

1 **Table S1.** Accessions used for vernalization experiments.

Accession	Species	Tribe	Location
USDA PI253581	<i>Achnatherum bromoides</i> ¹	Stipeae	Israel
USDA PI415826	<i>Achnatherum calamagrostis</i>	Stipeae	Switzerland
USDA PI325354	<i>Achnatherum caragana</i>	Stipeae	Stavropol, Russia
USDA PI236879	<i>Achnatherum hymenoides</i> ¹	Stipeae	Canada
USDA PI578861	<i>Achnella caduca</i>	Stipeae	NDakota, USA
USDA W625504	<i>Agrostis mertensii</i> ¹	Poeae I	Greenland
B&T World 62975	<i>Ampelodesmos mauretanicus</i> ¹	Stipeae	Unknown
NGB14333	<i>Anthoxanthum odoratum</i>	Aveneae	Finland
USDA PI314138	<i>Boissiera squarrosa</i>	Triticeae	Uzbekistan
McKeown-VT-2015	<i>Brachyleytrum aristosum</i>	Brachyelytreae	Vermont, USA
Kew 371232	<i>Brachyleytrum erectum</i> ¹	Brachyelytreae	Missouri, USA
USDA PI170218	<i>Brachypodium distachyon</i>	Brachypodieae	Turkey
PI253334	<i>Brachypodium distachyon</i>	Brachypodieae	Morocco
USDA PI318958	<i>Brachypodium phoenicoides</i> ¹	Brachypodieae	Zaragoza, Spain
USDA PI325216	<i>Brachypodium pinnatum</i> ¹	Brachypodieae	Stavropol, Russia
USDA PI639821	<i>Brachypodium ruprestre</i> ¹	Brachypodieae	Krym, Ukraine
USDA PI204410	<i>Briza minor</i> ¹	Poeae	Turkey
NorGen NGB2875	<i>Bromus inermis</i>	Triticeae	Norway
NorGen NGB7723	<i>Dactylis glomerata</i>	Poeae II	Norway
USDA PI662331	<i>Deschampsia cespitosa</i> ¹	Poeae II	Norway
USDA W6 23553	<i>Duthiea brachypodium</i>	Duthieae	China
Marcussen-NO-2015	<i>Elymus caninus</i> ¹	Triticeae	Norway
NorGen NGB2520	<i>Festuca pratensis</i>	Poeae II	Sweden
Kew 380100	<i>Glyceria occidentalis</i>	Meliceae	Oregon, USA
Ames29899	<i>Glyceria striata</i>	Meliceae	Unknown
MSB 336026	<i>Helictotrichon hookeri</i> ¹	Poeae II	Unknown
MSB 65160	<i>Helictotrichon pubescens</i> ¹	Poeae II	Unknown
PI W6 37446	<i>Hesperostipa comata</i>	Stipeae	Utah, USA

USDA W6 27071	<i>Hesperostipa neomexicana</i> ¹	Stipeae	Colorado, USA
USDA PI372565	<i>Herperostipa spartea</i>	Stipeae	Canada
PI614642	<i>Hordeum bulbosum</i>	Triticeae	Ukraine
Sonja	<i>Hordeum vulgare</i>	Triticeae	Unknown
MSB 235174	<i>Hystrix patula</i>	Triticeae	Unknown
NorGen NGB4262	<i>Lolium perenne</i>	Poeae II	Norway
MSB 105167	<i>Lygeum spartum</i>	Nardeae	Egypt
USDA PI239234	<i>Macrochloa tenacissima</i>	Stipeae	Tunisia
USDA W625184	<i>Melica altissima</i>	Meliceae	Kazakhstan
Kew 31675	<i>Melica ciliata</i>	Meliceae	Stereia Ellas, Greece
PI442519	<i>Melica nutans</i>	Meliceae	Belgium
PI619447	<i>Melica transsilvanica</i>	Meliceae	China
USDA PI478588	<i>Nassella brachyphylla</i>	Stipeae	Peru
USDA PI289543	<i>Nassella hyaline</i>	Stipeae	Buenos Aires, Argentina
USDA W6 24255	<i>Nassella leucotricha</i>	Stipeae	Texas, USA
USDA PI237818	<i>Nassella neesiana</i> ¹	Stipeae	Spain
USDA PI478575	<i>Nassella pubiflora</i>	Stipeae	Peru
USDA NSL439946	<i>Nassella pulchra</i>	Stipeae	California, USA
USDA PI387938	<i>Nassella viridula</i> ¹	Stipeae	Alberta, Canada
B&T World 4393	<i>Nardus stricta</i>	Nardeae	Norway
USDA PI236875	<i>Oryzopsis canadensis</i>	Stipeae	Canada
Paris-VT-2013	<i>Oryzopsis racemosa</i> ¹	Stipeae	Vermont, USA
B&T World 448347	<i>Phaenospermata globosum</i>	Duthieae	Unknown
USDA PI271588	<i>Piptatherum aequiglume</i>	Stipeae	Himachal Pradesh, India
USDA PI207500	<i>Piptatherum coerulescens</i> ¹	Stipeae	Afghanistan
USDA PI249763	<i>Piptatherum holciforme</i> ¹	Stipeae	Greece
USDA PI207772	<i>Piptatherum miliaceum</i>	Stipeae	Israel
USDA PI227453	<i>Piptatherum songaricum</i> ¹	Stipeae	Iran
USDA PI266189	<i>Piptochaetium avenaceum</i>	Stipeae	Jordan

