HRI's Mission:

To direct, fund, promote and communicate horticultural research, which increases the quality and value of ornamental plants, improves the productivity and profitability of the nursery and landscape industry, and protects and enhances the environment.

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Evaluation of Ornamental Grasses for the Northern Great Plains[1]

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Abstract

A total of 160 grass or grass-like species/cultivars were evaluated under field conditions for a period of four years. Detailed assessments of survival, growth and development are presented. Horticultural evaluations were completed on all material, providing a basis for making recommendations for utilization of grasses in the landscape in colder regions (USDA zone 3) of the Great Plains. Thirty accessions were identified with very good to outstanding visual appeal. Plants that were rated very high for horticultural value included: big bluestem (*Andropogon gerardii*), feathertop (*Calamagrostis epigejos*), many of the sedges (*Carex* sp.), plumegrass (*Erianthus ravennae*), Hervier's fescue (*Festuca hervierri*), Leman's fescue (*Festuca lemanii*), tall purple moorgrass (*Molinia caerulea* spp. *arundinacea* cv. Skyracer), switchgrass species and cultivars (*Panicum virgatum* cv. Haense Herms, Heavy Metal and Strictum), ravenna grass (*Saccharum ravennae*) and variegated cordgrass (*Spartina pectinata* cv. Aureo-marginata). Eighteen accessions were removed from the test mainly due to their invasive nature (e.g., *Bromus inermis* cv. Skinner's Golden, *Elymus* spp., *Glyceria maxima* and *Phragmites australis*). Of the remaining 142 accessions, 71.8% had at least one plant remaining at the end of the test period (1996).

Index words: grasses, ornamental grass, plant evaluation.

Significance to the Nursery Industry

Information on the overwintering survival and horticultural evaluation of ornamental grasses is essential to gain an appreciation for the potential value of the many different species and cultivars. In this three-year trial (established in 1992), over 160 accessions representing over 80 different species in 43 genera were evaluated. Plants that were rated very high for horticultural value included: big bluestem (*Andropogon gerardii*), feathertop (*Calamagrostis epigejos*), many of the sedges (*Carex* sp.), plumegrass (*Erianthus ravennae*), Hervier's fescue (*Festuca hervierri*), Leman's fescue (*Festuca lemanii*), tall purple moorgrass (*Molinia caerulea* spp. *arundinacea* cv. Skyracer), switchgrass species and cultivars (*Panicum virgatum* cv. Haense Herms, Heavy Metal and Strictum), ravenna grass (*Saccharum ravennae*) and variegated cordgrass (*Spartina pectinata* cv. Aureo-marginata). This study provides a detailed assessment of the potential value for the landscape industry and suggests that a greater diversity of material can be grown even in very cold locations (USDA Zone 3).

Introduction

Ornamental grasses have been increasing in popularity for a number of years (1, 2, 3, 4). The diversity of plant charac-

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Table 1. Listing of species and cultivars, plant source, survival and invasiveness ratings for the ornamental grass trial at the AAFC-Morden Research Centre.

Species[z]	Family[y]	Common name	Plant source[x]	# Years survived[w]	% Survival[v]	Invasiveness[u]
Acorus calamus L. cv. Variegatus[1]	A	variegated sweet flag	Brampton, ON	3	0	low
Acorus calamus L. cv. Variegatus1[2]	A	variegated sweet flag	Abbotsford, BC	3	0	low
Agropyron trachycaulum (Link) Malte	G	slender wheatgrass	Argyle, MB	3	100	low
Agropyron trachycaulum var. *unilaterale* (Cass.) Malte	G	slender wheatgrass	St. Andrews, MB	3	100	low
Alopecurus aequalis Sobol.[1]	G	short-awned foxtail	Reykjavik, Iceland	3	33	low
Alopecurus aequalis Sobol.[2]	G	short-awned foxtail	Berlin, Germany	1	0	—
Alopecurus pratensis L.	G	yellow foxtail	Brampton, ON	5	66	low
Alopecurus pratensis L. cv. Aureus[1]	G	yellow foxtail	Brampton, ON	5	33	low
Alopecurus pratensis L. cv. Aureus[2]	G	yellow foxtail	Abbotsford, BC	4	0	low
Andropogon gerardii Vitm.[1]	G	big bluestem	St. Andrews, MB	5	100	low
Andropogon gerardii Vitm.[2]	G	big bluestem	Abbotsford, BC	5	100	low
Andropogon gerardii Vitm.[3]	G	big bluestem	Argyle, MB	3	100	low
Anthoxanthum odoratum L.[1]	G	sweet vernal grass	Brampton, ON	2	0	low
Anthoxanthum odoratum L.[2]	G	sweet vernal grass	Reykjavik, Iceland	1	0	—
Anthoxanthum odoratum L.[3]	G	sweet vernal grass	Berlin, Germany	3	50	low
Arrhenatherum elatius (L.) Beauv. ex Presl.	G	tall oat grass	Bordeaux, France	3	100	low
Arrhenatherum elatius var. *bulbosum* (Willd.) Spenn. cv. Variegatum[1]	G	variegated bulbous oatgrass	Abbotsford, BC	5–D	0–D	low
Arrhenatherum elatius var. *bulbosum* (Willd.) Spenn. cv. Variegatum[2]	G	variegated bulbous oatgrass	Brampton, ON	3–D	0–D	low
Arrhenatherum elatius var. *bulbosum* (Willd.) Spenn. cv. Variegatum[3]	G	variegated bulbous oatgrass	Morpeth, ON	5	66	intermediate
Beckmannia syzigachne (Steud.) Fern.	G	slough grass	Argyle, MB	3	33	low
Bouteloua curtipendula (Michx.) Torr.[1]	G	side-oat grama	St. Andrews, MB	2	0	low
Bouteloua curtipendula (Michx.) Torr.[2]	G	side-oat grama	Argyle, MB	2	—	low
Bouteloua gracilis (HBK) Lag. ex Steud.[1]	G	blue grama	Brampton, ON	5	33	low
Bouteloua gracilis (HBK) Lag. ex Steud.[2]	G	blue grama	St. Andrews, MB	5	66	low
Bouteloua gracilis (HBK) Lag. ex Steud.[3]	G	blue grama	Argyle, MB	1	0	—
Brachypodium pinnatum	G		Bordeaux, France	2	—	low
Brachypodium sylvaticum	G		Brampton, ON	3	0	low
Briza maxima L.[1]	G	big quaking grass	Brandon, MB	1	0	—
Briza maxima L.[2]	G	big quaking grass	Brandon, MB	1	0	—
Briza media L.[1]	G	quaking grass	Hamburg, Germany	5–D	0–D	low
Briza media L.[2]	G	quaking grass	Montreal, QC	3	0	low
Briza minor L.	G	little quaking grass	Brandon, MB	1	0	—
Bromus ciliatus L.	G	fringed brome	St. Andrews, MB	1	0	—
Bromus L. cv. Gay Bouquet	G	brome	Saskatoon, SK	1	0	—
Bromus inermis var. *aureus* Leyss. cv. Skinner's Golden[1]	G	Skinner's Golden brome	Roblin, MB	4	0	high
Bromus inermis var. *aureus* Leyss. cv. Skinner's Golden[2]	G	Skinner's Golden brome	Abbotsford, BC	5–D	0–D	high
Calamagrostis x acutiflora (L.) Roth cv. Karl Foerster[1]	G	feather reedgrass	Brampton, ON	5	100	low
Calamagrostis x acutiflora (L.) Roth cv. Karl Foerster[2]	G	feather reedgrass	Abbotsford, BC	5	33	low
Calamagrostis x acutiflora (Schrader) Rchb. cv. Stricta[1]	G	feather reedgrass	Brampton, ON	5	100	low
Calamagrostis x acutiflora (Schrader) Rchb. cv. Stricta[2]	G	feather reedgrass	Abbotsford, BC	5	100	low
Calamagrostis canescens (Weber) Roth	G	reedgrass	Helsinki, Finland	3	100	low
Calamagrostis epigejos (L.) Roth	G	feathertop	Berlin, Germany	3	100	high
Carex conica F. Boott. Marginata[1]	C	dwarf variegated sedge	Brampton, ON	1	0	—
Carex conica F. Boott. Marginata[2]	C	dwarf variegated sedge	Brampton, ON	2	0	low
Carex elata aurea	C	Bowles' golden sedge	Thunder Bay, ON	2	100	low
Carex glauca Scop.[1]	C	blue sedge	Brampton, ON	5	100	intermediate
Carex glauca Scop.[2]	C	blue sedge	Abbotsford, BC	5	100	intermediate
Carex japonica	C	Japanese sedge	Brampton, ON	5	100	intermediate
Carex morrowii F. Boott. cv. Aureo-variegata[1]	C	morrow's sedge	Abbotsford, BC	1	0	—
Carex morrowii F. Boott. cv. Aureo-variegata[2]	C	morrow's sedge	Brampton, ON	1	0	—
Carex morrowii F. Boott. cv. Variegata	C	variegated Japanese sedge	Brampton, ON	5	33	low
Carex muskingumensis Schwein.[1]	C	palm branch sedge	Montreal, QC	4	100	intermediate
Carex muskingumensis Schwein.[2]	C	palm branch sedge	Brampton, ON	5	100	intermediate
Carex nigra (L.) Reichard	C	black flowering sedge	Abbotsford, BC	5	100	intermediate
Carex pendula Huds.	C	weeping sedge	Brampton, ON	2	0	low
Carex sp.	C	sedge	Westhawk Lake, MB	3	100	low
Chasmanthium latifolium (Michx.) Yates[1]	G	northern sea oats	Montreal, QC	1	0	—
Chasmanthium latifolium (Michx.) Yates[2]	G	northern sea oats	Brampton, ON	2	0	low
Chasmanthium latifolium (Michx.) Yates[3]	G	northern sea oats	Abbotsford, BC	2	0	—
Chloris argentina (Hackel) Lillo & Parodi	G		Berlin, Germany	1	0	—
Chrysopogon gryllus[1]	G	gold beardgrass	Brampton, ON	5	100	low
Chrysopogon gryllus[2]	G	gold beardgrass	Bordeaux, France	3	100	low
Coix lacryma-jobi L.[1]	G	Job's tears	Brandon, MB	1	0	—
Coix lacryma-jobi L.[2]	G	Job's tears	Bordeaux, France	1	0	—
Coix lacryma-jobi var. *ma-yeun* (Rom. du Gaill.) Stapf.	G	Job's tears	Berlin, Germany	1	0	—
Cortaderia selloana Asch. & Graebn.[1]	G	pampas grass	Abbotsford, BC	2	0	—

Table 1. Listing of species and cultivars, plant source, survival and invasiveness ratings for the ornamental grass trial at the AAFC-Morden Research Centre, continued.

