

Plant		Garlic		447	Primary essential character	
No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Plant height	10 plants	Measurement	cm (integer)		The longest length of leaf sheath and leaf blade at the beginning of bulbing stage
2	Number of leaves	10 plants	Measurement	Leaves (round to the 1st decimal place)		Number of expanded leaves per plant at the beginning of bulbing stage
3	Leaf blade length	10 plants	Measurement	cm (round to the 1st decimal place)		Length of the largest leaf blade at the beginning of bulbing stage
4	Leaf blade width	10 plants	Measurement	mm (round to the 1st decimal place)		Width of the widest part of the longest leaf at the beginning of bulbing stage
5	Leaf-sheath diameter	10 plants	Measurement	mm (round to the 1st decimal place)		Diameter of the thickest part of leaf-sheath at the beginning of bulbing stage
6	Bolting	10 plants	Observation	0:Absent 3:Occasional 5:Intermediate 7:Frequent		Degree of bolting at harvest time. Absent:0%, occasional:1-49%, intermediate:50-79%, frequent:>=80%
7	Bolting type	10 plants	Observation	1:Absent 2:Incomplete 3:Complete		Bolting type at harvest time
8	Transverse diameter of bulb	10 bulbs	Measurement	mm (round to the 1st decimal place)		Diameter of the equatorial plane of bulb at harvest time
9	Distribution of cloves	10 bulbs	Observation	1:Radial 2:Non-radial		Distribution of primary cloves at harvest time
10	External cloves	10 bulbs	Observation	0:Absent 9:Present		External cloves outside of bulb
11	Number of cloves (primary)	10 bulbs	Measurement	Cloves (round to the 1st decimal place)		Number of primary cloves at harvest time
12	Clove weight (primary)	10 bulbs	Measurement	g (round to the 1st decimal place)		Average weight of a primary clove at harvest time

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1	Plant vigor	10 plants	Observation	1:Extremely weak 2:Very weak 3:Weak 4:Slightly weak 5:Intermediate 6:Slightly vigorous 7:Vigorous 8:Very vigorous 9:Extremely vigorous		Growth increment of above-ground part at the growing period
2	Plant form	10 plants	Observation	3:Erect 4:Slightly erect 5:Semi-erect 6:Slightly horizontal 7:Horizontal		Spreading degree of leaf sheath and leaf blade at the beginning of bulbing stage
3	Leaf color	10 plants	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		Color of leaf at the growing period
4	Leaf thickness	10 plants	Measurement	mm (round to the 1st decimal place)		Thickness at the widest part of the longest leaf at the beginning of bulbing stage (at the point a quarter the leaf width inward of leaf margin)
5	Angle of transvers section of leaf blade	10 plants	Measurement	Degree (integer)		Angle between half blades at the widest part of the longest leaf at the beginning of bulbing stage
6	Leaf angle	10 plants	Measurement	Degree (integer)		Angle of leaf blade against leaf-sheath at the beginning of bulbing stage
7	Leaf bending	10 plants	Observation	3:Little 5:Intermediate 7:Much		Degree of leaf bending at the beginning of bulbing stage
8	Bloom	10 plants	Observation	0:Absent 3:Little 5:Intermediate 7:Much		Amount of wax on the leaf surface at the beginning of bulbing stage
9	Leaf-sheath length	10 plants	Observation	1:Extremely short 2:Very short 3:Short 4:Slightly short 5:Intermediate 6:Slightly long 7:Long 8:Very long 9:Extremely long		Length from ground level to the leaf blade base of the longest leaf at the beginning of bulbing stage
10	Anthocyanin coloration at base of pseudostem	10 plants	Observation	0:Absent 1:Extremely week 2:Very week 3:Week 4:Slightly week 5:Intermediate 6:Slightly strong 7:Strong 8:Very strong 9:Extremely strong		Intensity of anthocyanin coloration at base of pseudostem at the growing period

