

Plant		Warm season pulses		470	Primary essential character	
No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Plant height	10 plants, 2 replications	Measurement	cm (integer)		Height from the ground to the top of plant at flowering time
2	Stem thickness	10 plants, 2 replications	Measurement	mm (round to the 1st decimal place)		Long diameter of the thickest part of stem at flowering time
3	Presence of vine	10 plants, 2 replications	Observation	0:None 9:Present		Presence of vine
4	Twining	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 twining ability
5	Presence and clearness of leaf water marks	10 plants, 2 replications	Observation	1:None or extremely vague 2:Very vague 3:Vague 4:Slightly vague 5:Intermediate 6:Slightly clear 7:Clear 8:Very clear 9:Very extremely clear		Presence and clearness of leaf water marks on mature leaf
6	Hairiness	10 plants, 2 replications	Observation	1:None or extremely little 2:Very little 3:Little 4:Slightly little 5:Intermediate 6:Slightly much 7:Much 8:Very much 9:Extremely much		Amount of pubescence on leaves and stems
7	Leaf shape	10 plants, 2 replications	Observation	3:Single 4:Trifoliolate 5:Pinnately compound 6:Palmetely compound 7:Other		Shape of leaf by the classification into simple, pinnately compound, palmetely compound leaf, etc.
8	Leaf length	10 plants, 2 replications	Measurement	mm (integer)		Length of the leaf blade of single leaf, or the middle leaflet of a compound leaf
9	Leaf width	10 plants, 2 replications	Measurement	mm (integer)		Width of the leaf blade of single leaf, or the middle leaflet of a compound leaf
10	Date of first flowering	10 plants, 2 replications	Observation	date		Date when plants had begun to flower
11	Flower color	10 plants, 2 replications	Observation	1:White 2:Purple 3:Blue 4:Green 5:Yellow 6:Orange 7:Pink 8:Red 9:Other		Main color of standard petal at the beginning of flowering time

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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 semi-prostrate 7:Semi-prostrate 8:Nearly prostrate 9:Prostrate		Angle that a plant makes with the horizontal in growing stage
2	Pod length	10 plants, 2 replications	Measurement	mm (integer)		Length of pod measured by sampling three pods per plant
3	Pod width	10 plants, 2 replications	Measurement	mm (integer)		Width of pod measured by sampling three pods per plant
4	Pod weight	10 plants, 2 replications	Measurement	mg (integer)		Weight of pod weighed by sampling three mature pods per plant
5	Number of seeds per pod	10 plants, 2 replications	Measurement	Number of seeds per pod (round to the 1st decimal place)		Number of seeds per pod, measured by sampling 3 mature pods per plant
6	Weight of 1000 seeds	100 seeds, 2 replications	Measurement	g/1000 seeds (round to the 2nd decimal place)		Weight of 1000 seeds, estimated by sampling 100 mature seeds with at least 3 replications

Plant		Warm season pulses		470	Secondary essential character
No	Characters	No. of samples	Methods	Rank or measurement unit	Remarks
1	Regrowth	10 plants, 2 replications	Measurement	1:Extremely poor 2:Very poor 3:Poor 4:Slightly poor 5:Intermediate 6:Slightly vigorous 7:Vigorous 8:Very vigorous 9:Extremely vigorous	Regrowth after cutting
2	Overwintering ability	10 plants, 2 replications	Observation	1:Extremely poor 2:Very poor 3:Poor 4:Slightly poor 5:Intermediate 6:Slightly vigorous 7:Vigorous 8:Very vigorous 9:Extremely vigorous	Overwintering ability estimated from number of dead plants, sprouting, plant vigor, etc. in early spring

