

**Supplemental Table 1. Genetic diversity of the three subgroups**

Group	No. of varieties	No. of alleles	Average No. of alleles per locus	Genetic diversity	PIC
G1	62	1720	4.6	0.44	0.41
G2	66	2543	6.9	0.6	0.56
G3	66	2151	5.8	0.49	0.46
Total	194	6414	17.3	1.54	1.43

**Supplemental Table 2. Percentage of symptomatic spikelets of the accession in G1**

ACC.	PSS	Origin	Pedigree
JG 1	9.6	China	Unknown pedigree
Ning7840	11.8	China	Aurora/Anhui 11//Sumai 3
Fu5114	13.4	China	LongXi 18/(Aurora/Anhui11//Sumai 3)
F60096	18.9	China	Jingzhou 1/Sumai 2
Su49	21.5	China	N7922/(Aurora/Anhui 11//Sumai 3)
Sumai3	21.5	China	Funo/Taiwanxiaomai
Sumai2	22.3	China	Funo relative
Suyang7-2	22.8	China	Funo relative
ND2419	24.9	China	Selection of Mentana
QIAOMAIXIAOMA	25.8	China	Landrace
Xiangmai12	27.4	China	Mexico120/Dali63//Wanya3
Zhen 7495	27.6	China	Unknown pedigree
Sumai1	28.2	China	Funo relative
F5125	28.3	China	Unknown pedigree
Fumai3	29.4	China	Orofen/Funo
Emai6	29.6	China	Selection from radiated Nanda 2419
Qunzhong10	36.8	China	Funo relative
Youyimai	36.8	China	Unknown pedigree
Xiangmai10	37.7	China	Funo relative
Wumai1	38.7	China	Funo relative
Wannian 2	39.0	China	Selection of Mentana
Hubei 48130	40.7	China	Unknown pedigree
Ai73	41.1	China	Funo relative
Fumai3-1	44.0	China	Orofen/Funo
Dsuma i3	44.1	China	Damuzhiai/Sumai 3*22 (carrying Rht3)
Ning 8319	45.1	China	Unknown pedigree
Huai69-6	46.0	China	Funo relative
Zhongshan11	46.1	China	Funo relative
Jingguangmai	47.2	China	Funo relative
Huamai7	50.2	China	Funo relative
Jiangdu 1	51.1	China	Funo relative
Ninjing 6935-8	52.0	China	Unknown pedigree
Yixi4	52.0	China	Funo relative
Yangmai1	52.8	China	Selection from Funo
Yangmai5	56.2	China	916//ST1472/506
Yunmai35	58.9	China	Funo relative
Wanya2	59.4	China	Funo relative
Xiangmai11	59.8	China	Funo relative
Maoyingafu2	60.0	China	Funo relative
Yangmai2	61.9	China	Unknown pedigree
Xiangmai8	63.2	China	Funo relative
Qianjiang1	65.1	China	Funo relative
Yunmai25	65.9	China	Selected from Yunmai5
Zhemai6	67.0	China	Funo relative
Linnong12	67.4	China	Funo relative
Xuan7	67.7	China	Funo relative
Yunmai27	72.8	China	Unknown pedigree
Fengmai2	76.1	China	Fengxiang//Funo//Yumai4
Jingzhou 1	76.7	China	Unknown pedigree
Yangmai3	77.6	China	Selection from Yangmai 1
Yangmai4	78.0	China	Funo relative
Xiannong68	78.4	China	Selected from Xiannong4
Luohan 2	82.0	China	78(111)Ai/Jinmai33
Zhenmai17	87.4	China	Funo relative
Linnong14	89.1	China	Funo relative
Mengfeng8	89.8	China	Mengfeng7*Neimeng64
Huimaoafu	93.3	China	Funo relative
Sanshukomugi	31.9	Japan	Landrace
Funo	70.0	Italy	Duecentodieci/Demiano
Frontana	71.8	Brazil	Fronteira (=Polysu / Alfredo Chaves 6 - 21) / Mentana