Species[z]	Family[y]	Common name	Plant source[x]	# Years survived[w]	% Survival[v]	Invasiveness[u]
Cortaderia selloana Asch. & Graebn.[2]	G	pampas grass	Brandon, MB	1	0	—
Cyperus alternifolius var. *nanus* L.	C	umbrella sedge	Brandon, MB	1	0	—
Dactylis glomerata L.[1]	G	orchardgrass	Berlin, Germany	3	100	low
Dactylis glomerata L.[2]	G	orchardgrass	Berlin, Germany	3	100	low
Dactylis glomerata L.[3]	G	orchardgrass	Helsinki, Finland	3	100	intermediate
Dactylis glomerata ssp. *lobata* (Drejer) Lindb.	G	orchardgrass	Berlin, Germany	3	100	low
Dactylis glomerata ssp. *lusitanica* Stebbins & Zohary	G	orchardgrass	Berlin, Germany	3	100	low
Deschampsia caespitosa (L.) Beauv.[1]	G	tufted hairgrass	Abbotsford, BC	5	100	low
Deschampsia caespitosa (L.) Beauv.[2]	G	tufted hairgrass	Montreal, QC	1	0	—
Deschampsia caespitosa (L.) Beauv.[3]	G	tufted hairgrass	Berlin, Germany	3	66	low
Deschampsia caespitosa (L.) Beauv.[4]	G	tufted hairgrass	Berlin, Germany	3	100	low
Deschampsia caespitosa (L.) Beauv.[5]	G	tufted hairgrass	Helsinki, Finland	3	66	low
Deschampsia caespitosa (L.) Beauv.[6]	G	tufted hairgrass	Helsinki, Finland	3	100	low
Deschampsia caespitosa (L.) Beauv. cv. Bronze Veil	G	tufted hairgrass	Abbotsford, BC	7	100	low
Deschampsia flexuosa (L.) Trin.[1]	G	wavy hairgrass	Reykjavik, Iceland	3	100	intermediate
Deschampsia flexuosa (L.) Trin.[2]	G	wavy hairgrass	Berlin, Germany	3	100	low
Diplachne fascicularis (Lam.) Beauv.	G	salt-meadow grass	Brandon, MB	1	0	—
Echinochloa crus-galli (L.) P. Beauv.[1]	G	barnyard grass	Berlin, Germany	1	0	—
Echinochloa crus-galli (L.) P. Beauv.[2]	G	barnyard grass	Berlin, Germany	1	0	—
Echinochloa crus-galli (L.) P. Beauv.[3]	G	barnyard grass	Berlin, Germany	1	0	—
Elymus arenarius L.	G	sea lime/blue lyme grass	—	5–D	0–D	high
Elymus canadensis L.[1]	G	Canada wild rye	Morden, MB	5–D	0–D	intermediate
Elymus canadensis L.[2]	G	Canada wild rye	St. Andrews, MB	5	100	low
Elymus interruptus Buckl.	G	variable-glumed wild rye	Morden, MB	6–D	0–D	low
Elymus patula Buckl.[1]	G	wild rye	Morden, MB	6–D	0–D	low
Elymus patula Buckl.[2]	G	wild rye	Morden, MB	5–D	0–D	high
Elymus racemosus Lam.[1]	G	volga wild rye	Thornhill, ON	4–D	0–D	high
Elymus racemosus Lam.[2]	G	volga wild rye	Abbotsford, BC	3–D	0–D	high
Elymus virginicus L.	G	Virginia wild rye	Morden, MB	5–D	0–D	high
Elymus virginicus var. *submuticus* Hook.	G	Virginia wild rye	Morden, MB	6–D	0–D	low
Eragrostis curvula (Schrad.) Nees.	G	weeping lovegrass	Brandon, MB	1	0	—
Eragrostis tef (Zuccagni) Trott.	G	teff	Brandon, MB	1	0	—
Eragrostis trichodes (Nutt.) A. Wood	G	sand lovegrass	Abbotsford, BC	3–D	0–D	low
Erianthus ravennae (L.) Beauv.[1]	G	plumegrass	Abbotsford, BC	3	0	intermediate
Erianthus ravennae (L.) Beauv.[2]	G	plumegrass	Abbotsford, BC	5	0	low
Festuca amethystina L. cv. Klose	G	green jade fescue	Brampton, ON	5	100	low
Festuca amethystina L. cv. Superba	G	superb blue fescue	Brampton, ON	4	0	low
Festuca calva	G	calva fescue	Brampton, ON	5	66	low
Festuca cinerea Vill. cv. Blue Finch	G	true blue fescue	Brampton, ON	5	100	low
Festuca cinerea Vill. cv. Blue Fox	G	true blue fescue	Brampton, ON	3	0	low
Festuca cinerea Vill. cv. Meerblau/Ocean Blue	G	ocean blue fescue	Brampton, ON	5	100	low
Festuca cinerea Vill. cv. Seeigel/Sea Urchin[1]	G	sea urchin fescue	Abbotsford, BC	5–D	0–D	low
Festuca cinerea Vill. cv. Seeigel/Sea Urchin[2]	G	sea urchin fescue	Brampton, ON	5	33	low
Festuca cinerea Vill. cv. Silberreiher/Silver Egret	G	silver egret fescue	Brampton, ON	5	66	low
Festuca cinerea Vill. cv. Solling	G	solling fescue	Abbotsford, BC	5	100	low
Festuca circummediterranea Vill.	G	Mediterranean fescue	Brampton, ON	5	100	low
Festuca dalmatica	G	dalmatian fescue	Brampton, ON	5	100	low
Festuca hervierri	G	Hervier's fescue	Brampton, ON	5	100	low
Festuca lemanii	G	Leman's fescue	Brampton, ON	5	100	low
Festuca longifolia Thuill.	G	fescue	Berlin, Germany	3	100	low
Festuca ovina L.	G	sheep fescue	Argyle, MB	3	100	low
Festuca ovina var. *glauca* (Lam.) W.D.J. Koch[1]	G	blue fescue	Montreal, QC	4	100	low
Festuca ovina var. *glauca* (Lam.) W.D.J. Koch[2]	G	blue fescue	Brampton, ON	4	0	low
Festuca ovina var. *glauca* (Lam.) W.D.J. Koch cv. Skinner's Blue[1]	G	Skinner's blue fescue	Abbotsford, BC	7	100	low
Festuca ovina var. *glauca* (Lam.) W.D.J. Koch cv. Skinner's Blue[2]	G	Skinner's blue fescue	Brampton, ON	5	100	low
Festuca paniculata ssp. *durandoi* (Clausen) Emb. & Mair.	G	fescue	Berlin, Germany	3	100	low
Festuca rubra ssp. *arctica* L.	G	red fescue	Reykjavik, Iceland	3	100	low
Festuca tenuifolia Sibth.[1]	G	hair fescue	Abbotsford, BC	2	0	—
Festuca tenuifolia Sibth.[2]	G	hair fescue	Brampton, ON	3	0	low
Festuca tenuifolia Sibth.[3]	G	hair fescue	Abbotsford, BC	2	0	low
Festuca trachyphylla (Hackel) Kraj.[1]	G	fescue	Berlin, Germany	3	100	low
Festuca trachyphylla (Hackel) Kraj.[2]	G	fescue	Berlin, Germany	3	100	low
Festuca varia	G	fescue	Brampton, ON	5	100	low
Glyceria maxima (Hartm.) Holmb. cv. Variegata[1]	G	manna grass	Abbotsford, BC	5–D	0–D	high
Glyceria maxima (Hartm.) Holmb. cv. Variegata[2]	G	manna grass	Brampton, ON	1	0	—
Glyceria maxima (Hartm.) Holmb. cv. Variegata[3]	G	manna grass	Abbotsford, BC	3	0	low
Hakonechloa macra (Munro) Makino	G		Brampton, ON	2	0	low

Table 1. Listing of species and cultivars, plant source, survival and invasiveness ratings for the ornamental grass trial at the AAFC-Morden Research Centre, continued.