USDA PI202062	<i>Piptochaetium napostense</i>	Stipeae	Argentina
NorGen NGB1197	<i>Poa alpina</i>	Poeae II	Sweden
USDA PI384952	<i>Stipa barbata</i> ¹	Stipeae	Iran
MSB 428103	<i>Schizachne purpurascens</i>	Meliceae	Wisconsin, USA

2 ¹NF, generally non-flowering in both treatments

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4 **Table 2.** Summary statistics for linear mixed effects models calculating the influence of
5 time point and temperature on *VRN1* and *VRN3* expression.

Factors/Species	<i>N. pulchra</i>	<i>N. pubiflora</i>	<i>M. nutans</i>	<i>M. ciliata</i>	<i>N. stricta</i>	<i>B. aristosum</i>
<i>VRN1</i>						
Timepoint (Ti)	11.21 ₂ ***	0.12 ₂	3.79 ₂ *	3.81 ₂ *	2.96 ₂	18.57 ₂ ***
Treatment (Tr)	40.99 ₁ ***	6.53 ₁ *	3.28 ₁	0.70 ₁	4.01 ₁	15.34 ₂ **
Ti*Tr	9.71 ₂ ***	0.16 ₂	6.50 ₂ **	0.09 ₂	10.22 ₂ **	5.40 ₂ *
PRE vs. 4 wk cold	2.919**	NA	1.856	NA	-0.19	0.952
PRE vs. 4 wk warm	-0.015	NA	0.631	NA	0.43	-0.23
PRE vs. 6 wk cold	6.453***	NA	4.37***	NA	4.05***	5.912***
PRE vs. 6 wk warm	0.224	NA	-0.531	NA	-0.48***	1.548
<i>VRN3</i>						
Ti	59.39 ₂ ***	0.91 ₂	0.630 ₂	7.91 ₂ *	1.63 ₁	5.00 ₁
Tr	49.34 ₁ ***	9.66 ₁ **	12.08 ₁ **	5.83 ₁ *	1.94 ₁	5.18 ₁
Ti*Tr	49.02 ₂ ***	6.95 ₂ *	5.287 ₂ **	23.10 ₂ **	1.31 ₁	5.18 ₁ *
PRE vs POST cold	10.4***	1.189	1.064	1.411	NA	4.000***
PRE vs POST warm	0.498	-2.535*	-2.187*	-5.387***	NA	-0.379

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7 F-statistic with number of degrees of freedom is indicated as the subscript. When no time
8 point by treatment interaction was observed, further contrasts were not conducted and are
9 indicated with NA. * $P < 0.05$, ** $P < 0.01$, and *** $P < 0.001$

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12 **Table S3.** Summary statistics for linear mixed effects models calculating the influence of
 13 early time point and temperature on *VRN3* expression.

