

## **Cogongrass (*Imperata cylindrica* (L.) Beauv.) Biology, Ecology and Management in Florida<sup>1</sup>**

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### **History**

Cogongrass is an aggressive, rhizomatous, perennial grass that is distributed throughout the tropical and subtropical regions of the world. It has become established in the southeastern United States within the last fifty years, with Alabama, Mississippi, and Florida having extensive acreage of roadway and pasture infested with cogongrass. Cogongrass first appeared in the area around Grand Bay, Alabama as an escape from Satsuma orange crate packing in 1912. It was intentionally introduced from the Philippines into Mississippi as a possible forage in 1921. Cogongrass was introduced into Florida in the 1930s and 1940s as a potential forage and for soil stabilization purposes. However, it was revealed that cogongrass was of little economic (forage) benefit and could become a serious pest. Consequently, it was placed on the noxious weed list, which prohibits new plantings. Unfortunately, cogongrass was spread by illegal plantings and inadvertent transport in forage and in soil during roadway construction. It does not

survive in cultivated areas but becomes established along roadways, in forests, parks, and mining areas. It is now found throughout Florida from the panhandle region well into south Florida.

### **Taxonomy**

Cogongrass is a perennial grass that varies greatly in appearance. The leaves appear light green, with older leaves becoming orange-brown in color. In areas with killing frosts, the leaves will turn light brown during winter months and present a substantial fire hazard. Cogongrass grows in loose to compact bunches, each 'bunch' containing several leaves arising from a central area along a rhizome. The leaves originate directly from ground level and range from one to four feet in length. Each leaf is 1/2 to 3/4 of an inch wide with a prominent, off-center, white mid-rib. The leaf margins are finely serrated; contributing to the undesirable forage qualities of this grass. Seed production predominately occurs in the spring, with long, fluffy-white seedheads. Sporadic

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seedhead formation can also be induced by mowing, burning or fertilization. Seeds are extremely small and attached to a plume of long hairs. Although the seeds can be carried long distances by wind and animals, the spread of cogongrass by seed is questionable and still under investigation.

## Ecology

Cogongrass is native to southeast Asia and infests nearly 500 million acres of plantation and agricultural land worldwide. It is found on every continent, although it does not tolerate cool temperatures. In the United States, cogongrass extends as far north as South Carolina and west to Texas. In Florida, cogongrass infests ditch banks, pastures, road sides/right-of-ways, golf courses, and forests. In central Florida, monocultures of cogongrass have become established on hundreds of acres of reclaimed phosphate mining areas. Cogongrass thrives on fine sand to heavy clay and does well on soils of low fertility. Attempts at finding natural pests of cogongrass have met with limited success. Pathogens have been isolated but none have been developed for effective control. Cogongrass does not tolerate dense shade. In Asian rubber plantations, cogongrass dies back upon canopy formation. However, reports of invasion into old growth forests in Florida suggest that a more shade-tolerant ecotype has developed.

The rhizomes are responsible for the survival and short-distance spread of cogongrass. Established stands may produce over 3 tons of rhizomes per acre. The specialized anatomy of the rhizome allows for water conservation. The rhizome can also penetrate to a depth of 4 feet in the soil, although the majority of rhizomes remain in the top 6 inches. The sheer mass and persistence of rhizomes is not the only factor contributing to the ability of cogongrass to dominate an area. It has also been reported that these rhizomes exude allelopathic substances which inhibit growth of other plants. As the density of cogongrass increases, all other vegetation may be excluded and normal succession of species will not occur.

## Forage Value

Cogongrass has been utilized in southeast Asia as a forage due to the fact that it is the dominant vegetation on over 300 million acres. In these areas it was found that only very young shoots should be grazed or cut for hay. At this stage, the leaves lack the sharp points and razor-like leaf margins. Crude protein rarely attained the minimal 7% level needed to sustain cattle. Cogongrass yields are relatively low, even under heavy fertilization, and usually do not exceed 5 tons per acre. Furthermore, the nitrogen, phosphorus, and energy content of cogongrass is very low, making supplementation essential for livestock.

