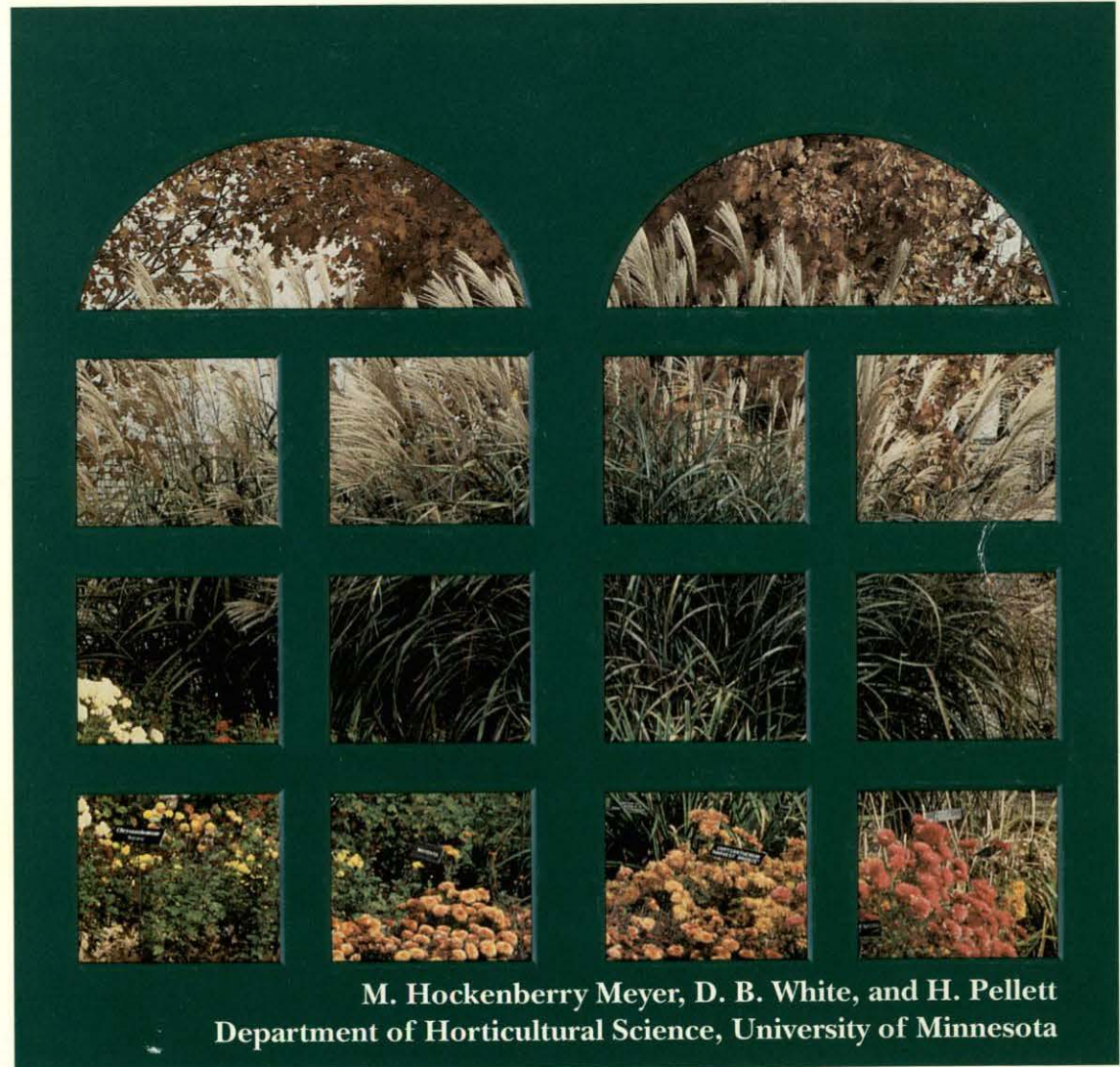


Ornamental Grasses for Cold Climates

North Central Regional Extension Publication 573



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Silverfeather miscanthus at the Minnesota Landscape Arboretum

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Miscanthus sinensis 'Malepartus'

The ruler symbol appears throughout this bulletin as a height reference for illustrations. It is equal to 12 inches.

Introduction

Ornamental grasses have been used in European and Asian gardens for centuries. It is only in recent years that they have become popular in the United States. Their varied forms, colors, and textures make them attractive, but lack of information on hardiness and performance in the northern states has limited their use.

A six-year (1987-1993) winter hardiness study at the Minnesota Landscape Arboretum of 165 ornamental grasses found 85 that can be grown successfully in USDA Zone 4a (see map, page 3). Minimum annual temperatures during the study ranged from -20° to -30°F (-29° to -34°C). These temperatures are typical of many states, ranging from Maine to Montana. This bulletin reports on the results of the study and makes cold-climate recommendations for culture, maintenance, and special landscape uses.



Miscanthus sinensis 'Silberfeder' (silverfeather)

Desirable Traits

Ornamental grasses are attractive landscape plants that can give gardens a new look.

Desirable traits include:

- Very few insect or disease problems
- Low nutrient requirements
- Little maintenance (except spring cutback) once established
- More than one season of interest; flowering in spring, summer, or fall, with beauty and color lasting into winter
- Fast growth; for example, some large plants grow 5 to 8 feet tall by the second year
- Varied textures, from fine fescues to coarse giant miscanthus
- Foliage colors of blue, yellow, bronze, and red, as well as variegated white and yellow
- Movement with the wind, which provides interesting sounds as well as beauty

Culture & Maintenance

In cold climates, plant ornamental grasses in the spring. Fall planting can be successful if container plants are used, but winter protection may be necessary. Local nurseries and garden centers often sell grasses and usually supply large plants, but typically do not have the variety that is available from mail order nurseries. (See Sources, page 27.)

Determine spacing needs according to the desired landscape effect and the plant's setting. A rule of thumb is to space plants equal to their mature height (thus, plants 4 feet tall are spaced 4 feet apart), but you can use more or less space to achieve a desired effect. For example, grasses used as a hedge or screen are usually planted closer together, while individual specimens are typically spaced further apart.

Division (digging the plant and cutting the crown and roots) is the most common method of propagation, especially for cultivars. Seed propagation, although successful, usually results in undesirable flower and foliage color variation, and requires several years to produce mature plants.

Large, mature grasses may benefit from spring division, especially if the center of the plant is dead. However, this can be a major job requiring a sharp ax or spade and a strong back.

Cut ornamental grasses back to the ground to remove the previous year's growth. This must be done each year in late winter or early spring, before new growth starts. If the grasses are not cut back, spring growth will be delayed and the plants will be unattractive late into the growing season. Manual trimming with a string or electric hedge trimmer works well for small areas. Large areas can be burned, if burning is permitted and closely supervised. Do not cut or burn in the fall, because winter injury may result, and the winter beauty of the plants will be lost.

Established ornamental grasses rarely need fertilization or irrigation except in cases of extreme drought or very sandy soil. Most grasses prefer full sun. Grasses that can grow in special garden locations are listed on pages 22-26 .

Research in Minnesota

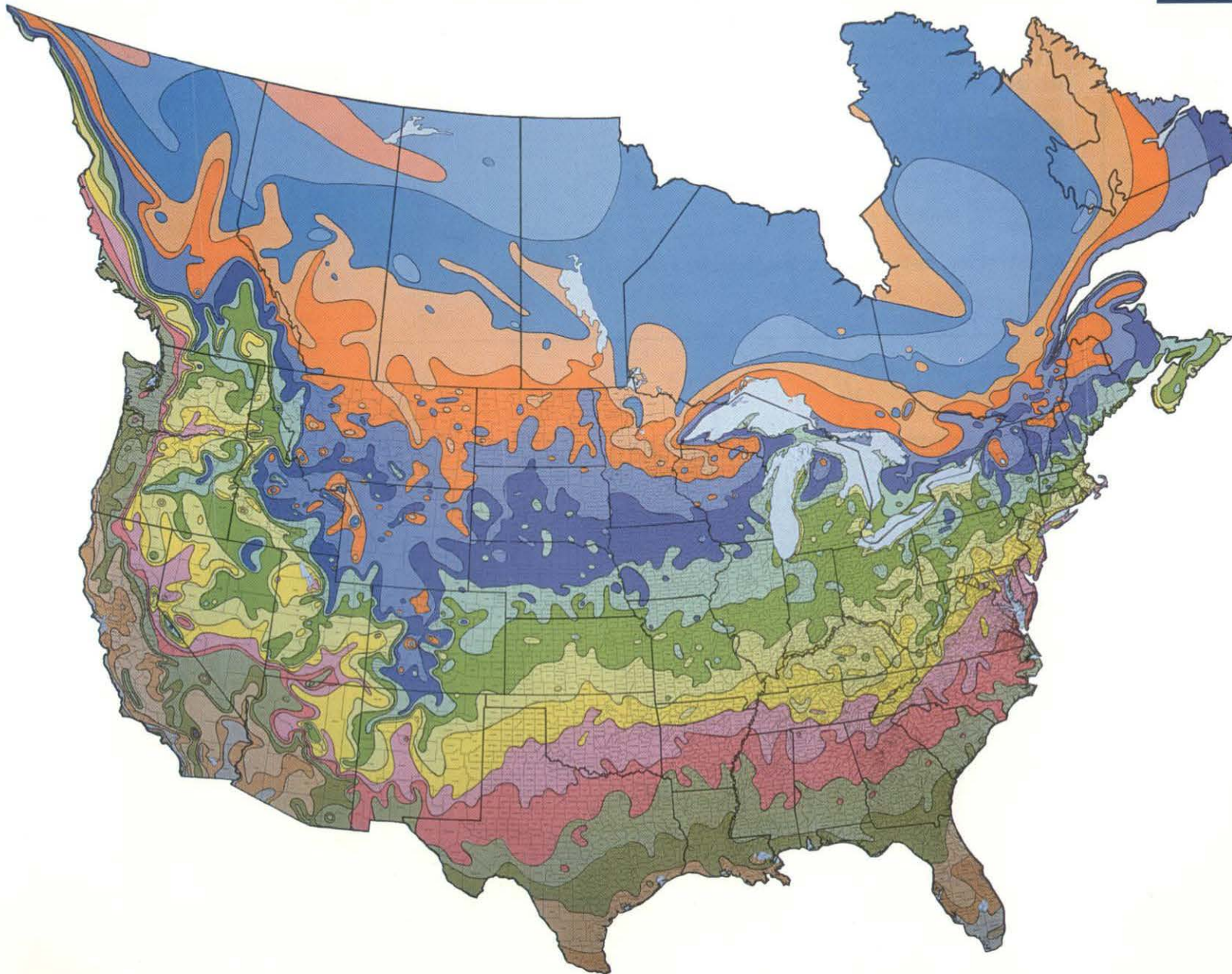
In early July 1987, four plants each of 157 ornamental grasses were planted at the Minnesota Landscape Arboretum in Chanhassen, Minnesota. Thirty of the more popular grasses were also planted at the University of Minnesota, St. Paul campus. In May 1988, four cultivars each of little bluestem, *Schizachyrium scoparium*, and Indian grass, *Sorghastrum nutans*, were obtained from local sources and planted at the arboretum.