**Supplemental Table 3. Percentage of symptomatic spikelets of the accessions in G2**

ACC.	PSS	Origin	Pedigree
TaFangShen	27.0	China	Landrace
HeimangDongMai	27.3	China	Landrace
PC-2	28.2	China	Unknown pedigree
Par-55	30.7	China	Unknown pedigree
Xiangnong3	31.6	China	Funo relative
Taiwan wheat	32.9	China	Landrace
JG 2	37.0	China	Unknown pedigree
Tawanhsiaomai	50.4	China	Landrace
Siyang117	50.6	China	Funo relative
JiangDongMen	52.5	China	Landrace
XingHuaBaiYuHua	56.3	China	Landrace
JG 3	56.4	China	Unknown pedigree
Wan7107	62.6	China	Selected from Nanyang
Mutangchiang	63.0	China	Landrace
Zhongliang11	66.4	China	Funo relative
Sanchahoh	69.8	China	Landrace
Fusuihuang	73.1	China	Landrace
Beiquan565	75.4	China	Unknown pedigree
Zhenghan 1	77.1	China	Selected from Nuohan
Hua 512	84.3	China	Selected from Huamai5
Wenmai 6	85.2	China	Selected from Yumai49
Jinmai 33	87.3	China	79391/7626
ND2928	13.9	USA	Ning 7840/ND706
Roane	19.3	USA	VA71-54-147(CI17449)/C68-15//IN65309C1-18-2-3-2 (formerly VA93-54-429)
Endurance	23.1	USA	HBV756A/ Siouxland//2180
Ernie	25.6	USA	Pike/3/Stoddard/Blueboy//Stoddard/D1707
Freedom	32.4	USA	GR876/OH217
Bess	36.8	USA	MO11769/Madison (formerly MO981020)
Atlas66	43.9	USA	Frondoso // Redhart 3 / Noll 28
Jerry	46.6	USA	Roughrider//Winoka/NB66425/3/Arapahoe
Branson	49.3	USA	Pio2737W/891-4584A (Pike/FL302) (formerly M00-3701)
Fuller	50.3	USA	Unknown, Jagger related
Century	51.4	USA	Payne//TAM W-101/Amigo
Wesley	54.9	USA	Plainsman V / Odesskaya 51 // Colt / Cody
Centerfield	56.9	USA	(TXGH12588-105*4/FS4)/2*2174
Clark	62.5	USA	Beau//65256A1-8-1/67137B5-16/Sullivan/Beau//5517B8-5-3-3/Logan
Antelope	66.7	USA	Pronghorn/Arlin
TAM110	68.2	USA	(TAM 105*4/Amigo)*5//Largo
chisholm	70.0	USA	Sturdy sib/Nicoma
Scout66	73.0	USA	composite of 85 selections from Scout
TAM107	73.3	USA	TAM105*4/Amigo
Deliver	77.2	USA	Yantar/2*Chisholm//Karl
Overley	78.5	USA	TAM-107 *3/ TA 2460/ Heyne 'S'// Jagger
Trego	81.6	USA	KS87H325/Rio Blanco
T158	84.6	USA	KS93U206/ 2*T81
Duster	91.5	USA	W0405D/NE78488//W7469C/TX81V6187
Wheaton	91.9	USA	Crim(CI13465)/2*(CI13986)Era//Buitre/Gallo
Guymon	94.5	USA	Intrada/W189-163W
Vilela Sol	47.5	Argentina	Unknown pedigree
111.92	58.8	Argentina	Unknown pedigree
Coop Capoido	79.3	Argentina	Unknown pedigree
Coop Millan	84.5	Argentina	Unknown pedigree
Livius	53.4	Austria	Karat/Lentia
Martin	42.6	Austria	Unknown pedigree
Toropi	51.3	Brazil	Petiblanco 8//Frontana1971-37//Quaderna A
Encruzilhada	44.1	Brazil	Fortaleza/ Kenya Farmer
Klein Atlas	43.8	CIMMYT	Klein Lucero/Klein 157//Klein Rendidor
Las Rosas Inta	80.6	CIMMYT	Unknown pedigree
Poncheau	77.6	France	Landrace
ABURA	21.2	Japan	Landrace
SapporoHaruKomugiJugo	21.7	Japan	Landrace
Aurora (ABPOPA)	85.2	Russia	Unknown pedigree
Suwon 92	36.7	South Korea	Landrace
Chokwang	58.4	South Korea	Landrace
Kharkof	64.7	Ukraine	Collected in: Kharkiv, Ukraine
FK17	16.2	United Kindom	Unknown pedigree