## Control

Extensive research has been conducted in Africa, southeast Asia and the United States for the control of cogongrass. Burning, cultivation, cover crops, and herbicides have been used with varying degrees of effectiveness. To eliminate cogongrass, the rhizomes must be destroyed to avoid regrowth. Cultivation and herbicides have been the two control strategies used most often. One of the oldest and most successful methods is to deep plow or disk several times during the dry season to desiccate the rhizomes and exhaust the food reserves. It is essential to cut to a depth of at least 6 inches to ensure that most, if not all the rhizomes have been cut. Results from these practices are evident when observing cogongrass growing up to the edge of a cultivated field with no evidence of spread into the field itself.

The use of herbicides for control of cogongrass began in the 1940s. Today, only a few of the hundreds of herbicides tested are effective against cogongrass. In non-crop areas such as rights-of-way and fence rows, the so-called soil sterilants such as prometon (Pramitol), tebuthiuron (Spike), and imazapyr (Arsenal) will give excellent control; however, areas treated with these materials will be free of any vegetation for 6 months to a year. Often these conditions promote erosion and are unacceptable.

In other areas, current chemical control alternatives are very limited. Glyphosate (Roundup, etc.) applied at 3-4 qt/A will substantially reduce cogongrass stands but multiple applications are

needed. However, Roundup is a non-selective herbicide and will control/injure all vegetation present at the time of treatment. Subsequent to application, crops can be planted immediately because glyphosate has little or no residual soil activity. If high rates (4-5 qt) of Roundup are used, slight soil residual may exist in Florida soils; therefore, a 10-14 day waiting period should be observed before revegetating with tender seeds or seedlings. Fluazifop (Fusilade DX) provides moderate suppression of cogongrass. Fusilade is a selective grass herbicide that provides more flexibility when desirable broadleaf species are present for revegetation. For exact rates and times of herbicide application, consult the herbicide label for most current legal information.

### **Integrated Management**

Although tillage and herbicides will provide some control and suppression of cogongrass, long-term eradication is seldom achieved. It has been shown that an integrated approach that combines burning, tillage (mechanical disturbance) and chemical applications provide the best solution for cogongrass management.

Initially, cogongrass should be burned or mowed to remove excess thatch and older leaves. This initiates regrowth from the rhizomes, thereby reducing rhizome biomass. It also allows herbicides to be applied to only actively growing leaves, maximizing herbicide absorption into the plant. Ideally, burning should take place in the summer. A one-to-four month regrowth period has been shown to provide a sufficient level of leaf biomass for herbicide treatment. This targets herbicide applications to be made in the late summer/early fall - approximately 1 month prior to the average killing frost, depending on area. Once again, the herbicides glyphosate (Roundup, others) or imazapyr (Arsenal, Chopper) have been shown to provide the best control. If tillage can be incorporated, then a disking treatment directly following a burn is the best approach. This will further deplete the rhizome reserve through dessication and increase the number of shoots per given area. A one-to-four month regrowth period before herbicide treatment is also needed with this approach as well.

Once good control of cogongrass has been achieved, it is essential to introduce desirable vegetation as quickly as possible to prevent cogongrass from re-infesting the area. Several species have been shown to colonize rapidly and tolerate the residual affects of imazapyr. A wider range of plant species can be used with glyphosate due to the lack of soil activity. However, cogongrass will eventually begin to re-infest, regardless of control. Therefore, diligence and persistence are essential to remove/treat re-infested areas before this grass regains a foothold. Selective herbicide choices are limited and research is continuing in this area.

Cogongrass continues to be an increasing problem in Florida. Substantial efforts to manage cogongrass have been made in infested areas, but it is important that cogongrass not be allowed to spread into non-infested areas. Allowing cogongrass to grow unchecked ensures its continued spread along roadways and into pastures, mining areas, forest land, parks and other recreation areas. If you have any questions concerning the identification and/or treatment of cogongrass contact your local county Extension personnel.