Plant	Maize	462	Primary essential character

No	Characters	No. of samples	Methods	Rank or measurement unit	Remarks
1	Time of anthesis (50% of plants)	20 plants	Observation	date	Date when about 50% of plants are anthesis
2	Time of silk emergence (50% of plants)	20 plants	Observation	date	Date when about 50% of plants are silking
3	Plant height	10 plants	Measurement	cm (integer)	Length from the ground to the base of tassel on main stem after milk-ripe stage
4	Ear height	10 plants	Measurement	cm (integer)	Length from the ground to the node bearing the uppermost ear after milk-ripe stage
5	Stalk diameter	10 plants	Measurement	mm (integer)	Long diameter of the middle of the internode just below the node bearing the uppermost ear on main stem
6	Number of tillers	20 plants	Measurement	Number of tillers per plant (round to the 1st decimal place)	Number of tillers excluding main stem at maturity
7	Ear length	10 plants	Measurement	cm (round to the 1st decimal place)	Length from the base to the tip of ear
8	Ear diameter	10 plants	Measurement	cm (round to the 1st decimal place)	Diameter of the middle of ear
9	Number of kernel rows	10 plants	Measurement	Number of kernel rows (round to the 1st decimal place)	Number of kernel rows in the middle of ear
10	Main color of top of kernel	10 plants	Observation	0:Blue black 1:White 2:Yellowish white 3:Yellow 4:Yellow orange 5:Orange 6:Red orange 7:Red 8:Purple 9:Brownish	Main color of top of kernel at maturity
11	Color of dorsal side of kernel	10 plants	Observation	1:White 2:Yellow 3:Orange 4:Red 5:Purple 6:Mixed 7:Brown 9:Other	Color of dorsal side of kernel at maturity
12	Kernel texture	10 plants	Observation	0:Other 1:Dent 3:Semi-dent 5:Mixed 7:Semi-flint 9:Flint	Texture of dent or flint in kernel at maturity

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No	Characters	No. of samples	Methods	Rank or measurement unit	Remarks
1	Vigor in early stage	20 plants	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 observed at the stage of 6-10 leaves including semi-expanded leaves
2	Time of tasseling (50% of plants)	20 plants	Observation	date	Date when about 50% of plants are tasseling
3	Number of ears	10 plants	Measurement	Number/plant (round to the 1st decimal place)	Number of ears on main stem
4	Number of prop roots	20 plants	Observation	0:None 1:Almost none 2:Extremely few 3:Very few 4:Few 5:Intermediate 6:Slightly abundant 7:Abundant 8:Very abundant 9:Extremely abundant	Degree of development of prop roots on main stem
5	Leaf length	10 plants	Measurement	cm (integer)	Length of the leaf blade attached to the node just above the uppermost ear
6	Leaf width	10 plants	Measurement	cm (round to the 1st decimal place)	Width of the widest part of leaf blade attached to the node just above the uppermost ear
7	Number of leaves per plant	10 plants	Measurement	Number/plant (round to the 1st decimal place)	Number of leaves on main stem except cotyledon
8	Leaf position of ear	10 plants	Measurement	Leaf position (round to the 1st decimal place)	Leaf number from the firat leaf to the leaf attached to the node bearing the uppermost ear on main stem
9	Angle of upper leaves	20 plants	Observation	1:Extremely upright 2:Very upright 3:Upright 4:Slightly upright 5:Intermediate 6:Slightly dull 7:Dull 8:Very dull 9:Extremely dull	Angle between main stem and the leaf attached to the node just above the uppermost ear
10	Leaf color	20 plants	Observation	1:Extremely light green 2:Very light green 3:Light green 4:Slightly light green 5:Green 6:Slightly dark green 7:Dark green 8:Very dark green 9:Extremely dark green	Color of leaf blade attached to the node bearing the uppermost ear