Species[z]	Family[y]	Common name	Plant source[x]	# Years survived[w]	% Survival[v]	Invasiveness[u]
Helictotrichon sempervirens (Vill.) Pilg.[1]	G	blue oatgrass	Brampton, ON	5	66	low
Helictotrichon sempervirens (Vill.) Pilg.[2]	G	blue oatgrass	Abbotsford, BC	5	66	low
Helictotrichon sempervirens (Vill.) Pilg.[3]	G	blue oatgrass	Morpeth, ON	5	100	low
Hierochloe australis	G		Bordeaux, France	2	0	low
Hierochloe odorata (L.) Beauv.	G	sweetgrass	Argyle, MB	3	66	low
Hordeum jubatum L.	G	foxtail barley	Brandon, MB	4	66	low
Hystrix patula Moench.[1]	G	bottlebrush grass	Brampton, ON	5	33	low
Hystrix patula Moench.[2]	G	bottlebrush grass	Abbotsford, BC	5	66	low
Imperata cylindrica rubra cv. Red Baron	G	Japanese bloodgrass	Brampton, ON	4	0	low
Koeleria cristata (L.) Pers.	G	junegrass	Argyle, MB	1	0	—
Koeleria glauca (Schkuhr) DC[1]	G	blue junegrass	Montreal, QC	1	0	—
Koeleria glauca (Schkuhr) DC[2]	G	blue junegrass	Brampton, ON	4	0	low
Koeleria glauca (Schkuhr) DC[3]	G	blue junegrass	Berlin, Germany	3	66	low
Koeleria vallesiana (Honck.) Gaudin	G		Berlin, Germany	1	0	—
Lagurus ovatus L.	G	hare's tail	Brandon, MB	1	0	—
Luzula nivea (L.) Lam. & DC.[1]	J	snowy woodrush	Montreal, QC	4	50	low
Luzula nivea (L.) Lam. & DC.[2]	J	snowy woodrush	Brampton, ON	4	0	low
Luzula sylvatica (Huds.) Gaud-Beaup.[1]	J	greater woodrush	Brampton, ON	1	0	—
Luzula sylvatica (Huds.) Gaud-Beaup.[2]	J	greater woodrush	Abbotsford, BC	4	100	intermediate
Miscanthus sp.	G	Siberian bamboo	Brandon, MB	4–D	0–D	high
Miscanthus sacchariflorus (Maxim.) Hack.	G	eulalia grass	Brampton, ON	5	100	low
Miscanthus sacchariflorus (Maxim.) Hack. cv. Robustus	G	eulalia grass	Brampton, ON	5	66	low
Miscanthus sinensis Anderss. cv. Autumn Light	G	hardy maidengrass	Brampton, ON	2	0	low
Miscanthus sinensis Anderss. cv. Gracillimus	G	maidengrass	Abbotsford, BC	1	0	—
Miscanthus sinensis Anderss. cv. Purpurescens	G	eulalia grass	Abbotsford, BC	4	0	low
Miscanthus sinensis Anderss. cv. Sarabande	G	eulalia grass	Brampton, ON	2	0	low
Miscanthus sinensis Anderss. cv. Silberfeder/Silver Feather	G	silver feathergrass	Brampton, ON	4	0	low
Miscanthus sinensis Anderss. cv. Strictus	G	porcupine grass	Abbotsford, BC	1	0	—
Molinia caerulea (L.) Moench. cv. Moorhexe[1]	G	purple moorgrass	Edmonton, AB	4	0	low
Molinia caerulea (L.) Moench. cv. Moorhexe[2]	G	purple moorgrass	Brampton, ON	4	0	low
Molinia caerulea ssp. *arundinacea* (L.) Moench.	G	tall purple moorgrass	Brampton, ON	5	66	low
Molinia caerulea ssp. *arundinacea* (L.) Moench. cv. Karl Foerster	G	tall purple moorgrass	Brampton, ON	5	33	low
Molinia caerulea ssp. *arundinacea* (L.) Moench. cv. Skyracer	G	tall purple moorgrass	Abbotsford, BC	5	100	low
Panicum capillare L.	G	witchgrass	Argyle, MB	3	100	low
Panicum violaceum cv. Violet Spikes	G	panicgrass	Brandon, MB	1	0	—
Panicum virgatum L.	G	switchgrass	St. Andrews, MB	5	100	intermediate
Panicum virgatum L. cv. Haense Herms	G	switchgrass	Abbotsford, BC	5	100	low
Panicum virgatum L. cv. Heavy Metal	G	switchgrass	Brampton, ON	5	66	intermediate
Panicum virgatum L. cv. Strictum	G	switchgrass	Brampton, ON	5	66	low
Pennisetum alopecuroides (L.) K. Spreng. cv. Hameln	G	fountain grass	Brampton, ON	5	33	low
Pennisetum setaceum (Forssk.) Chiov.[1]	G	crimson fountain grass	Brandon, MB	1	0	—
Pennisetum setaceum (Forssk.) Chiov.[2]	G	crimson fountain grass	Brandon, MB	1	0	—
Pennisetum villosum R. Br. ex Fresen	G	feathertop	Brandon, MB	1	0	—
Phalaris arundinacea L.	G	reed canarygrass	Montreal, QC	5	100	intermediate
Phalaris arundinacea L. cv. Feesey's Form	G	dwarf ribbongrass	Brampton, ON	4	—	high
Phalaris arundinacea L. cv. Luteo-picta	G	golden ribbongrass	Brampton, ON	5	66	high
Phalaris minor	G	dwarf canarygrass	Brandon, MB	1	0	—
Phleum pratense L.	G	timothy	Brampton, ON	5	100	low
Phragmites australis (Cav.) Trin. ex Steud.	G	common reedgrass	Brampton, ON	3–D	0–D	high
Polypogon monspeliensis (L.) Desf.	G	annual beardgrass	Brandon, MB	1	0	—
Rhynchelytrum repens (Willd.) C.E. Hubb	G	natal grass	Brandon, MB	1	0	—
Saccharum ravennae (L.) Murray	G	ravenna grass	Berlin, Germany	3	100	low
Schizachyrium scoparium (Michx.) Nash[1]	G	little bluestem	Winnipeg, MB	7	100	low
Schizachyrium scoparium (Michx.) Nash[2]	G	little bluestem	St. Andrews, MB	5	66	low
Schizachyrium scoparium (Michx.) Nash[3]	G	little bluestem	Argyle, MB	3	33	low
Schizachyrium scoparium (Michx.) Nash[4]	G	little bluestem	Abbotsford, BC	5	100	low
Sesleria caerulea (L.) Ard.[1]	G	blue moorgrass	Brampton, ON	5	100	low
Sesleria caerulea (L.) Ard.[2]	G	blue moorgrass	Abbotsford, BC	5	100	low
Sesleria sadlerana ssp. *tatre* (Degen) Deyl	G		Berlin, Germany	3	100	low
Sorghastrum avenaceum (Michx.) Nash	G	Indian grass	Brandon, MB	1	0	—
Sorghastrum nutans (L.) Nash	G	Indian grass	St. Andrews, MB	5	66	low
Sorghum nigrum	G	black sorghum	Brandon, MB	1	0	—
Spartina pectinata Link	G	prairie cordgrass	St. Andrews, MB	5	66	intermediate
Spartina pectinata Link cv. Aureo-marginata[1]	G	variegated cordgrass	Brampton, ON	3	—	intermediate
Spartina pectinata Link cv. Aureo-marginata[2]	G	variegated cordgrass	Abbotsford, BC	4	0	intermediate
Spodiopogon sibiricus Trin.		silver spike grass	Brampton, ON	1	0	—
Sporobolus asper (Michx.) Kunth	G	tall dropseed	Argyle, MB	2	0	low

Table 1. Listing of species and cultivars, plant source, survival and invasiveness ratings for the ornamental grass trial at the AAFC-Morden Research Centre, continued.

Species[z]	Family[y]	Common name	Plant source[x]	# Years survived[w]	% Survival[v]	Invasiveness[u]
Sporobolus heterolepsis Gray	G	prairie dropseed	St. Andrews, MB	5	33	low
Sporobolus poiretii (R. & S.) Hitchc.[1]	G	smut-grass	Berlin, Germany	2	0	low
Sporobolus poiretii (R. & S.) Hitchc.[2]	G	smut-grass	Berlin, Germany	1	0	—
Stipa gigantea Link	G	giant feathergrass	Berlin, Germany	1	0	—
Stipa viridula Trin.[1]	G	green needlegrass	Argyle, MB	1	0	—
Stipa viridula Trin.[2]	G	green needlegrass	Argyle, MB	3	50	low

[z]Superscripts indicate plant source.

[y]A = Araceae, C = Cyperaceae, G = Gramineae, J = Juncaceae

[x]Plant source: Abbotsford, BC = Valleybrook Gardens, 1831 Peardonville Rd., RR 1, Abbotsford, BC, V2S 1M3; Argyle, MB = Prairie Habitats, P.O. Box 1, Argyle, MB, R0C 0B0; Berlin, Germany = Botanical Garden & Museum Berlin-Dahlem, Konigin-Luise-StraBe 6-8, D14191 Berlin; Bordeaux, France = Jardin Botanique, Terrasse du Jardin Public, Place Bardineau, F-33000 Bordeaux, France; Brampton, ON = Humber Nursery Ltd., RR 8, Brampton, ON, L6T 3Y7; Brandon, MB = McFayden Seed Co. Ltd., 30-9th Street, Suite 200, Brandon, MB, R7A 6N4; Edmonton, AB = Devonian Botanic Garden, University of Alberta, Edmonton, AB, T6G 2E1; Hamburg, Germany = Jelitto Staudensamen GmbH, Postfach 1264, D-29 685 Schwarmstedt; Helsinki, Finland = Botanical Garden, P.O. Box 44, Fin-00014, University of Helsinki, Finland; Montreal, QC = W.H. Perron Company, 515 Labelle Blvd., Laval, QC, H7V 2T3; Morden, MB = Native collection, Morden, MB; Morpeth, ON = Stirling Perennials, RR 1, Morpeth, ON, N0P 1X0; Reykjavik, Iceland = Hortus Botanicus Reykjavicensis, Skulatuni 2, IS-105 Reykjavik, Iceland; Roblin, MB = Skinner's Nursery Ltd, P.O. Box 220, Roblin, MB, R0L 1P0; Saskatoon, SK = University of Saskatchewan, Saskatoon, SK; St. Andrews, MB = Prairie Originals, Box 83, Grp 6, RR 1B, Winnipeg, MB, R3C 4A3; Thornhill, ON = Gardenimport, P.O. Box 760, Thornhill, ON, L3T 4A5; Thunder Bay, ON = Thunder Bay, ON; Westhawk Lake, MB = Native collection by Campbell Davidson; Winnipeg, MB = Assiniboine Park Conservatory, Winnipeg, MB.