The plants were mulched with wood chips over a landscape mat to control weeds. They were spaced a distance equal to their mature height. Irrigation was applied as necessary during establishment. A natural organic fertilizer (6-3-0) was applied in mid-summer at the rate of 1 pound of nitrogen per 1,000 square feet. The plants were cut back or burned to remove the previous year's growth in early April of each year.

Visual observations were made each spring, about June 1.

USDA Hardiness Map

The winter hardiness study reported in this bulletin was conducted in Zone 4a where the average annual minimum temperature ranges from -25° to -30°F (-32° to -34°C).



Zone
1
2a
2b
3a
3b
4a
4b
5a
5b
6a
6b
7a
7b
8a
8b
9a
9b
10a
10b
11

Research Results

Minimal snow cover, low air temperatures, and very low soil temperatures the winter of 1989-90 damaged many ornamental plants, including ornamental grasses. Additionally, in December 1992, a combination of little snow cover and sub-zero air temperatures damaged some grasses. The other four winters in this study resulted in average or typical winter air and soil temperatures with adequate snow cover on the test sites.

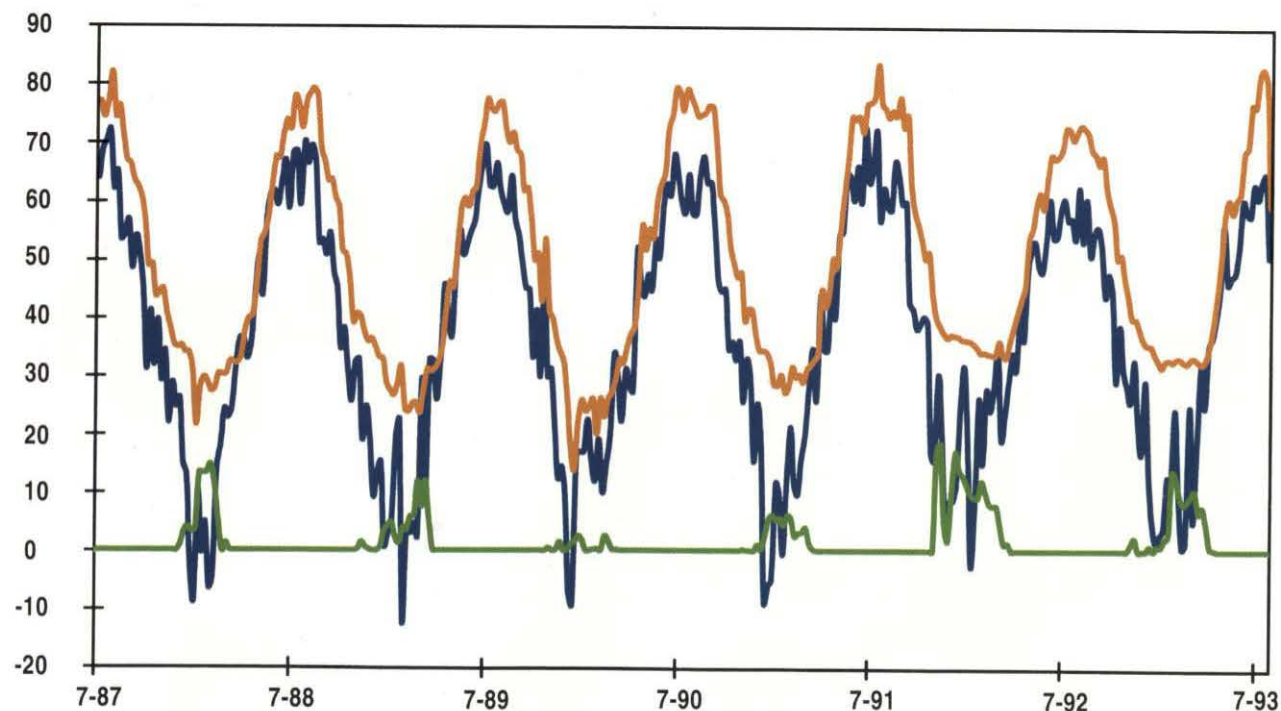
At the end of the study, the grasses were placed in three groups, according to winter hardiness. Group 1, the most winter hardy, contains the 85 species or cultivars that survived all six winters. Plants in this group are therefore considered hardy in USDA Zone 4a. Group 2 contains the 35 grasses that survived four or five of the six winters, but died or showed major injury some years, especially in 1989-90 or 1992-93. Grasses in group 2 are classified as marginally hardy. Finally, group 3 grasses survived only one or two winters and are not recommended as perennials for Zone 4a.

Snow Cover and Minimum Temperatures for the Six-Year Trial

Note especially the winter of 1989-90, when low soil temperatures contributed to the death of many of the less hardy species. (Temperatures are given in Fahrenheit and snow depth in inches.)



All data shown on the chart represent weekly averages.



Group 1

Recommended for Cold Climates Including USDA Zone 4a

Name	Height	Origin	Season of Interest	Comments
<i>Acorus calamus</i> sweet flag	2-4 ft.	N. Hemisphere	June-frost	Tolerates shade; usually grown in water.
<i>Acorus calamus</i> 'Variegatus' variegated sweet flag	2-3 ft.	Horticultural selection	June-frost	Same as above.
<i>Alopecurus pratensis</i> 'Aureus' yellow foxtail	1-2 ft.	Europe	June-October	Forms a dense clump of yellow foliage.
<i>Arrhenatherum elatius</i> 'Variegatum' bulbous oatgrass	8-12 in.	Europe	June-October	Slow growing; tolerates poor and dry soils.
<i>Bouteloua curtipendula</i> side oats grama	12-30 in.	N. America	August-winter	A dominant grass of the shortgrass prairie; prefers dry soil, full sun.
<i>Calamagrostis x acutiflora</i> 'Karl Foerster' (synonym <i>Calamagrostis x acutiflora</i> 'Stricta') feather reedgrass	4½ ft.	Europe	July-winter	Stiff, upright flowers are pink in July, turning beige by August. Wheat-like appearance.



Alopecurus pratensis 'Aureus'



Arrhenatherum elatius 'Variegatum'



Calamagrostis acutiflora 'Karl Foerster'

Group 1

Recommended for Cold Climates Including USDA Zone 4a

Name	Height	Origin	Season of Interest	Comments
<i>Calamagrostis brachytricha</i> fall blooming reedgrass	4 ft.	Europe	September-winter	Pink and purple flowers in September. Beautiful in fall.
<i>Carex digitata</i> finger sedge	12-14 in.	Europe	June-winter	Prefers shade and moist soil.
<i>Carex flacca</i> blue sedge	14 in.	Europe	June-winter	Reported to be invasive but was not in our trials. Tolerates drier soil than most sedges.
<i>Carex flava</i> yellow sedge	24 in.	Europe N. America	June-winter	Beautiful yellow-striped foliage. Tolerates very wet soil; needs shade.
<i>Carex grayi</i> Grays sedge	30 in.	N. America	June-winter	Irregular growth habit, coarse foliage, conspicuous flowers. Good for shady naturalized wet areas.



