tall shrubs or small trees growing to about 30 ft tall, with evergreen leaves, that spread by bird-dispersed seeds and by underground runners. Both species have leafy stems with opposite leaves. Chinese privet leaves are less than 1 inch long and Japanese privet leaves are 1-3 inches long. Both have clusters of small



Chinese privet

Japanese privet

white flowers in spring, yielding large clusters of round dark-purple berries during winter. Both will form dense stands that prevent pine and hardwood regeneration or land access.

Origin: Both introduced from China.

Range: Scattered throughout MS north to TN and KY and east to AL, GA, SC and NC.

Uses: Traditional southern ornamental shrubs.

Herbicide control: Apply Accord or Roundup as a 3% solution (12 ounces in a 3 gal sprayer) or Arsenal AC as a 1%



solution (4 ounces in a 3 gal sprayer) in water with a wetting agent to thoroughly wet all leaves in August through September. For stems too tall for foliar sprays, apply Garlon 4 to the young bark completely around the trunk up to 16 inches above the ground in January to February or May to October using a 20% solution (2 quarts in 3 gal sprayer) in diesel, mineral or vegetable oil with a penetrant (check with a herbicide distributor).

Bicolor (*Lespedeza bicolor*) and **Serecia lespedeza** (*Lespedeza cuneata*)



back front
Bicolor



back front
Serecia lespedeza

Nature: Although still mistakenly planted for quail food, these plants will quickly invade surrounding forests, replacing native plants. Bicolor is a shade-tolerant, 3-leaflet, legume shrub up to 10 ft tall that spreads by seeds dispersed by birds and animals. Serecia is

not really a shrub, but a semi-woody plant to 3 ft tall, having many small 3-leaflet leaves feathered along erect stems. Bicolor has small purple flowers and serecia has tiny cream-colored flowers during the summer. Both will form dense stands that prevent pine and hardwood regeneration or land access.

Origin: Introduced from Japan.
Range: Found as infestations throughout the Piedmont and Coastal Plain in the Southeast.

Uses: Wildlife food for birds and soil stabilization.

Herbicide control: Apply Accord, Roundup, Garlon 3A or Garlon 4 as 2% solutions in water (8 ounces in a 3 gal sprayer) with a wetting agent to thoroughly wet all leaves in July to October. Apply Transline as a 0.2% solutions in water (1 ounce in a 3 gal. sprayer) to thoroughly wet all leaves and stems in July to September.

Multiflora rose (*Rosa multiflora*)

Nature: An open-growing thorny rose, planted widely 20 to 40 years ago for "living fences," wildlife cover and windbreaks. It has clusters of white roses in spring unlike our native roses that have single roses. Multiflora rose reproduces by seeds, root sprouts and rooting at the ends of arching branches. It forms dense thickets that prevent tree regeneration and land access.

Origin: Introduced from Japan and Korea.

Range: Most of the eastern U.S.



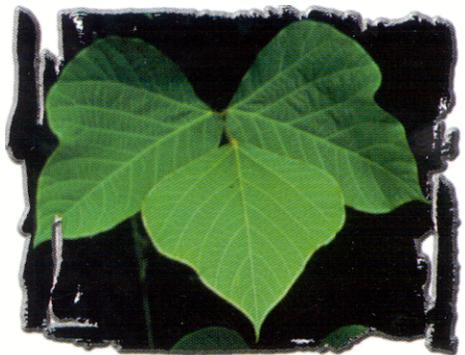
Multiflora rose

Uses: Some wildlife value.
Herbicide control: Apply Escort™ at 2 oz per acre (0.6 dry ounces in 3 gal sprayer) in water and a wetting agent in Ma); wetting foliage to run-off. This may damage fescue and bahiagrass pastures.

