

# CHARACTERIZATIONS AND DROUGHT RESISTANCE OF *LOLIUM PERENNE* (L.) AND *FESTUCA ARUNDINACEA* (Schreber) CULTIVARS FOR A MEDITERRANEAN CLIMATE

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Cool season grasses are the dominant species used for turf in Italy, as well as in many other countries surrounding the northern Mediterranean Sea. The low summer rainfall of the Mediterranean region and an increasing limited water supply are dictating the need to use among these species the low water rate and drought tolerant cultivars or warm season grasses. Objective of this research was to assess the turfgrass performance and the drought tolerance of 39 cultivars of *Lolium perenne* and 27 of *Festuca arundinacea*.

The experimental site was just west of Rome near Casalpalocco at 41°40'N and 10°15'E. The native root zone was composed of 83% sand (95% above 0.25 mm in diameter), 11% silt and 6% clay. The soil pH was 7.1. The planting rate was 12 September 1996. Plot size was 3 by 2 m, in a randomized block design with 3 replication.

During the trial the cutting height was maintained at 50 mm on tall fescue and 25 mm on perennial ryegrass plots, with a mowing frequency of 2 to 3 times per week. A total of 2,3 kg 100 m<sup>-2</sup> of nitrogen was applied during each growing season. Visual turfgrass quality rating estimates were made at 15 to 30 day interval throughout the growing season, using a rating scale from 1 (poorest) to 9 (best). To evaluate the drought resistance, the irrigation system was stopped the 10 July 2000, and the percent of dried surface on each plot was estimated at 3 day interval.

About the tall fescue quality ratings Matador, Lexus and CB95 obtained a seasonal mean greater than 7 during 4 years. Finelawn had a poor quality, with a rating of 5.3. TB II, CB 95. Murray and Pixie showed the best drought tolerance: these cultivars can resist over 50 days without irrigation. MB 21, MB22 and MB 23 were almost completely damaged after 29, 25 and 23 days respectively (Table 1).

The perennial ryegrass cultivars performed in general worse than tall fescue in terms of turfgrass quality due to a different color retention during the growing season: in particular American varieties showed a more dark green color than European cultivars. Brightstar, Manhattan II and Divine obtained a mean of 6.8 during 4 years. All the cultivars of *Lolium perenne* did not resist more than one month without water: in particular Aphrodite, Manhattan II and Amadeus obtained the better results (Table 2).

Table 1 – Quality rating (scale 1-9) and drought resistance (expressed as days to reach the 50% and 90% of brown cover) of 27 cultivars of *Festuca arundinacea*

Cultivars	Seasonal Mean	Days to reach the	
		50% of dried surface	90% of dried surface
Matador	7,4	16	51
Lexus	7,1	13	47
CB 95	7,0	25	56
Afa	6,9	15	49
Barbizon	6,9	13	49
Mirage	6,9	17	50
MOMFA 488	6,8	19	42
Murray	6,8	18	55
Apache II	6,7	21	49
Tomahawk	6,7	22	51
TB II	6,6	27	60
ATF007	6,6	12	40
MB 23	6,6	13	23
Murietta	6,6	22	48
Pixie	6,5	30	55
Armida	6,5	13	49
Hounddog 5	6,5	20	49
Vegas	6,4	11	47
MB 22	6,4	13	26
MB 21	6,3	13	29
Barfelix	6,3	12	49
Apache	6,3	15	47
CMR	6,3	22	48
Eldorado	6,3	12	47
Adobe	6,2	15	43
Silverado	6,2	14	52
Finelawn	5,3	14	47
LSD	0,5	9,5	12,6

Table 2 – Quality rating (scale 1-9) and drought resistance (expressed as days to reach the 50% and 90% of brown cover) of 39 cultivars of *Lolium perenne*

Cultivars	Seasonal	Days to reach the	
	Mean	50% of dried surface	90% of dried surface
Brightstar	6,8	12	20
Manhattan II	6,8	15	30
Divine	6,8	11	18
M11-5-284 Aphrodite	6,7	15	32
Essence	6,6	12	26
MPRH	6,5	13	21
Barema	6,5	10	20
Barclay	6,5	11	18
Barcredo	6,4	14	20
Yorktown II	6,4	14	21
M11-5-205 Athena	6,4	11	31
Sabor	6,4	12	21
Numan	6,4	10	19
Barluxe	6,4	10	20
Kelvin	6,3	13	27
Precision	6,3	10	18
Barlinda	6,2	14	21
Barrage	6,2	11	21
Top hat	6,2	11	22
Citation III	6,2	14	26
Charger	6,2	14	26
Target	6,2	10	17
Accolade	6,1	10	19
MB 1-5	6,1	10	20
Amadeus	6,1	12	30
Bardessa	6,0	13	24
Repell II	6,0	11	28
Barsportivo	6,0	12	20
Achiever	6,0	12	26
B3-5-31 Arthur	6,0	12	21
Dacapo	5,9	12	24
M56-RG115 Apollo	5,9	13	23
Navajo	5,9	9	19
Allegro	5,9	10	26
Cherokee	5,9	14	28
MB 41	5,9	10	20
Accent	5,9	12	21
Melanie	5,8	12	26
Citation II	5,4	11	21
LSD	0,5	4,5	5,9