

Plant		White clover		466	Primary essential character	
No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Plant habit	10 plants, 2 replications	Observation	1:Erect 3:Semi-erect 5:Intermediate 7:Semi-prostrate 9:Prostrate		Angles that plants make with the ground at flowering time
2	Plant height	10 plants, 2 replications	Measurement	cm (integer)		Plant height from the ground to the top of leaf canopy at flowering time
3	Stem thickness	10 plants, 2 replications	Measurement	mm (round to the 1st decimal place)		Diameter of the third or fourth internode from the tip of stolon
4	Leaflet length	10 plants, 2 replications	Measurement	mm (integer)		Length of the middle leaflet of the third or fourth leaf from the tip of stolon
5	Leaflet width	10 plants, 2 replications	Measurement	mm (integer)		Width of the middle leaflet of the third or fourth leaf from the tip of stolon
6	Clearness of leaf water mark	10 plants, 2 replications	Observation	0:None 1:Extremely vague 2:Very vague 3:Vague 4:Slightly vague 5:Intermediate 6:Slightly clear 7:Clear 8:Very clear 9:Extremely clear		Presence and clearness of leaf water mark
7	Flowering date	10 plants, 2 replications	Observation	date		Date when 50% of plants have 3 flowering heads
8	Flower color	10 plants, 2 replications	Observation	1:White 2:White-Yellowish white 3:Light purple 4:Light reddish purple 5:Light red 6:Light red-Red 7:Red 8:Red-Dark red 9:Dark red		Color of floret petal at the beginning of flowering stage
9	Peduncle length	10 plants, 2 replications	Measurement	mm (integer)		Length of peduncle at the full flowering stage
10	Number of heads	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 flower heads (inflorescences) per plant, 30 days after flowering date
11	Number of florets	10 plants, 2 replications	Measurement	Number of florets / head (integer)		Average number of florets estimated by sampling 10 heads within 1 month after flowering time

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12	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 total 20 plants (10 plants with 2 replications) with 4 replications

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1	Internode length	10 plants, 2 replications	Measurement	mm (integer)		Length of the third or fourth internode from the tip of stolon
2	Petiole length	10 plants, 2 replications	Measurement	mm (integer)		Petiole length of the third or fourth leaf from the tip of stolon
3	Size of leaflet	10 plants, 2 replications	Measurement	square millimeter (integer)		Multiply leaflet length by leaflet width of the third or fourth internode from the tip of stolon
4	Ratio of length to width of leaflet	10 plants, 2 replications	Measurement	(round to the 2nd decimal place)		Divide leaflet length by leaflet width of the third or fourth internode from the tip of stolon
5	Shape of leaflet	10 plants, 2 replications	Observation	1:Elliptic 3:Circular 5:Rhombic 7:Obovate		Shape of a center leaflet of the largest leaf at the flowering stage
6	Shape of tip of leaflet	10 plants, 2 replications	Observation	1:Acute 3:Obtuse 5:Rounded 7:Emarginate		Shape of a center leaflet of the largest leaf at the flowering stage
7	Density of foliage	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:Abundant		Overall ground cover of the foliage in the vegetative phase
8	Number of variant leaves	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:Abundant		Number of plants with other than trifoliate leaves at the first cutting
9	Presence and number of blood spots	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:Abundant		Presence and number of red marks on leaves at flowering time
10	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 green 7:Green 8:Very dark green 9:Extremely dark green		Greenness of leaf color at flowering time
11	Main leaf color	10 plants, 2 replications	Measurement			RHS color chart (indicate reference number) of main leaf color

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12	Secondary leaf color	10 plants, 2 replications	Measurement			RHS color chart (indicate reference number) of secondary leaf color
13	Tertiary leaf color	10 plants, 2 replications	Measurement			RHS color chart (indicate reference number) of tertiary leaf color
14	Petiole thickness	10 plants, 2 replications	Measurement	mm (round to the 1st decimal place)		Diameter of petiole on the third or fourth internode from the tip of vigorous stolon at the first cutting
15	Flowering time	10 plants, 2 replications	Observation	date		Date when 80% of plants have 3 flowering heads
16	Sprouting date	10 plants, 2 replications	Observation	date		Date of beginning of sprouting after overwintering

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1	Mosaic virus 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		Degree of resistance to mosaic virus based on the infection when it became apparent by artificial inoculation or planting in an infected field
2	Sclerotinia root rot and crown rot 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		Degree of resistance to Sclerotinia trifolii based on the infection when it became apparent by artificial inoculation or planting in an infected field
3	Spreading of plant	10 plants, 2 replications	Measurement	square centimeter per plant (integer)		Spreading estimated by long diameter x short diameter of plants with stolons
4	Density of stolons	10 plants, 2 replications	Observation	1:Extremely sparse 2:Very sparse 3:Sparse 4:Slightly sparse 5:Intermediate 6:Slightly dense 7:Dense 8:Very dense 9:Extremely dense		Density of stolons estimated by number and length of stolons per square meter
5	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 growth 1 month after sprouting in spring
6	Plant vigor in summer	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 mid summer
7	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 regrowth in late autumn

