

Plant		Japanese bunching onion		449	Primary essential character	
No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Plant type	30 plants	Observation	1:Extremely erect 3:Erect 5:Intermediate 7:Spreading 9:Extremely spreading		Angle between leaf blades in harvest time
2	Leaf blade color	10 plants	Observation	1:Extremely light 3:Light 5:Intermediate 7:Dark 9:Extremely dark		Leaf blade color in harvest time
3	Degree of leaf waxiness	10 plants	Observation	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong		Amount of leaf waxiness in harvest time
4	Leaf blade length	10 plants	Measurement	cm (integer)		Leaf blade length of the longest leaf
5	Number of pseudostems	10 plants	Measurement	Pseudostems (round to the 1st decimal place)		Number of externally-observable pseudostems per plant
6	Red color of pseudostem	10 plants	Observation	0:Colorless 1:Extremely light 3:Light 5:Intermediate 7:Dark 9:Extremely dark		Red color of pseudostem in harvest time
7	Tightness of leaf sheath neck	10 plants	Observation	1:Extremely loose 3:Loose 5:Intermediate 7:Tight 9:Extremely tight		Tightness of leaf sheath neck in harvest time
8	Tightness of leaf sheath	10 plants	Measurement	1:Extremely loose 3:Loose 5:Intermediate 7:Tight 9:Extremely tight		Tightness of leaf sheath in harvest time
9	Pseudostem length	10 plants	Measurement	cm (integer)		Leaf sheath length of the outermost leaf after preparation

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1	Pigmentation of pseudostem (seedling stage)	10 plants	Observation	0:Colorless 5:Light 9:Dark		Anthocyanin pigmentation at seedling stage
2	Degree of leaf bending	30 plants	Observation	1:Extremely low 3:Low 5:Intermediate 7:High 9:Extremely high		Observe stand plants after a strong wind blow
3	Number of leaves	10 plants	Measurement	Leaves (round to the 1st decimal place)		Number of externally-observable leaves of the thickest pseudostem
4	Width of flattened leaf blade	10 plants	Measurement	mm (integer)		Maximum width of the longest leaf blade. Flatten the cylindrical leaf blade to measure.
5	Interval between leaf blade bases	10 plants	Measurement	mm (integer)		Distance between the leaf blade base of outermost leaf after preparation and that of the next
6	Shape in cross section of leaf blade bases	10 plants	Observation	3:Circle 5:Ellipse 7:Long ellipse		Shape in cross section of leaf blade bases in harvest time
7	Angle of gathering of leaf sheath	10 plants	Observation	3:Obtuse 5:Intermediate 7:Acute		Angle of top edge of leaf sheath to level line
8	Diameter of pseudostem at the middle	10 plants	Measurement	mm (integer)		Diameter of pseudostem after preparation
9	Diameter of pseudostem at the base	10 plants	Measurement	mm (integer)		Maximum diameter of pseudostem around its base
10	Internal tillering rate	30 plants	Measurement	% (integer)		Percentage of pseudostems with internal tillers. Observe the cross-cutting of pseudostem at the middle.
11	Number of leaves composing a pseudostem	10 plants	Measurement	Leaves (round to the 1st decimal place)		Observe the cross-cutting of pseudostem at the middle

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No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
12	Number of pseudostems(in blanching culture)	10 plants	Measurement	Pseudostems (round to the 1st decimal place)		Number of externally-observable pseudostems per plant
13	Pseudostem length(in blanching culture)	10 plants	Measurement	cm (integer)		Leaf sheath length of the outermost leaf after preparation
14	Diameter of pseudostem at the middle(in blanching culture)	10 plants	Measurement	mm (integer)		Diameter of pseudostem after preparation
15	Internal tillering rate(in blanching culture)	50 plants	Measurement	% (integer)		Percentage of pseudostems with internal tillers. Observe the cross-cutting of pseudostem at the middle.
16	Number of leaves composing a pseudostem(in blanching culture)	10 plants	Measurement	Leaves (round to the 1st decimal place)		Observe the cross-cutting of pseudostem at the middle
17	Scape length	10 plants	Measurement	cm (integer)		Scape length in flowering time
18	Number of floret	10 plants	Measurement	Florets (round to the 1st decimal place)		Number of florets per umbel
19	Flower stalk length	30 florets	Measurement	mm (round to the 1st decimal place)		Flower stalk length in flowering time
20	Seed weight	1000 seeds	Measurement	mg (round to the 1st decimal place)		Weight of one dried seed

Plant		Japanese bunching onion		449	Secondary essential character
No	Characters	No. of samples	Methods	Rank or measurement unit	Remarks
1	Rust resistance	50 plants	Observation	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong	Natural infection(In artificial inoculation, use 20 plants)
2	Purple blotch resistance	50 plants	Observation	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong	Natural infection(In artificial inoculation, use 20 plants)
3	Bolting time	50 plants	Observation	1:Extremely early 2:Very early 3:Early 4:Slightly early 5:Intermediate 6:Slightly late 7:Late 8:Very late 9:Extremely late	Base on the date when 50% of plants have bolted
4	Start of flowering time	50 plants	Observation	1:Extremely early 2:Very early 3:Early 4:Slightly early 5:Intermediate 6:Slightly late 7:Late 8:Very late 9:Extremely late	Base on the date when 50% of plants have started flowering
5	End of flowering time	50 plants	Observation	1:Extremely early 2:Very early 3:Early 4:Slightly early 5:Intermediate 6:Slightly late 7:Late 8:Very late 9:Extremely late	Base on the date when 50% of plants have completed flowering