Exotic Vines and Herbicide Controls

Exotic vines are some of the most troublesome invaders because they form the most dense infestations. Kudzu and Chinese wisteria can overtop even mature forests, while Japanese honeysuckle can form dense cover even under tree canopies. Reforestation after harvesting infested stands often requires high-cost treatments. A relative newcomer is Japanese climbing fern, which is extending its range rapidly by wind-blown spores. It can be found along forest roads, margins and even within dense forest cover.

Kudzu (*Pueraria lobata*)



Kudzu Leaves

Nature: Semi-woody legume vine that spreads by vine growth, rhizomes and weds.

Origin: Introduced from China and Japan into MS, AL, GA, TN, NC and SC.

Range: Occurs on roadsides, fields and forests throughout the Southeast and scattered north from IL to CT.

Uses: Erosion control, livestock feed and folk art.

Herbicide control: Apply foliar sprays of Tordon 101™ (1 pt in 3 gal sprayer) or Tordon KTM (0.5 pt in 3 gal sprayer)



and wet foliage until run-off in June to September for successive years. Tordon herbicides are soil active and can kill or damage plants having roots within the treated area. Other options provide partial control and may be useful in specific situations. Specific for legumes and relatively safe to other plants, Transline should be applied as a 0.2% solution in water (1 ounce in a 3 gal. sprayer) to thoroughly wet all leaves and stems in July to September. To treat kudzu in young pine plantations, apply Escort from 2-4 oz per acre (0.6-1.2 dry ounces in 3 gal sprayer) to foliage in July or August.

Japanese honeysuckle

(*Lonicera japonica*)

Nature: Shade-tolerant, climbing and trailing semi-woody vine with ever-



Japanese honeysuckle

green leaves that spreads by stolons and seeds. Forms dense cover after harvest to prevent regeneration in areas.

Origin: Introduced from Japan.

Range: Eastern U.S.

Uses: Valued as deer browse in Piedmont and erosion control.

Herbicide control: Apply Escort at 2 oz per acre (0.6 dry ounces in 3 gal sprayer) in water and a wetting agent in June when pine tolerance is needed. Apply Accord or Roundup as a 2% solution in water (8 ounces in a 3 gal sprayer) with a wetting agent to the leaves in middle to late summer.

Chinese wisteria (*Wisteriasinensis*)

Nature: Semi-woody legume vine (or shrub) that spreads by vine growth and seeds. One of four species in the Southeast with one other being exotic but rare [Japanese wisteria (*Wisteria floribunda*)], while the native or naturalized *Wisteria frutescens* is the more frequent.

Origin: Introduced from Asia.

Range: Piedmont and Coastal Plain



Chinese wisteria

from VA to LA and north to AR and TN.

Uses: Traditional southern porch vine.

Herbicide control: Apply foliar sprays of Tordon 101 at 3% solution (12 ounces in 3 gal sprayer), Tordon K™ at 2% solution (8 ounces in 3 gal sprayer), or Garlon 4 at 4% solution (15 ounces in 3 gal sprayer) in water with a wetting agent and wet foliage until run-off in July to October for successive years.

Japanese climbing fern

(*Lygodium japonicum*)

Nature: Delicate vine-like fern, climbing and twining to form clumps that can cover shrubs and trees. One of three species of climbing fern in the SE (the others—*Lygodium palmatum* in the Blue Ridge and *Lygodium microphyllum* in FL—are native). Climbing and twining perennial vine with lacy leaves, and black and wiry vines.

Origin: Introduced from Japan

Range: Currently found scattered throughout the lower halves of AL, MS,



Japanese climbing fern

LA, SC, GA and central FL.

Uses: Ornamental.

Herbicide control: Apply Accord, Roundup, Garlon 3A or Garlon 4 as 2% solutions (8 ounces in a 3 gal sprayer) or Arsenal AC as a 1% solution (4 ounces in a 3 gal sprayer) in water with a wetting agent to thoroughly wet all leaves in July to October. Damage to surrounding plants may occur with these herbicides.