**Supplemental Table 4. Percentage of symptomatic spikelets of the accessions in G3**

ACC.	PSS	Origin	Pedigree
Huangcandou	10.1	China	Landrace
HuangFangZhu	11.2	China	Landrace
QiangShuiHuang	12.2	China	Landrace
MeiQianWu	12.6	China	Landrace
LingHaiMaoYang Mo	13.5	China	Landrace
WSB	13.6	China	Landrace
Hongjianzi	14.4	China	Landrace
Caizihuang	14.5	China	Landrace
HuiShanYangMai	14.7	China	Landrace
Baisanyuehuang	14.8	China	Landrace
ShuiLiZhan	16.9	China	Landrace
Huochaobairimai	17.0	China	Landrace
Haiyanzhong	17.9	China	Landrace
Xueliqing	18.6	China	Landrace
CanLaoMai	25.0	China	Landrace
Dafanliuzhu	26.4	China	Landrace
FSW	26.9	China	Landrace
ShanghaiCaiZiHuang	31.8	China	Landrace
YangLaZi	32.5	China	Landrace
WZHHS	35.1	China	Landrace
Sanyuehuang	48.0	China	Landrace
LiangGuangTou	49.0	China	Landrace
Y155	50.0	China	Landrace
Heshangmai	50.3	China	Landrace
Dahongpao	55.1	China	Landrace
HongMangMai	57.2	China	Landrace
DaBaiPao	62.4	China	Landrace
FangTouHongMang	62.5	China	Landrace
DaHuangPi	62.6	China	Landrace
YouBaoMai	67.0	China	Landrace
SanYueHuang	69.9	China	Landrace
FangTouBaiMang	70.0	China	Landrace
PaiMaiTze	73.8	China	Landrace
ChuShanBao	74.1	China	Landrace
NTDHP	77.3	China	Landrace
HongMongBai	78.4	China	Landrace
Chinese Spring	82.0	China	Landrace
HongHuaWu	86.3	China	Landrace
YouZiMai	87.7	China	Landrace
Huochaomai	95.3	China	Landrace
Anxuan2	67.9	China	Funo relative
NyuBai	6.6	Japan	Landrace
NobeokaBozu	7.3	Japan	Landrace
ASOZAIIRIII	9.0	Japan	JGB99-16, accession no. 23524, unknown pedigree
MINAMIKYUSHU 69	11.8	Japan	Landrace
AsoZairai(YuubouKappu)	12.9	Japan	Landrace
TOKAI66	13.2	Japan	Landrace
SHOUKOMUGI II	13.8	Japan	JGB99-61, accession no. 23653, unknown pedigree
NYUUBAI	15.5	Japan	JGB99-36, accession no. 22957, unknown pedigree
SOBAKOMUGI 1C	19.7	Japan	Landrace
SOBAKOMUGI 1B	20.0	Japan	Landrace
ASOTOMEA	20.6	Japan	Landrace
KIKUCHI	21.4	Japan	JGB99-28, accession no. 23546, unknown pedigree
ITOUKOMUGI	21.7	Japan	JGB99-23, accession no. 23647, unknown pedigree
ABURAKOMUGI	22.6	Japan	Landrace
KAGOSHIMA	26.4	Japan	Landrace
SHIRONANKIN	27.5	Japan	JGB99-58, accession no. 23277, unknown pedigree
NobeokabozuKomugi	29.8	Japan	Landrace
SOTOME	33.1	Japan	Landrace
Shinchunaga	45.3	Japan	selection from landrace Nakanaga
ZAIRAIYUUBOU	47.6	Japan	Landrace
Shirasaya No.1	53.1	Japan	Landrace
Shanasui	64.3	Japan	Landrace
CHILE	69.8	Japan	Chili
Sanshukomugi	76.2	Japan	Landrace
Chukoku 81	37.3	South Korea	Landrace

