

GEPHE SUMMARY

VRN1 (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~VRN1~#gephebase-summary-title)		Gephebase Gene	GP00001183	GepheID
Published		Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

Physiology (https://www.gephebase.org/search-criteria?/and+TraitCategory=~Physiology~#gephebase-summary-title)		Trait Category	
Flowering time (https://www.gephebase.org/search-criteria?/and+Trait=~Floweringtime~#gephebase-summary-title)		Trait	
Lolium perenne - Veyo		Trait State in Taxon A	
Lolium perenne -Falster		Trait State in Taxon B	
Data not curated		Ancestral State	
Intraspecific (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=~Intraspecific~#gephebase-summary-title)		Taxonomic Status	
Taxon A		Taxon B	
Lolium perenne (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Loliumperenne~#gephebase-summary-title)		Lolium perenne (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Loliumperenne~#gephebase-summary-title)	
-		-	
Festuca perennis; Festuca perennis (L.) Columbus & J.P.Sm., 2010; Lolium vulgare; perennial ryegrass; Lolium perenne L., 1753; Lolium vulgare Host, 1801		Festuca perennis; Festuca perennis (L.) Columbus & J.P.Sm., 2010; Lolium vulgare; perennial ryegrass; Lolium perenne L., 1753; Lolium vulgare Host, 1801	
species		species	
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Poodae; Poeae; Poeae Chloroplast Group 2 (Poeae type); Loliinae; Lolium		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Poodae; Poeae; Poeae Chloroplast Group 2 (Poeae type); Loliinae; Lolium	
Lolium () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4522)		Lolium () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4522)	
4522 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4522)		4522 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4522)	
Yes		Yes	
Lolium perenne - Veyo		Lolium perenne -Falster	

GENOTYPIC CHANGE

VRN1		Generic Gene Name	UniProtKB Arabidopsis thaliana
REDUCED VERNALIZATION RESPONSE 1; REM39; REPRODUCTIVE MERISTEM 39; At3g18990; K13E13.10		Synonyms	GenebankID or UniProtKB
3702.AT3G18990.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier= 3702.AT3G18990.1)		String	
-		Sequence Similarities	
GO:0043565 : sequence-specific DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0043565)		GO - Molecular Function	
GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)			

GO:0009909 : regulation of flower development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009909>)
GO:0010048 : vernalization response
(<https://www.ebi.ac.uk/QuickGO/term/GO:0010048>)

GO:0005654 : nucleoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005654>)

No ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=%^No^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=%5E%5ENo%5E#gephebase-summary-title))

Cis-regulatory ([https://www.gephebase.org/search-criteria?/and+Molecular Type=^Cis-regulatory^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular+Type=^Cis-regulatory^#gephebase-summary-title))

Indel ([https://www.gephebase.org/search-criteria?/and+Aberration Type=^Indel^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type=^Indel^#gephebase-summary-title))

1-10 kb

8.6kb indel in first intron

Candidate Gene ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Candidate Gene^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=^Candidate+Gene^#gephebase-summary-title))

Comparative sequence analysis of VRN1 alleles of *Lolium perenne* with the co-linear regions in barley, wheat, and rice. (2011) (<https://pubmed.ncbi.nlm.nih.gov/22081040>)

Asp T; Byrne S; Gundlach H; Bruggmann R; Mayer KF; Andersen JR; Xu M; Greve M; Lenk I; L  bberstedt T

Vernalization, a period of low temperature to induce transition from vegetative to reproductive state, is an important environmental stimulus for many cool season grasses. A key gene in the vernalization pathway in grasses is the VRN1 gene. The objective of this study was to identify causative polymorphism(s) at the VRN1 locus in perennial ryegrass (*Lolium perenne*) for variation in vernalization requirement. Two allelic Bacterial Artificial Chromosome clones of the VRN1 locus from the two genotypes Veyo and Falster with contrasting vernalization requirements were identified, sequenced, and characterized. Analysis of the allelic sequences identified an 8.6-kb deletion in the first intron of the VRN1 gene in the Veyo genotype which has low vernalization requirement. This deletion was in a divergent recurrent selection experiment confirmed to be associated with genotypes with low vernalization requirement. The region surrounding the VRN1 locus in perennial ryegrass showed microcolinearity to the corresponding region on chromosome 3 in *Oryza sativa* with conserved gene order and orientation, while the micro-colinearity to the corresponding region in *Triticum monococcum* was less conserved. Our study indicates that the first intron of the VRN1 gene, and in particular the identified 8.6 kb region, is an important regulatory region for vernalization response in perennial ryegrass.

Additional References

1 (Flowering locus T (LpFT3)) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=^4522^/and+Trait=Flowering time/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=^4522^/and+Trait=Flowering+time/and+groupHaplotypes=true#gephebase-summary-title))
 No matches found.

COMMENTS