PROPAGATION OF ORNAMENTAL GRASSES ADAPTED TO GEORGIA AND THE U. S. SOUTHEAST

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Abstract. From the world collection of 350 ornamental grasses, 17 were rated as superior, low-maintenance performers in climatic zone 8A Their propagation modes were studied simultaneously with evaluation as landscape plants All annual grasses propagated readily from seeds with the exception of crimson fountain grass, which is sterile. Many of the perennial grasses are sterile, making division the usual form of vegetative propagation, but four grasses root readily from stem cuttings; blue lyme, crimson fountain, ribbon, and sea oats. Tissue-culture techniques have been developed for *Miscanthus* and pampas grass cultivars.

INTRODUCTION

Clump-forming ornamental grasses have been grown for centuries in Europe where they were used in informal designs, naturalistic settings, and as specimen plants. Only pampas grass, fountain grass, and blue sheep fescue have been used to an appreciable degree in the U.S. Since limited landscape maintenance budgets, resource conservation, and environmental concerns in recent years are making low maintenance plants more popular, ornamental grasses are receiving attention and acceptance from landscape architects, nurserymen, and home gardeners. These grasses are ideal low-maintenance plants since they have low water and fertility requirements and are pest tolerant. In addition, most of them produce plumes that are ideal for dry flowers, making them dual-purpose plants. Their landscape uses include perennial and shrub borders, informal landscapes, and naturalistic areas (3, 4, 5, 6, 7).

MATERIALS AND METHODS

In 1969 to 1975 a collection of all ornamental grass germplasm from domestic and foreign sources was begun. During these years over 350 grasses were collected and evaluated (1). Seeds of annuals were sown in greenhouse flats using the usual techniques of artifical soil mixes and liquid fertilizers for producing bedding plants from seeds. Perennial materials were usually received as divisions which were potted and grown for 4 to 6 weeks until sufficient root and top growth developed.

Transplants were established in field plots by early summer. Plants were irrigated when water stress occurred during the growing season. An application of 500 pounds per acre of 10-10-10

fertilizer was made in early summer and fall. Seeds of dubious germination capacity were harvested, cleaned, stored, and germinated according to recommended treatments for related grasses.

Preliminary experiments were conducted to evaluate the effect of Hormodin No. 1 and Hormodin No. 3 on the rooting of stem cuttings of sterile grasses under intermittent mist. Tip and basal cuttings with 2 to 3 nodes from mature non-flowering stems were stuck in a well-drained medium. Tissue-culture propagation was investigated for *Miscanthus* cultivars and seed-sterile *Cortaderia selloana* 'Pumila' (2, 8).

RESULTS AND DISCUSSION

Table 1 provides a compilation of propagation modes for 17 superior-rated ornamental grasses. The grasses are a taxonomically diverse group of annuals and herbaceous perennials with a wide array of plant sizes, textures, colors and forms. Characteristics and cultural requirements are given in Table 4. Annual grasses are propagated readily from seeds with the exception of crimson

Table 1. Propagation modes of superior ornamental grasses

Scientific name	Common name	Persistence	Propagation Seeds	Propagation Vegetative
Arundo donax var. *versicolor*	variegated giant reed	Perennial		X
Calamagrostis acutifolia	feather reed grass	Perennial		X
Chasmanthium latifolium	upland sea oats	Perennial	X	X
Cortaderia selloana	pampas grass	Perennial	X	X
Cortaderia selloana 'Pumila'	dwarf pampas grass	Perennial		X
Elymus glaucus	blue lyme grass	Perennial		X
Erianthus ravennae	Ravenna grass	Perennial	X	X
Festuca ovina var *glauca*	blue sheep fescue	Perennial	X	X
Miscanthus sinensis 'Gracillimus'	maiden grass	Perennial		X
Miscanthus sinensis 'Variegatus'	variegated miscanthus	Perennial		X
Miscanthus sinensis 'Zebrinus'	zebra grass	Perennial		X
Pennisetum alopecuroides	Dwarf fountain grass	Perennial	X	X
Pennisetum setaceum	fountain grass	Annual or Peren.	X	
Pennisetum setaceum 'Rubrum'	crimson fountain grass	Annual or Peren		X
Pennisetum villosum	feathertop grass	Perennial	X	X
Phalaris arundinacea var *picta*	ribbon grass	Perennial		X
Uniola paniculata	sea oats	Perennial	X	X

fountain grass (*Pennisetum setaceum* 'Rubrum'), which is sterile and grown as an annual in areas with frost. For the fertile annuals, germination occurred in 2 to 3 weeks and gallon-sized plants were produced in 3 to 4 months. Reproduction of variegated grasses from seeds failed in all cases since seedlings reverted to normal green foliage. In tissue culture all variegated clones retained the variegated patterns of the parent plant.