[w]# of years survived includes year of establishment. Thus something that survived 1 year did not overwinter.–D means plants were discarded.

[v]% Survival = survival in 1996; –D means plants were discarded.

[u]Invasiveness is that in the last surviving year.

teristics and the adaptability of grass species to a wide range of growing conditions have contributed to this increased utilization. Landscape architects, planners and designers as well as nurserymen have recognized grass species as a valuable new plant material for use in the landscape. Examples of uses include ground covers, edging/borders, specimen planting, container/tub planting, large scale naturalizing, special foliage colors to draw attention, backdrop for perennials, erosion control, wildlife utilization attracting fauna, butterflies and birds, exceptionally wet or dry landscape situations, winter gardens and dried flower arrangements (3, 4, 5, 6). Furthermore, grasses generally require minimum maintenance, have few pest problems and present a great range in adaptability, as well as being able to grow in problem areas where other plants cannot (3, 4, 5, 6, 7).

The large number of grass and grass-like species has led to confusion in terms of identification, adaptation and use. The objective of this study was to extend the recommendations for the range and diversity of grass species that may be grown under cold, arid conditions (USDA Zone 3) as well as to provide descriptive and horticultural evaluations of the plant material.

Materials and Methods

Two-hundred-six accessions (seeds and/or plants) were obtained from various sources including commercial nurseries and botanic gardens as well as native collections (Table 1). Several species/cultivars were obtained from a variety of sources (e.g., *Carex glauca*), which enabled comparisons among sources.

All plantings were established at the AAFC-Morden Research Centre, Morden, Manitoba, Canada (USDA Zone 3). The initial planting was established in 1990; however, the majority of taxa were established from 1992 to 1994. Three to five plants were randomly planted in a clean cultivated field (clay-loam) at approximately 1 m (3 ft) centers. A caragana (*Caragana arborescens* L.) shelter-belt was located on the north side of the site. Plants were irrigated only at planting. The inter-row spaces were kept weed free by cultivation, while spaces between plots and between plants were hoed by hand.

A summary of characteristics measured and rated during the course of the study is presented in Table 2. Only plants that survived the first growing season and winter (i.e., established plants) were assessed. Most measurements or assessments were made in mid-late August when plants had reached maximum size. Plant survival was assessed in early spring each year. Fall color assessments were completed in mid-September. All measurements and assessments were done annually (1993–1996) and are reported as a mean value, unless otherwise stated.

The horticultural value assessment was based on a qualitative assessment of the plants (1 = poor; 5 = excellent). Although such assessments are only estimates based on an overall visual impression of growth and development, they do provide a subjective comparison of both positive and negative features. Positive attributes noted included color and foliage variegation, seed head characteristics, texture, density, habit and height, while negative attributes included poor vigor, presence of excessive dry, dead plant material, leaf tip dieback, weedy/invasiveness and limited visual appeal.

The average annual temperature in 1996 (1.6C (35F)) was lower than the 78-year average of 3.4C (40F). During the remaining years of the test, temperatures tended to be near long-term averages. Annual precipitation generally was higher in all test years, especially from 1993–1995, than the 78-year average. In addition, there were higher sunshine hours than the average in both 1994 and 1996 (data available upon request).

Table 2. List of characteristics and assessment methods utilized in the evaluation of grasses.

Characteristic	Assessment method	Unit of measure or ratings
Survival	Count	percentage based on number of plants surviving in 1996
Invasiveness	Qualitative rating	low, intermediate, high in last surviving year
Vigor	Qualitative rating	0–5; where 0 = dead, 1 = very poor to 5 = excellent
Color	Visual determination	color observed
Height/Length	Measurement	cm/mm
Width	Measurement	cm/mm
Plant Habit	Qualitative rating	upright, erect, arching, mat-forming, clump-forming
Plant Density	Qualitative rating	very open, open, intermediate, dense, very dense (number of foliage/stems per plant)
Leaf Texture	Qualitative rating	1–5; where 1 = very fine to 5 = very coarse
Horticultural Assessment	Qualitative rating	1–5; where 1 = no visual appeal to 5 = outstanding visual appeal

Results and Discussion

In general, establishment, growth and survival of the plant material were very good. Of the over 200 accessions planted in the field, only 46 (37 species in 30 genera) did not establish or did not survive the first winter (e.g., *Briza maxima*, *Briza minor*, *Carex morrowii* cv. Aureo-variegata, *Coix lacryma-jobi*, *Coix lacryma-jobi var. ma-yeun*, *Echinochloa crus-galli*, *Lagurus ovatus*, *Pennisetum setaceum* and *Pennisetum villosum)* (Table 1). Lack of adaptation to prairie growing conditions (USDA Zone 3), poor plant quality at planting and/or winter injury could have contributed to the failures.

Several accessions (e.g., *Elymus arenarius*, *Bromus inermis* cv. Skinner's Golden, *Elymus* spp., *Glyceria maxima* and *Phragmites australis*) were very invasive and were removed from the trial to prevent excessive competition with other accessions (18 accessions in 14 species in 9 different genera were discarded mainly due to invasive natures) (Table 1). It should be noted that species that are invasive could be suited for erosion control plantings. However, aggressive spread may lead to 'weedy' problems if planted in the wrong location. Hockenberry et al. (1) reported that *Miscanthus sacchariflorus* has naturalised in Minnesota (MN) and was a 'potential aggressive invader'.

The survival of the remaining 142 accessions, representing 105 unique taxa (78 different species in 43 genera in 4 families: Araceae (1), Cyperaceae (1), Juncaceae (1) and Graminaea (40)), was generally very good (Table 1). At least one plant of the three planted survived to the end of the test period in 71.8% of the accessions. The final survival rate of all of the plants of the 142 accessions (generally 3 plants per accession) was 61.1% at the end of the test period (1996). Differential survival was noted in several species obtained from different sources (e.g., *Bouteloua gracilis*) (Table 1). Differences in quality of initial planting material or different seed sources (provenances) may be responsible for this. In addition, growth of species obtained from different sources was not always equal (e.g., *Acorus calamus* cv. Variegatus) (Table 3). Some sources appear better adapted to growing conditions at Morden, perhaps due to the original source population. It should be noted that many species have very specific site requirements for good survival and development. For example, many are not well adapted to dry growing conditions and our test may not be an adequate representation of their full potential. It would have been necessary to evaluate the material in a variety of growing conditions, but this was beyond the scope of the current study. However, many species such as sedges (*Carex* sp.) are known to be well suited to wet habitats (3, 6) but did very well under the dry test conditions at Morden.

In total, 160 accessions (including 18 discarded accessions) were assessed during the study period (Tables 3 and 4). The maximum height of the plants measured varied from 2.0 in (*Sporobolus poiretii*) to 77.7 in (*Andropogon gerardii*) (mean = 24.0 ± 1.4 in) (Table 3). Plant width varied from 2.6 in (*Bouteloua curtipendula*) to 81.1 in (*Panicum virgatum*) (mean = 23.6 ± 1.3 in). In total, 105 accessions reached sexual maturity and flowered. The mean inflorescence length and width was 5.3 ± 0.4 in and 1.4 ± 0.2 in, respectively. Plants that had appealing seed heads were noted in Table 4. The following plants had large inflorescences (> 12 in): *Andropogon gerardii*, *Carex glauca*, *Elymus virginicus*, *Molinia caerulea* spp. *arundinacea* cv. Karl Foerster, *Molinia caerulea* spp. *arundinacea* cv. Skyracer, *Panicum virgatum* cv. Haense Herms, *Panicum virgatum* cv. Strictum. The most common inflorescence types were panicles (67 accessions) or spikes (29 accessions). Mean plant vigor was 3.0 ± 0.1 with 0 = dead and 5 = excellent. Species that were rated highly for plant vigor (i.e., 4.5–5) were *Andropogon gerardii*, *Bromus inermis* cv. Skinner's Golden, *Calamagrostis epigejos*, *Carex glauca*, *Carex muskingumensis*, *Carex* sp., *Elumus arenarius*, *E. interruptus*, *E. patula*, *E. racemosus*, *E. virginicus*, *Festuca rubra* spp. *artica*, *Miscanthus* spp., *Panicum virgatum*, *P. virgatum* cv. Haense Herms, *P. virgatum* cv. Heavy Metal, *P. virgatum* cv. Strictum. High plant vigor scores suggest rapid establishment and good growth.

