

IDENTIFYING AND CONTROLLING COGONGRASS IN GEORGIA

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Cogongrass (*Imperata cylindrica* (L.) Beauv.) has become a major problem for landowners, land managers, foresters, and governmental agencies since its introduction into the southeast. Known to many as “Jap grass”, cogongrass was accidentally introduced into Alabama near Grand Bay about 1911 as seed in packing materials from Japan (4). Purposeful introductions, primarily for forage production (1,4), soon followed in other areas of Alabama, Mississippi and Florida. Horticultural varieties of cogongrass continue to be sold under the name “Japanese bloodgrass” or “Red Baron grass”. Infestations of this perennial grass from Asia form exclusive colonies, displacing native vegetation with the exception of mature trees (5). Cogongrass is a fire adapted species, meaning that it thrives where fire is a regular occurrence (1,4). As a result, cogongrass burns hot and readily, creating safety and property loss concerns. Wildfire in cogongrass can kill mature and seedling trees and native plants, furthering its domination. Rights-of-way managers loathe cogongrass for its unsightly growth habit, difficulty in mowing and displacement of more manageable species.

Cogongrass spreads by both wind-blown seeds and underground creeping rhizomes. The rhizomes can form a dense mat in the upper 6 to 8 inches (to a maximum depth of 12 to 24 inches) of soil and may comprise as much as 80% of the total plant mass (1,2). It is the rhizome system that makes this plant particularly hard to control. Elimination of aboveground portions of the plant can be easily accomplished, but if the rhizomes are not killed or removed, rapid re-sprouting and regrowth will occur.

Conservative estimates put the infested area between 500,000 and one million acres in Alabama, Mississippi and the Florida panhandle. Regionally, cogongrass can be found throughout southern and central Louisiana, Mississippi, Alabama and Florida with a few scattered infestations in east Texas, southeast South Carolina and eastern Virginia. In Georgia, cogongrass has been found in 9 southern counties (see Figure 6). Once cogongrass gains a foothold in an area, it’s just a matter of time before it spreads from the infested site. *Therefore, it is very important to recognize and eliminate cogongrass before it spreads and to understand ways to prevent its movement and introduction. In Georgia, if you think you have cogongrass on your land, please contact your local County Extension or Forestry Commission office.*

Identification

Cogongrass has some distinctive vegetative features that aid identification. Cogongrass rarely is found as a single plant as it quickly forms patches or infestations, often circular in outline. Plants vary in height, even in the same patch, from 1 to 5 ft. tall (1,5). Taller leaves will lean over in late summer. Leaves measure ½ to 1 inch in width and are commonly 12 to 30 inches long. They rarely have a lush green color; instead, they often appear mostly



Figure 1. Forest infestation in Seminole County, Georgia
Photo by Chris Evans, UGA

yellowish green. A reddening of the leaves sometimes has been observed in the fall, and is correlated to extreme changes in temperature. The whitish upper midrib of a mature leaf is often not centered on the blade as with most grasses. This makes identification somewhat easier. Also leaf margins are rough to the touch due to tiny saw-like serrations, which is a common trait of some other grasses as well. This rough margin, which can cut the tongue of a grazing animal, and high silica content make cogongrass a useless forage crop. The leaves appear to arise directly from the soil, giving the impression that the plant is stemless, but short stems are present. A few short hairs may arise at the node, or the place where the leaf arises from the stem, but otherwise the plant is hairless.

Another key identifying feature of cogongrass is its production of fluffy, white, plume-like seed heads in early spring (late March through mid-June in south Georgia). This spring flowering is contrary to most summer grasses, which flower later in the season. Cogongrass also has been documented to initiate flowering at other times of the year in response to disturbance such as herbicide application, fire, mowing, or the first hard frost (4). Seed heads range from 2 to 8 inches in length and may contain as many as 3,000 seeds. Each seed has silky, white hairs that aid in wind

