

Plant		Perennial ryegrass		26(06002)	Primary essential character	
No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Plant type	10 plants, 2 replications	Observation	1:Erect 2:Nearly erect 3:Semi-erect 4:Slightly semi-erect 5:Intermediate 6:Slightly intermediate 7:Semi-prostrate 8:Nearly prostrate 9:Prostrate		Angle that outer main stems make with the horizontal at internode elongation to heading time
2	Plant height	10 plants, 2 replications	Measurement	cm (integer)		Length from the ground to the tip of plant at heading time or at the first cutting
3	Spike length	10 plants, 2 replications	Measurement	cm (round to the 1st decimal place)		Length from the neck node to the tip of spike
4	Leaf length	10 plants, 2 replications	Measurement	cm (round to the 1st decimal place)		Length of the first leaf below flag leaf
5	Leaf width	10 plants, 2 replications	Measurement	mm (round to the 1st decimal place)		Width of the widest part of the first leaf below flag leaf
6	Date of first heading	10 plants, 2 replications	Observation	date		Average date when the first head of each plant has emerged
7	Stem thickness	10 plants, 2 replications	Obs.&Measr.	1:Extremely thin 2:Very thin 3:Thin 4:Slightly thin 5:Intermediate 6:Slightly thick 7:Thick 8:Very thick 9:Extremely thick		Long diameter of the internode just below the neck node of the spike of the longest stem at the full heading stage or at the first cutting
8	Number of stems	10 plants, 2 replications	Observation	1:Almost none 2:Extremely few 3:Very few 4:Few 5:Intermediate 6:Some 7:Many 8:Very many 9:Extremely many		Number of stems at heading stage or at the first cutting
9	Number of spikes	10 plants, 2 replications	Observation	0:Absent 1:Almost none 2:Extremely few 3:Very few 4:Few 5:Intermediate 6:Some 7:Many 8:Very many 9:Extremely many		Number of spikes at the full heading stage or at the first cutting

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No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Culm length	10 plants, 2 replications	Measurement	cm (integer)		Culm length of main stem from the ground to the neck node of spike at heading stage
2	Leaf color	10 plants, 2 replications	Observation	1:Extremely light green 2:Very light green 3:Light green 4:Slightly light green 5:Intermediate 6:Slightly dark green 7:Dark green 8:Very dark green 9:Extremely dark green		Greenness of leaf blade at heading stage
3	Anthocyanin pigmentation of seedlings	10 plants, 2 replications	Observation	1:Extremely light 2:Very light 3:Light 4:Slightly light 5:Intermediate 6:Slightly dark 7:Dark 8:Very dark 9:Extremely dark		Anthocyanin pigmentation of the stem base before overwintering
4	Anthocyanin pigmentation of mature plants	10 plants, 2 replications	Observation	1:Extremely light 2:Very light 3:Light 4:Slightly light 5:Intermediate 6:Slightly dark 7:Dark 8:Very dark 9:Extremely dark		Anthocyanin pigmentation of the node at the beginning of heading to the full heading stage
5	Ratio of heading stems	10 plants, 2 replications	Observation	0:None 1:Extremely low 2:Very low 3:Low 4:Slightly low 5:Intermediate 6:Slightly high 7:High 8:Very high 9:Extremely high		Ratio of heading stems to the total number of stems regenerated after cutting
6	Heading in autumn	10 plants, 2 replications	Observation	0:None 1:Extremely little 2:Very little 3:Little 4:Slightly little 5:Intermediate 6:Some 7:Much 8:Very much 9:Most		Number of spikes from regenerated tillers in autumn
7	Leaf texture	10 plants, 2 replications	Measurement	1:Extremely tender 2:Very tender 3:Tender 4:Slightly tender 5:Intermediate 6:Slightly rough 7:Rough 8:Very rough 9:Extremely rough		Texture of leaf blade determined by touch at heading time
8	Weight of 1000 seeds	10 plants, 2 replications	Measurement	g (round to the 2nd decimal place)		Weight of 1000 seeds estimated by sampling 100 seeds from a mixture of seeds of 20 plants with 4 replications
9	Weight of 20 spikes	10 plants, 2 replications	Measurement	g (round to the 1st decimal place)		Dry weight of 20 spikes

