alter the production forecasts and plant saleability prediction.

At Wight Nurseries we also try to keep our production time span as short as possible. We try to shift the largest plant economically feasible to the next size to shorten the time it takes to make the plant saleable. Shortening this time span allows us more time to read the market and react accordingly. Shifting a large mature plant also improves crop uniformity as it eliminates some growing variables.

In today's economic situation production forecasts have been less beneficial than they should be. This is true because one can forecast with a fair degree of accuracy when a plant will be saleable, but many plants are being shipped well past their predicted availability dates. This is due to the soft retail market and the percent over-production dilemma in the industry.

Forecasts are based on past experience, present conditions, and future market outlook; they are an integral part of the planning process and must be based on carefully interpreted information, not guesswork.

PROPAGATION OF ORNAMENTAL GRASSES

W. L. CORLEY
Georgia Experiment Station
Experiment, Georgia 30212

Abstract. From the world collection of 350 ornamental grasses, 15 were rated as superior performers in climatic zone 8A. Their propagation modes were studied simultaneously with evaluation as landscape plants. All annual grasses were propagated readily by seed with the exception of purple fountain grass, which is sterile. Many of the perennial grasses are sterile, necessitating vegetative propagation. Stem cuttings of four sterile perennials rooted readily.

Clump-forming ornamental grasses have been grown for centuries in Europe where they are 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 this country. Since energy consciousness and limited landscape maintenance budgets in recent years are making low-maintenance plants more popular, ornamental grasses are receiving attention and acceptance from landscape architects and nurserymen. 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.

MATERIALS AND METHODS

In 1969-1970 a collection of all ornamental grass germplasm from domestic and foreign sources was begun. During these years over 350 grasses were collected. Seeds of annuals were sown in greenhouse flats using artificial soil mixes and liquid fertilizers as is done in producing bedding plants by seeds. Perennial materials were usually received as divisions which were potted and grown for 4 to 6 weeks until vigorous 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 lb/A 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.

In 1981 and 1982 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 used.

RESULTS AND DISCUSSION

Table 1 provides a compilation of propagation modes for 15 superior-rated ornamental grasses. Annual grasses propagated readily from seeds with the exception of purple fountain grass (*Pennisetum macrostachyum*), which is a sterile annual. For the fertile annuals seed 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.

Among the perennials, pampas grass (*Cortaderia selloana*) propagates readily by seed. However, the plants are dioecious and wind-pollinated, resulting in a high degree of seedling variability. Other perennials propagated by seed are ravenna grass (*Erianthus ravennae*), dwarf fountain grass (*Pennisetum alopecuroides*), feathertop (*Pennisetum villosum*), and the two species of *Uniola*.

Plant division is the usual technique for propagating sterile grasses. Since this is a slow process, a preliminary experiment was conducted to evaluate the effects of 2 concentrations of IBA on rooting of tip and basal stem cuttings of sterile grasses. Results are shown in Table 2. Basal cuttings of *Elymus* rooted readily while tip cuttings failed. Both tip and basal cuttings of *Pennisetum macrostachyum*, *Phalaris*, and *Uniola* rooted readily. IBA had no effect on the rooting response.

None of the *Miscanthus* cultivars rooted. Tissue culture may be a feasible alternative for propagation of sterile grasses whose stem cuttings do not root readily.

Table 1. Propagation modes of some superior ornamental grasses.

Species	Common name	Persistence	Propagation	
			Seed	Vegetative
Arundo donax versicolor	Variegated giant reed	Perennial		X
Cortaderia solloana	Pampas grass	Perennial	X	X
Elymus glaucus	Blue wild rye	Perennial		X
Erianthus ravennae	Ravenna grass	Perennial	X	X
Miscanthus sinensis	Eulalia	Perennial		X
Miscanthus sinensis 'Gracillimus'	Maiden grass	Perennial		X
Miscanthus sinensis 'Variegatus'	Variegated eulalia	Perennial		X
Miscanthus sinensis 'Zebrinus'	Zebra grass	Perennial		X
Pennisetum alopecuroides	Dwarf fountain grass	Perennial	X	
Pennisetum macrostachyum	Purple fountain grass	Annual		X
Pennisetum reppellianum	Fountain grass	Annual	X	
Pennisetum villosum	Feathertop grass	Perennial	X	
Phalaris arundianacea picta	Ribbon grass	Perennial		X
Uniola latifolia	Upland sea oats	Perennial	X	X
Uniola paniculata	Sea oats	Perennial	X	X

Table 2. Stem cutting rooting response of 9 ornamental grasses to 2 concentrations of Hormodin (IBA + talc).

Name	Type Cutting	Percent rooted cuttings*		
		Control	Hormodin No. 1	Hormodin No. 3
Cortaderia selloana	tip	0	0	0
(Pampas grass)	basal	0	0	0
Elymus glaucus	tip	0	0	0
(Blue wild rye)	basal	100	100	100
Miscanthus sinensis	tip	0	0	0
(Eulalia)	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 macrostachys	tip	100	100	100
(Purple fountain grass)	basal	100	100	90
Phalaris arundinacea 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 30 cuttings

LITERATURE CITED

1. Corley, W. L. 1975. Ornamental grasses for Georgia. *Ga. Agr. Exp. Sta. Res. Rept.* 217, 14 pp.

2. Loewer, H. Peter 1977. Growing and decorating with grasses. New York: Walter and Co., 128 pp.
3. Meyer, M. H. 1975. Ornamental grasses. New York: Charles Scribners Sons, 136 pp.

LIN TABER: Can true sea oats be grown inland?

WILL CORLEY: We've had no problem in the Piedmont.

BRYSON JAMES: How does the time of cutting back affect winter hardiness?

WILL CORLEY: We cut back as soon as the plants are dormant and our survival rate is good.

TOM WALLACE: We have trouble ordering and then getting the correct cultivars. What do you suggest?

WILL CORLEY: There is much confusion in the nomenclature. Of course, it would be best to see the plants or their picture.

LEYLAND CYPRESS PROPAGATION

TED BILDERBACK
North Carolina State University
Raleigh, North Carolina 27650

Leyland cypress (× *Cupressocyparis leylandii*) is an intergeneric hybrid between *Cupressus macrocarpa* and *Chamaecyparis nootkatensis*. Several clones exist and the most common and available ones are listed in Table 1 (1,3,4,5,6,7,8). These clones may be the fastest growing conifers in the world (8). In full sun and well-drained soils, 3 to 5 ft. of growth per year is possible (1,5). The columnar form and rapid growth make it a good plant for hedges where fast screening is desired. Old Leyland cypress trees in Europe are 95 to 100 ft. tall but trees may reach only ½ to ⅔ that height in the Southeastern U.S. (3,6,8). It is reported to be hardy to zone 5 (9). Leyland cypress apparently has few insect or disease problems although bag worms have been observed on them; trees apparently do not grow well in the San Francisco Bay Area due to *Phomopsis* canker and a borer associated with the cankers.

Table 1. × *Cupressocyparis leylandii* (1888, 1911, 1940). (*Cupressus macrocarpa* × *Chamaecyparis nootkatensis*) clones.

'Haggerston Grey'	'Green Spire'
'Leighton Green'	'Stapehill'
'Naylor's Blue'	'Silver Dust'
'Castlewellan'	'Hyde Hall'
'Robinson's Gold'	