

Appendix A Numerical representation of morphological or physiological traits of RIL population in this study

Trait	Numerical values					
	1	2	3	4	5	6
EL (cm)	EL≤12	12<EL≤14	14<EL≤16	16<EL≤18	18<ASI≤20	EL>20
KT (description)	Flint	Flint-like	Intermediate	Dent-like	Dent	
ED (cm)	ED≤3	3<ED≤3.5	3.5<ED≤4	4<ED≤4.5	4.5<ED≤5	ED>5
HKW (g)	HKW≤10	10<HKW≤15	15<HKW≤20	20<HKW≤25	25<HKW≤30	HKW>30
EH (cm)	EH≤65	65<EH≤75	75<EH≤85	85<EH≤95	95<EH≤105	105>22
RKN (average)	RKN≤20	20<RKN≤25	25<RKN≤30	30<RKN≤35	35<RKN≤40	RKN>40
ASI (day)	ASI≤2	2<ASI≤3	3<ASI≤4	4<ASI≤5	5<ASI≤6	ASI>6
ES (description)	long cylindrical	long conical	Medium cylindrical	Short cylindrical	Short conical	
KRN (average)	12<KRN≤14	14<KRN≤16	16<KRN≤18	18<KRN≤20	20<KRN≤22	KRN>22
LA (du)	LA≤25	25<LA≤30	30<LA≤35	35<LA≤40	40<LA≤45	LA>45
PH (cm)	PH≤140	140<PH≤160	160<PH≤180	180<PH≤200	200<PH≤220	PH>220
TNB(description)	Absent	Very few	Few	Medium	Many	Very many
DZZ(description)	Absent	Very slight	Medium	Strong		
LW (cm)	LW≤4	4<LW≤4.5	4.5<LW≤5	5<LW≤5.5	5.5<LW≤6	LW>6
KRO (%)	KRO≤75	75<KRO≤80	80<KRO≤85	85<KRO≤90	90<KRO≤95	KRO>95
AB (description)	Straight	Slightly recurved	Recurved	Strongly recurved	Very strong recurved	
HER (%)	HER≤30	30<HER≤35	35<HER≤40	40<HER≤45	45<HER≤50	HER>50