Calamagrostis brachytricha



Carex flava



Carex digitata

Group 1

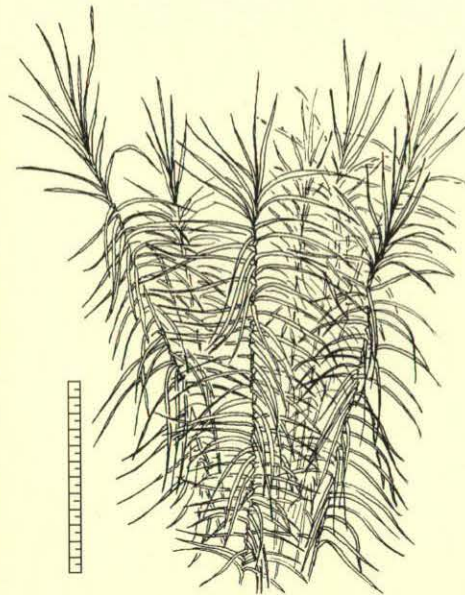
Recommended for Cold Climates Including USDA Zone 4a

Name	Height	Origin	Season of Interest	Comments
<i>Carex montana</i> mountain sedge	10 in.	Europe	year-round	Forms a fine, dense mound of foliage. Tolerates sun and shade.
<i>Carex muskingumensis</i> palm sedge	2-3 ft.	Europe	June-winter	Attractive dark green foliage grows at right angles to the stem. Plants are yellow if grown in full sun.
<i>Carex nigra</i> black flowering sedge	12-14 in.	N. America	June-winter	Blue-green foliage; likes wet soil and light shade.
<i>Carex speciosa</i> * 'Velebit Humilis' velvet sedge	12 in.	Europe	June-winter	Forms a beautiful mound of dense, grass-like foliage. Prefers light shade.
<i>Carex umbrosa</i> umbrosa sedge	10-12 in.	Europe	June-winter	Forms a dense mound of foliage. Prefers light shade.
<i>Deschampsia caespitosa</i> tufted hairgrass	3 1/2-4 ft.	N. Hemisphere	June-October	Large beige flowers make a soft mound of "hair" above almost evergreen foliage. Prefers moist and shady sites; can be difficult to establish in full sun.

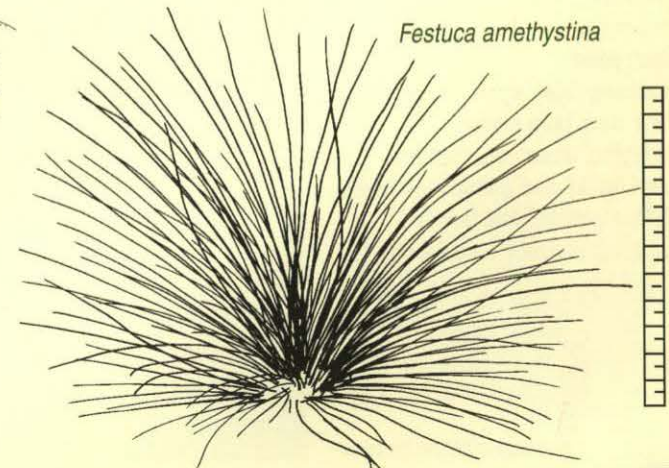


Deschampsia caespitosa

* Species name is used in the trade, but has no botanical reference.



Carex muskingumensis



Festuca amethystina

Group 1

Recommended for Cold Climates Including USDA Zone 4a

Name	Height	Origin	Season of Interest	Comments
'Bronzeschleier' bronze veil hairgrass	40 in.	N. Hemisphere	June-October	Flowers slightly darker than the species.
'Fairy's Joke' fairy's joke hairgrass	3 ft.	N. Hemisphere	June-September	Small plantlets are formed in the flowers in place of seeds, causing the heads to fall over.
'Goldgehaenge' gold pendant hairgrass	3 ft.	N. Hemisphere	June-October	Flowers slightly yellow.
'Scotland' Scotland hairgrass	3 ft.	N. Hemisphere	June-October	Very similar to species.
<i>Festuca amethystina</i> 'Bronzeglanz' bronzeluster fescue	12-14 in.	Europe	year-round	Dense mounds of fine blue-green foliage, slightly larger than <i>F. cinerea</i> . Full sun; well-drained soil.
'Klose' klose fescue	12-14 in.	Europe	year-round	Light blue foliage.
'Superba' supurba fescue	12-14 in.	Europe	year-round	Blue-green foliage.
<i>Festuca cinerea</i> 'Blaufink' blue finch fescue 'Blauglut' blue ember fescue 'Blausilber' blue silver fescue 'Daeumling' tom thumb fescue 'Elijah Blue' 'Fruehlingsblau' spring blue fescue 'Harz' harz blue fescue 'Meerblau' ocean blue fescue 'Sea Urchin' sea urchin blue fescue 'Solling' solling blue fescue 'Superba' supurba blue fescue	8-10 in.	Europe	year-round	This species is very similar to the N. American <i>Festuca ovina</i> 'Glauca'. All cultivars listed form a dense, finely textured mound of short glaucous blue or blue-green foliage that retains some of its color through the winter. Tan or beige flowers are borne 6-24 inches above the foliage. 'Solling' has been selected for its lack of flowers, which some people feel detract from the uniform blue appearance. All prefer full sun and well-drained or dry soil. Even with the best of conditions the dwarf blue fescues are short lived and may need to be replanted every few years.



Festuca cinerea cultivar

Group 1

Recommended for Cold Climates Including USDA Zone 4a

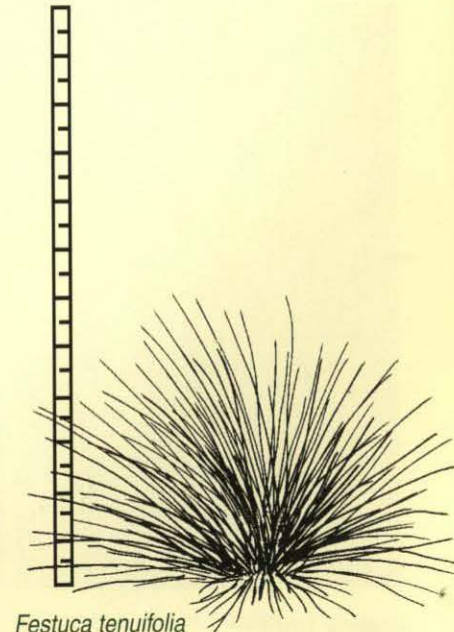
Name	Height	Origin	Season of Interest	Comments
<i>Festuca muelleri</i> * Muellers fescue	6 in.	Europe	year-round	Fine dense clump. Needs full sun and well-drained soil.
<i>Festuca tenuifolia</i> fine-leaved fescue	4-6 in.	Europe	year-round	Small, fine textured. Needs full sun and well-drained soil.
<i>Hakonechloa macra</i> hakonegrass	20-30 in.	Japan	June-frost	Attractive bamboo-like foliage. Needs shade.
<i>Helictotrichon sempervirens</i> blue oatgrass	2-3 ft.	Europe	year-round	Forms a blue mound of foliage larger than dwarf blue fescue. More tolerant of heavy soil, but still prefers full sun and good drainage.
<i>Hystrix patula</i> bottlebrush	30-36 in.	N. America	July-September	Native to shady woods, but will grow in full sun; can self-seed.
<i>Juncus effusus</i> common rush	2½ ft.	N. America	June-October	Common in swamps and wetlands.



Hakonechloa macra



Helictotrichon sempervirens



Festuca tenuifolia

* Species name is used in the trade, but has no botanical reference.

Group 1

Recommended for Cold Climates Including USDA Zone 4a

Name	Height	Origin	Season of Interest	Comments
<i>Koeleria brevis</i> blue hairgrass	6-12 in.	Europe	May-October	Dense clumps of blue-green foliage. Likes full sun and good drainage. May be short lived.
<i>Leymus arenarius</i> (synonym <i>Elymus arenarius</i>) blue lymegrass	24-30 in.	Europe	June-November	Coarse blue foliage; irregular growth habit and invasive rhizomes. Can be used along lake or sea shores. Heavy soils confine rhizomes.
<i>Leymus racemosus</i> (synonym <i>Elymus giganteus</i>) giant blue rye	30 in.	Europe	June-November	Same as above.
<i>Luzula sylvatica</i> greater woodrush	1-2 ft.	Europe	June-November	Needs shade and moist soil. Almost evergreen.
<i>Miscanthus floridulus</i> giant miscanthus	8-10 ft.	Asia	June-winter	Huge, bamboo-like, long coarse leaves; rarely flowers; slightly spreading clump.



Koeleria brevis



Luzula sylvatica



Leymus racemosus

Group 1

Recommended for Cold Climates Including USDA Zone 4a

Name	Height	Origin	Season of Interest	Comments
<i>Miscanthus oligostachyus</i> small Japanese silvergrass	3½-4 ft.	Japan	July-winter	Short, wide bamboo-like leaves; earliest flowering miscanthus in Minnesota, forms a dense clump.
<i>Miscanthus sacchariflorus</i> Chinese silvergrass	6-8 ft.	Asia	August-winter	Invasive rhizomes, hardy in Zone 3. Naturalized in ditches and waste areas in the Midwest.
<i>Miscanthus sinensis</i> 'Purpurascens' red flame miscanthus	4-5 ft.	E. Asia	August-winter	An excellent grass for cold climates; forms clumps; orange fall color.
<i>Miscanthus sinensis</i> 'Silberfeder' silverfeather miscanthus	6-8 ft.	E. Asia	September-winter	Clump-forming, large silvery white flowers.
<i>Molinia caerulea</i> 'Heidebraut' heath bride moorgrass	3-4 ft.	Europe	August-winter	Attractive, upright open form; yellow fall color.
'Moorhexe' moorwitch moorgrass	3-4 ft.	Europe	August-winter	Same as above.