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No	Characters	No. of samples	Methods	Rank or measurement unit	Remarks	
1	Crown rust resistance	10 plants, 2 replications	Observation	1:Extremely low 2:Very low 3:Low 4:Slightly low 5:Intermediate 6:Slightly high 7:High 8:Very high 9:Extremely high	Resistance to Puccinia coronata. Judged from the development of uredia or the damage by inoculation or planting in an infected field	
2	Net blotch resistance	10 plants, 2 replications	Observation	1:Extremely low 2:Very low 3:Low 4:Slightly low 5:Intermediate 6:Slightly high 7:High 8:Very high 9:Extremely high	Resistance to Drechslera dictyoides. Judged from the degree of the infection by inoculation or planting in an infected field	
3	Regrowth	10 plants, 2 replications	Observation	1:Extremely poor 2:Very poor 3:Poor 4:Slightly poor 5:Intermediate 6:Slightly good 7:Good 8:Very good 9:Excellent	Degree of regrowth two weeks after the first cutting in spring	
4	Plant vigor in autumn	10 plants, 2 replications	Observation	1:Extremely poor 2:Very poor 3:Poor 4:Slightly poor 5:Intermediate 6:Slightly good 7:Good 8:Very good 9:Excellent	Amount of growth in autumn	
5	Tolerance to summer depression	10 plants, 2 replications	Observation	1:Extremely poor 2:Very poor 3:Poor 4:Slightly poor 5:Intermediate 6:Slightly good 7:Good 8:Very good 9:Excellent	Tolerance to summer depression. Judged from ratio of dead plants and stems and plant vigor in early autumn	
6	Overwintering ability	10 plants, 2 replications	Observation	1:Extremely poor 2:Very poor 3:Poor 4:Slightly poor 5:Intermediate 6:Slightly good 7:Good 8:Very good 9:Excellent	Overwintering ability. Judged from ratio of dead plants and stems and injury of leaves in early spring	

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1	Brown patch resistance	10 plants, 2 replications	Observation	1:Extremely low 2:Very low 3:Low 4:Rather low 5:Intermediate 6:Rather high 7:High 8:Very high 9:Extremely high		Resistance to Rhizoctonia solani. Judged from the damage
2	Leaf blight resistance	10 plants, 2 replications	Observation	1:Extremely low 2:Very low 3:Low 4:Rather low 5:Intermediate 6:Rather high 7:High 8:Very high 9:Extremely high		Resistance to Drechslera siccan. Judged from degree of lesioning and the dead portion of leaves
3	Halo blight resistance	10 plants, 2 replications	Observation	1:Extremely low 2:Very low 3:Low 4:Rather low 5:Intermediate 6:Rather high 7:High 8:Very high 9:Extremely high		Resistance to Pseudomonas syringae. Judged from degree of lesioning and the dead portion of leaves
4	Snow blight resistance	10 plants, 2 replications	Observation	1:Extremely low 2:Very low 3:Low 4:Rather low 5:Intermediate 6:Rather high 7:High 8:Very high 9:Extremely high		Resistance to snow mold diseases. Judged from ratio of dead plants and the damage in leaves and stems after overwintering in a heavy snow area
5	Tolerance to snow cover	10 plants, 2 replications	Observation	1:Extremely low 2:Very low 3:Low 4:Rather low 5:Intermediate 6:Rather high 7:High 8:Very high 9:Extremely high		Overwintering ability. Judged from ratio of dead plants and stems and the dead portion of leaves 10 to 15 days after snow melted in a heavy snow area
6	Ergot resistance	10 plants, 2 replications	Observation	1:Extremely low 2:Very low 3:Low 4:Rather low 5:Intermediate 6:Rather high 7:High 8:Very high 9:Extremely high		Resistance to Claviceps purpurea. Judged from number of ergots borne on spikes
7	Plant vigor in spring	10 plants, 2 replications	Observation	1:Extremely poor 2:Very poor 3:Poor 4:Slightly poor 5:Intermediate 6:Slightly good 7:Good 8:Very good 9:Excellent		Amount of regrowth 2 weeks after sprouting in early spring
8	High temperature tolerance	10 plants, 2 replications	Observation	1:Extremely poor 2:Very poor 3:Poor 4:Slightly poor 5:Intermediate 6:Slightly good 7:Good 8:Very good 9:Excellent		High temperature tolerance. Judged from amount of growth or regrowth after cutting under high temperature in summer

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9	Cold hardiness	10 plants, 2 replications	Observation	1:Extremely low 2:Very low 3:Low 4:Slightly low 5:Intermediate 6:Slightly high 7:High 8:Very high 9:Extremely high	Low temperature tolerance. Judged from ratio of dead plants and stems and dead portion of leaves under thin snow cover	
10	Spring habit	10 plants, 2 replications	Observation	0:None 1:Extremely low 2:Very low 3:Low 4:Slightly low 5:Intermediate 6:Slightly high 7:High 8:Very high 9:Extremely high	Percentage of heading plants when sown in spring (none:0% - extremely high:100%)	