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No	Characters	No. of samples	Methods	Rank or measurement unit	Remarks
11	Tassel length	10 plants	Measurement	cm (round to the 1st decimal place)	Length of main axis above lowest lateral branch (if it has no lateral branch, length above basal node)
12	Length of main axis of tassel	10 plants	Measurement	cm (round to the 1st decimal place)	Length of main axis above highest lateral branch
13	Angle of lateral branches of tassel	20 plants	Observation	1:Extremely upright 2:Very upright 3:Upright 4:Slightly upright 5:Intermediate 6:Slightly dull 7:Dull 8:Very dull 9:Extremely dull	Angle between main axis and lateral branches
14	Attitude of lateral branches of tassel	20 plants	Observation	1:Straight 3:Slightly recurved 5:Recurved 7:Strongly recurved 9:Very strongly recurved	Attitude of lateral branches
15	Length of lateral branch of tassel	10 plants	Measurement	cm (round to the 1st decimal place)	Length of the longest lateral branch
16	Number of primary lateral branches per tassel	10 plants	Measurement	Number/tassel (round to the 1st decimal place)	Number of primary rachis-branches on main stem
17	Anther color	20 plants	Observation	1:Green 2:Yellow 3:Pink 4:Red 5:Purple 9:Other	Anther color at flowering
18	Color of silks	20 plants	Observation	1:Green 2:Pink 3:Salmon pink 4:Red 5:Mixed 9:Other	Silk color at silking
19	Number of kernels per row	10 plants	Measurement	Number/kernel row (integer)	Number of kernels per row counted on representative two rows per ear
20	Weight of ear	10 plants	Measurement	g/ear (integer)	Weight of an air-dried ear
21	Weight of 100 kernels	10 plants	Measurement	g (round to the 1st decimal place)	Weight of 100 kernels estimated with 2 replications by sampling 100 fully matured kernels after harvest and drying
22	Cob color	10 plants	Observation	1:White 2:Pink 3:Red 4:Light brown 5:Mixed 7:Purple 9:Other	Cob color after harvest

Plant	Maize	462	Primary optional character

No	Characters	No. of samples	Methods	Rank or measurement unit	Remarks
23	Length of ear shank	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 of shank bearing the uppermost ear on the main stem. Short:<=4 cm, intermediate:4-8 cm, long:>=8 cm
24	Angle of ear shank	20 plants	Observation	1:Very upward 3:Upward 4:Slightly upward 5:Medium 6:Slightly downward 7:Downward 9:Very downward	Angle that the ear shank makes with stalk on main stem at maturity
25	Kernel shape	10 plants	Observation	1:Extremely round 2:Very round 3:Round 4:Slightly round 5:Intermediate 6:Slightly wedged 7:Wedged 8:Very wedged 9:Extremely wedged	Shape of kernel observed by placing it on a flat plate at maturity
26	Seed coat color	10 plants	Observation	1:White 2:Red with white top 3:Yellowish brown 4:Bronze 5:Brown 6:Reddish 7:Pink 8:Spotted 9:Other	Color of kernel coat at maturity
27	Color of aleurone layer	10 plants	Observation	1:White 2:Pink 3:Yellowish brown 4:Brown 5:Bronzy 6:Red 7:Purple 8:Light purple 9:Other	Color of aleurone layer of kernel at maturity
28	Endosperm color	10 plants	Observation	1:White 2:Light yellow 3:Yellow 4:Orange 5:Dark orange 9:Other	Endosperm color of kernel at maturity

Plant	Maize	462	Secondary essential character

No	Characters	No. of samples	Methods	Rank or measurement unit	Remarks
1	Resistance to root lodging	20 plants	Obs.&Measr.	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 root lodging estimated by the ratio of plant roots lodged at harvest time under late and dense planting conditions or by the pulling resistance measured with an instrument
2	Resistance to stalk lodging	20 plants	Obs.&Measr.	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 stalk lodging estimated by the ratio of plants stalk-lodged at harvest time under late and dense planting or by the breaking stalk resistance measured with an instrument
3	Resistance to southern leaf blight	20 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	Resistance to Bipolaris maydis based on the infection index of Elliot and Jenkins by planting in the field infested artificially or naturally
4	Resistance to northern leaf blight	20 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	Resistance to Exserohilum turcicum based on the infection index of Elliot and Jenkins by planting in the field infested artificially or naturally