Miscanthus oligostachyus



Molinia caerulea 'Heidebraut'



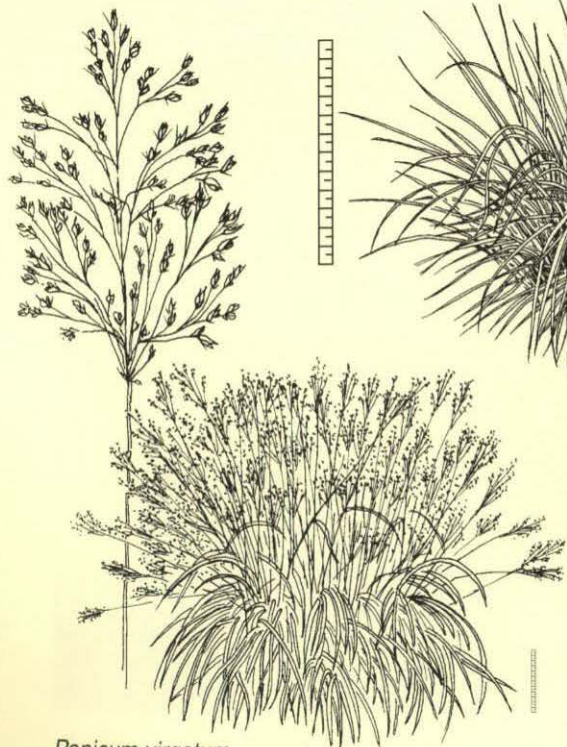
Molinia caerulea 'Windspiel'

Name	Height	Origin	Season of Interest	Comments
<i>Molinia caerulea</i> ssp. arundinacea tall moorgrass	6-8 ft.	Europe	August-winter	Tall, open, spreading, pencil-thin stems atop basal foliage give this grass a unique look. Beautiful yellow fall color.
'Bergfreund' mountain friend tall moorgrass	6-8 ft.	Horticultural selection	August-winter	All cultivars are similar to the subspecies above.
'Skyracer' skyracer tall moorgrass	6-8 ft.	Horticultural selection	August-winter	
'Staefa' stafa tall moorgrass	6-8 ft.	Horticultural selection	August-winter	
'Transparent' transparent tall moorgrass	6-8 ft.	Horticultural selection	August-winter	
'Windspiel' windplay tall moorgrass	6-8 ft.	Horticultural selection	August-winter	
<i>Panicum clandestinum</i> deerstongue grass	2½-3 ft.	Eastern U.S.	July-October	Can have invasive rhizomes. Questionable ornamental.
<i>Panicum virgatum</i> switchgrass	3-8 ft.	N. America	July-winter	One of the predominant grasses in the tallgrass prairie. Quite variable in height, foliage, and flower color. Tolerates wet or dry soil.
'Haense Herms' red switchgrass	5 ft.	Horticultural selection	July-winter	Red-tinged foliage and red flowers.
'Rehbraun' red-brown switchgrass	5 ft.	Horticultural selection	July-winter	Same as above.
'Rotstrahlbusch' red-rays switchgrass	5 ft.	Horticultural selection	July-winter	Same as above.
'Squaw' * squaw switchgrass	5 ft.	Horticultural selection	July-winter	Similar to species.
'Strictum' tall switchgrass	4-5 ft.	Horticultural selection	July-winter	A stiffer, shorter form of switchgrass, with blue-gray foliage.
'Warrior' * warrior switchgrass	5 ft.	Horticultural selection	July-winter	Similar to species.

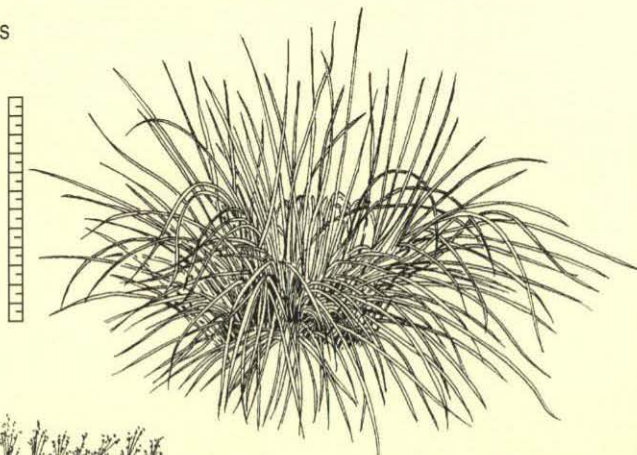
Group 1

Recommended for Cold Climates Including USDA Zone 4a

Name	Height	Origin	Season of Interest	Comments
<i>Pennisetum flaccidum</i> (synonym <i>Pennisetum incomptum</i>) meadow pennisetum	3-4 ft.	E. Asia	July-October	Very aggressive rhizomes; can self-seed. Not recommended.
<i>Phalaris arundinacea</i> 'Picta' ribbongrass	2-4 ft.	Europe	June-frost	Hardy in Zone 3, but invasive rhizomes make it difficult to contain.
<i>Phalaris arundinacea</i> var. <i>luteo-picta</i> yellow ribbongrass	2-4 ft.	Horticultural selection	June-frost	Yellow and pink stripes on the new foilage, turns green by midsummer when it can be mowed or cut back to encourage new growth. Invasive.
<i>Phalaris arundinacea</i> 'Feeseys Form' Feeseys form ribbongrass	2-4 ft.	Horticultural selection	June-frost	A superior selection grown for its nearly white foliage, pink or reddish in the spring. Not as invasive as above.



Panicum virgatum



Sesleria heufeliana

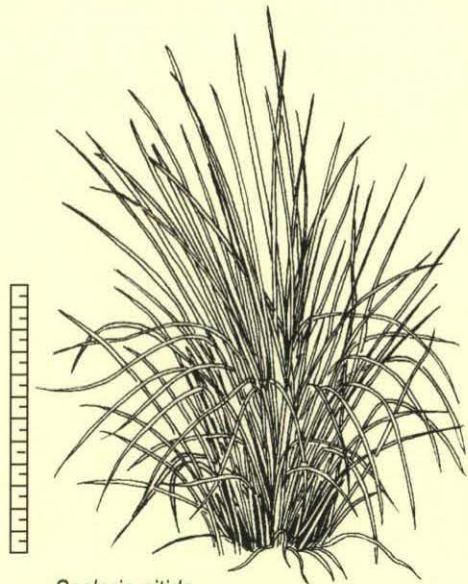


Phalaris arundinacea 'Feeseys Form'

Group 1

Recommended for Cold Climates Including USDA Zone 4a

Name	Height	Origin	Season of Interest	Comments
<i>Schizachyrium scoparium</i> (synonym <i>Andropogon scoparius</i>) 'Aldos', 'Little Camper', 'Blaze' little bluestem	3-4 ft.	N. America	August-winter	Predominant prairie species, blue-green foliage turning red-orange in September. Variable in form, height, and lodging.
<i>Sesleria caerulea</i> blue moorgrass	12-18 in.	Europe	year-round	Semi-evergreen blue-gray foliage.
<i>Sesleria heufeliana</i> green moorgrass	14-20 in.	Europe	year-round	Light green clumps.
<i>Sesleria nitida</i> gray moorgrass	20 in.	Europe	year-round	Gray-green clumps.
<i>Sorghastrum nutans</i> 'Holt', 'Osage', 'Rumsey' Indian grass	4-6 ft.	N. America	August-winter	Very common in the prairie; beautiful yellow brown flowers variable in height, flowering time, and lodging.