The mean score for the horticultural assessments was 2.7 ± 0.1 out of 5, ranging from 1 (e.g., *Alopecurus aequalis*) to 5 (e.g., *Andropogon gerardii*) (Table 4). Plants that were rated very high (4–5) for horticultural value included: *Andropogon gerardii*, *Calamagrostis epigejos*, *Carex glauca*, *Carex muskingumensis*, *Carex* sp., *Erianthus ravennae*, *Festuca hervierri*, *F. lemanii*, *Molinia caerulea* spp. *arundinacea* cv. Skyracer, *Panicum virgatum* cvs. Haense Herms, Heavy Metal and Strictum, *Saccharum ravennae* and *Spartina pectinata* cv. Aureo-marginata. A variety of different characteristics were influential in the high scoring. These include form (e.g., *Andropogon gerardii*), stem density (e.g., *Carex glauca*), foliage, color and texture, seedheads and plant size. Plants that rated poorly (e.g., *Alopecurus aequalis*) were scored low for a variety of reasons (poor vigor, presence of excessive dry, dead plant material, leaf tip dieback, weedy/invasiveness and limited visual appeal).

Plant habit varied from mat forming (10 accessions, e.g., *Carex glauca*), clump/mound forming (45 accessions, e.g., *Festuca ovina* species and cultivars), arching (38 accessions,

Table 3. Quantitative data for the ornamental grass assessments at the AAFC-Morden Research Centre.

Species	Plant			Inflorescense			
	Mean vigor[z]	Maximum height (cm)	Maximum width (cm)	Type	Length (mm)	Width (mm)	Color
Acorus calamus L. cv. Variegatus	2.5[2]–3.0[1y]	31[2]–64[1y]	42[2]–71[1y]	did not flower	—	—	—
Agropyron trachycaulum (Link) Malte	3.0	81.5	27	spike	124.0	2.0	tan
Agropyron trachycaulum var. *unilaterale* (Cass.) Malte	2.5	63	30.1	spike	153.0	9.8	tan/green
Alopecurus aequalis Sobol.	1.0	—	—	did not flower	—	—	—
Alopecurus pratensis L.	3.0	78	50	spike-like panicle	54.1	4.1	tan
Alopecurus pratensis L. cv. Aureus	1.0[2]–1.8[1]	19[2]–19.5[1]	24[2]–33[1]	did not flower	—	—	—
Andropogon gerardii Vitm.	4.3[2]–4.5[1,3]	141.3[2]–197.4[1]	68.8[3]–110[1]	raceme	108.6[2]–520.0[3]	63.6[1]–221.0[3]	brown/purple/red
Anthoxanthum odoratum L.	1.5[2]–3.0[1]	11[1]–15.7[2]	21[1]–25.7[2]	panicle	38[1]–51.5[2]	4.0[1]–5.0[2]	tan
Arrhenatherum elatius (L.) Beauv. ex Presl.	2.0	35	26	panicle	33.8	4.5	
Arrhenatherum elatius var. *bulbosum* (Willd.) Spenn. cv. Variegatum	1.0[2]–3.0[1]	22[2]–57.5[3]	14[2]–50[3]	panicle	67.6[3]–144[1]	17.1[3]–23[1]	tan
Beckmannia syzigachne (Steud.) Fern.	1.0	23.1	31.8	spike-like panicle	39.3	3.1	
Bouteloua curtipendula (Michx.) Torr.	1.0[1]–3.0[2]	15[1]–30.5[2]	6.7[2]–19[1]	spike	112.6	5.7	
Bouteloua gracilis (HBK) Lag. ex Steud.	2.3[1]–2.5[2]	28[1]–41.5[2]	36.1[1]–40[2]	sickle	22.3[1]–31.4[2]	5.6[1]–5.7[2]	purple/tan
Brachypodium pinnatum	2.0	50	45.4	open panicle	112.6	59.1	tan
Brachypodium sylvaticum	2.0	23	33	panicle	74	4	tan
Briza media L.	2.0[1]–5.0[2]	12.6[1]–35[2]	25[2]–59[1]	panicle	115	96	tan
Bromus inermis Leyss. aureus cv. Skinner's Golden	4.5[1]–5.0[2]	62[1]–65[2]	143	panicle	136	92	tan
Calamagrostis x acutiflora (L.) Roth cv. Karl Foerster	2.0[2]–3.8[1]	104[2]–152[1]	52[2]–85.1[1]	panicle	145.0[2]–175.0[1]	8.5[1]–8.9[2]	yellow
Calamagrostis x acutiflora (Schrader) Rchb. cv. Stricta (Karl Foerster)	3.5[2]–4.0[1]	137.8[2]–162.6[1]	79[2]–83[1]	panicle	171.0[1]–190.0[2]	6.3[2]–18.0[1]	yellow
Calamagrostis canescens (Weber) Roth	1.0	21.9	18.1	did not flower	—	—	—
Calamagrostis epigejos (L.) Roth	4.5	84.5	55	panicle	158.0	19.8	brown
Carex conica F. Boott. Marginata	1.0	10	16	did not flower	—	—	—
Carex elata var. *aurea*	4.0	62	57.9	spike	46.2	17.2	brown
Carex glauca Scop.	5.0	66[1]–94[2]	93[1]–128.8[2]	spike	169.0[2]–270.0[1]	45.0[1]–86.0[2]	dark brown
Carex japonica	4.0	63.6	102	spike	71.3	5.4	dark brown
Carex morrowii F. Boott. cv. Variegata	2.8	39	64.3	did not flower	—	—	—
Carex muskingumensis Schwein.	5.0	72.6[1]–105[2]	85[1]–138[2]	spike	76.7[1]–79.8[2]	8.9[1]–10.7[2]	dark brown
Carex nigra (L.) Reichard	4.1	148.2	125	spike	156.0	40.0	dark brown
Carex pendula Huds.	1.0	19	21	did not flower	—	—	—
Carex sp.	5.0	119	128.1	spike	263.0	61.0	brown
Chasmanthium latifolium (Michx.) Yates	1.0	8[1]–11[2]	10[1]–14[2]	did not flower	—	—	—
Chrysopogon gryllus	4.0[1]–2.0[2]	19[2]–107.5[1]	20[2]–105[1]	panicle	173.0[1]–215.0[2]	11.2[2]–19.5[2]	tan
Dactylis glomerata L.	2.5[1]–4.5[3]	79.5[1]–128.5[2]	52.8[1]–72[2]	panicle	115.1[3]–186.0[1]	26.4[3]–80.7[2]	tan
Dactylis glomerata ssp. *lobata* (Drejer) Lindb.	3.0	66.5	40	panicle	109.1	11.0	tan
Dactylis glomerata ssp. *lusitanica* Stebbins & Zohary	2.5	79.5	38.5	panicle	67.9	9.1	tan
Deschampsia caespitosa (L.) Beauv.	2.5[1–4]–3.8[5]	14.8[1]–91.2[5]	29.5[1]–77.8[5]	open panicle	55.4[1]–231.0[5]	7.5[1]–196.0[2]	brown
Deschampsia caespitosa (L.) Beauv. cv. Bronze Veil	4.0	98	124	open panicle	294.0	220.0	light brown
Deschampsia flexuosa (L.) Trin.	2.5	17[2]–28[1]	21.2[2]–27.3[1]	open panicle	90.6	46.6	tan
Elymus arenarius L.	5.0	91	159	did not flower	—	—	—
Elymus canadensis L.	2.8[2]–5.0[1]	31[1]–164[2]	128[1]–174.5[2]	spike	184[2]–218[1]	22.7[2]–35[1]	tan
Elymus interruptus Buckl.	5.0	52	155	spike	248	50	tan
Elymus patula Buckl.	5.0	57[1]–75[2]	87[1]–118[2]	spike	111[2]–155[1]	10[2]–52[1]	tan
Elymus racemosus Lam.	5.0	79[1]–98[2]	120[2]–137[1]	spike	240	17	tan
Elymus virginicus L.	5.0	67	96	spike	397	18	tan
Elymus virginicus var. *submuticus* Hook.	3.0	55	57	spike		tan	
Eragrostis trichodes (Nutt.) A. Wood	3.0	52	63	did not flower	—	—	—
Erianthus ravennae (L.) Beauv.	3.0[2]–5.0[1]	74[1]–102.5[2]	96[1]–130[2]	did not flower	—	—	—
Festuca amethystina L. cv. Klose	3.0	38	42.2	panicle	64.1	1.1	tan
Festuca amethystina L. cv. Superba	1.0	12	18	did not flower	—	—	—
Festuca calva	3.0	23	35.7	panicle	48	4	tan
Festuca cinerea Vill. cv. Blue Finch	2.5	38.5	55.8	panicle	56.2	3.9	tan
Festuca cinerea Vill. cv. Blue Fox	2.0	14	23	did not flower	—	—	—
Festuca cinerea Vill. cv. Meerblau/Ocean Blue	3.3	20.6	38.1	did not flower	—	—	—
Festuca cinerea Vill. cv. Seeigel/Sea Urchin	2.3[2]–3.0[1]	14[2]–20[1]	25[2]–33[1]	panicle	48	3	
Festuca cinerea Vill. cv. Silberreiher/Silver Egret	2.0	12.9	21.2	panicle	39	2	tan
Festuca cinerea Vill. cv. Solling	3.8	25.2	44.3	did not flower	—	—	—
Festuca circummediterranea Vill.	2.5	30.5	36	panicle	64.4	3.5	tan
Festuca dalmatica	3.0	42	54.1	panicle	51.6	2.0	tan

Table 3. Quantitative data for the ornamental grass assessments at the AAFC-Morden Research Centre, continued.