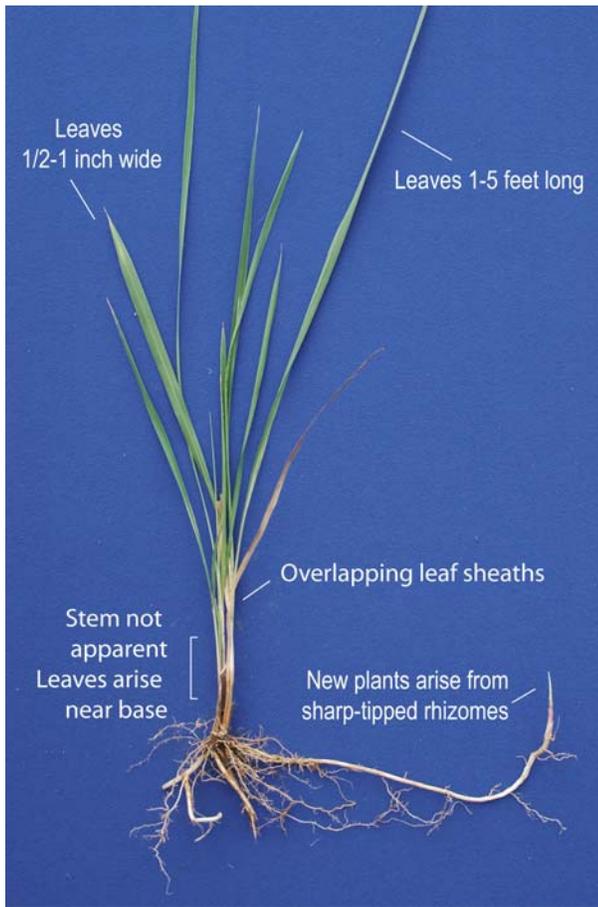


Figure 2. Morphological features of cogongrass
Photo by Chris Evans, UGA

Control Measures

Cogongrass control varies according to the age and rhizome mat density and depth. Young infestations are usually easier to control than older well-established infestations. For newer patches, tillage can eliminate cogongrass from an area if continued during the course of a growing season. The initial tillage should begin in the spring (March through May) with an implement that inverts the soil to a depth of at least 6 inches. Perform additional tillage with a disk harrow or other appropriate implement every 6 to 8 weeks. It is important to clean all equipment on site to prevent the spread by rhizomes. Dry periods during the summer will aid in the control of cogongrass. The area can be planted to a fall cover crop and then followed the next season with perennial or annual grass or broadleaf crops. Mowing may help reduce cogongrass stands, but areas must be mowed frequently and at a low height. Monitor the site throughout the growing season; spot treat any recurring infestations with appropriate herbicides.

Tillage may not be an option on many sites such as steep slopes, established tree plantings, or around dwellings. Out of dozens of herbicides tested for significant activity on cogongrass only two, the active ingredients glyphosate (Roundup^a, Glypro, Accord^b, etc...) and imazapyr (Arsenal, Arsenal AC, and Chopper^c), have much effect on this grass (6). Even at high

dispersal. Seed viability is variable and seed must land on bare ground for germination (3). Rhizomes of cogongrass are white, segmented, branched and have been found extending 48 inches below the soil surface. It can extend about 10 feet yearly from an established plant (7). They more commonly completely occupy the upper 6-8 inches of the soil surface (2,5). Rhizomes are sharp-pointed and often pierce the roots of other plants and unprotected human feet and hands. Each rhizome segment can give rise to a new plant which can occur with cultivation or partial herbicide control (4).

Habitat

Cogongrass is opportunistic and invades a wide range of non-cultivated habitats including rights-of-way, forests, pastures, orchards, and waste areas. Cogongrass thrives in full sunlight, but may extend well into a mature forest stand, especially if there is no intermediate tree or shrub layer. Cogongrass will not grow in saturated soils, but tolerates periodic flooding reasonably well. Although cogongrass will not tolerate continued soil disturbance, it is a rapid invader of recently disturbed soil such as that found in road construction areas, industrial lands, mechanically site prepared forest land, and even the container-grown ornamental industry. Cogongrass has never been a pest of row-crop agriculture in the United States, but the rapid adoption of reduced tillage practices could allow it to become a potential threat. Other industries potentially impacted by cogongrass include sod production and wildlife. Increasingly, homeowners in forested areas are placed at risk by cogongrass-fueled wildfires.



Figure 3 a) seedhead b) off-center midrib (vein) c) segmented rhizomes with paperlike sheaths, removed (top) and intact (bottom).

