

Propagating Wiregrass from Seed

by Paula A. Seamon and Ronald L. Myers

Wiregrass, *Aristida stricta*, is a common bunchgrass which dominates the understory of longleaf pine forests and savannahs throughout much of the Southeast Coastal Plain. Until recently, the reproductive biology of this species has been somewhat of a mystery. But we now know wiregrass blooms in response to growing-season fires, and the flowers do produce viable seed.

Many questions remain, however, as summarized in the October 1989 *Natural Areas Journal*, which presents much of the information current at the time of publication. One lingering question about this species has been how to propagate plants from seed.

We became interested in wiregrass propagation for use in restoration of disturbed sites. Specifically, our work has been a part of the major restoration initiative under way at Apalachicola Bluffs and Ravines Preserve in Liberty County, Florida. At this site, The Nature Conservancy is attempting a broad-scale reconstruction of the longleaf pine/wiregrass community that once covered over 3000 acres of the Preserve. In the late 1950s, this area was clearcut, windrowed, and planted with slash pine. The slash pine have been cut, and 800,000 longleaf pine seedlings have been planted at the site to date. A method of reintroducing wiregrass was needed as the next step in the restoration process.

We have experimented with two methods of wiregrass propagation: seeding directly at the restoration site, and transplanting nursery-grown plugs to the site. Both methods have been successful, but each has its benefits and drawbacks. When a mechanical device for direct seeding is perfected, this method should provide an economical means for reintroducing wiregrass to extensive areas. Plants develop slowly, however, and an extended time frame is needed to establish a population. Raising wiregrass plugs in a nursery may be more labor-intensive and expensive than direct seeding, but does result in larger individuals (some knee-high) within a year of outplanting.

Judging by the interest shown in our work, an increasing number of people would like to know how to propagate



Two blooming wiregrass plants grown from seed. The plants grew nine months in a nursery and have been 18 months in the field.

wiregrass. So, what follows is a step-wise procedure for growing wiregrass plugs in a nursery, along with some general observations gleaned from our experience. We do not presume this is the best method for propagation, but it has been successful for us.

Select Site and Conduct Burn.

The first step must, of course, be selection of the seed source and a growing-season burn. At present, there is no way to tell if a particular site will yield seed of high viability. Also, there is no indication that only certain populations produce viable seed. You may want to select a local seed source if you are concerned with conserving the genetic integrity of the population. The genetic diversity of wiregrass populations is currently under investigation by Dr. Doria Gordon (The Nature Conservancy, Florida Museum of Natural History, Gainesville).

In Florida, the wiregrass site should be burned during the growing season to stimulate profuse flowering, but we have not found the particular month of burn to be significant. In our area, burns from late March to July result in production of viable seed.

Harvest Seed.

Timing of seed harvest is crucial for successful wiregrass propagation. Investigators in the past who claimed

wiregrass never produced viable seed were almost certainly collecting at the wrong time. There is an optimal window for collection, before which the seed is immature, and after which viable seed has dropped from the stem.

In north Florida, wiregrass seed matures in late fall or early winter, so we begin testing seed in late October. We collect small samples of seeds and place them on moist filter paper in petri dishes. If viable, the seeds will begin germinating in five to ten days. We repeat this bioassay until we determine the seeds are mature, and then harvest. We've found germination rates vary widely, from 4% to 40%, depending on the site and the year.

Harvesting methods can be manual or mechanical. We gather seed by hand in order to minimally impact the collection site. This is simply accomplished by running the fingers up the flowering stalk, with the seed collecting between the fingertips. Although this may sound like a slow and tedious task, it takes little time to collect a considerable amount of seed free from extraneous plant material. A number of devices for mechanical harvesting have been proposed, but we have had experience only with a weed whacker adapted for the purpose (see Mahler, D. 1988. *Restoration and Management Notes*, 6:1). This machine worked adequately, collecting entire flowering stalks. The excess plant material may be a drawback when collecting seed intended for use in a nursery.

We have stored seed in boxes for five months at room temperature without a substantial decrease in viability.

Plant the Seed.

We have been growing wiregrass in a simple nursery located at Tall Timbers Research Station in Tallahassee. Seeds were sown in flats of "grow-tubes" designed for tree propagation. Individual conical tubes measured 3" x 6". The flats were placed on the ground under 30% shade cloth. Sprinkler hoses were used for watering.

We experimented with several soil mixtures, combining potting soil with native soil taken from the site of an

existing wiregrass population to provide mycorrhizal inoculant. Plants grew well in 3:1 native:potting soil, but the resulting plugs were heavy, loose, and difficult to transplant. Seeds sown in 1:10 native:potting soil developed into robust plants and lighter, more compact plugs. We used a potting soil containing a slow-release fertilizer, mixed by a local nursery. Per 10 yards, the potting soil contained 6 parts bark, 3 parts sand, 1 part peat, 17 lb. Micromax, 100 lbs. Osmocote, 50 lbs. superphosphate, 80 lbs. dolomite.

We made no attempt to separate the seed from the lemma and awns before planting. Seeds were sown shallowly (1/4") and watered daily. Germination began in approximately 14 days. There is no dormancy period, and it appears that no special temperature or light pretreatment is required for germination. It is possible to transplant young shoots into empty compartments within the trays, although reseeding is more efficient. You may choose to thin the plants to one or two per tube, but it is not necessary. It is important to keep the soil moist as the plants develop. We have not experimented with additional fertilizer applications, although this may be beneficial.

We noticed some variability in the morphology of young wiregrass plants. Leaves vary from the typical, tightly involuted habit to a relatively broad, flat leaf. Leaves may originate as basal clumps, or arise from a stem as much as one inch above ground level. Some plants are so uncharacteristic as to lead growers to believe they have something other than *Aristida stricta* coming up in their nurseries. Plants assume a more typical growth habit as they mature.

Some young plants in the nursery flowered within six months. Seeds produced were of low viability (3-6%). Plants became dormant in the fall, and appeared quite brown by November. We cut back on watering as active growth decreased.

Transplant.

We have successfully outplanted wiregrass plugs at an age range of 6 to 18 months. If possible, plugs should be transplanted to the intended site during a period of predictably wet weather. We planted seedlings by hand, using either a dibble stick or trowel. Planting density is determined by the goals for the restoration site. We have experimented by placing plants one, three, or five paces apart, singly or in groups of three. Nine thousand plugs were

planted at Apalachicola Bluffs and Ravines Preserve in December, 1990, with a 99% survival rate at 15 months. Some plants flowered during the summer of 1991. We did not test seed viability from these plants, but we hope seed production will augment the outplanted population. An additional 6000 plugs were added to the site in December, 1991.

This work has, of course, spawned new questions about wiregrass, and our research on the subject continues. There are other people investigating wiregrass propagation from seed, including Tim Pittman at Florida Division of Forestry's Herren Nursery in Lake Placid, Rosi Mulholland at Wekiwa Springs State Park, William and Nancy Bissett of The Natives in Davenport, and Dave Borland of International Forest Seed Company in Odenville, Alabama. Their efforts will certainly help to redefine what we know about this important but poorly understood species.

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