Seed Propagation of Ornamental Grasses

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After centuries of misunderstanding and avoidance, ornamental grasses are becoming popular in the United States - the New American Garden. Being suitable plant materials in xeriscapes and environmental (low maintenance) gardens, they are being used as specimen plants, intermingled in herbaceous borders, and in developing informal designs of naturalistic landscapes. From the world collection of ornamental grasses, 18 grasses were determined as well adapted to the southeast. Their propagation modes are listed in Table 1. Ten of these are seed propagated, providing an opportunity for flower growers to expand their plant taxa offerings, particularly when these can be further promoted and contract grown.

Production scheduling research was conducted during the past several years to determine scheduling requirements for interested growers. Seeds were sown in greenhouse flats using the usual techniques for artificial soil mixes and liquid fertilizers for producing bedding plants from seeds. Seedlings were transplanted from cell packs to four inch and gallon nursery containers. Their germination, seedling development, and plant development in saleable containers were recorded. Table 2 shows that seed propagated ornamental grasses, although finished in four inch or larger containers, are relatively fast cropping, providing a viable new crop for flower growers to produce. These data are presented with the intent of comparing economics of production of these grasses with instant color annuals. Seed germination is fairly rapid in two to four weeks and saleable plants in quarts or gallon containers can be produced in three to four months. When markets exist, ornamental grasses should be grown, demonstrated, and promoted.

References

1. Corley, W.L. 1989. Propagation of ornamental grasses adapted to Georgia and the southeast. Proc. IPPS 89:332-337.

2. Meyer, Mary H. and R.G. Mower. 1989. Ornamental grasses for the home and garden. Cornell Coop. Ext. Bull. 64.

3. Plant and Gardens. 1988. Ornamental grasses. Brooklyn Bot. Garden Record 44(3).

4. Reinhardt, T.A., Martina Reinhardt and Mark Moskowitz. 1988. Ornamental Grass Gardening. Michael Friedman Publishing, New York.

Table 1. *Propagation modes of superior ornamental grasses.*

Scientific name	Common name	Persistence	Propagation	
			Seeds	**Vegetative**
Arundo donax 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	Perennial		X
Elymus glaucus (arenarius)	Blue Lyme Grass	Perennial		X
Erianthus ravennae	Ravenna Grass	Perennial	X	X
Miscanthus sinensis gracillimus	Maiden Grass	Perennial		X
Miscanthus sinensis variegatus	Variegated Miscanthus	Perennial		X
Miscanthus sinensis zebrinus	Zebra Grass	Perennial		X
Panicum virgatum	Switch Grass	Perennial	X	X
Panicum virgatum rubrum	Red Switch Grass	Perennial	X	X
Pennisetum alopecuroides	Dwarf Fountain Grass	Perennial	X	X
Pennisetum alopecuroides purpurascens	Purple Dwarf Fountain Grass	Perennial	X	X
Pennisetum setaceum	Fountain Grass	Annual	X	
Pennisetum setaceum rubrum	Crimson Fountain Grass	Annual		X
Pennisetum villosum	Feathertop Grass	Perennial	X	X
Phalaris arundinacea picta	Ribbon Grass	Perennial		X
Sorghastrum nutans	Indian Grass	Perennial	X	X

Table 2. *Early spring production schedules for sexually propagated southeastern ornamental grasses.*

Taxa	Hardiness zone**	Weeks to: Germination	Weeks to: Marketable plants
Chasmanthium latifolium Upland Sea Oats*	5	4	10
Cortaderia selloana Pampas Grass	8a	3	12
Erianthus ravennae Ravenna Grass	5	3	12
Festuca ovina glauca Blue Sheep Fescue	4	3	14
Panicum virgatum Switch Grass*	5	3	12
Panicum virgatum rubrum Red Switch Grass*	5	3	12
Pennisetum alopecuroides Dwarf Fountain Grass	5	2	12
Pennisetum alopecuroides purpurascens Purple Dwarf Fountain Grass	6	2	12
Pennisetum setaceum Fountain Grass	9	2	12
Pennisetum villosum Feathertop Grass	8a	2	12
Sorghastrum nutans Indian Grass*	6	3	14

* Native to Southeast
** USDA Hardiness Zone Map

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a perforated tube of polyethylene material 18 to 24 inches in diameter, connected to a high velocity fan. The fan is normally located at one end with the polytube extending down the length of the greenhouse near the roof. Air outlet holes, two to three inches in diameter, are located at intervals along the length of the polytube. The end of the polytube opposite the fan is closed.

