

# Cold Weather Tolerance of Ornamental Grasses

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## INTRODUCTION

Ornamental grasses are a group of plants from the grass (Graminae) family and from closely related families including sedges (Cyperaceae), rushes (Juncaceae) and others. The general nature of the term 'ornamental grass' allows some non-grass plants to be included in the group because they have grass-like appearance. The term 'ornamental' characterizes these plants as being showy in the landscape. The showiness may feature the plant's foliage, flowers, texture, shape, growth habit form, or seasonal color. Those decorative features allow them to be used in flowerbeds, mass plantings, and as unique specimen plants by themselves.

An investigation of cold weather hardiness of ornamental grasses was initiated at the Noer Facility in 1995. This study keeps records and reports on how well the ornamental grasses in our study survive our climate. The Noer facility and all but the northern fifth of Wisconsin are in the USDA Hardiness Zone 4, so this information may be applicable to the majority of the state.

Some ornamental grasses are invasive which may be a good or bad feature. The invasive ones in our study are identified in this report. Invasiveness can be a positive feature when trying to stabilize a stream bank, fill a large flowerbed, provide a backdrop for a putting green, or soften the appearance of a large wall. However it can be a detriment if the invasive plant is placed in a flowerbed that is too small, planted too close to a sidewalk, or spreads seed to an unwanted landscape area.

A recent six-year winter hardiness study of ornamental grasses was completed at the Minnesota Landscape Arboretum. They found 85 out of the 165 ornamental grasses studied there could be grown successfully in USDA Zone 4. You may get a copy of their publication by calling 608-262-3346 and asking for North Central Regional Publication #573, Ornamental Grasses for Cold Climates. Their publication has many useful pictures and descriptions to help you choose ornamental grasses. A visit to the Noer facility can also familiarize you with many different ornamental grasses and their characteristics. In addition, the Noer study can verify the hardiness data from the Minnesota study.

## MATERIALS AND METHODS

We began planting ornamental grasses at the Noer facility in July 1995. We are adding to the collection of plants every year as more plants become available. The current status of the study is described here.

- We added 21 new plants in 2000 that were donated by Kurt Bluemel, Inc.
- This brings the total number of different plants that have been included in the study to 85 species from 39 different genera.
- Twelve of the 85 species have not survived.

- Two of the twelve species that died were reinstalled this year.
- Presently 75 species are in the study for the 2000 season.

The strategy we used in the design of the Noer demonstration was to place the plants in their natural settings: Shade loving plants were placed in the shade, moisture-loving plants were irrigated, etc. The majority of the plants naturally grow in groups so we placed most varieties in groups of three. All of the plants were mulched with 3” of shredded hardwood bark.

## OBSERVATIONS

This study is in its fifth year and will continue indefinitely. We will have more confidence in recommending different species by continuing the study for many years. The long timeframe will allow us to observe survival under different climatic extremes giving the ratings of winter temperature tolerance more validity. During the five years of the study, the winters have had different extremes.

- The winter of 95/96 set records for cold and severity.
- The winters of 96/97 and 98/99 were more average.
- The winters of 97/98 and 99/00 set records for mild temperatures.

The ratings of plant hardiness are done by visually observing plant health and survival rate. Those observations are done in early June at which time all the plants have put on new growth. The rating given to each species is as follows for our climatic region:

- Group 1 (The most winter hardy and recommended as perennials)
- Group 2 (Some of the plants die or show extensive winter injury.)
- Group 3 (Most or all plants died thus are not recommended as perennials)
- Group 4 (These plants are newly planted and have not been observed over-winter in our study.)

Of the 85 grasses studied these five years, the following results of winter hardiness has been concluded:

- Forty-two of the species can be recommended winter hardy for Zone 4.
- Ten of the species may survive in mild winters or protected environments.
- Twelve species are not recommended as perennials for Zone 4
- Twenty-one species are newly planted in 2000 and have not been tested through a winter yet.

Those plants that are considered invasive have a parenthesis shown after the common name, which gives the means of invasiveness. Invasiveness occurs through seeding, or by the spread of either above or belowground stem called stolons or rhizomes respectively.

