

Supplementary Table 2. Investigation standards and measurement methods for quantitative agronomic traits of oat germplasms (*Avena sativa* L.).

No.	Category	Trait	Unit	Investigation standard	Sampling scale ^z	Investigation method ^y	Growth stage (Zadoks stage) ^x
1	Plant	First heading date	Days	The day when the first panicle emerged in a plot.	WP	VG	47-51
2	Plant	Heading date	Days	The day when 40% of total panicles have emerged.	WP	VG	54-55
3	Plant	Maturity date	Days	The day when most panicles turn yellow.	WP	VG	92
4	Plant	Height	cm	Distance from culm base to the panicle tip.	SP	MS	54-59
5	Flag leaf	Blade length	cm	Measured as the distance from the ligule to the tip of the flag leaf blade immediately after heading.	SP	MS	54-59
6	Flag leaf	Blade width	cm	Measured at the widest part of the flag leaf blade immediately after heading.	SP	MS	54-59
7	Panicle	Panicle Length	cm	Distance from the uppermost node to the tip of the panicle excluding awn.	SP	MS	54-59
8	Panicle	Panicle Density	cm/node	The ratio of panicle length to the number of rachis nodes. Total rachis length (cm) / The number of rachis nodes.	SP	MS	92
9	Grain	Thousand grain weight	g	Measured using dehulled grains and calculated as the total grain weight (g) per panicle divided by the total number of grains per panicle, multiplied by 1,000.	SP	MS	92
10	Grain	Lemma length	cm	Measured from the point of attachment to the rachilla to the lemma apex excluding the awn using a digital caliper on intact grains.	SP	MS	92
11	Grain	Lemma width	cm	Measured as the maximum width across the lemma using a digital caliper on intact grains.	SP	MS	92

^zSampling scale refers to the spatial unit of data collection. WP, Whole plot: for collecting overall environmental or yield data; SP, Sample plants: for detailed, individual plant growth characteristic measurements.

^yInvestigation method refers to the approach used for phenotypic evaluation. VG, Visual assessment of a group of plants; MS, Measurement of individual plants.

^xGrowth stages were described according to the decimal code of Zadoks et al. (1974).