	Plant			Inflorescense			
Species	Mean vigor[z]	Maximum height (cm)	Maximum width (cm)	Type	Length (mm)	Width (mm)	Color
Festuca hervierri	3.8	47.5	39.1	panicle	44.3	2.1	tan
Festuca lemanii	4.3	38	61.6	panicle	60.0	3.7	tan
Festuca longifolia Thuill.	2.5	24.4	35.1	panicle	61.6	2.7	tan
Festuca ovina L.	2.5	30.5	36.9	panicle	54.0	16.5	tan
Festuca ovina var. *glauca* (Lam.) W.D.J. Koch	1.7[2]–3.0[1]	14[2]–38[1]	23[2]–41.9[1]	panicle	33.2	3.4	tan
Festuca ovina var. *glauca* (Lam.) W.D.J. Koch cv. Skinner's Blue	3.0[2]–4.0[1]	43.5[2]–57.1[1]	43.6[2]–96.3[1]	panicle	55.6[2]–72.3[1]	2.9[2]–6.5[1]	tan
Festuca paniculata ssp. *durandoi* (Clausen) Emb. & Mair.	2.0	73.4	35.2	panicle	80.4	6.2	tan
Festuca rubra ssp. *arctica* L.	4.5	21.5	29.2	did not flower	—	—	—
Festuca tenuifolia Sibth.	1.0[2]–2.0[1]	6[2]–17[1]	15[2]–29[1]	panicle	41	2	tan
Festuca trachyphylla (Hackel) Kraj.	2.5[1]–3.5[2]	26.4[1]–57.5[2]	36.6[1]–58.6[2]	panicle	52.6[1]–83.1[2]	2.9[1]–5.1[2]	brown
Festuca varia	3.5	28.7	44.1	panicle	48.6	2.3	tan
Glyceria maxima (Hartm.) Holmb. cv. Variegata	1.0[2]–5.0[1]	26[2]–76[2]	31[2]–128[1]	open panicle	280	100	
Hakonechloa macra (Munro) Makino	1.0	7	7	did not flower	—	—	—
Helictotrichon sempervirens (Vill.) Pilg.	3.5[1]–4.5[2,3]	86[3]–98.6[2]	45[1]–119[3]	panicle	142.0[1]–194.0[3]	49.0[2]–100.3[3]	tan
Hierochloe australis	1.0	—	—	did not flower	—	—	—
Hierochloe odorata (L.) Beauv.	4.0	32.5	52.1	did not flower	—	—	—
Hordeum jubatum L.	3.0	63.5	61.6	spike	137.0	71.0	green/red/tan
Hystrix patula Moench.	1.5	74.5[2]–90.5[1]	52[2]–52.1[1]	spike	139.0[1]–148.0[2]	41.0[1]–54.0[2]	tan/purple/brown
Imperata cylindrica var. *rubra* cv. Red Baron	1.3	28	27	did not flower	—	—	—
Koeleria glauca (Schkuhr) DC	1.7[1]–2.5[2]	9[1]–13.5[2]	13.8[2]–18[1]	spike-like panicle	48	3.3	tan
Luzula nivea (L.) Lam. & DC.	1.0[2]–2.5[1]	33[2]–108[1]	17.6[2]–133.2[1]	umbel	27.9[2]–196.0[1]	4.5[2]–31.5[1]	tan
Luzula sylvatica (Huds.) Gaud-Beaup.	4.0	53.9	63	cyme	59.0	56.5	brown
Miscanthus sp.	5.0	149	118	did not flower	—	—	—
Miscanthus sacchariflorus (Maxim.) Hack.	1.8	27	25	did not flower	—	—	—
Miscanthus sacchariflorus (Maxim.) Hack. cv. Robustus	1.8	34	30	did not flower	—	—	—
Miscanthus sinensis Anderss. cv. Autumn Light	1.0	24	19	did not flower	—	—	—
Miscanthus sinensis Anderss. cv. Purpurescens	2.3	59	66	did not flower	—	—	—
Miscanthus sinensis Anderss. cv. Sarabande	1.0	20	20	did not flower	—	—	—
Miscanthus sinensis Anderss. cv. Silberfeder/Silver Feather	1.0	33	36.5	did not flower	—	—	—
Molinia caerulea (L.) Moench. cv. Moorhexe	2.7[2]–5.0[1]	22[2]–40[1]	29[2]–37[1]	panicle	121[2]–150[1]	5[1]–5.4[2]	tan
Molinia caerulea ssp. *arundinacea* (L.) Moench.	2.3	118	23	panicle	286.0	141.0	tan
Molinia caerulea ssp. *arundinacea* (L.) Moench. cv. Karl Foerster	3.8	141	23	panicle	365.0	126.0	yellow/tan
Molinia caerulea ssp. *arundinacea* (L.) Moench. cv. Skyracer	3.8	173.5	75	open panicle	503.0	141.0	brown/yellow
Panicum capillare L.	1.5	37	16.1	did not flower	—	—	—
Panicum virgatum L.	4.8	137.1	206	open panicle	179.0	148.0	tan
Panicum virgatum L. cv. Haense Herms	5.0	122.5	91	open panicle	377.0	47.0	purple/brown
Panicum virgatum L. cv. Heavy Metal	5.0	126.5	122.2	open panicle	260.0	97.0	purple/brown
Panicum virgatum L. cv. Strictum	5.0	170.3	123	open panicle	419.0	68.3	purple/brown
Pennisetum alopecuroides (L.) K. Spreng. cv. Hameln	1.3	27.3	36	did not flower	—	—	—
Phalaris arundinacea L.	3.8	143.4	105	panicle	139.2	6.3	tan
Phalaris arundinacea L. cv. Feesey's Form	2.7	44.5	40	did not flower	—	—	—
Phalaris arundinacea L. cv. Luteo-picta	2.8	44.5	42	panicle	48.8	6.8	
Phleum pratense L.	2.3	99	29.6	column	88.1	6.8	tan
Phragmites australis (Cav.) Trin. ex Steud.	1.0	121	95	did not flower	—	—	—
Saccharum ravennae (L.) Murray	3.0	159	91.9	did not flower	—	—	—
Schizachyrium scoparium (Michx.) Nash	2.5[4]–4.7[1]	29[4]–104.5[1]	32[4]–111.2[1]	raceme	49.0[4]–244.0[3]	1.0[1]–26.4[3]	tan
Sesleria caerulea (L.) Ard.	3.5[1]–4.3[2]	45[2]–67.9[1]	46[2]–70.5[1]	spike	19.6	2.7[2]–9.5[1]	tan
Sesleria sadlerana ssp. *tatre* (Degen) Deyl	3.0	49	35.4	spike	26.2	5.6	tan
Sorghastrum nutans (L.) Nash	1.8	32	43	panicle	123	16	brown
Spartina pectinata Link	3.3	149.1	110	spike	247	40.7	yellow/tan
Spartina pectinata Link cv. Aureo-marginata	3.5	104[1]–107[2]	107[1]–150[2]	spike	220	31	
Sporobolus asper (Michx.) Kunth	1.0	12.5	20.4	did not flower	—	—	—
Sporobolus heterolepsis Gray	3.0	36	54	did not flower	—	—	—
Sporobolus poiretii (R. & S.) Hitchc.	1.0	5.2	9.6	did not flower	—	—	—
Stipa viridula Trin.	1.5	27	24.2	did not flower	—	—	—

[z]Where 0 = dead, 1 = very poor, 2 = poor, 3 = fair, 4 = good, 5 = excellent

[y]Superscripts indicate plant source as outlined in Table 1.

Table 4. Qualitative assessments for the ornamental grass trial at the AAFC-Morden Research Centre.