Exotic Grasses and Herbicide Controls

Exotic grasses present severe competition for establishing forest plantations on abandoned row-crop and pasture lands. Some of these are generally considered naturalized like Bermuda grass (*Cynodon dactylon*), crabgrass (*Digitaria* spp.) and giant fescue (*Festuca arundinacea*) but are still troublesome for forestry. Most exotic grasses spread untreated along highway and utility right-of-ways.

Cogongrass (*Imperata cylindrica*)



Cogongrass



Nature: Dense, erect perennial grass that is spreading by wind-blown seeds and persists by tough rhizomes. Has light yellow-green leaves with an off-center midvein and finely serrated margins.

Origin: Native to Southeast Asia and listed as the World's Seventh Worst Weed.

Range: Found in all MS, lower AL, and isolated infestations in southwest GA and SC.

Uses: Improved forage initially projected without success, and initially for soil stabilization.

Herbicide control: Apply Arsenal AC as a 1% solution (1.3 ounces in a 3 gal sprayer) or Accord as a 2% solution (8 ounces in a 3 gal sprayer) or a combination of the two in water with a wetting agent to thoroughly wet all foliage in September or October with multiple applications to regrowth.

Japanese grass or stiltgrass

(*Microstegium vimineum*)



Japanese grass

Nature: Dense, mat-forming annual grass that roots at nodes and is shade tolerant and occupies various habitats including stream banks, floodplains, forest roadsides and trails, damp fields and swamps.

Origin: Native to temperate and tropical Asia, it was introduced near Knoxville, Tennessee around 1919.

Range: Eastern U.S.

Uses: None

Herbicide control: Apply Accord or Vantage™ as 2% solutions in water (8 ounces in a 3 gal sprayer) with a wetting agent in late summer.

Bermudagrass (*Cynodon dactylon*), **Giant fescue** (*Festuca arundinacea*), **Bahiagrass** (*Paspalum notatum*) and **Johnsongrass** (*Sorghum halepense*)

Nature: All these grasses have been widely planted and continue to provide excellent forage for cattle and sheep, but can present problems for forest landowners and right-of-way managers.

Origin: Introduced from the mediter-



Johnsongrass



Giant fescue

anean and Africa, and now widely distributed most everywhere in the world.

Uses: Improved pasture for livestock production and wildlife plantings.

Herbicide control: Apply Accord as a 2% solution in water (8 ounces in a 3 gal sprayer) with a wetting agent in late-summer before planting trees. Then over sprays with mixtures of 1 % Arsenal AC (4 ounces in a 3 gal sprayer), 1-2 ounces Oust (0.3-0.6 dry ounces in 3 gal sprayer), and 1 ounce Escort (0.3 dry ounces in a 3 gal sprayer) in water and a wetting agent in May when pine tolerance is needed.

The Rehabilitation Phase

The most important and final phase of an eradication and rehabilitation program is the establishment of fast growing native plants, which will out-compete any surviving unwanted plants. This often means planting genetically-improved pine seedlings and insuring their initial rapid growth through cultural means. Another option is the planting of improved forage grasses, but most of these are actually introduced plants that can spread through your lands. Native plants are becoming available for planting for rehabilitation, but limited seed supplies and the absence of well-developed establishment procedures hinder their current use. Check with your state tree nursery for available native plants.

An eradication program for infestations of exotic plants usually takes several years and surveillance for many more years to check for seed germination or new invasions. By doing this in a planned manner, and being persistent, your lands can be protected from an "unfriendly takeover" by useless alien plants. In this way, native plants and forest productivity can be safeguarded and wildlife can continue to have suitable habitat.

Caution

Pesticides used improperly can be injurious to humans, domestic animals, desirable plants, and fish or other wildlife. Use all herbicides and pesticides selectively and carefully. Follow recommended practices for the disposal of surplus herbicides and pesticides and their containers.

Use of trade names is for reader information and does not constitute official endorsement or approval by the U.S. Department of Agriculture or Forest Landowners Association to the exclusion of any suitable product or process. 🌿