The fan can be either integral to the heating system or separate. If the fan is part of the heating system, it must be wired to operate even when the heater is off. If it is separate, it should be as near the warm air outlet of the heater as possible. Single polytubes in greenhouses longer than 100 feet are seldom satisfactory unless the spacing of the perforations are closely controlled. More perforations must be provided towards the end opposite the fan to give an even air flow. Without exact distribution of the air outlet holes, consistent air distribution is not likely to occur. For greenhouses longer than 150 feet, a separate polytube system at each end is recommended.

Beneficial air movement necessary for proper greenhouse management does not require high air velocities.

Horizontal Air Flow (HAF) is another method often employed to move air inside a greenhouse. HAF employs pairs of caged fans suspended from the roof of the greenhouse to move air in a continuous circuit. The HAF system has several advantages over the polytube system. The cost of installation and maintenance is less than with a polytube system. The polytube material will need to be replaced at least every two years plus the cost of hangers to suspend the polytube through the greenhouse can be expensive. Also, considerable less power is consumed for the same level of benefit as a polytube system. This is because, if circulated in a fixed pattern as with HAF, the air enclosed by a greenhouse may be moved with a minimum input of energy. Once in motion, a mass of air will be slowed only by friction with the surface of the greenhouse, plant material and other obstructions. The HAF fans must only be sized to make-up for this friction loss. Polytube systems waste much fan energy on useless turbulence.

The size and number of fans used in an HAF system is dependent on the size of the greenhouse. In the interest of consistent air velocity and distribution, it is generally better to use more smaller fans than a few larger ones. For greenhouses up to 40 feet wide and 150 feet long, two 1/4 HP fans (for example, W.W. Grainger part number 4C456 or 4C458) have proven satisfactory. The two fans are located midway the house, approximately six feet from the outside wall and blowing in opposite directions. Such a fan arrangement will cause the air to flow down one side of the house, across the end and back up the other side in a complete circuit. For greenhouses longer than 150 feet, four (or more) fans are required.

Even in mid-winter, there will be days that are warm enough to require greenhouse ventilation. This is accomplished by louvered ventilation fans pulling outside air through the house or by lowering sides for natural ventilation. When this occurs, there is no benefit from the continued operation of a polytube or HAF system. Consequently, they should be wired to shut down during periods of ventilation.

Benefits of Proper Air Movement in a Greenhouse

1. *Uniform Temperatures.* The mechanical movement and stirring imparted by the fans will help to eliminate stratification of the air inside the greenhouse and distribute the heat to maintain uniform temperatures throughout. Stable plant surface temperatures reduce growing stresses. Air movement will also aid in the functioning of the thermostat in maintaining consistent temperatures.

2. *Uniform Distribution of Greenhouse Gases.* During the day, plants absorb carbon dioxide and expel oxygen. The process is reversed at night. Movement and mixing of the air ensures the proper distribution of these gases for best plant growth and development.

3. *The Movement of Air Reduces Heating Costs.* Moving the warm air from the roof to plant level reduces fuel consumption because the warm air is being placed where it is needed most. Additionally, there is some evidence that air infiltration/exfiltration is reduced in greenhouses employing horizontal air flow.

4. *Reduction in Condensation for Healthier Plants.* Although the regular motion of air inside a greenhouse will have little effect on total condensation, it will significantly reduce the amount of condensation of the plant surfaces. Many plant diseases require high temperature and humidity to initiate infections. The movement of air around plant surfaces lowers humidity and reduces disease.

Editor's Note: This article appeared on my desk with no source. We could not track its source, but as the information is timely it is printed with much appreciation to M.D. Boyette.