

Plant		Other pulses		471	Primary essential character	
No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Plant habit	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		Growth habit based on the angle that plants make with the horizontal at the beginning of flowering stage
2	Presence of vines	10 plants, 2 replications	Observation	0:Absent 9:Present		Presence of vines
3	Twining	10 plants, 2 replications	Observation	1:None 2:Very poor 3:Poor 4:Slightly poor 5:Intermediate 6:Good 7:Excellent		Degree of twining ability
4	Presence of stolon	10 plants, 2 replications	Observation	0:Absent 9:Present		Presence of stolon
5	Presence of rhizome	10 plants, 2 replications	Observation	0:Absent 9:Present		Presence of rhizome
6	Plant height	10 plants, 2 replications	Measurement	cm (integer)		Plant height from the ground to the tip of plant at flowering stage
7	Stem thickness	10 plants, 2 replications	Measurement	mm (round to the 1st decimal place)		Long diameter of the middle of main stem at flowering time
8	Hairiness	10 plants, 2 replications	Observation	0:None 1:Extremely little 2:Very little 3:Little 4:Slightly little 5:Intermediate 6:Slightly abundant 7:Abundant 8:Very abundant 9:Extremely abundant		Amount of pubescence on leaves and stems
9	Leaf shape	10 plants, 2 replications	Observation	1:Simple 3:Trifoliolate 5:Pinnately compound 7:Palmately compound 9:Other		Shape of leaf based on the classification into pinnate compound, palmate compound leaf, etc.
10	Presence and clearness of leaf spot	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 spots on mature leaflets
11	Flowering date	10 plants, 2 replications	Observation	date		Date when 50% of plants began flowering
12	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		Standard petal color at flowering stage

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1	Spreading of plant at the flowering date	10 plants, 2 replications	Obs.&Measr.	1:Extremely small 2:Very small 3:Small 4:Slightly small 5:Intermediate 6:Slightly large 7:Large 8:Very large 9:Extremely large		Plant spreading estimated by long diameter x short diameter at the beginning of flowering stage
2	Spreading of plant in spring	10 plants, 2 replications	Obs.&Measr.	1:Extremely small 2:Very small 3:Small 4:Slightly small 5:Intermediate 6:Slightly large 7:Large 8:Very large 9:Extremely large		Plant spreading estimated by long diameter x short diameter in spring
3	Spreading of plant in fall	10 plants, 2 replications	Obs.&Measr.	1:Extremely small 2:Very small 3:Small 4:Slightly small 5:Intermediate 6:Slightly large 7:Large 8:Very large 9:Extremely large		Plant spreading estimated by long diameter x short diameter in fall
4	Internode length	10 plants, 2 replications	Measurement	mm (round to the 1st decimal place)		Internode length in the middle of main stem
5	Number of branches	10 plants, 2 replications	Obs.&Measr.	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 primary branches of the main stem at flowering stage
6	Leaf color	10 plants, 2 replications	Observation	1:Yellowish green 2:Slightly yellowish green 3:Light green 4:Slightly light green 5:Green 6:Slightly dark green 7:Dark green 9:Other		Color of leaf blade at flowering stage
7	Leaf length	10 plants, 2 replications	Measurement	mm (round to the 1st decimal place)		Long diameter of the leaf blade of simple leaf or the middle leaflet of compound leaf
8	Leaf width	10 plants, 2 replications	Measurement	mm (round to the 1st decimal place)		Short diameter of the leaf blade of simple leaf or the middle leaflet of compound leaf
9	Petiole length	10 plants, 2 replications	Measurement	mm (round to the 1st decimal place)		Length of petiole
10	Seed shape	10 plants, 2 replications	Observation	1:Round 2:Round-Oval 3:Oval 4:Oval-Reniform 5:Reniform 6:Reniform-Square 7:Square 9:Other		Shape of mature seed
11	Flower color (Yellow color type)	10 plants, 2 replications	Observation	1:White 2:Yellowish white 3:Yellow 4:Orange 5:Red		Main color of petals at flowering

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12	Flower color (Blue color type)	10 plants, 2 replications	Observation	1:White 2:Bluish white 3:Blue 4:Dark blue 5:Dark purple 6:Purple 7:Pink 8:Green 9:Other color		Main color of petals at flowering
13	Weight of 1000 seeds	10 plants, 2 replications	Measurement	g (round to the 1st decimal place)		1000 seed weight estimated by sampling 100 mature seeds with at least two replications after drying

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1	Summer survival	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		Summer survival estimated from the ratio of dead plants, regrowth, plant vigor, etc. in early autumn
2	Overwintering ability	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		Winter survival estimated from the ratio of dead plants, regrowth, etc. in early spring
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:Extremely good		Regrowth one month after cutting

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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 diseases, based on the degree of the damage and the ratio of infected plants when the infection became apparent (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 insects, based on the degree of the damage by artificial inoculation or natural occurrence (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 good 7:Good 8:Very good 9:Excellent		Regrowth one month after sprouting in early spring
4	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		Plant vigor in mid summer
5	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		Regrowth after the cutting in mid autumn
6	Lodging 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 lodging at each cutting, especially when lodging is apparently occurred by stormy wind, heavy rain, etc.
7	Self fertility ratio	10 plants, 2 replications	Measurement	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 self fertility estimated by the percentage seed fertility by bagging each flower or isolating each plant

Plant		Other pulses		471	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 an area of 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 300-500 g fresh sample and drying at 70 centi degrees for 48 hours at the first harvest
3	Dry matter yield of first harvest	2 plots	Calculation	kg/a (integer)		Dry matter yield calculated by fresh weight x dry matter ratio/100 at the first harvest
4	Fresh yield of regrowth	2 plots	Measurement	kg/a (integer)		Total fresh yield of regrowth 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)		Ratio of dry matter of regrowth after 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 dry matter yield of regrowth after the first harvest calculated in the same way as dry matter yield of the first harvest

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1	Dry matter digestibility	2 plots, 2 replications	Measurement	% (round to the 1st decimal place)		Ratio of digestible dry matter determined 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 dry matter base analyzed by Kjeldahl 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 dry matter base analyzed 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 analyzed by neutral detergent-acetone washing
5	Acid detergent lignin	2 plots, 2 replications	Measurement	% (round to the 1st decimal place)		Ratio of ADL content on dry matter base analyzed by acid detergent-acetone washing
6	Mono- and oligosaccharides	2 plots, 2 replications	Measurement	% (round to the 1st decimal place)		Ratio of mono- and oligosaccharide content on dry matter base analyzed by phenol sulphuric acid method after ethanol extraction
7	Seed productivity	2 plots, 2 replications	Measurement	g per square meter (round to the 1st decimal place)		Yield of pure seed per 1 square meter
8	Number of seeds per pod	10 plants, 2 replications	Measurement	Number of seeds per pod (round to the 1st decimal place)		Number of pure seeds per pod estimated by sampling 10 mature pods per plant
9	Intake	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 estimated by grazing or free cafeteria feeding