Factors/Species	<i>M. ciliata</i>	<i>N. pubiflora</i>
Timepoint (Ti)	4.531**	3.104*
Treatment (Tr)	0.1518	0.0559
Ti*Tr	0.7445	1.889
2 versus 4 weeks cold	-1.367	1.217
2 versus 5 weeks cold	-1.718	0.986
2 versus 6 weeks cold	-1.730	0.320
2 versus 7 weeks cold	-3.553***	1.599
2 versus 4 weeks warm	0.720	3.189**
2 versus 5 weeks warm	-0.231	2.858**
2 versus 6 weeks warm	-1.185	3.204**
2 versus 7 weeks warm	-1.857	2.227*

14 F-statistic with number of degrees of freedom is indicated as the subscript. * $P < 0.05$, **
 15 $P < 0.01$, *** $P < 0.001$

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17 **Table S4.** Primers used for *VRN1* and *VRN3* cloning and q-RT-PCR. All q-RT-PCR
 18 primer efficiencies were between 90-110%.

Primer	Primer sequence (5' - 3')	Taxa
<i>Cloning</i>		
VRN3_23f	ACCCGCTGGTGGTTGGYAGGGT	All
VRN3_115f	GTGTCCAAGGCTGCGAGCTCA	All
VRN3_445r	GTAGAGCTCGGCGAAGTC	All
VRN1_34f	GAGAACAAGATCAACCGSCAGGT	All
VRN1_100_f	GAGATCTCCGTGCTCTGCGAC	All
VRN1_478_r	TTATTCTCCTCCTGCAGTGA	All
VRN1_799_r	CTCASCATCCAYGGTGGMAGCCC	All
Melica_VRN3_139f	GCTYAAGCCCTCCATGGT	<i>Melica</i>
Melica_VRN3_1324r	TAGAGCTCGGCGAAGTCC	<i>Melica</i>
<i>qPCR</i>		
Grass_UBQ5_F	CGCCGACTACAACATCCAG	All species
Grass_UBQ5_R	TCACCTTCTTGTGCTTGTGC	All species
Lolium_EF1alphaF	CCTTGCTTGAGGCTCTTGAC	All species
Lolium_EF1alphaR	GTTCCAATGCCACCAATCTT	All species
cMelica_VRN3_401_f	TGGTCACTGATATCCCTGGAA	<i>Melica</i>
cMelica_VRN3_612_r	AACAGCACGAACACGAAGC	<i>Melica</i>
Melica.qVRN1.384.f	GCACCTCATGGGAGAGGATA	<i>Melica</i>
Melica.qVRN1.477.r	GCTGGCTCTTTCTGGATCTG	<i>Melica</i>
NassPul_qVRN3_61_f	GTGCTGGACCCCTTCGTC	<i>N. pulchra</i>
NassPul_qVRN3_743_r	GAGCATCCGGGTCTACCAT	<i>N. pulchra</i>
NassPul_qFUL1_f	TAAGGTTCTACAGAAGGAACCTCGTG	<i>Nassella</i>
NassPul_qFUL1_r	GCCGCTGGGTACCTGATATT	<i>Nassella</i>
NassPub_VRN3_1012_f	GCAGGAGGTGGTATGCTACG	<i>N. pubiflora</i>
NassPub_VRN3_1304_r	CCCTGGTGTGAAGTTCTGG	<i>N. pubiflora</i>
NarStr.FT1a.q.F.B	CTGGTGGTTGGTAGGGTTGT	<i>N. stricta</i>
NarStr.FT1a.q.R.B	AAGATTAGGGTCGCTTGGGC	<i>N. stricta</i>
NarStr.FUL1q.F.A	GTCGCGCTCATCATCTTCTC	<i>N. stricta</i>
NarStr.FUL1q.R.A	TTCGTGACACCTATTGCCCT	<i>N. stricta</i>

Brachyrec.FUL1q_f	AGAAGCAGAAGGCCCATACA	<i>B. aristosum</i>
Brachyrec.FUL1q_r	CGTCCTCTCCCCTCTCTCC	<i>B. aristosum</i>
ByaVRN3.q.B_f	CAGGAGGTCATGTGCTACGA	<i>B. aristosum</i>
ByaVRN3.q.B_r	ATTGTAGAGCTCGGCGAAGT	<i>B. aristosum</i>

19