Photo 3a & 3b by Mark Atwater. Photo 3c by Chris Evans, UGA



Figure 4 a) small infestation **b)** right-of-way infestation
 Photo 4a by Wayne Williamson
 Photo 4b by Wilson Faircloth, USDA ARS

rates and using tank-mix combinations, cogongrass often regenerates within a year following a single application of either product. A minimum of two applications per year is needed, realizing that older infestations may require 2 to 3 years of treatment to eliminate rhizomes. Glyphosate has no soil residual activity. Imazapyr has both soil and foliar activity and can severely injure susceptible plant species that are planted too soon after the last treatment. Most vegetables, row crops, and ornamentals *will be injured* if planted within 24 months following an imazapyr application. As with all pesticides, proper handling and usage is of utmost importance and *always read and follow label directions*.

Small Area Infestations and Home Landscapes

Cogongrass in small (less than 20 foot diameter) patches can be treated with a glyphosate solution in early fall (August through October). A 4% solution of 41% active ingredient material (5 1/3 fluid ounces per gallon of water) sprayed on the green leaves and allowed to dry for 2 to 3 hours will kill the top growth of cogongrass. Regrowth must be treated the following spring and possibly the next fall to ensure rhizome kill. **CAUTION:** glyphosate herbicide spray mixtures should be considered non-selective when sprayed on green tissue. Keep spray and spray drift off any desirable plants. Treat larger infestations with glyphosate using a tractor-mounted boom sprayer calibrated to deliver 10 to 15 gallons of spray solution (water + herbicide) per acre. Use glyphosate at the rate of 3 to 4 pounds active ingredient per acre. This translates into 3 to 4 quarts of herbicide per acre for the 41% active material. Replacement species should be planted in the area following the last treatment (either spring or second fall after 90% control is achieved) to suppress reinfestation. Plant crimson clover or

ryegrass after the fall application of glyphosate to stabilize sloping areas through winter. Replace this cover crop with a perennial grass or with shrubs planted in a high-density pattern to provide shade over the area.

Rights-of-Way, Industrial Sites, Pastures and Non-Crop Areas

Where selective treatment is not needed, tank mixes of glyphosate (3 to 4 pounds active ingredient per acre) plus imazapyr (Arsenal 1 to 4 pints per acre) are effective. Sulfometuron (Oust XP^d) at 2 ounces per acre has been shown to increase cogongrass control when applied with imazapyr, but should not be applied as a stand-alone treatment. For selective treatment of cogongrass in unimproved bahiagrass and bermudagrass turf, apply Arsenal at a rate of 8 fluid ounces per acre. In pastures, apply 8 to 48 ounces of Arsenal per acre. There are no grazing restrictions following Arsenal application. Do not cut hay within seven days of application. Burning or mowing prior to herbicide application may increase chemical effectiveness by eliminating thatch and causing the production of new growth, which better absorbs pesticide. A cogongrass fire is *hot and fast*. *Proceed with extreme caution and careful planning and preparation*. Always consult with local authorities on the rules concerning burning in your area.

Pine Plantations

To increase application effectiveness, prescribe burn, if feasible, during winter before treatment to eliminate logging debris and cogongrass thatch at harvest. Chemically site prepare with Arsenal AC (2 pints per acre) or Chopper (4 pints per acre) plus glyphosate at 4 pounds active ingredient per acre in the fall prior to planting in late winter (at least 3 months after application). This combination may be applied by helicopter and should include a suitable surfactant not to exceed 0.5%.



Figure 5 a) growing season **b)** dormant season
 Photo 5a & 5b by David Moorhead, UGA

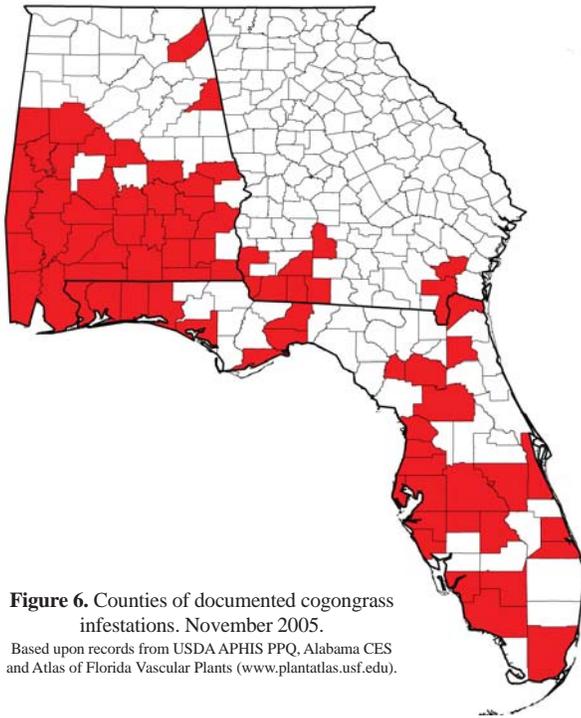


Figure 6. Counties of documented cogongrass infestations. November 2005.