Species	Plant habit[z]	Plant density[y]	Leaf			Horticultural assessment		
			Texture[x]	Summer color[w]	Fall color[w]	Value[v]	Positive[u]	Negative[u]
Acorus calamus L. cv. Variegatus	U	O–I	2^{2}–5^{1t}	bl/gr var. cr	gr var. cr	1^{2}–3^{1t}	Col	PV
Agropyron trachycaulum (Link) Malte	U, E	I	3	gr	tan/gr	3	SH, Hab	DM, disease
Agropyron trachycaulum var. *unilaterale* (Cass.) Malte	U, E	O	3	gr	tan/gr	3	SH	PV, DM, DB
Alopecurus aequalis Sobol.	U	very O	1			1		PV
Alopecurus pratensis L.	U, A	O	2	d gr	br/gr	2	awns	PV, DM
Alopecurus pratensis L. cv. Aureus	U	O	$2^{1,2}$	gr vert. yl var.	br/gr/yl	1^{2}–2^{1}	Var.	PV, DM, Dn
Andropogon gerardii Vitm.	U, A	very D	3^{1-3}	m gr/pur	gr/ pur	5^{1-3}	Col, Ht, SH, Dn, Hab	
Anthoxanthum odoratum L.	U, Cl	I–O	1^{2}	m gr	gr/tan	1^{2}		PV, DM
Arrhenatherum elatius (L.) Beauv. ex Presl.	U, E	I	3	gr	br/gr	2		PV, DM, DB
Arrhenatherum elatius var. *bulbosum* (Willd.) Spenn. cv. Variegatum	U, E	I–very O	1^{3}	gr vert. cr var.	gr vert. cr var.	2^{3}	3 = SH	1,2=disc. in 1994; 3=PV, DM
Beckmannia syzigachne (Steud.) Fern.		very O	1	l gr	gr	1	SH	PV, DM, Dn
Bouteloua curtipendula (Michx.) Torr.	U, E	O	2^{2}	m gr	gr	3^{2}	Col, SH	PV
Bouteloua gracilis (HBK) Lag. ex Steud.	U	very O	$1^{1,2}$	m gr	br/tan	2^{1}–3^{2}	SH, Tx	PV, DM, Hab
Brachypodium pinnatum	U, E	O	2	gr	tan/gr	2	SH	PV, DM
Brachypodium sylvaticum	U, E	O		yl/gr	gr/tan	1		
Briza media L.	Mat	I–D	2^{2}	d gr	br/gr	1^{2}		1=disc. in 1994;2=PV
Bromus inermis var. *aureus* Leyss. cv. Skinner's Golden	U, Mat	O–D	3^{1}	gr vert. yl var.	red/gr vert. yl var.	1^{1}		1=reverts, weedy; 2=disc. in 1994
Calamagrostis x acutiflora (L.) Roth cv. Karl Foerster	U	D–very O	3^{2}–4^{1}	m gr	yl/gr	2^{2}–4^{1}	SH, Ht	PV, DM, DB
Calamagrostis x acutiflora (Schrader) Rchb. cv. Stricta (synonym for *Calamagrostis x acutiflora* cv. Karl Foerster)	U, E	D	$3^{1,2}$	m gr	gr/tan	3^{2}–5^{1}	SH, Dn, Ht, Col	DM, DB
Calamagrostis canescens (Weber) Roth	U	very O	2	gr		1		PV, DM, Dn
Calamagrostis epigejos (L.) Roth	U, E	I	3	gr	br/gr	4	SH	
Carex conica F. Boott. Marginata	A	very O		gr marg. cr var.	gr marg. cr var.			
Carex elata var. *aurea*	A	D	3	yl marg. gr var.		3	SH, Tx, Col	DM, DB, Dn
Carex glauca Scop.	A, Mat	very D	$2^{1,2}$	m gr	br/gr/bl/yl	$5^{1,2}$	Hab, Dn, SH, Col, ShLv, Tx	DM
Carex japonica	A, Mat	D	2	l gr	br/gr	3	SH, Col, Hab, Tx, Dn, ShLv	DM
Carex morrowii F. Boott. cv. Variegata	A, Cl	O	4	yl/gr marg. cr var.	yl/gr marg. cr var.	3	var, Hab, Tx, Col	PV, DM
Carex muskingumensis Schwein.	A, Mat	very D	$2^{1,2}$	yl/gr	yl/gr	$5^{1,2}$	SH, Dn, Hab, Col, ShLv	DM
Carex nigra (L.) Reichard	A, Mat	D	2	m gr	gr/bl	3	SH, Hab, Dn, Col, ShLv	middle=dead, DM
Carex pendula Huds.	A	very O	1	gr	yl		ShLv	
Carex sp.	A, Cl	D	4	gr	br/yl/gr	4	SH, Dn, Hab, Tx	DB, Col
Chasmanthium latifolium (Michx.) Yates		I–very O		yl/gr				
Chrysopogon gryllus	U	I–O	2^{2}–4^{1}	m gr/pur	br/tan/gr	2^{2}–4^{1}	SH, Col, pub. lvs	DM, PV, Dn
Dactylis glomerata L.	U, A	D	3^{1-3}	l gr	tan/gr	$3^{1,2}$–4^{3}	Hab, Dn, Tx, SH, Ht, LBF	PV, DM, DB
Dactylis glomerata ssp. *lobata* (Drejer) Lindb.	U, A, Cl	D	3	l gr	br/gr	3	SH, LBF, Hab	PV, DM, DB
Dactylis glomerata ssp. *lusitanica* Stebbins & Zohary	U, A	I	3	l gr	br/gr	2	Col, SH, LBF	PV, DM, DB
Deschampsia caespitosa (L.) Beauv.	U, E, Cl	I–D	2^{1-5}	gr	br/gr	1^{1}–4^{5}	SH, Col, Hab, awns, Tx	PV, DM, DB
Deschampsia caespitosa (L.) Beauv. cv. Bronze Veil	A, Cl	I	2	d gr		3	SH, Tx, Ht, Hab, Col	disease
Deschampsia flexuosa (L.) Trin.	U	O	$2^{1,2}$	gr	br/gr	$3^{1,2}$	SH, awns, Col	PV, DM, Dn
Elymus arenarius L.	A, Mat	D		bl/gr				disc. in 1994
Elymus canadensis L.	U	O	5^{2}	bl/gr	tan/bl/gr	3^{2}	SH, awns, Ht	1=disc. in 1994, 2=PV, DM, Dn
Elymus interruptus Buckl.	U	O		m gr			awns	disc. in 1995
Elymus patula Buckl.	U	I–D		m gr			awns	1=disc. in 1995; 2=disc. in 1994
Elymus racemosus Lam.	A, Mat	D–I		bl/gr	bl^{2}			1,2=disc. in 1994
Elymus virginicus L.	U	D		m gr			awns	disc. in 1994

Table 4. Qualitative assessments for the ornamental grass trial at the AAFC-Morden Research Centre, continued.

Species	Plant habit[z]	Plant density[y]	Leaf			Horticultural assessment		
			Texture[x]	Summer color[w]	Fall color[w]	Value[v]	Positive[u]	Negative[u]
Elymus virginicus var. *submuticus* Hook.	U	I		m gr			awns	disc. in 1995
Eragrostis trichodes (Nutt.) A. Wood	U	O		yl/gr	be/yl			disc.
Erianthus ravennae (L.) Beauv.	U, A	D–O	5^{2}	gr cent. cr var.	br/gr/red cent. cr var.	4^{2}	Ht, Hab, var	2=DM
Festuca amethystina L. cv. Klose	U, E, Cl	I	1	bl/gr	br/gr/bl	2	Hab, Col	PV, DM
Festuca amethystina L. cv. Superba	U, E, Cl	O	1	bl/gr	br/bl/gr	1	Col	PV, DM
Festuca calva	U, E, Cl	O	1	m gr	red/br/gr	2		PV, DM, DB
Festuca cinerea Vill. cv. Blue Finch	E, Cl	I	1	bl/gr	br/bl/gr	2	Col, SH	PV, DM
Festuca cinerea Vill. cv. Blue Fox	E, Cl	I	1	bl/gr	bl/be	1		PV
Festuca cinerea Vill. cv. Meerblau/Ocean Blue	E, Cl	D	1	bl/gr	br/bl/gr	3	Col, Hab	DM, DB
Festuca cinerea Vill. cv. Seeigel/Sea Urchin	E, Cl	I–O	1^{2}	bl/gr	br/bl/gr	2^{2}	Col	1=disc.; 2=PV, DM
Festuca cinerea Vill. cv. Silberreiher/Silver Egret	E, Cl	O	1	bl/gr	br/bl/gr	1		PV, DM
Festuca cinerea Vill. cv. Solling	E, Cl	D	1	bl/gr	br/bl/gr	3	Col, Dn, Ht, Hab	DM
Festuca circummediterranea Vill.	E, Cl	I	1	d gr	br/gr	2	SH	PV, DM, DB
Festuca dalmatica	U, E, Cl	I	1	bl/gr	br/bl/gr	3	SH, Col	PV, DM, DB
Festuca hervierri	U, E, Cl	D	1	bl/gr	br/bl/gr	4	SH, Col, Dn	DM
Festuca lemanii	E, Cl	D	1	bl/gr	br/bl/gr	4	SH, Col, Hab	DM
Festuca longifolia Thuill.	U	I	1	l gr	br/l gr	1		PV, DM
Festuca ovina L.	Cl	I	1	gray/gr	br/gr	2	SH	PV, DM
Festuca ovina var. *glauca* (Lam.) W.D.J. Koch	E, Cl	I–O	$1^{1,2}$	bl/gr	br/bl/gr	1^{2}–3^{1}	SH, Col	PV, DM
Festuca ovina var. *glauca* (Lam.) W.D.J. Koch cv. Skinner's Blue	E, Cl	very D–I	$1^{1,2}$	bl/gr	br/bl/gr	3^{2}–4^{1}	Col, SH, Dn, Hab	PV, DM
Festuca paniculata ssp. *durandoi* (Clausen) Emb. & Mair.	U	O	1	m gr	br/gr	1		PV, DM, DB, Dn
Festuca rubra ssp. *arctica* L.	U, Cl	D	1	gr	br/gr	3	Hab, Dn	
Festuca tenuifolia Sibth.	E, Cl	O	1	d gr/bl	gr/tan	1^{1}		very PV
Festuca trachyphylla (Hackel) Kraj.	Cl	I	$1^{1,2}$	br/gr	br/gr	2^{1}–4^{2}	Dn, Col, SH	PV, DM
Festuca varia	U, E, Cl	D	1	bl/gr	br/gr	3	SH, Dn	DM
Glyceria maxima (Hartm.) Holmb. cv. Variegata	U	D–O	3^{2}	yl vert. gr var.		1^{2}		1=disc. in 1994–weedy; 2=PV
Hakonechloa macra (Munro) Makino		very O		m gr				
Helictotrichon sempervirens (Vill.) Pilg.	U, Cl	I–D	2^{1-3}	bl/gr	br/bl/gr	3^{3}–$4^{1,2}$	Col, Hab, Tx, SH	PV, DM
Hierochloe australis		very O	2	gr cent. var.	br/gr	1		PV, DM
Hierochloe odorata (L.) Beauv.	U, E	O	3	gr	br/gr	2		DM, DB, Dn
Hordeum jubatum L.	U, E	I	3	gr	br/gr	3	SH, awns	DM
Hystrix patula Moench.	U	O	$4^{1,2}$	m gr/pur	br/gr/red	$3^{1,2}$	SH, awns, Col	PV, DM
Imperata cylindrica var. *rubra* cv. Red Baron	U	very O	2	m gr vert. pur var.	tan/yl vert. red var.	2	Col	PV
Koeleria glauca (Schkuhr) DC	U, Cl	I–O	$1^{1,2}$	gr	bl/pur	2^{2}–1^{1}	Col	PV
Luzula nivea (L.) Lam. & DC.	U	O–very O	3^{2}–4^{1}	gr vert. pur var.	br/gr/pur	1^{2}–3^{1}	var, Col, SH, Ht	DM, DB, Dn, PV
Luzula sylvatica (Huds.) Gaud-Beaup.	A, Cl	D	3	yl/gr	gr/yl/br	3	Col, Tx, Hab, Dn, pub. lvs	DM
Miscanthus sp.	U	very O		cent. cr var.	cent. cr var.			disc.
Miscanthus sacchariflorus (Maxim.) Hack.	U, E	O	3	m gr vert. or var.	gr/br vert. or var.	2	Col	PV
Miscanthus sacchariflorus (Maxim.) Hack. cv. Robustus	U	I	3	m gr/bl vert. or var.	gr/br vert. or var.	1		PV, DM
Miscanthus sinensis Anderss. cv. Autumn Light	U	very O		gr cent. cr var.	gr cent. cr var.			
Miscanthus sinensis Anderss. cv. Purpurescens	U	very O	2			1	fall Col	PV, DM
Miscanthus sinensis Anderss. cv. Sarabande	E	very O		cent. cr var.	cent. cr var.			
Miscanthus sinensis Anderss. cv. Silberfeder/Silver Feather	U	very O	3	gr cent. cr var.	br/yl/gr cent. cr var.	1		PV, DB
Molinia caerulea (L.) Moench. cv. Moorhexe	E	O	1^{2}	m gr	tan	1^{2}	SH	PV
Molinia caerulea ssp. *arundinacea* (L.) Moench.	U, E	very O	3	m gr	gr/yl	2	SH	PV, Dn, Ht