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No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	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, estimated from the rate of infected plants and the degree of damage (note the name of disease)
2	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 insect infestation, estimated from the ratio of infected plants and the degree of damage (note the name of insect)
3	Plant vigor in spring	10 plants, 2 replications	Observation	1:Extremely poor 2:Very poor 3:Poor 4:Slightly poor 5:Intermediate 6:Slightly vigorous 7:Vigorous 8:Very vigorous 9:Extremely vigorous		Plant vigor after overwintering
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 vigorous 7:Vigorous 8:Very vigorous 9:Extremely vigorous		Regrowth in autumn
5	Self-fertility rate	10 plants, 2 replications	Measurement	1:None or extremely low 2:Very low 3:Low 4:Slightly low 5:Intermediate 6:Slightly high 7:High 8:Very high 9:Extremely high		Rate of self-fertility estimated by bagging flowers of a plant or pollination within a plant in the isolated plot
6	Ratio of hard seeds	10 plants, 2 replications	Measurement	1:None or 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 hard seeds estimated by germination test with 200 mature seeds
7	Persistency	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		Regrowth vigor after cutting or Plant vigor at after establishment for several years
8	Dormancy	10 plants, 2 replications	Observation	1:None or extremely low 2:Very low 3:Low 4:Slightly low 5:Intermediate 6:Slightly deep 7:Deep 8:Very deep 9:Extremely deep		Plant vigor or regrowth rate at summer dormancy or winter dormancy

Plant		Warm season pulses		470	Tertiary essential character	
No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Fresh yield of first harvest	2 plots	Measurement	kg/a (integer)		Fresh yield estimated by fresh weight harvested from area more than 2 square meters at the first harvest
2	Dry matter ratio of first harvest	2 plots	Measurement	% (round to the 1st decimal place)		Ratio of dry matter estimated by sampling 300 g of fresh weight at the first harvest and measuring immediately after drying at 70 centi degrees for 48 hours up as far as reaching plateau
3	Dry matter yield of first harvest	2 plots	Calculation	kg/a (integer)		Dry matter yield estimated by fresh weight x dry matter rate / 100 at the first harvest
4	Fresh yield of regrowth	2 plots	Measurement	kg/a (integer)		Total of fresh yield of regrowth every after the first harvest measured by the same way as fresh yield of the first harvest
5	Dry matter ratio of regrowth	2 plots	Measurement	% (round to the 1st decimal place)		Average ratio of dry matter of regrowth every after the first harvest measured by the same way as dry matter ratio of the first harvest
6	Dry matter yield of regrowth	2 plots	Calculation	kg/a (integer)		Total of dry matter yield of regrowth every after first harvest calculated by the same way as dry matter yield of the first harvest

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No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Dry matter digestibility	2 plots, 3 replications	Measurement	% (round to the 1st decimal place)		Ratio of digestible dry matter on dry matter base by in vitro enzyme method or near infrared spectroscopy (NIRS)
2	Crude protein	2 plots, 3 replications	Measurement	% (round to the 1st decimal place)		Ratio of crude protein content on a dry matter base analyzed by Kjeldahl method or near infrared spectroscopy (NIRS)
3	Acid detergent fiber (ADF)	2 plots, 3 replications	Measurement	% (round to the 1st decimal place)		Ratio of ADF content on a dry matter base analyzed by acid detergent-acetone washing
4	Neutral detergent fiber (NDF)	2 plots, 3 replications	Measurement	% (round to the 1st decimal place)		Ratio of NDF content on a dry matter base analyzed by neutral detergent-acetone washing
5	Acid detergent lignin (ADL)	2 plots, 3 replications	Measurement	% (round to the 1st decimal place)		Ratio of ADL content on a dry matter base analyzed by acid detergent-acetone washing
6	Mono-and oligosaccharides	2 plots, 3 replications	Measurement	% (round to the 1st decimal place)		Mono-and oligosaccharides content on a dry matter base analyzed by ethanol extraction and thin layer chromatography
7	Intake	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		Intake per unit time by grazing or feeding
8	Palatability	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		Palatability estimated by grazing or free cafeteria feeding