Plant	Maize	462	Secondary optional character

No	Characters	No. of samples	Methods	Rank or measurement unit	Remarks
1	Resistance to streaked dwarf blight	20 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	Resistance to rice black-streaked dwarf virus based on the infection by planting in the field infested artificially or naturally
2	Resistance to smut	20 plants	Obs.&Measr.	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 Ustilago maydis based on the ratio of infected plants when the infection is apparent
3	Resistance to sheath blight	20 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	Resistance to Rhizoctonia solani observed when the infection is apparent
4	Resistance to mosaic virus	20 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	Resistance to CMV or ScMV observed when the infection is apparent
5	Resistance to root rot	20 plants	Obs.&Measr.	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 Pythium graminicola or Pythium arrhenomanes based on the ratio of infected plants when the infection is apparent
6	Resistance to northern leaf spot	20 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	Resistance to Cochliobolus carbonum observed when the infection is apparent
7	Resistance to bacterial stripe	20 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	Resistance to Pseudomonas andropogonis observed when the infection is apparent
8	Resistance to common rust	20 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	Resistance to Puccinia sorghi observed when the infection is apparent
9	Resistance to southern rust	20 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	Resistance to Puccinia polysora observed when the infection is apparent
10	Resistance to Gibberella ear rot	20 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	Resistance to Gibberella ear rot observed on and after mid-dent stage

Plant	Maize	462	Secondary optional character

No	Characters	No. of samples	Methods	Rank or measurement unit	Remarks
11	Resistance to downy mildew	20 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	Resistance to Phytophthora macrospora observed when the infection is apparent
12	Resistance to anthracnose	20 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	Resistance to Colletotrichum graminicola observed when the infection is apparent
13	Resistance to brown stripe downy mildew	20 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	Resistance to Sclerophthora rayssiae observed when the damage is apparent
14	Resistance to oriental corn borer	20 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	Resistance to Ostrinia furnacalis observed when the damage is apparent
15	Resistance to armyworm, pink borer, etc.	20 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	Resistance to Mythimua separata, Sesamia inferens, etc. observed when the damage is apparent
16	Resistance to aphids	20 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	Resistance to aphids observed when the damage is apparent
17	Resistance to wallaby ear disease	20 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	Resistance to wallaby ear disease observed when the damage is apparent
18	Cold tolerance	20 plants	Obs.&Measr.	1:Extremely low 2:Very low 3:Low 4:Slightly low 5:Intermediate 6:Slightly high 7:High 8:Very high 9:Extremely high	Cold tolerance estimated by the effect of low temperature on plants in the field or in the chamber for chilling treatment
19	Wet endurance	20 plants	Obs.&Measr.	1:Extremely low 2:Very low 3:Low 4:Slightly low 5:Intermediate 6:Slightly high 7:High 8:Very high 9:Extremely high	Estimated by the effect of excessively wet condition on plants in the field or in the installation for wet treatment