Table 2. Early spring production schedules for annual, perennial, and divisions of ornamental grasses

Taxa	Hardiness zone	Weeks to Germination	Weeks to Marketable plants
Arundo donax var *versicolor* variegated giant reed	7	-	10
Calamagrostis acutifolia feather reed grass	4	-	16
Chasmanthium latifolium upland sea oats (river oats)	5	4	10
Cortaderia selloana pampas grass	8a	3	12
Cortaderia selloana 'Pumila' dwarf pampas grass	7b	-	12
Elymus glaucus blue lyme grass	4	-	16
Erianthus ravennae Ravenna grass	5	3	12
Festuca ovina glauca blue sheep fescue	4	3	14
Miscanthus sinensis 'Gracillimus' maiden grass	4	-	10
Miscanthus sinensis 'Variegatus' variegated miscanthus	5	-	10
Miscanthus sinensis 'Zebrinus' zebra grass	5	-	10
Pennisetum alopecuroides dwarf fountain grass	5	2	12
Pennisetum setaceum fountain grass	10	2	12
Pennisetum setaceum 'Rubrum' crimson fountain grass	10	-	8
Pennisetum villowsum feathertop grass	8	2	12
Phalaris arundinacea var *picta* ribbon grass	4	-	10
Uniola paniculata sea oats	8	3	10

Among the perennials, pampas grass (*Cortaderia selloana*) propagates readily from seeds. However, the plants are dioecious and wind pollinated, resulting in a high degree of seedling variability. Other perennials propagated by seeds are upland sea oats (*Chasmanthium latifolium*), Ravenna grass (*Erianthus ravennae*), blue sheep fescue (*Festuca ovina* var. *glauca*), dwarf fountain grass (*Pennisetum alopecuroides*), feathertop (*Pennisetum villosum*), and sea oats (*Uniola paniculata*).

Plant division is the usual technique for propagating sterile grasses (Table 2). Since this is a slow process for some grasses, a preliminary experiment was conducted to evaluate the effects of two concentrations of IBA on rooting tip and basal stem cuttings of sterile grasses. Results are shown in Table 3. Basal cuttings of *Elymus* rooted readily while tip cuttings failed. Both tip and basal cuttings of *Chasmanthium, Pennisetum, Phalaris,* and *Uniola* rooted readily. IBA had no effect on the rooting response. *Miscanthus* cultivars had the only stem cuttings with pronounced nodes that showed no inclination to root. Tissue culture may be a feasible alternative for propagation of sterile grasses that regenerate slowly from division.

Table 3. Stem-cutting rooting response of eight ornamental grasses to two concentrations of Hormodin

		Percent rooted cuttings*		
	Type		Hormodin	Hormodin
Name	Cutting	Control	No 1	No 3
Cortaderia selloana	Tip	0	0	0
pampas grass	Basal	0	0	0
Elymus glaucus	Tip	0	0	0
blue lyme grass	Basal	100	100	100
Miscanthus sinensis	Tip	0	0	0
miscanthus, eulalia grass	Basal	0	0	0
Miscanthus sinensis 'Gracillimus'	Tip	0	0	0
maiden grass	Basal	0	0	0
Miscanthus sinensis 'Zebrinus'	Tip	0	0	0
zebra grass	Basal	0	0	0
Pennisetum setaceum 'Rubrum'	Tip	100	100	100
crimson fountain grass	Basal	100	100	90
Phalaris arundinacea var *picta*	Tip	100	100	100
ribbon grass	Basal	100	100	100
Uniola paniculata	Tip	100	90	100
sea oats	Basal	100	100	100

*Mean of 100 cuttings

Table 4. Characteristics and culture requirements of some ornamental grasses

Annuals.

3-ft plants, need monthly grooming fountain grass— *Pennisetum setaceum*, perennial in mild climates

crimson fountain grass—*Pennisetum setaceum* 'Rubrum' Sterile seeds, perennial in frost-free areas

Perennials.

Main cultural requirements involve cutting back to ground at end of winter and dividing every 3 to 4 years

variegated giant reed—*Arundo donax* var *versicolor* 10-ft height, mature foliage may revert to normal reed green, somewhat invasive, zone 7

feather reed grass—*Calamagrostic acutifolia* Not adapted to deep south, erect 4-ft plants, zones 5 to 7

upland sea oats—*Chasmanthium latifolium* 3-ft plants, very versatile, zone 5

pampas grass-*Cortaderia selloana* Queen of grasses, but dioecious and variable, zone 8B

dwarf pampas grass—*Cortaderia selloana* 'Pumila '' 6 foot, silver female, seed sterile, zone 7B

blue lyme grass—*Elymus glaucus* Unusual blue color, slightly invasive, 3 ft, zone 4

Ravenna grass—*Erianthus ravennae* ''Hardy pampas grass'', not pampas grass-quality plumes, but vigorous and hardy to zone 5

blue sheep fescue—*Festuca ovina* var *glauca* Dainty groundcover, that does best with shade and adequate moisture, zone 5-8A

maiden grass—*Miscanthus sinensis* 'Gracillimus ' Best of the miscanthus group, dark green, fine textured, 6 ft, zone 4

variegated miscanthus—*Miscanthus sinensis* 'Variegatus' Slightly shorter than maiden grass, and with typical variegation, zone 5

zebra grass—*Miscanthus sinensis* 'Zebrinus' Unusual banded variegation, susceptible to athracnose leafspot, zone 5

dwarf fountain grass—*Pennisetum alopecuroides* 3 ft, needs monthly grooming, zone 5

feathertop grass—*Pennisetum villosum* Creamy panicles on a 2-ft plant that blooms only in July, zone 8

ribbon grass—*Phalaris arundinacea* var *picta* Highly variegated groundcover, grows well in shade and with very moist soil, zone 4

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