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1	Phytophthora blight resistance	50 plants	Observation	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong		Natural infection(In artificial inoculation, use 20 plants)
2	Downy mildew resistance	50 plants	Observation	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong		Natural infection(In artificial inoculation, use 20 plants)
3	Yellow dwarf resistance	50 plants	Observation	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong		Natural infection(In artificial inoculation, use 20 plants)
4	Basal rot resistance	50 plants	Observation	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong		Natural infection(In artificial inoculation, use 20 plants)
5	Botrytis leaf blight resistance	50 plants	Observation	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong		Natural infection(In artificial inoculation, use 20 plants)
6	Bacterial soft rot resistance	50 plants	Observation	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong		Natural infection(In artificial inoculation, use 20 plants)
7	Onion thrips resistance	50 plants	Observation	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong		Natural infection(In artificial inoculation, use 20 plants)
8	Stone leek leafminer resistance	50 plants	Observation	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong		Natural infection(In artificial inoculation, use 20 plants)
9	Heat tolerance	50 plants	Observation	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong		Degree of heat tolerance in growing condition
10	Drought tolerance	50 plants	Observation	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong		Degree of drought tolerance in growing condition
11	Moisture tolerance	50 plants	Observation	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong		Degree of moisture tolerance in growing condition
12	Growth under low temperature	50 plants	Observation	0:Winter dormant 1:Extremely low 3:Low 5:Intermediate 7:High 9:Extremely high		Degree of growth under low temperature in growing condition

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No	Characters	No. of samples	Methods	Rank or measurement unit	Remarks
13	Wintering ability	50 plants	Observation	1:Extremely low 3:Low 5:Intermediate 7:High 9:Extremely high	Degree of wintering ability in growing condition

Plant	Japanese bunching onion		449	Tertiary essential character	
No	Characters	No. of samples	Methods	Rank or measurement unit	Remarks
1	Foliage weight	10 plants	Measurement	g (integer)	Fresh foliage weight per plant
2	Pseudostem weight	10 plants	Measurement	g (integer)	Fresh weight of pseudostems per plant

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No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Leaf blade hardness	10 plants	Sensory	1:Extremely soft 3:Soft 5:Intermediate 7:Hard 9:Extremely hard		Leaf blade hardness by feeling with the hand
2	Pseudostem firmness(in blanching culture)	10 plants	Sensory	1:Extremely soft 3:Soft 5:Intermediate 7:Hard 9:Extremely hard		Pseudostem firmness by feeling with the hand
3	Foliage weight(in blanching culture)	10 plants	Measurement	g (integer)		Fresh foliage weight per plant
4	Pseudostem weight(in blanching culture)	10 plants	Measurement	g (integer)		Fresh weight of pseudostems per plant
5	Dry matter ratio of pseudostem(in blanching culture)	10 plants	Measurement	% (integer)		100 x dry weight / fresh weight
6	Pseudostem pungency(in blanching culture)	5 plants	Sensory	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong		Sensory evaluation by fresh eating
7	Sugar content of pseudostem(in blanching culture)	5 plants	Measurement	% (round to the 1st decimal place)		Brix of the tissue sample sliced off at the middle of pseudostem
8	Pyruvic acid production of pseudostem (in blanching culture)	5 plants	Measurement	mg/g (round to the 1st decimal place)		Pyruvic acid production of the tissue sample sliced off at the middle of pseudostem
9	Glucose content of pseudostem (in blanching culture)	5 plants	Measurement	mg/g (round to the 1st decimal place)		Glucose content of the tissue sample sliced off at the middle of pseudostem
10	Sucrose content of pseudostem (in blanching culture)	5 plants	Measurement	mg/g (round to the 1st decimal place)		Sucrose content of the tissue sample sliced off at the middle of pseudostem

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11	Fructose content of pseudostem (in blanching culture)	5 plants	Measurement	mg/g (round to the 1st decimal place)		Fructose content of the tissue sample sliced off at the middle of pseudostem
12	Dry matter ratio of foliage	10 plants	Measurement	% (integer)		100 x dry weight / fresh weight
13	Leaf blade pungency	5 plants	Sensory	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong		Sensory evaluation by fresh eating
14	Pseudostem pungency	5 plants	Sensory	1:Extremely weak 3:Weak 5:Intermediate 7:Strong 9:Extremely strong		Sensory evaluation by fresh eating
15	Sugar content of pseudostem	5 plants	Measurement	% (round to the 1st decimal place)		Brix of the tissue sample sliced off at the middle of pseudostem