Plant		Perennial ryegrass		26(06002)	Tertiary essential character	
No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Green yield in spring	2 plots	Measurement	kg/a (integer)		Fresh yield harvested from an area of 2 square meters of the 6 square meter plot at each cutting in spring
2	Dry matter ratio in spring	2 plots	Measurement	% (round to the 1st decimal place)		Rate of dry matter of 300 to 500 g of fresh sample dried at 70 centi degree for 48 hours in spring
3	Dry matter yield in spring	2 plots	Calculation	kg/a (integer)		Fresh weight x dry matter ratio/100 in spring
4	Green yield in summer	2 plots	Measurement	kg/a (integer)		Fresh weight harvested from at least from 2 square meter area in the 6 square meter plot at each cutting in summer
5	Dry matter ratio in summer	2 plots	Measurement	% (round to the 1st decimal place)		Ratio of dry matter of 300 to 500 g of fresh sample dried at 70 centi degree for 48 hours in summer
6	Dry matter yield in summer	2 plots	Calculation	kg/a (integer)		Fresh weight x dry matter ratio/100 in summer
7	Green yield in autumn	2 plots	Measurement	kg/a (integer)		Fresh weight harvested from at least from 2 square meter area in the 6 square meter plot at each cutting in autumn
8	Dry matter ratio in autumn	2 plots	Measurement	% (round to the 1st decimal place)		Ratio of dry matter of 300 to 500 g of fresh sample dried at 70 centi degrees for 48 hours in autumn
9	Dry matter yield in autumn	2 plots	Calculation	kg/a (integer)		Fresh weight dry matter ratio/100 in autumn

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No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Dry matter digestibility	2 plots, 2 replications	Measurement	% (round to the 1st decimal place)		Ratio of digestible dry matter by in vivo or in vitro enzyme method
2	Crude protein content	2 plots, 2 replications	Measurement	% (round to the 1st decimal place)		Ratio of crude protein content on dry matter base by Kjeldahl method or Near Infra-red Analyzer
3	Acid detergent fiber (ADF)	2 plots, 2 replications	Measurement	% (round to the 1st decimal place)		Ratio of ADF content on dry matter base by acid detergent-acetone washing
4	Neutral detergent fiber (NDF)	2 plots, 2 replications	Measurement	% (round to the 1st decimal place)		Ratio of NDF content on dry matter base by neutral detergent-acetone washing
5	Acid detergent lignin (ADL)	2 plots, 2 replications	Measurement	% (round to the 1st decimal place)		Ratio of ADL content on dry matter base by acid detergent-acetone washing
6	Mono-and oligosaccharids	2 plots, 2 replications	Measurement	% (round to the 1st decimal place)		Ratio of mono and oligosaccharides content on dry matter base by ethanol extraction and phenol sulfuric acid method
7	Persistency	2 plots, 2 replications	Obs.&Measr.	1:Extremely poor 2:Very poor 3:Poor 4:Slightly poor 5:Intermediate 6:Slightly good 7:Good 8:Very good 9:Excellent		Rate of survival and soil coverage 3 to 4 years after sowing
8	Suitability for grazing	2 plots, 2 replications	Obs.&Measr.	1:Extremely poor 2:Very poor 3:Poor 4:Slightly poor 5:Intermediate 6:Slightly good 7:Good 8:Very good 9:Excellent		Comprehensive estimation of grazing suitability by soil coverage, intake, yield, etc. under conditions
9	Acceptability	2 plots, 2 replications	Obs.&Measr.	1:Extremely poor 2:Very poor 3:Poor 4:Slightly poor 5:Intermediate 6:Slightly good 7:Good 8:Very good 9:Excellent		Comprehensive estimation of intake by rate of amount taken time required for intake, intensity of intake under grazing
10	Seed productivity	2 plots, 2 replications	Measurement	g/square meter (integer)		Weight of cleaned seed per square meter
11	Seed weight per spike	2 plots, 2 replications	Measurement	g/spike (round to the 1st decimal place)		Pure seed weight per spike averaged from 20 normal spikes

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12	Seed fertility	2 plots, 2 replications	Measurement	% (integer)		Rate of seed fertility estimated by number of seeds cleaned/number of seeds harvested x 100 using 10 normal spikes