<u>Botanical Name</u>	<b>Group 1</b> <b>(The most winter hardy)</b>	<u>Common Name</u>	<u>Invasive</u> <u>Means</u>
<i>Alopecurus pratensis</i>	‘Aureus’	yellow foxtail grass	
<i>Andropogon gerardii</i>		big bluestem, turkey foot	(Seed)
<i>Arrhenantherum elatius bulbosum</i>	‘Variegatum’	bulbous oat grass	

<i>Bouteloua curtipendula</i>	side oats gramma	(Seed)
<i>Calamagrostis acutiflora</i> ‘Stricta’	feather reed grass	
<i>Calamagrostis arundinacea</i> ‘Karl Foerster’	Foerster’s feather reed grass	
<i>Calamagrostis arundinacea</i> ‘Overdam’	Feather reed grass	
<i>Carex</i> ‘The Beatles’	‘The Beatles’ sedge, mop-headed sedge	
<i>Carex muskingumensis</i>	palm sedge	
<i>Chasmanthium latifolium</i>	northern sea oats, wild oats	
<i>Elymus racemosus</i> ‘Glaucus’	volga wild rye, giant dune grass	(Rhiz)
<i>Erianthus ravennae</i>	hardy pampas grass, plume grass	
<i>Glyceria maxima</i> ‘Variegata’	variegated manna grass	(Rhiz)
<i>Helictotrichon sempervirens</i>	blue oat grass	
<i>Hystrix patula</i>	bottlebrush grass	(Seed)
<i>Juncus effusus</i>	soft rush	
<i>Juncus inflexus</i> (glaucus)	rush	
<i>Koeleria glauca</i>	large blue hairgrass	
<i>Miscanthus sinensis</i> ‘Autumn Light’	‘Autumn Light’ Japanese silver grass	
<i>Miscanthus sinensis</i> ‘Graziella’	‘Graziella’ Japanese silver grass	
<i>Miscanthus sinensis</i> ‘Morning Light’	‘Morning Light’ Japanese silver grass	
<i>Miscanthus sinensis</i> ‘Purpurascens’	flame grass, purple silver grass	
<i>Molinia caerulea</i> ‘Skyracer’	‘Skyracer’ tall moor grass	(Seed)
<i>Molinia caerulea</i> ‘Variegata’	variegated moor grass	
<i>Molinia caerulea arundinacea</i>	tall moor grass, tall purple moor grass	(Seed)
<i>Panicum virgatum</i> ‘Cloud Nine’	‘Cloud Nine’ switch grass	(Seed)
<i>Panicum virgatum</i> ‘Haense Herms’	red switch grass	
<i>Panicum virgatum</i> ‘Heavy Metal’	‘Heavy Metal’ switch grass	(Seed)
<i>Panicum virgatum</i> ‘Rehbraun’	dear red-brown switch grass	(Seed)
<i>Panicum virgatum</i> ‘Rotstrahlbusch’	red rays switch grass	(Seed)
<i>Pennisetum alopecuroides</i>	fountain grass	(Seed)
<i>Phalaris arundinacea</i> ‘Feeseys Form’	‘Feeseys Form’ ribbon grass	(Rhiz)
<i>Phalaris arundinacea picta</i>	ribbon grass, gardener’s-garters	(Rhiz)
<i>Schizachyrium scoparium</i>	little bluestem, prairie beard grass	(Seed)
<i>Scirpus lacustris</i> ‘Albescens’	‘Albescens’ bullrush	(Rhiz)
<i>Sesleria</i>	moor grass	
<i>Sorghastrum nutans</i>	Indian grass, gold beard grass	(Seed)
<i>Sorghastrum nutans</i> ‘Sioux Blue’	‘Sioux Blue’ Indian grass	(Seed)
<i>Spartina pectinata</i> ‘Aureomarginata’	‘Golden-edged’ prairie cordgrass	(Rhiz)
<i>Sporobolus heterolepis</i>	prairie dropseed, northern dropseed	(Seed)
<i>Stipa viridula</i>	green needle grass	(Seed)
<i>Typha minima</i>	dwarf Japanese cattail	(Rhiz)

<u>Botanical Name</u>	<b>Group 2</b>	<u>Common Name</u>	<u>Invasive</u>
	<b>Doubtful hardiness</b>		<u>Means</u>