Based upon records from USDA APHIS PPQ, Alabama CES and Atlas of Florida Vascular Plants (www.plantatlas.usf.edu).

After planting, apply herbaceous and release treatments of Arsenal AC following label guidelines over-the top of loblolly, longleaf and slash pine to control cogongrass. For loblolly pine seedlings, Arsenal AC may be applied following planting at a rate of 6 to 10 ounces per broadcast acre. A nonionic surfactant not to exceed 1/4 percent of spray solution volume can be used only for loblolly pine. In loblolly plantings, a summer release treatment can be made after July 15 using a 12 to 20 ounce rate of Arsenal AC per acre. For slash and longleaf pines use a 4 ounce rate of Arsenal AC per broadcast acre without surfactant for herbaceous control after planting. In 2 to 5 year old slash and longleaf plantations apply Arsenal AC only after August 15 with a rate of 12 to 16 ounces per acre without a surfactant. In slash and longleaf pines over 5 years of age do not treat with an over-the-top spray until after September 15 using a 12 to 14 ounce rate of Arsenal AC per acre without surfactant. *Do not* use surfactant with this treatment, as severe tree injury and/or mortality will result. Oust XP (1 to 2 ounces per acre) can be tank-mixed with Arsenal AC (4 to 6 fluid ounces per acre) for improved control in *loblolly pine only*. On well-established pines (DBH > 5 inches), apply the site prep mixture described above from August through October, taking care not to contact pine foliage. Fire is NOT recommended in standing timber unless cogongrass is in a suppressed state from prior treatment.

The Rehabilitation Phase

Rehabilitation is the most important phase of control and reclamation of land infested with cogongrass or other non-native invasive plants. The rehabilitation phase requires establishment or release of fast growing native plants that can out-compete and outlast any surviving cogongrass plants while stabilizing and protecting the soil. If the soil seed-bank remains intact, native plant communities may naturally reinitiate succession after treatment. Light seeded native species are usually present in the seed-bank while heavier seeded plants will gradually be deposited on a site by birds and other animals. In recent years, native plant seed and seedlings have become increasingly available for rehabilitation sowing and planting, but a limited number of species and absence of well-developed establishment procedures often hinder use. Georgia Forestry Commission and private tree nurseries are good sources of many species of native trees and shrubs. It is often necessary to establish fast growing tree species during the later control phase to hinder reestablishment of cogongrass. Reestablishing native grasses and forbs is equally important. These species are available from commercial nurseries specializing in native plants. Utilize local sources when possible. Seedling native plants can be also collected and transplanted from suitable field sites. Their establishment will be more challenging than the commonly available nonnative plants so often used for soil stabilization and wildlife food plots. Constant surveillance, treatment of new unwanted arrivals, and finally, rehabilitation following control are critical to preventing reinfestation on a specific site.

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^a Roundup is a registered trademark of Monsanto Co., 800 N. Lindbergh Blvd., St. Louis, MO 63167.

^b Glypho and Accord are registered trademarks of Dow Agrosiences, 9330 Zionsville Rd., Indianapolis, IN 46268.

^c Arsenal, Arsenal AC, and Chopper are registered trademarks of BASF, 26 Davis Drive, Research Triangle Park, NC 27709.

^d Oust XP is a registered trademark of Dupont, Wilmington, DE 19898.



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For more information on cogongrass, visit www.cogongrass.org. For more information on invasive species in Georgia, visit www.gainvasives.org. All images provided by and available through Invasive.org.



Use pesticides only according to the directions on the label. Follow all directions, precautions, and restrictions that are listed. Do not use pesticides on plants that are not listed on the label. Trade names are used only to give specific information. Use of trade names does not imply endorsement by any agency.

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