Plant	Maize	462	Tertiary essential character

No	Characters	No. of samples	Methods	Rank or measurement unit	Remarks
1	Date of dent stage	20 plants	Observation	date	Date when starch of 75% of grains became too hard to be pressed out in most plants
2	Fresh forage yield	10 plants, 2 replications	Measurement	kg/a (integer)	Fresh yield of leaves and stems including shanks and husks harvested from an area of more than 2.5 square meters at yellow-ripe stage
3	Fresh ear yield	10 plants, 2 replications	Measurement	kg/a (integer)	Fresh yield of ear measured, excluding shanks and husks when fresh forage yield was measured
4	Total fresh yield	10 plants, 2 replications	Calculation	kg/a (integer)	Total yield of fresh forage and ear
5	Dry matter ratio of forage	10 plants, 2 replications	Measurement	% (round to the 1st decimal place)	Dry matter ratio of forage measured by sampling more than 1 kg of fresh forage cut into pieces from more than 5 plants, and drying at 70 centi degrees for 48 hours
6	Dry matter yield of forage	10 plants, 2 replications	Calculation	kg/a (round to the 1st decimal place)	Dry matter yield of forage calculated by fresh forage yield x dry matter rate of forage/100
7	Dry matter ratio of ears	10 plants, 2 replications	Measurement	% (round to the 1st decimal place)	Dry matter ratio of fresh ears measured by sampling more than 1 kg of fresh ears cut into pieces from more than 5 plants, and drying at 70 centi degrees for 48 hours
8	Dry matter yield of ears	10 plants, 2 replications	Calculation	kg/a (round to the 1st decimal place)	Dry matter yield of ears calculated by fresh ear yield x dry matter ratio of ear / 100
9	Total dry matter yield	10 plants, 2 replications	Calculation	kg/a (round to the 1st decimal place)	Dry matter yield of forage and ear

Plant	Maize	462	Tertiary optional character

No	Characters	No. of samples	Methods	Rank or measurement unit	Remarks
1	Dry matter yield of grains	10 plants, 2 replications	Measurement	kg/a (integer)	Dry matter yield of shelled grain measured by sampling from more than 10 plants, and drying at 70 centi degrees for 48 hours
2	Sugar content of stem	10 plants, 2 replications	Measurement	% (round to the 1st decimal place)	Brix of sap of internodes near the node bearing the uppermost ear at yellow-ripe stage
3	Dry matter digestibility	2 replications	Measurement	% (round to the 1st decimal place)	Ratio of digestible dry matter estimated by in vivo test or in vitro enzyme method or near infrared spectroscopy (NIRS)
4	Crude protein content	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)
5	Acid detergent fiber(ADF)	2 replications	Measurement	% (round to the 1st decimal place)	Ratio of ADF content on dry matter base analyzed by acid detergent-acetone washing
6	Acid detergent lignin (ADL)	2 replications	Measurement	% (round to the 1st decimal place)	Ratio of ADL content on dry matter base analyzed by acid detergent-acetone washing
7	Neutral detergent fiber (NDF)	2 replications	Measurement	% (round to the 1st decimal place)	Ratio of NDF content on dry matter base analyzed by neutral detergent-acetone washing
8	Organic cellular contents (OCC) of stover	2 replications	Measurement	% (round to the 1st decimal place)	Organic cellular contents (OCC) of stover analyzed by enzymatic method or near infrared spectroscopy (NIRS)
9	Organic cell wall (OCW) of stover	2 replications	Measurement	% (round to the 1st decimal place)	Organic cell wall (OCW) of stover analyzed by enzymatic method or near infrared spectroscopy (NIRS)
10	Organic b fraction in cell wall (Ob) of stover	2 replications	Measurement	% (round to the 1st decimal place)	Organic b fraction in cell wall (Ob) of stover analyzed by enzymatic method or near infrared spectroscopy (NIRS)

Plant	Maize	462	Tertiary optional character

No	Characters	No. of samples	Methods	Rank or measurement unit	Remarks
11	Mono and oligosaccharides	2 replications	Measurement	% (round to the 1st decimal place)	Ratio of mono-and oligosaccharide content on dry matter base analyzed by thin layer chromatography after ethanol extraction
12	Hydrocyanic acid	2 replications	Measurement	ppm (round to the 1st decimal place)	Hydrocyanic acid content on dry matter base analyzed by colorimetric analysis with alkali picrate solution
13	Nitrate nitrogen	2 replications	Measurement	ppm (round to the 1st decimal place)	Nitrate nitrogen content on dry matter base analyzed by phenol di-sulfuric acid method
14	Occurrence of sterility in dense planting	10 plants, 2 replications	Obs.&Measr.	0:None 1:Extremely rare 2:Very rare 3:Rare 4:Slightly rare 5:Intermediate 6:Slightly frequent 7:Frequent 8:Very frequent 9:Extremely frequent	Degree of occurrence of sterile ears under dense planting conditions