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11	Longitudinal diameter of bulb	10 bulbs	Measurement	mm (integer)		Height of bulb at harvest time
12	Outer bulb skin color	10 bulbs	Observation	1:White 2:Light pink 3:Light red 4:Light brown 5:Red 6:Crimson 7:Red purple		Color of outer bulb skin at harvest time
13	Anthocyanin stripes on dry external scales of bulb	10 bulbs	Observation	0:Absent 9:Present		Anthocyanin stripes on dry external scales of bulb at harvest time
14	Thickness of neck	10 bulbs	Observation	1:Extremely thin 2:Very thin 3:Thin 4:Slightly thin 5:Intermediate 6:Slightly thick 7:Thick 8:Very thick 9:Extremely thick		Diameter of pseudostem at the lowest point at harvest time
15	Neck firmness	10 bulbs	Sensory	1:Extremely loose 2:Very loose 3:Loose 4:Slightly loose 5:Intermediate 6:Slightly tight 7:Tight 8:Very tight 9:Extremely tight		Firmness of pseudostem at the lowest point
16	Bulb shape in longitudinal section	10 bulbs	Observation	1:Transverse narrow elliptic 2:Transverse broad elliptic 3:Circular		Bulb shape in longitudinal section at harvest time
17	Bulb shape in cross section	10 bulbs	Observation	1:Elliptic 2:Circular		Bulb shape in cross section at harvest time
18	Position of cloves at tip of bulb	10 bulbs	Observation	1:Inserted 2:Same level 3:Exerted		Position of cloves at tip of bulb
19	Position of root disc	10 bulbs	Observation	1:Depressed 2:Flat 3:Raised		Position of root disc on bulb
20	Bulb shape of base	10 bulbs	Observation	1:Recessed 2:Flat 3:Rounded		Bulb shape of base
21	Compactness of cloves	10 bulbs	Observation	1:Very loose 3:Loose 5:Intermediate 7:Compact 9:Very compact		Compactness of cloves
22	Bulb-skin thickness	10 bulbs	Observation	1:Extremely thin 2:Very thin 3:Thin 4:Slightly thin 5:Intermediate 6:Slightly thick 7:Thick 8:Very thick 9:Extremely thick		Thickness of outer bulb skin at harvest time

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23	Peeling	10 bulbs	Observation	1:Extremely easy 2:Very easy 3:Easy 4:Slightly easy 5:Intermediate 6:Slightly hard 7:Hard 8:Very hard 9:Extremely hard		Hardness of peeling outer skin of stored bulb
24	Cracking of bulb skin	10 bulbs	Observation	1:Extremely frequent 2:Very frequent 3:Frequent 4:Slightly frequent 5:Intermediate 6:Slightly rare 7:Rare 8:Very rare 9:Extremely rare		Frequency of bulb skin cracking at harvest time
25	Clove skin color	10 bulbs	Observation	1:White 2:Light pink 3:Light red 4:Light brown 5:Red 6:Crimson 7:Red purple		Clove skin color of stored bulb
26	Intensity of clove skin color	10 bulbs	Observation	1:Extremely week 2:Very week 3:Week 4:Slightly week 5:Intermediate 6:Slightly strong 7:Strong 8:Very strong 9:Extremely strong		Intensity of clove skin color of stored bulb
27	Anthocyanin stripes on clove skin	10 bulbs	Observation	0:Absent 9:Present		Anthocyanin stripes on clove skin of stored bulb
28	Clove shape	10 bulbs	Observation	3:Slim-round 5:Flat 7:Thick-round		Shape of primary clove at harvest time
29	Dividing bulb into cloves	10 bulbs	Observation	1:Extremely easy 2:Very easy 3:Easy 4:Slightly easy 5:Intermediate 6:Slightly hard 7:Hard 8:Very hard 9:Extremely hard		Easiness of dividing stored bulb into cloves
30	Clove firmness	10 bulbs	Sensory	1:Extremely tender 2:Very tender 3:Tender 4:Slightly tender 5:Intermediate 6:Slightly tough 7:Tough 8:Very tough 9:Extremely tough		Bite at harvest time
31	Clove color of flesh	10 bulbs	Observation	1:White 2:Yellowish		Clove color of flesh of stored bulb
32	Number of bulbils	10 plants	Observation	1:Extremely few 3:Few 5:Intermediate 7:Many 9:Extremely many		Number of bulbils per flower stalk. Extremely few:<=3, few:4-9, intermediate:10-24, many:25-34, extremely many:>=35
33	Flower stalk length	10 plants	Measurement	cm (integer)		Length of flower stalk. Very short:<=29 cm, short:30-69 cm, intermediate:70-90 cm, long:91-110 cm, extremely long:>=111 cm