Table 4. Qualitative assessments for the ornamental grass trial at the AAFC-Morden Research Centre, continued.

Species	Plant habit[z]	Plant density[y]	Leaf			Horticultural assessment		
			Texture[x]	Summer color[w]	Fall color[w]	Value[v]	Positive[u]	Negative[u]
Molinia caerulea ssp. *arundinacea* (L.) Moench. cv. Karl Foerster	U	very O	3	d gr	yl/gr	2	SH	Dn, Ht
Molinia caerulea ssp. *arundinacea* (L.) Moench. cv. Skyracer	U, A	I	5	m gr	gr/yl	4	Ht, SH, Tx	
Panicum capillare L.	U, E	O	2	gr	red/br	1		PV, DM, DB, Dn
Panicum virgatum L.	U, A	very D	3	m gr	br/yl/gr	4	SH, Col, Dn, Ht	
Panicum virgatum L. cv. Haense Herms	U, A	D	4	pur vert. m gr var.	pur/br/gr	5	var, Col, Ht, SH, Hab, Dn	
Panicum virgatum L. cv. Heavy Metal	U, E	I	4	pur vert. d gr var.	pur/red/br/gr	5	var, Col, SH, Hab, Ht	
Panicum virgatum L. cv. Strictum	U, A	very D	3	d gr	gr/tan	5	Ht, Dn, Hab, Col, SH	
Pennisetum alopecuroides (L.) K. Spreng. cv. Hameln	U	O	2	d gr	br/gr/red	1	Col	PV, DM
Phalaris arundinacea L.	U, E	D	5	l gr	br/gr	3	SH, Tx, Dn, Ht	DM
Phalaris arundinacea L. cv. Feesey's Form	U, E	very O	5	gr vert. cr var.	br/gr vert. cr var.	3	var, Tx	PV, DM, Dn
Phalaris arundinacea L. cv. Luteo-picta	U	I	4	gr vert. cr var.	br/gr vert. cr var.	3	SH, var	DM
Phleum pratense L.	U, A	I	3	m gr	br/gr	2	SH	PV, DM
Phragmites australis (Cav.) Trin. ex Steud.	U	very O		m gr	tan			disc. in 1994
Saccharum ravennae (L.) Murray	U	O	4	gr cent. cr var.	br/gr cent. cr var.	4	var, Col, Hab, Ht	DM
Schizachyrium scoparium (Michx.) Nash	U, E, Cl	D	2^{1-4}	m gr/pur	br/red/gr	3^{2-4}–5^{1}	Col, SH, Hab, Dn, Ht, Tx	PV, DM
Sesleria caerulea (L.) Ard.	U, E, Cl	D–I	$2^{1,2}$	bl/gr/d grey	red/gr/tan	$3^{1,2}$	Col, Hab, SH, Dn	DM
Sesleria sadlerana ssp. *tatre* (Degen) Deyl	U, E	I	3	gr	gr/red/gold	2	SH	DM, DB
Sorghastrum nutans (L.) Nash	U	very O	3	m gr	red/gr	2	Col	PV
Spartina pectinata Link	U	very O	3	d gr	br/gr/yl	3	Ht, Hab, Col, SH	PV, DM
Spartina pectinata Link cv. Aureo-marginata	U, A	O	$5^{1,2}$	gr marg. yl var.	gr marg. yl var.	4^{2}–5^{1}	Hab	Dn, invasive
Sporobolus asper (Michx.) Kunth		very O	2			1	pub. around collar	PV
Sporobolus heterolepsis Gray	A, Cl	very O	2	m gr	br/gr	2		Dn
Sporobolus poiretii (R. & S.) Hitchc.		very O	2			1		PV, DM
Stipa viridula Trin.	U, E	very O	2	gr	br/gr	2		PV, DM, DB

[z]U = upright, E = erect, A = arching, Mat = mat-forming, Cl = clump-forming

[y]Density in last surviving year; O = open, I = intermediate, D = dense

[x]where 1 = very fine, 2 = fine, 3 = medium, 4 = coarse, 5 = very coarse

[w]bl = blue, br = brown, cr = cream, gr = green, or = orange, pur = purple, yl = yellow; d = dark, l = light, m = medium; var. = variegation, vert. = vertical, marg. = marginal, cent. = central

[v]where 1 = no visual appeal, 2 = not very appealing, 3 = average appeal, 4 = visually appealing, 5 = outstanding visual appeal

[u]Col = colour, Dn = density, Hab = habit, Ht = height, LBF = leaf blades flat, lvs = leaves, pub. = pubescent, SH = seed head, ShLv = shiny leaves, Tx = texture, var = variegation, PV = poor vigour, DM = dry matter, DB = dieback, disc = discarded

[t]Superscripts indicate plant source as outlined in Table 1.

e.g., *Carex elata* var. *aurea*), to erect (61 accessions, e.g., *Agropyron trachycaulum).*

Summer leaf color was predominantly green, with light (10 accessions, e.g., *Beckmannia syzigachne*), medium (57 accessions, *Anthoxanthum odoratum*) or dark green (12 accessions, e.g., *Alopecurus pratensis*) shades most common (Table 4). Variegated (e.g., *Saccharum ravennae*), blue-green (e.g., *Elymus aremarius*), yellow-green (e.g., *Chasmanthium latifolium*) and purple-green (e.g., *Panicum virgatum* cv. Haense Herms) types were also observed (31, 23, 8 and 5 accessions, respectively). Leaf variegation can be an added attraction for visual impact. Fall coloration was predominantly brown-green or brown-blue-green but red, purple and yellow tones were noted. *Panicum* species/cultivars were particularly noted for excellent coloration. Foliage/stem density varied from very dense (8 accessions, e.g., *Andropogon gerardii*) to very open (30 accessions, e.g., *Beckmannia syzigachne*).

Of the 165 accessions evaluated in MN (USDA Zone 4) conditions (1), 85 accessions performed well, 35 were marginal and 45 failed to survive. There were 51 accessions common between our evaluation and those completed by the MN researchers. Of these common plants, 32 accessions had similar ratings between the two sites, 17 had higher ratings in MN (e.g., *Acorus calamus* 'Variegatus', *Alopecurus pratensis* 'Aureus', *Bouteloua curtipendula*, *Festuca amethystina* 'Superba', *Festuca cinerea* 'Sea Urchin', *Festuca tenuifolia*, *Hakonechloa macra*, *Hystrix patula*, *Koeleria glauca*, *Miscanthus sinensis* 'Autumn Light', *Miscanthus sinensis* 'Gracillimus', *Miscanthus sinensis* 'Sarabande', *Miscanthus sinensis* 'Siberfedher', *Miscanthus sinensis* 'Strictus', *Spodiopogon sibericus*, *Sorghastrum nutans*, *Stipa gigantea*) and 2 (*Carex morrowii* cv. Variegata and *Saccharum ravennae*) had better ratings in Morden, Manitoba (MB). Those plants that were poor or injured in MN tended to have low or no survival in MB. However, 16 percent with good survival in MN (e.g., *Alopecurus pratensis* cv. Aureus) were rated as poor (low or no survival and/or low vigor) in MB, suggesting that the northern limit of their adaptability may have been reached in MN. There was 1 accession (*Saccharum ravennae*) with poor survival in MN that did quite well in MB (100% survival). This would suggest that local site conditions, plant source differences or establishment problems could all play a role in determining whether a particular species is well adapted to a site.

Combining the two lists, it is possible to obtain a reasonable estimate of adaptability and hardiness for over 270 grass and grass-like accessions (165 in MN + 160 in MB – 51 common plants = 274 species/cultivars). It should be noted that the material was tested under field growing conditions at two different sites and time periods. No attempts were made to address special needs (e.g., shade or moisture) of the species. If these requirements were addressed, the list of adapted material may be extended further. Micro-climatic conditions can strongly influence growth and survival of plant material.

Grass and grass-like species provide a good opportunity for diversification of landscape plant material. Foliage color, plant size and other interesting or unique features can help to add new characteristics to the landscape. A wide range are hardy enough to grow in cold, generally dry conditions with minimum care. In combination with the study by Hockenberry et al. (1), over 270 different accessions have been assessed and details are available concerning adaptability to more northerly conditions.

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