Sesleria nitida



Schizachyrium scoparium

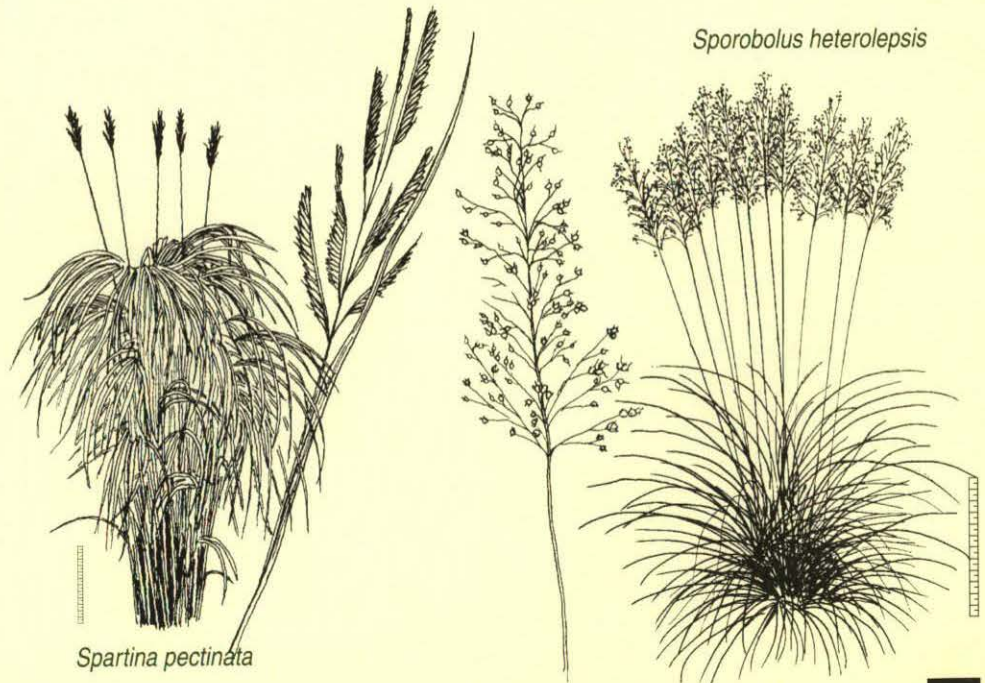
Group 1

Recommended for Cold Climates Including USDA Zone 4a

Name	Height	Origin	Season of Interest	Comments
<i>Spartina pectinata</i> cordgrass	6-7 ft.	N. America	July-winter	Wide tolerance of soil types, prefers wet soils; lodging may be a problem. Invasive, especially in light sandy soil.
<i>Spartina pectinata</i> 'Aureo-Marginata' variegated cordgrass	6-7 ft.	Horticultural selection	July-winter	Same as above but with yellow stripes along leaf margins.
<i>Spodiopogon sibericus</i> silver spikegrass	4-4½ ft.	Horticultural selection	July-winter	Thick clump of bamboo-like foliage; bronze fall color.
<i>Sporobolus heterolepis</i> prairie dropseed	3-3½ ft.	N. America	August-winter	Beautiful fine texture with airy cloud-like flowers; reddish fall color.
<i>Stipa extremorientalis</i> eastern feathergrass	4½-5 ft.	Europe	August-October	Large, open flowers; may lodge.
<i>Themeda triandra</i> 'Japonica' Japanese themeda	5-5½ ft.	Japan/China	September-November	Open-spreading to irregular growth habit; bronze fall color.



Spodiopogon sibericus



Spartina pectinata

Sporobolus heterolepis

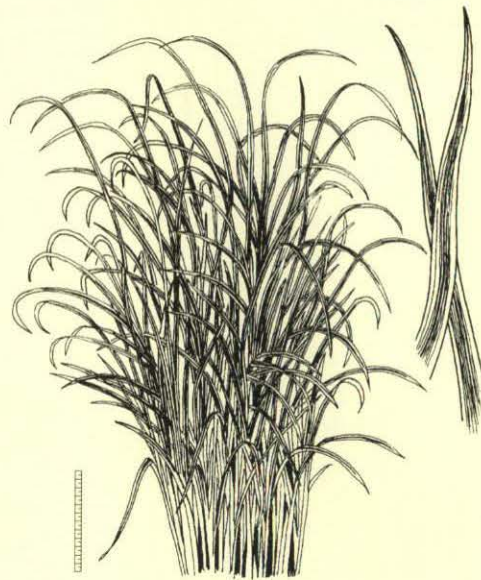
Group 2

Marginally Hardy in USDA Zone 4a

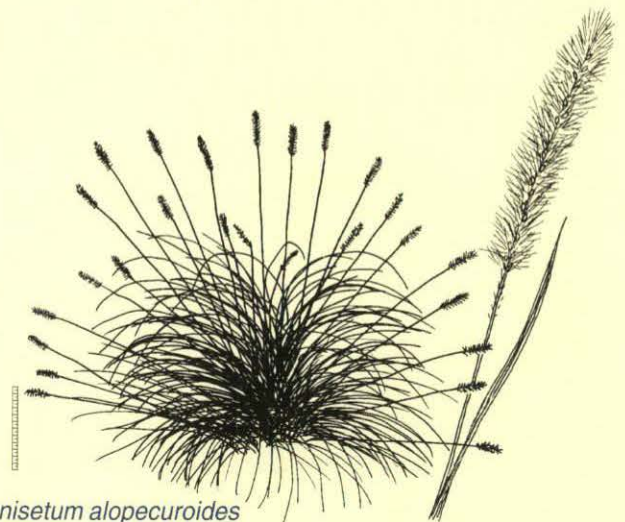
Name	Height	Origin	Season of Interest	Comments
<i>Carex sylvatica</i> forest sedge	6 in.	Europe	June-winter	Needs shade.
<i>Carex</i> x 'The Beatles' mop-head sedge	4 in.	hybrid	June-frost	Needs shade; curly mound of leaves.
<i>Festuca amethystina</i> 'April Green' April green fescue	8-14 in.	Europe	year-round	Olive green foliage.
<i>Festuca cinerea</i> 'Silberreiher' silver heron fescue	6 in.	Europe	year-round	Fine, dainty.
<i>Festuca mairei</i> atlas fescue	2-2½ ft.	N. Africa	year-round	Olive green foliage.
<i>Festuca pallens</i> pallens fescue	4-6 in.	Europe	year-round	Clear blue foliage.
<i>Festuca pseudeskia</i> Sierra Nevada fescue	6 in.	N. America	year-round	Dense blue foliage; 15-inch flowers.



Miscanthus sinensis



Miscanthus sinensis 'Variegatus'



Pennisetum alopecuroides

Group 2

Marginally Hardy in USDA Zone 4a

Name	Height	Origin	Season of Interest	Comments
<i>Festuca vallesiaca</i> 'Glaucantha' wallis fescue	6-10 in.	Asia	year-round	Fine, dense blue foliage.
<i>Koeleria glauca</i> blue June grass	12 in.	Eurasia	June-winter	Blue-green foliage.
<i>Luzula purpurea</i> purple woodrush	8 in.	Europe	June-winter	Shade; moist soil.
<i>Luzula sylvatica</i> 'Hohe Tatra' high tatra mountain rush	12 in.	Europe	June-winter	Shade; moist soil.
<i>Miscanthus sinensis</i> Japanese silvergrass; miscanthus	6-8 ft.	Asia	September-winter	Coarse foliage; cultivars are usually superior to the species.
'Autumn Light' autumn light miscanthus	5-7 ft.	Horticultural selection	September-winter	Narrow, upright, medium-textured foilage. Red flowers in September.
'Condensatus' purple blooming Japanese silvergrass	5-7 ft.	Horticultural selection	September-winter	Reddish-purple flowers.
'Gracillimus' maidengrass	5-6 ft.	Horticultural selection	August-winter	Very fine, stiff, upright narrow plants. October flowers are rare in Upper Midwest.
'Graziella'* graziella miscanthus	4-5½ ft.	Horticultural selection	August-winter	Smaller, upright with medium-fine textured foliage. White flowers in September.
'Malepartus'* malepartus miscanthus	6-7 ft.	Horticultural selection	August-winter	Showy red flowers. Yellow-orange fall color.
'Morning Light' morning light miscanthus	4-5 ft.	Horticultural selection	July-winter	A variegated form of maidengrass.
'November Sunset' November sunset miscanthus	5-7 ft.	Horticultural selection	September-winter	Late September flowers.
'Sarabande'* sarabande miscanthus	4-5 ft.	Horticultural selection	September-winter	Fine, silvery foliage. Very slow growth in our trials.
'Silberpfeil' silverarrow miscanthus	5-7 ft.	Horticultural selection	September-winter	Late September flowers.

* Planted in 1990.

Group 2

Marginally Hardy in USDA Zone 4a

Name	Height	Origin	Season of Interest	Comments
'Strictus' porcupine grass	6-8 ft.	Horticultural selection	July-winter	Upright zebra grass.
'Variegatus' variegated miscanthus	5-6 ft.	Horticultural selection	July-winter	Forms a large clump of beautiful foliage. Almost hardy in Zone 4a.
'Zebrinus' zebra grass	6-8 ft.	Horticultural selection	July-winter	Very similar to 'Strictus'.
<i>Molinia caerulea</i> 'Strahlenquelle' fountain spray moorgrass	3-4 ft.	Europe	August-winter	Uncertain why this form of moorgrass died and others lived.
<i>Pennisetum alopecuroides</i> (synonym <i>Pennisetum caudatum</i>) fountain grass	3-4 ft.	E. Asia, Australia	August-winter	Most plants died in 1989; many showed injury in 1993.
'Hameln' dwarf fountain grass	24-32 in.	Horticultural selection	July-winter	Fine-textured foliage; earlier flowers.
'Weserbergland' dwarf fountain grass	24-32 in.	Horticultural selection	July-winter	Same as above.
<i>Pennisetum orientale</i> oriental fountain grass	2-3 ft.	Asia	July-winter	Pink flowers, not as hardy as <i>P. alopecuroides</i> .
<i>Poa caesia</i> alpine bluegrass	6 in.	Europe	June-winter	Small green bunchgrass.
<i>Poa chaixii</i> forest bluegrass	2 ft.	Europe	June-winter	Questionable ornamental.
<i>Sesleria autumnalis</i> autumn moorgrass	12-18 in.	Europe	June-winter	Light olive-green foliage.
<i>Stipa gigantea</i> giant feathergrass	4-5 ft.	Spain	June-October	Showy flowers, may be short lived.
<i>Stipa pennata</i> feathergrass	3-4 ft.	Europe	July	Conspicuous flowers with long fluffy awn. Short lived.