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34	Flower stalk diameter	10 plants	Measurement	mm (round to the 1st decimal place)		Diameter of flower stalk at harvest time or at the ending time of elongation
35	Curvature of flowering stem	10 plants	Observation	0:Absent 1:Minimal 3:Minor 5:Intermediate 7:Major 9:Maximal		Degree of curvature of flowering stem
36	Harvest time	10 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		When 30-80% of leaves were dead

Plant	Garlic	447	Secondary essential character		
No	Characters	No. of samples	Methods	Rank or measurement unit	Remarks
1	Resistance to fusarium basal rot	10 plants	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	Evaluated by the degree of fusarium basal rot injury during storage

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1	Sprouting habit	10 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		Earliness of the sprouting time
2	Storage ability	10 bulbs	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		Evaluated by with a ratio of healthy bulb after storage
3	Resistance to virus	10 plants	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		Evaluated by degree of virus infection at growing stage under natural condition
4	Resistance to bulb mite	10 plants	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		Evaluated by degree of bulb mite injury at growing stage and during storage under natural condition
5	Tolerance to cold	10 plants	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		Evaluated by the degree of withering and growth retardation during winter
6	Tolerance to excess soil moisture	10 plants	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		Tolerance to excess soil moisture at growing stage

Plant	Garlic		447	Tertiary essential character	
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1	Bulb weight	10 bulbs	Measurement	g (round to the 1st decimal place)	Weight of bulb at harvest time



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1	Bulb pungency	10 cloves	Sensory	1:Extremely mild 2:Very mild 3:Mild 4:Slightly mild 5:Intermediate 6:Slightly strong 7:Strong 8:Very strong 9:Extremely strong		Evaluated by using of dilution series of clove juice
2	Bulb odour	10 cloves	Sensory	1:Extremely mild 2:Very mild 3:Mild 4:Slightly mild 5:Intermediate 6:Slightly strong 7:Strong 8:Very strong 9:Extremely strong		Evaluated by using dilution series of clove juice
3	Dry matter content of clove	About 20 g	Measurement	% (integer)		Measure water content
4	Sucrose content	About 30 g	Measurement	% (round to the 2nd decimal place)		Measure after freeze drying (Expressed as % per fresh weight)
5	Glucose content	About 30 g	Measurement	% (round to the 2nd decimal place)		Measure after freeze drying (Expressed as % per fresh weight)
6	Fructose content	About 30 g	Measurement	% (round to the 2nd decimal place)		Measure after freeze drying (Expressed as % per fresh weight)
7	Total free sugar content	About 30 g	Measurement	% (round to the 2nd decimal place)		Total of sucrose, glucose and fructose contents (Expressed as % per fresh weight)
8	Citric acid content	About 30 g	Measurement	% (round to the 2nd decimal place)		Measure after freeze drying (Expressed as % per fresh weight)
9	Malic acid content	About 30 g	Measurement	% (round to the 2nd decimal place)		Measure after freeze drying (Expressed as % per fresh weight)
10	Total free organic acid content	About 30 g	Measurement	% (round to the 2nd decimal place)		Total of citric acid and malic acid contents (Expression as % per fresh weight)