

North America Forage Maturity Index and Rating System

Evaluating and Comparing Forage Maturity Across Species

Challenge:

As forage grasses and legumes approach reproductive maturity, DM accumulation increases, however forage quality decreases. Because of the development by forage breeders to broaden maturity ranges, the traditional nomenclature of early, medium and late is no longer effective in classifying and comparing the relative reproductive maturity of varieties within a species. A producer attempting to select a correct variety for his/her operation is challenged to compare the maturity of varieties among different forage grass companies.

Additional challenges arise, when comparing reproductive maturity between species. Interspecies correlation is lacking. An "early maturity" variety in one species may actually be chronologically later in maturity than a "late maturity" variety in another species. Selecting for maturity in a monoculture, or even a two species mix is relatively easy, compared to synchronizing maturities in a diverse polyculture forage system. A better tool to describe variety maturity is needed.

Solution:

In an effort to standardize maturity classifications, DLF proposes a Northern American Forage Maturity Index for forage grasses. This is an adaptation of the maturity classification system utilized by European forage companies. The Maturity Index has been designed to accommodate the broader range of species and maturities utilized in the North American forage industry. It has a 13 point index with a maturity difference of approximately 3 days per unit, reflecting Oregon conditions. Variance with this index may occur in different regions since some cultivars are more temperature dependent, while others may be more day length dependent in maturity.

With all species using the same Maturity Index Rating System, the maturity range of various forage species can now be directly compared on the same chronological maturity index (the grey index scale at the top of the matrix). The red blocks in the FMM-Species reflect the maturity range of available varieties within the specie. The respective maturity of public varieties using the traditional nomenclature of early/medium/late is superimposed on the index. At specie level, this can be expanded and the available varieties can be indicated at the proper maturity index (see call-outs). A maturity index in one species corresponds to the same maturity in another forage species.

Utilization:

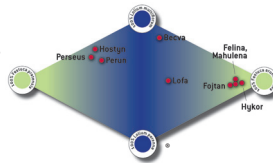
Within the structure of the Forage Maturity Index, individual species can be indexed and compared. Orchardgrass (*Dactylis glomerata*) is a species with significant confusion. Orchardgrass is traditionally classified as early, medium and late. Public varieties corresponding to these classifications include Potomac as early, Paiute as a medium and both Latar & Pennlate as late. This traditional classification does not appreciate the work of European, USA and Canadian orchardgrass breeders who have extended the maturity range by more than two maturity indexes. What one forage company may list as a "medium" maturity in their variety line-up, may match the maturity of a "late" in the traditional classification.

Orchardgrass/Alfalfa Maturity Index

Species	1	2	3	4	5	6	7	8
Orchardgrass		Early	Medium	Late				
		Ambassador	Amba	Endurance	Niva	Athos		
			Orca			Sparta		
			Inavale			Echelon		
		Potomac	Paiute	Pennlate	Latar			
Alfalfa (FD3-5)				Beginning Bloom				
				Power 4.2				

When alfalfa and orchardgrass are planted in the same field, optimization for DM yield and forage quality requires coordination of the maturity range and cutting regime for the two forage components. The Forage Maturity Index facilitates the recommendation of the correct varieties.

Festulolium varieties are "hybrids" between a ryegrass as one parent and a meadow fescue or a tall fescue as the other parent. (See Festulolium Diamond* at right)



It results in a spread in maturities. The traditional US maturity classification for festulolium is linked to the more dominant parent. Utilizing the Forage Maturity Index clearly ranks the maturity of festulolium varieties within these species.

Utilizing the Forage Maturity Index illustrates that a "medium" maturity ryegrass type festulolium is actually later in maturity than a "late" maturity tall fescue type.

Festulolium Maturity Index

Species	1	2	3	4	5	6	7	8
Festulolium			Mahulena		Fojtan	Perun	Lofa	
							Perus	

Future Work:

- Additional collaboration to fine-tune this Forage Maturity Index by the North American Forage Grass community and AFGC.
- Integration of alfalfa, clover and other major legumes into the Forage Maturity Index.
- Adoption of the Forage Maturity Index by the Forage Industry.

North America Forage Maturity Index

Species	1	2	3	4	5	6	7	8	9	10	11	12	13
Orchardgrass		Early	Medium	Late									
Forage Tall Fescue	Very Early	Early	Medium	Late									
Meadow Fescue			Early	Medium	Late								
Festulolium													
Annual Ryegrass Westerwold	Early	Med-Early	Medium	Med-Late	Late								
Annual Ryegrass Italian	Early	Med-Early	Medium	Med-Late	Late								
Intermediate Ryegrass					Early	Med-Early	Medium	Late					
Perennial Ryegrass					Early		Medium			Late			
Timothy										Early	Late		
Kentucky Bluegrass			Early	Medium	Late								
Reed Canarygrass							Early	Medium	Late				
Prairie Bromegrass			Early	Medium	Late								
Alfalfa (FD3-5)				Beginning Bloom									
Red Clover					Beginning Bloom								
White Clover				Beginning Bloom									

Maturity Index Legend

1 2 Maturity Index (1=Earliest, 13=Latest)

Red blocks Maturity range of available varieties within each specie

Early/Medium/Late Traditional US maturity classification

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