

Supplementary Table 1. Investigation standards and measurement methods for qualitative agronomic traits of oat germplasms (*Avena sativa* L.).

No.	Trait Category	Trait Name	Investigation standard	Unit	Sampling scale ^z	Investigation method ^y	Growth stage (Zadoks stage) ^x	Note
1	Plant	Growth habit	Erect	1	WP	VG	25-29	Evaluated visually by observing the posture of leaves and tillers.
			Semi-erect	3				
			Intermediate	5				
			Semi-prostrate	7				
			Prostrate	9				
2	Plant	Frequency of plants with recurved flag leaves	Absent or very low	1	WP	VG	47-51	Observed when awn tips begin to appear.
			Low	3				
			Medium	5				
			High	7				
			Very high	9				
3	Flag leaf	Sheath waxy bloom	Absent or very low	1	WP	VG	54-55	
			Low	3				
			Medium	5				
			High	7				
			Very high	9				
4	Panicle	Panicle Shape	Unilateral panicle	1	WP	VG	64-69	
			Semi-unilateral panicle	2				
			Scattered panicle	3				
			Compact panicle	4				
5	Panicle	Attitude of branches	Erect	1	WP	VG	64-69	Evaluated at flowering stage.
			Semi-erect	3				
			Horizontal	5				
			Semi-drooping	7				
			Drooping	9				
6	Panicle	Degree of seed shattering	Easy	1	SP	VS	92	Evaluated at flowering stage. Easy (>90%), Intermediate (60-89%), Difficult (<59%)
			Intermediate	5				
			Difficult	9				
7	Grain	Lemma color	White	1	SP	VS	92	
			Pale yellow	2				
			Yellow	3				
			Brown	5				
			Gray	7				

^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; VS, Visual assessment of individual plants.

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