Group 3

Not Recommended as Perennials for USDA Zone 4a

Botanical Name	Common Name
<i>Arundo donax</i>	giant reed
<i>Arundo donax</i> 'Variegata'	variegated giant reed
<i>Arundo plinii</i>	dwarf reed
<i>Briza media</i>	quaking grass
<i>Carex buchananii</i>	leatherleaf sedge
<i>Carex comans</i>	New Zealand sedge
<i>Carex flagelifera</i>	weeping brown New Zealand sedge
<i>Carex morrowi</i> 'Old Gold'	yellow variegated sedge
<i>Carex morrowi</i> 'Variegata'	variegated sedge
<i>Carex ornithopoda</i>	birdsfoot sedge
<i>Carex ornithopoda</i> 'Variegata'	variegated birdsfoot sedge
<i>Carex pendula</i>	drooping sedge
<i>Carex pilulifera</i> 'Tinney's Princess'	silver striped sedge
<i>Carex plantaginea</i>	plantain leaved sedge
<i>Chasmanthium latifolium</i>	northern sea oats
<i>Dactylis glomerata</i> 'Variegata'	variegated orchardgrass
<i>Eragrostis trichodes</i> (<i>Erianthus ravennae</i>)	lovegrass
see <i>Saccharum</i>	
<i>Erianthus contortus</i>	bent-awn plume grass
<i>Festuca alpestris</i> 'Aureola'	alpine fescue
<i>Festuca elegans</i> *	elegans fescue
<i>Festuca gautieri</i> (<i>Festuca scoparia</i>)	bearskin fescue
(<i>Festuca scoparia</i>) 'Pic Carlit'	
<i>Festuca gigantea</i>	dwarf bear skin fescue
<i>Festuca glacialis</i>	giant fescue
<i>Festuca rupicaprina</i> *	glacier fescue
	fescue

Botanical Name	Common Name
<i>Hakonechloa macra aurea</i>	golden hakonechloa
<i>Holcus lanatus</i>	velvetgrass
<i>Holcus lanatus</i> 'Variegatus'	variegated velvetgrass
<i>Imperata cylindrica</i> 'Red Baron'	Japanese bloodgrass
<i>Luzula nivea</i>	snowy woodrush
<i>Melica ciliata</i>	hairy mellic
<i>Millium effusum</i>	wood millet
<i>Millium effusum</i> 'Aureum'	golden wood millet
<i>Miscanthus sinensis</i> 'Yaku Jima'	Yaku Jima miscanthus
<i>Miscanthus transmorrisonensis</i>	evergreen miscanthus
<i>Molinia caerulea</i> 'Variegata'	variegated moorgrass
<i>Pennisetum alopecuroides</i> 'Moudry' ('Viridescens')	black flowering fountain grass
<i>Poa alpina</i> 'Vivipara'	alpine bluegrass
<i>Poa glauca</i>	greenland bluegrass
<i>Saccharum ravennae</i>	plume grass
<i>Schizachyrium scoparium</i> 'Cimarron' (<i>Andropogon scoparius</i>)	little bluestem
<i>Stipa barbata</i>	feathergrass
<i>Stipa capillata</i>	feathergrass

*Species name is used in the trade, but has no botanical reference.

Miscanthus for Cold Climates

Miscanthus is one of the most popular and diverse grasses for use in landscaping. Many different species, varieties, and cultivars are available from nurseries. Height, flowering time, flower color, and hardiness vary widely between different species and cultivars, so identification is very important. One popular and fairly common species is *Miscanthus sacchariflorus*, often called pampasgrass (see box on next page), Chinese silvergrass, or silver bannergrass. Frequently, *Miscanthus sacchariflorus* is wrongly identified as *Miscanthus sinensis*; the points listed below clarify the differences between the two species.

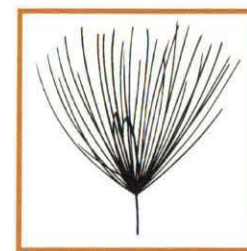
Miscanthus sacchariflorus has the following identifying characteristics:

- Plants have long, invasive rhizomes, which can be a nuisance.
- No awn extends from the spikelet (see inset illustration).
- Silky white hairs surrounding the spikelet are 2-4 times as long as the spikelet, and become fluffy with age.
- In Minnesota, this species sets no seed; is apparently sterile.
- Little variation; all plants are very similar.
- Very good hardiness, through Zone 3.

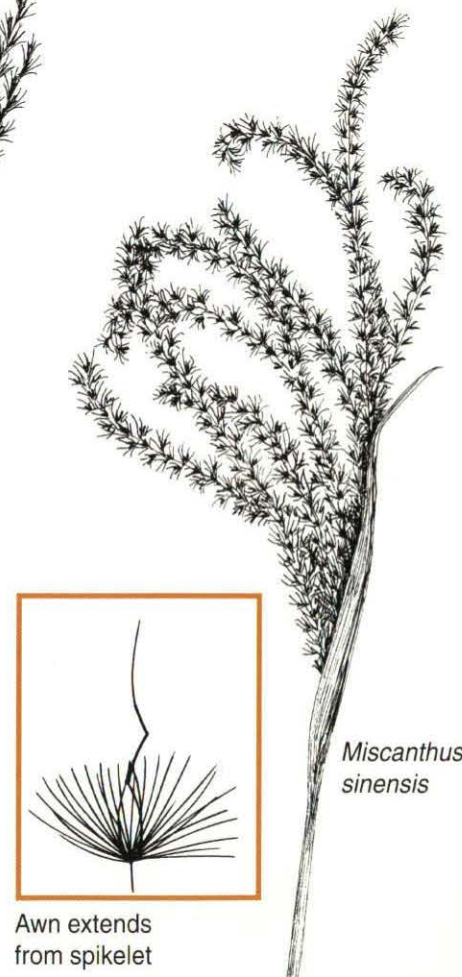
In contrast, *Miscanthus sinensis* is distinguished by the following features:

- Plants have no or weak rhizomes and form dense clumps.
- Awn extends from the spikelet (see inset illustration).
- Hairs surrounding the spikelet are equal to or slightly shorter than the spikelet. The hairs are tan, pink, purple, or reddish and become beige with age.
- Self-seeding can be a problem, especially in Zone 6 and warmer climates.
- Flower and foliage vary greatly in color, height, and flowering time.
- Hardiness varies by cultivar. See group 1 and group 2.

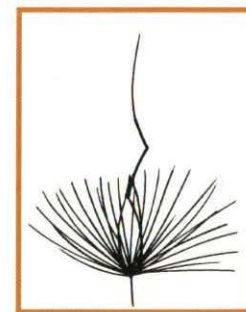
Miscanthus sacchariflorus



No awn extends from spikelet



Miscanthus sinensis



Awn extends from spikelet

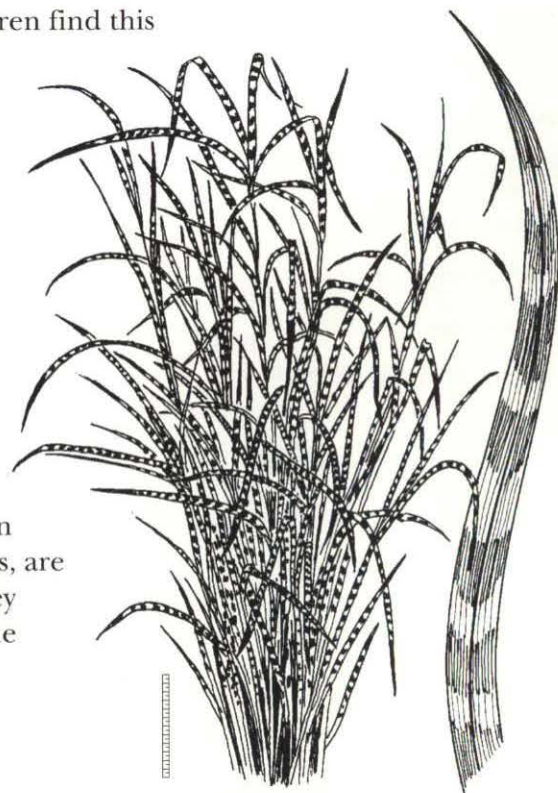
Two cultivars of *M. sinensis* that were hardy for six years in Zone 4a were 'Purpurascens' and 'Silberfeder'. 'Purpurascens' grows to 4-5 feet and flowers in late August or early September. The leaves develop a reddish cast beginning in late June, and by mid-September they are bright orange and finally change to a dull pumpkin color that lasts all winter. 'Silberfeder' grows to 6-8 feet and has silvery white flowers in September and beige fall color.

Two other winter hardy species of miscanthus are *Miscanthus floridulus*, giant miscanthus, and *Miscanthus oligostachyus*, small Japanese silvergrass.

Giant miscanthus grows in a large clump, 3-4 feet in diameter and 8-10 feet tall. It does not usually flower in Minnesota. Its long coarse leaves continually rustle in the wind. Children find this giant plant particularly attractive.

Small Japanese silvergrass flowers in late July, earlier than other miscanthus. Its short, bamboo-like leaves form a dense clump. The mature plants are only 3 1/2-4 feet tall.