<i>Eragrostis trichoides</i>	sand love grass	(Seed)
<i>Festuca cinerea</i> ‘Elija blue’	blue fescue, blue sheeps fescue	

<i>Festuca cinerea</i> ‘Sea Urchin’	‘Sea Urchin’ blue fescue
<i>Holcus lanatus</i> ‘Albovariegatus’	‘Albovariegatus’ velvet grass
<i>Imperata cylindrica rubra</i>	Japanese blood grass, cranberry grass
<i>Juncus effusus</i> ‘Spiralis’	corkscrew rush, spiral rush
<i>Miscanthus sinensis</i> ‘Gracillimus’	maiden grass
<i>Miscanthus sinensis</i> ‘Yaku Jima’	‘Yaku Jima’ Japanese silver grass
<i>Miscanthus sinensis</i> var. <i>strictus</i>	porcupine grass, banded miscanthus
<i>Pennisetum alepecuroides</i> ‘Hameln’	‘Hameln’ fountain grass

<u>Botanical Name</u>	<b>Group 3</b>	<u>Common Name</u>	<u>Invasive Means</u>
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**Most plants died**

<i>Acorus gramineus</i> ‘Variegatus’	white-striped Japanese sweet flag
<i>Briza media</i>	perennial quacking grass, rattlesnake grass
<i>Dactylus glomerata</i> ‘Variegata’	variegated orchard grass
<i>Festuca amethystina</i>	sheeps fescue
<i>Hakonechloa macra</i> ‘Aureola	golden variegated hakone grass
<i>Luzula nivea</i>	snowy woodrush
<i>Luzula sylvatica</i>	greater woodrush, sylvan woodrush
<i>Miscanthus sinensis</i> ‘Gracillimus Nana’	dwarf Japanese silver grass
<i>Miscanthus sinensis</i> ‘Variegatus’	variegatus Japanese silver grass
<i>Miscanthus sinensis</i> ‘Zebrinus’	zebra grass
<i>Pennisetum alepecuroides</i> ‘Little Bunny’	‘Little Bunny’ fountain grass
<i>Pennisetum alopecuroides</i> ‘Moudry’	black-flowering pennisetum grass

<u>Botanical Name</u>	<b>Group 4</b>	<u>Common Name</u>	<u>Invasive Means</u>
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**New to our study & not tested through a winter yet**

<i>Arrhenatherum elatius</i> ssp.	bulbosum variegatum
<i>Bouteloua gracilis</i>	blue grama, mosquito grass
<i>Briza media</i>	quacking grass
<i>Calamagrostis brachytricha</i>	Korean feather reed grass
<i>Carex muskingumensis</i> ‘Little Midge’	dwarf palm leaf sedge
<i>Carex muskingumensis</i> ‘Wachtposten’	palm leaf sedge
<i>Dactylis glomerata</i> ‘Variegata’	cocks-foot orchard grass
<i>Deschampsia caespitosa</i> ‘Fairy’s Joke’	fairy’s joke tufted hairgrass
<i>Deschampsia caespitosa</i> ‘Bronzeschleier’	tufted hair grass
<i>Deschampsia caespitosa</i> ‘Goldschleier’	tufted hair grass
<i>Deschampsia caespitosa</i> ‘Schottland’	tufted hair grass
<i>Deschampsia caespitosa</i> ‘Tardiflora’	tufted hair grass
<i>Deschampsia caespitosa</i> ‘Tautraeger’	tufted hair grass
<i>Fargesia nitida</i> ‘Ems River’	fountain bamboo
<i>Fargesia nitida</i>	fountain bamboo
<i>Festuca glauca</i> ‘Blauglut’	blue glow blue fescue

<i>Festuca glauca</i> 'Seeigel'	sea urchin blue fescue
<i>Festuca glauca</i> 'Silberreihel'	silver egret blue fescue
<i>Miscanthus</i> 'Giganteus'	giant miscanthus
<i>Miscanthus sinensis</i> 'Blondo'	Japanese silver grass
<i>Panicum virgatum</i> 'Prairie Sky'	blue switch grass
<i>Phalaris arundinacea</i> 'Dwarf Garters'	reed canary grass
<i>Phragmites Australis</i> 'Variegatus'	striped common reed