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1	Curvularia leaf blight 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 Curvularia trifolii based on the infection when it became apparent
2	Leaf 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 Uromyces trifolii based on the infection when it became apparent
3	Stem 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 Uromyces nerviphilus based on the infection when it became apparent
4	Pepper spot 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		Degree of resistance to Leptoshaerulina trifolii based on the infection when it became apparent by artificial inoculation or planting in an infected field
5	Disease 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 disease, judging from the degree of disease damage (note the name of disease)
6	Insect 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 insects, judging from the degree of insect damage (note the name of insect)
7	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 based on the rate of dead plants, sprouting, plant vigor, etc. in early spring
8	Summer survival	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 tolerance to summer depression based on the rate of dead plants, regrowth, plant vigor, etc. in early autumn

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No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Green yield in spring	2 plots	Measurement	kg/a (integer)		Total green yield estimated by fresh weight harvested from 1 square meter area at each cutting in spring
2	Dry matter ratio in spring	2 plots	Measurement	% (round to the 1st decimal place)		Average ratio of dry matter measured by sampling 300 g of fresh sample and drying at 70 centi degrees for 48 hours in spring
3	Dry matter yield in spring	2 plots	Calculation	kg/a (integer)		Total of dry matter yield calculated by green yield x dry matter ratio/100 in spring
4	Green yield in summer	2 plots	Measurement	kg/a (integer)		Total green yield harvested in summer in the same way as the green yield in spring
5	Dry matter ratio in summer	2 plots	Measurement	% (round to the 1st decimal place)		Ratio of dry matter in summer measured in the same way as the dry matter ratio in spring
6	Dry matter yield in summer	2 plots	Calculation	kg/a (integer)		Dry matter yield in summer calculated in the same way as the dry matter yield in spring
7	Green yield in autumn	2 plots	Measurement	kg/a (integer)		Total green yield harvested in autumn in the same way as the green yield in spring
8	Dry matter ratio in autumn	2 plots	Measurement	% (round to the 1st decimal place)		Ratio of dry matter in autumn measured in the same way as the dry matter ratio in spring
9	Dry matter yield in autumn	2 plots	Calculation	kg/a (integer)		Total dry matter yield in autumn calculated in the same way as the dry matter yield in spring

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1	Dry matter digestibility	2 plots, 2 replications	Measurement	% (round to the 1st decimal place)		Ratio of digestible dry matter analyzed by in vivo test or in vitro enzyme method
2	Crude protein	2 plots, 2 replications	Measurement	% (round to the 1st decimal place)		Ratio of crude protein content on a dry matter base analyzed by Kjeidahl method or near infrared spectroscopy (NIRS)
3	Acid detergent fiber (ADF)	2 plots, 2 replications	Measurement	% (round to the 1st decimal place)		Ratio of ADF content on a dry matter base analyzed by acid detergent-acetone washing
4	Ratio of plants containing cyanogenetic glucoside	100 plants	Measurement	% (round to the 1st decimal place)		Ratio of plants containing hydrocyanic acid analyzed by colorimetric analysis in alkali picrate solution for the first harvest
5	Saponin	2 plots, 2 replications	Measurement	ppm (round to the 3rd decimal place)		Saponin content on a dry matter base analyzed by the thin layer chromatography after ethanol extraction
6	Grazing adaptability	2 plots, 2 replications	Obs.&Mear.	1:Extremely poor 2:Very poor 3:Poor 4:Slightly poor 5:Intermediate 6:Slightly good 7:Good 8:Very good 9:Excellent		Grazing adaptability comprehensively estimated from intake, coverage, etc. under grazing on a plot of more than 30 square meters
7	Adaptability to mix seeding	2 plots, 2 replications	Obs.&Mear.	1:Extremely poor 2:Very poor 3:Poor 4:Slightly poor 5:Intermediate 6:Slightly good 7:Good 8:Very good 9:Excellent		Adaptability to mix seeding estimated by the proper rate of white clover to grasses in fresh weight in a mixed sowing plot of more than 6 square meters
8	Persistency	2 plots, 2 replications	Measurement	1:Extremely poor 2:Very poor 3:Poor 4:Slightly poor 5:Intermediate 6:Slightly good 7:Good 8:Very good 9:Excellent		Persistency based on the coverage of clover four years after sowing
9	Number of mature seeds per floret	2 plots, 2 replications	Measurement	Number of seeds / floret (round to the 1st decimal place)		Number of pure seeds per floret counted by sampling 20 mature heads within one month after flowering stage



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10	Seed productivity	2 plots, 2 replications	Measurement	g per square meters (integer)	Seed productivity estimated by measurement of pure seed yield from 1 square meter after maturity
11	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	Intake per unit time by grazing or free cafeteria feeding