The less hardy types of miscanthus such as zebra grass or maidengrass can be grown as annuals in Zone 4a because they develop so quickly into their mature size. If they do overwinter it is an added bonus. Microclimates, on the protected north side of buildings, are good locations for miscanthus, if they still get four to six hours of sun in the summer.



Miscanthus sinensis 'Zebrinus'

What About Pampasgrass?

Depending on where you live, a reference to "pampasgrass" could mean any one of three totally different grasses. In the southern United States, *Cortaderia selloana* is pampasgrass. In the Upper Midwest, *Miscanthus sacchariflorus* is pampasgrass. In some catalogs, *Saccharum ravennae* (*Erianthus ravennae*) is pampasgrass. Common names alone can't tell you what a plant really is!



Miscanthus sinensis 'Purpurascens'



Miscanthus floridulus; person is five feet tall. To left is *Miscanthus oligostachyus* and *P. alopecuroides* 'Hameln' is in right foreground.

Grasses for Different Landscape Needs

Water Gardens and Standing Water

These plants will grow in wet or poorly drained soils. *Spartina*, *Juncus*, and *Acorus* can tolerate standing water.

Acorus calamus and *A. calamus* 'Variegatus'

Juncus effusus

Miscanthus floridulus

Miscanthus sacchariflorus

Miscanthus sinensis 'Purpurascens'

Miscanthus sinensis

Panicum virgatum

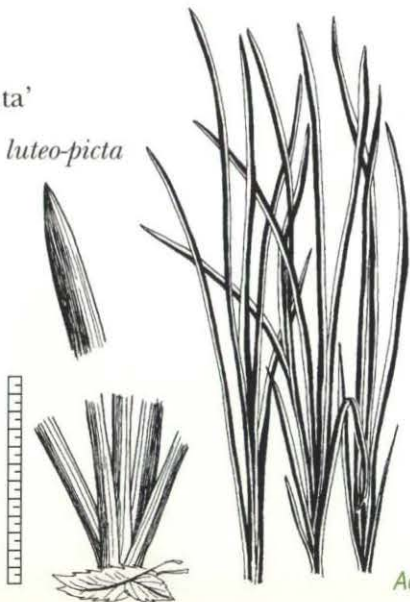
Phalaris arundinacea 'Picta'

Phalaris arundinacea var. *luteo-picta*

Phalaris arundinacea
'Feeseys Form'

Spartina pectinata

Spartina pectinata
'Aureo-Marginata'



Acorus calamus

- sweet flag
- common rush
- giant miscanthus
- Chinese silvergrass
- red flame miscanthus
- most cultivars
- switchgrass
- ribbongrass
- yellow ribbongrass
- Feeseys form ribbongrass
- cordgrass
- variegated cordgrass

Shady Locations

Some grasses will tolerate shade or actually prefer little direct sun. *Deschampsia* can tolerate sun or shade.

- | | |
|-------------------------------|------------------|
| <i>Carex</i> species | most sedges |
| <i>Deschampsia caespitosa</i> | tufted hairgrass |
| <i>Hakonechloa macra</i> | hakonegrass |
| <i>Hystrix patula</i> | bottlebrush |
| <i>Juncus effusus</i> | common rush |
| <i>Luzula</i> species | most woodrushes |



Carex nigra



Carex grayi

Erosion Control/Invasive Rhizomes

Most ornamental grasses do not have invasive rhizomes. The exceptions include two of the most widely grown grasses (ribbongrass and Chinese silvergrass), and their popularity has led to a common misconception that all grasses have rhizomes. The few grasses that do have rhizomes are listed below. All others will not creep or become troublesome.

Controlling invasive grasses may be difficult. Proper location is important when selecting grasses with invasive rhizomes. Ribbongrass can be kept in bounds with a lawn mower, but larger grasses require cement barriers, blacktop, or other structural confinement to keep them in check.

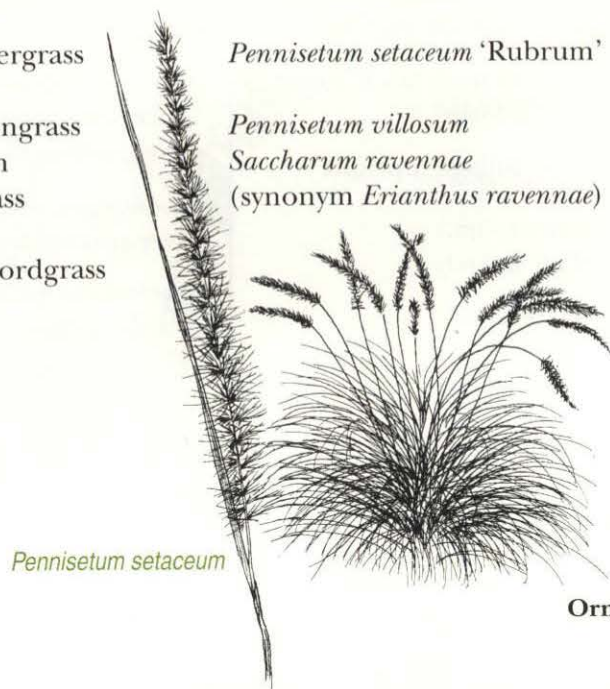
In areas where ground covers are desired or to control erosion on slopes and along lakeshores, invasive rhizomes can be an asset.

<i>Leymus arenarius</i> (synonym <i>Elymus arenarius</i>)	blue lymegrass
<i>Leymus racemosus</i> (synonym <i>Elymus giganteus</i>)	giant blue rye
<i>Miscanthus sacchariflorus</i>	Chinese silvergrass
<i>Phalaris arundinacea</i> 'Picta'	ribbongrass
<i>Phalaris arundinacea</i> var. <i>luteo-picta</i>	yellow ribbongrass
<i>Phalaris arundinacea</i> 'Feeseys Form'	Feeseys form ribbongrass
<i>Spartina pectinata</i>	cordgrass
<i>Spartina pectinata</i> 'Aureo-Marginata'	variegated cordgrass

Perennials That Can Be Grown as Annuals

The grasses listed below will not survive most winters in USDA Zone 4a. However, most will grow to their mature height in a single season and are effective enough to consider using them as annual plants in the landscape. *Pennisetum setaceum* and *Pennisetum villosum* are often sold as annual bedding plants in local nurseries or seed catalogues.

<i>Arundo donax</i>	giant reed
<i>Briza media</i>	quaking grass
<i>Carex morrowi</i> 'Old Gold'	yellow variegated sedge
<i>Carex morrowi</i> 'Variegata'	variegated sedge
<i>Eragrostis trichodes</i>	lovegrass
<i>Festuca gautieri</i> (synonym <i>Festuca scoparia</i>)	bearskin fescue
<i>Festuca gautieri</i> 'Pic Carlit'	dwarf bearskin fescue
<i>Hakonechloa macra aurea</i>	golden hakonechloa
<i>Imperata cylindrica</i> 'Red Baron'	Japanese bloodgrass
<i>Pennisetum orientale</i>	oriental fountain grass
<i>Pennisetum setaceum</i>	crimson or annual fountain grass
<i>Pennisetum setaceum</i> 'Rubrum'	purple-leaved or red fountain grass
<i>Pennisetum villosum</i>	feathertop
<i>Saccharum ravennae</i> (synonym <i>Erianthus ravennae</i>)	plumegrass



Pennisetum setaceum

Fall Color and Winter Interest

Name	Comments	Name	Comments
<i>Calamagrostis x acutiflora</i> 'Karl Foerster' feather reedgrass	Tan foliage; upright form.	<i>Panicum virgatum</i> switchgrass	Tan foliage; upright form.
<i>Calamagrostis brachytricha</i> fall blooming reedgrass	Pink flowers; tan foliage; upright form.	<i>Panicum virgatum</i> 'Haense Herms', 'Rotstrahlbusch' 'Rehbraun' red switchgrass	Red fall foliage and flowers; tan winter foliage.
<i>Miscanthus floridulus</i> giant miscanthus	Tan foliage; huge leaves and culms provide winter sound and movement.	<i>Pennisetum alopecuroides</i> fountain grass	Yellow or tan fall foliage.
<i>Miscanthus oligostachyus</i> small Japanese silvergrass	Silver flowers; tan foliage; upright form.	<i>Schizachyrium scoparium</i> little bluestem	Orange fall and winter foliage; silvery white flowers.
<i>Miscanthus sacchariflorus</i> Chinese silvergrass	Silver plumes; fall orange foliage.	<i>Sorghastrum nutans</i> Indian grass	Yellow fall flowers; tan; upright form.
<i>Miscanthus sinensis</i> 'Purpurascens' red flame miscanthus	White, plume-like flowers; orange-tan foliage.	<i>Spartina pectinata</i> cordgrass	Yellow fall color.
<i>Miscanthus sinensis</i> 'Silberfeder' silverfeather miscanthus	Beige plumes; tan foliage; upright form.	<i>Spartina pectinata</i> 'Aureo-Marginata' variegated cordgrass	Yellow fall color.
<i>Molinia caerulea</i> and all cultivars moorgrass	Yellow foliage; upright form.	<i>Spodiopogon sibericus</i> silver spikegrass	Bronze fall foliage; upright form.
		<i>Sporobolus heterolepsis</i> prairie dropseed	Yellow-orange fall foliage.

Alternative Lawns

Can ornamental grasses be used to replace a conventional lawn? Perhaps, but they will not look like the Kentucky bluegrass we are familiar with. Except for *Deschampsia caespitosa*, all plants listed on this page are low-growing (2 feet or less, so you do not need to mow them) and may be suitable as turfgrass alternatives. These plants form bunches or mounds and are not invasive. Buffalograss, *Buchloe dactyloides*, another low-growing grass often suggested as a turfgrass alternative, was not in the hardiness test, and although it is winter hardy in Zone 4a, it is adapted to drier areas in the West and South. A main drawback is that buffalograss is a warm season plant that turns brown with the first frost and is straw-colored all winter and late into the spring.

Some maintenance is required when ornamental grasses are planted as turf substitutes: weeding of undesirable species and mowing or burning off the previous year's growth in the spring. Burning may be inappropriate near buildings and requires a permit in most municipalities. Also, some towns have weed ordinances prohibiting tall grasses (12 inches or more) in lawns. Small animals, such as mice and gophers as well as birds, may be attracted to these turfgrasses, which may be viewed as a positive or negative feature. Grasses more than 3 inches tall provide attractive cover for field mice and voles.

Try a dozen or so of these grasses in a portion of your lawn or in a perennial garden to see if they are appropriate for your front or back yard. Remember that most of these cannot tolerate foot traffic like a conventional lawn.

For larger areas, one alternative may be to plant native prairie grasses to resemble an original prairie. (See the list of native ornamentals and references for further information.)



Bouteloua curtipendula

SUNNY, DRY LOCATIONS

<i>Arrhenatherum elatius</i> 'Variegatum'	bulbous oatgrass
<i>Bouteloua curtipendula</i>	side oats grama
<i>Bouteloua gracilis</i>	blue grama
<i>Festuca amethystina</i>	most cultivars of this species
<i>Festuca cinerea</i> or <i>F. ovina</i>	most cultivars of dwarf blue fescue
<i>Festuca muelleri</i>	Muellers fescue
<i>Festuca tenuifolia</i>	fine-leaved fescue
<i>Helictotrichon sempervirens</i>	blue oatgrass
<i>Koeleria brevis</i>	blue hairgrass
<i>Koeleria macrantha</i>	June grass

SHADY, MOIST SITES

<i>Carex</i> species	most sedges
<i>Carex montana</i> and <i>Carex speciosa</i> 'Velesbit Humilis'	best-suited species of <i>Carex</i>
<i>Deschampsia caespitosa</i> (3½-4 ft. tall)	tufted hairgrass
<i>Hakonechloa macra</i>	hakonegrass
<i>Luzula sylvatica</i>	greater woodrush
<i>Sesleria</i> species	most moorgrasses, light shade only

Fall Color and Winter Interest

Name	Comments	Name	Comments
<i>Calamagrostis x acutiflora</i> 'Karl Foerster' feather reedgrass	Tan foliage; upright form.	<i>Panicum virgatum</i> switchgrass	Tan foliage; upright form.
<i>Calamagrostis brachytricha</i> fall blooming reedgrass	Pink flowers; tan foliage; upright form.	<i>Panicum virgatum</i> 'Haense Herms', 'Rotstrahlbusch' 'Rehbraun' red switchgrass	Red fall foliage and flowers; tan winter foliage.
<i>Miscanthus floridulus</i> giant miscanthus	Tan foliage; huge leaves and culms provide winter sound and movement.	<i>Pennisetum alopecuroides</i> fountain grass	Yellow or tan fall foliage.
<i>Miscanthus oligostachyus</i> small Japanese silvergrass	Silver flowers; tan foliage; upright form.	<i>Schizachyrium scoparium</i> little bluestem	Orange fall and winter foliage; silvery white flowers.
<i>Miscanthus sacchariflorus</i> Chinese silvergrass	Silver plumes; fall orange foliage.	<i>Sorghastrum nutans</i> Indian grass	Yellow fall flowers; tan; upright form.
<i>Miscanthus sinensis</i> 'Purpurascens' red flame miscanthus	White, plume-like flowers; orange-tan foliage.	<i>Spartina pectinata</i> cordgrass	Yellow fall color.
<i>Miscanthus sinensis</i> 'Silberfeder' silverfeather miscanthus	Beige plumes; tan foliage; upright form.	<i>Spartina pectinata</i> 'Aureo-Marginata' variegated cordgrass	Yellow fall color.
<i>Molinia caerulea</i> and all cultivars moorgrass	Yellow foliage; upright form.	<i>Spodiopogon sibericus</i> silver spikegrass	Bronze fall foliage; upright form.
		<i>Sporobolus heterolepsis</i> prairie dropseed	Yellow-orange fall foliage.

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<i>Festuca amethystina</i>	most cultivars of this species
<i>Festuca cinerea</i> or <i>F. ovina</i>	most cultivars of dwarf blue fescue
<i>Festuca muelleri</i>	Muellers fescue
<i>Festuca tenuifolia</i>	fine-leaved fescue
<i>Helictotrichon sempervirens</i>	blue oatgrass
<i>Koeleria brevis</i>	blue hairgrass
<i>Koeleria macrantha</i>	June grass

SHADY, MOIST SITES

<i>Carex</i> species	most sedges
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<i>Deschampsia caespitosa</i> (3½-4 ft. tall)	tufted hairgrass
<i>Hakonechloa macra</i>	hakonegrass
<i>Luzula sylvatica</i>	greater woodrush
<i>Sesleria</i> species	most moorgrasses, light shade only

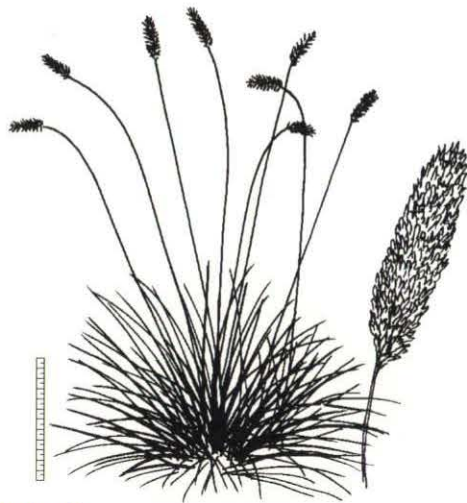
Native Ornamental Grasses

These grasses are native to the prairie that once covered the north central states. They are important in prairie restorations and can be attractive ornamentals with other flowering perennials.

<i>Andropogon gerardii</i>	big bluestem
<i>Bouteloua curtipendula</i>	side oats grama
<i>Bouteloua glauca</i>	blue grama
<i>Koeleria macrantha</i>	June grass
<i>Panicum virgatum</i>	switchgrass
<i>Schizachyrium scoparium</i> (synonym <i>Andropogon scoparius</i>)	little bluestem
<i>Sorghastrum nutans</i>	Indian grass
<i>Spartina pectinata</i>	cordgrass
<i>Sporobolus heterolepis</i>	prairie dropseed



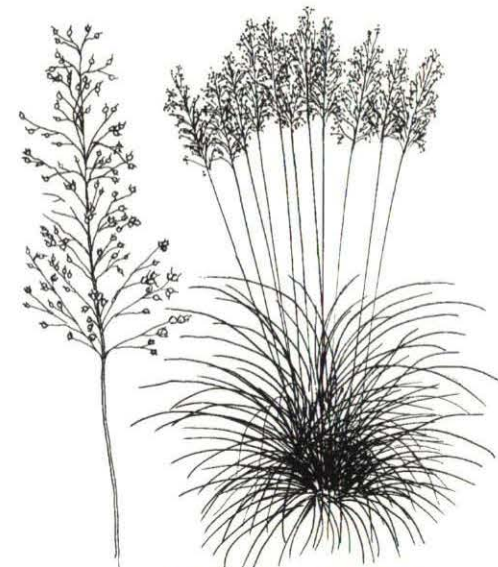
Sorghastrum nutans



Koeleria brevis



Hystrix patula (native to woodlands)



Sporobolus heterolepis

Sources

Local garden centers and nurseries sell ornamental grasses. Such grasses usually have a well-developed root system and, in the case of native plants, may be adapted to local growing conditions. Mail order sources may supply smaller unadapted bare root plants, but offer a wider variety. Below is a partial list of sources; it is given for convenience only and does not constitute an endorsement.

A reference for more sources is the *Andersen Horticultural Library's Source List of Plants and Seeds*, 1989; edited by Richard T. Isaacson. Andersen Horticultural Library: Chanhassen, MN.

Ambergate Gardens
8015 Krey Ave.
Waconia, MN 55387
(612) 443-2248

American Ornamental
Perennials
29977 S.E. Weitz Lane
Eagle Creek, OR 97022
(503) 637-3095

Bailey Nursery
1325 Bailey Road
St. Paul, MN 55119
(wholesale only)
(651) 459-9744

Bluebird Nursery, Inc.
P.O. Box 460
519 Bryan St.
Clarkson, NE 68629
(wholesale only)
(402) 892-3457

Kurt Bluemel, Inc., Nurseries
2740 Greene Lane
Baldwin, MD 21013
(410) 557-7229

Blue Mount Nurseries, Inc.
2103 Blue Mount Road
Monkton, MD 21111
(wholesale only)
(410) 329-6226

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