Supplemental Table 5. All the markers significant in single experiments

Marker	Chr.	2011		2012		2013	
		<i>p</i> value	<i>R</i> <sup>2</sup>	<i>p</i> value	<i>R</i> <sup>2</sup>	<i>p</i> value	<i>R</i> <sup>2</sup>
<i>Xwmc93</i>	1A	0.0432	0.0774				
<i>Xgwm11</i>	1B	0.0099	0.1177				
<i>Xbarc80</i>	1B			0.0464	0.0989		
<i>Xcfa2263</i>	2A	0.0311	0.1221	0.0038	0.158		
<i>Xgwm249</i>	2A	<b>0.0265</b>	<b>0.0679</b>	<b>0.0237</b>	<b>0.069</b>		
<i>Xgwm95</i>	2A	0.0395	0.0947				
<i>Xgwm275</i>	2A			<b>0.0356</b>	<b>0.0959</b>	<b>0.024</b>	<b>0.125</b>
<i>Xwmc296</i>	2AS	0.0441	0.1079				
<i>Xgwm526</i>	2B	0.02	0.0624				
<i>Xwmc332</i>	2B			0.0334	0.1423		
<i>Xgwm261</i>	2D	<b>0.0228</b>	<b>0.1511</b>	<b>0.0117</b>	<b>0.1634</b>	<b>0.0113</b>	<b>0.163</b>
<i>Xgwm320</i>	2D	0.0357	0.0722				
<i>Xgdm35</i>	2DS			0.0073	0.1723		
<i>Xbarc19</i>	3A	0.0227	0.07				
<i>Xgwm533</i>	3B	<b>0.003</b>	<b>0.1077</b>	<b>0.0452</b>	<b>0.0682</b>	<b>0.0104</b>	<b>0.089</b>
<i>Xbarc147</i>	3B	0.0012	0.1698			0.0243	0.117
<i>Xsr2</i>	3B	0.0316	0.1369				
<i>Xbarc133</i>	3B	<b>0.0218</b>	<b>0.1047</b>	<b>0.0491</b>	<b>0.0903</b>	<b>0.0086</b>	<b>0.118</b>
<i>Xgwm493</i>	3B			0.0443	0.1292		
<i>Xbarc77</i>	3B			0.0437	0.1367		
<i>Xgwm285</i>	3B			0.0452	0.136		
<i>Xwmc274</i>	3B			0.0483	0.0319		
<i>Xwmc757</i>	4A					0.0114	0.163
<i>Xgwm160</i>	4AL	<b>0.0323</b>	<b>0.0902</b>	<b>0.0001</b>	<b>0.1718</b>	<b>0.0067</b>	<b>0.113</b>
<i>Rht1,short</i>	4B			0.0305	0.0246		
<i>Xssr3B</i>	4D	0.0216	0.0408				
<i>Xups4</i>	4D	0.0393	0.0869				
<i>Xwmc705</i>	5A	0.0116	0.1646				
<i>Xbarc56</i>	5A			0.0172	0.0639		
<i>Xgwm304</i>	5A			0.025	0.1331		
<i>Xbarc117</i>	5A			0.0166	0.0644		
<i>Xbarc186</i>	5A			0.0019	0.1028		
<i>Xgwm212</i>	5D	0.0128	0.0871				
<i>Xgwm88</i>	6B			0.0008	0.1941		
<i>Xwmc397</i>	6B			0.0294	0.0911		
<i>Xgwm469</i>	6D	0.0356	0.127				
<i>Xgwm276</i>	7A	<b>0.0163</b>	<b>0.1578</b>			<b>0.0242</b>	<b>0.125</b>
<i>Xcfa2240</i>	7A			0.0041	0.0926		
<i>Xcfa2240.2</i>	7A			0.0053	0.0558		
<i>Xgwm60</i>	7AS	0.0396	0.1099				
<i>Xwmc364</i>	7B	0.0307	0.1375				
<i>Xwmc273</i>	7A,7B,7D	<b>0.0013</b>	<b>0.1303</b>	<b>0.0049</b>	<b>0.1097</b>	<b>0.0041</b>	<b>0.112</b>
<i>Xcfa2134</i>	3AL,3BL			0.0227	0.1502		
<i>Xbarc197</i>	3A,5A	0.045	0.1297				
<i>Xbarc173</i>	3B,6D	0.0415	0.086				
<i>Xgdm138</i>	5B,5D						
<i>Xbarc154</i>	7A,7D			0.0049	0.0902	0.0186	0.089
<i>Xcfa2040</i>	1D,2D,7A,7B,7D			<b>0.0245</b>	<b>0.1022</b>	<b>0.0293</b>	<b>0.098</b>
<i>Xcfa2170</i>	1D,3A,3B	0.0304	0.107				
<i>Xbarc169</i>	1D,6A,6B			0.0466	0.0421		
<i>Xwmc150</i>	2A,3A,5A,5D,6A,7D	0.0374	0.0715	0.0072	0.0949		
<i>Xbarc70</i>	4A,7A,7D			0.0423	0.0693		
<i>Xwmc47</i>	4B,5A,5B	<b>0.009</b>	<b>0.0922</b>	<b>0.0155</b>	<b>0.0839</b>	<b>0.0194</b>	<b>0.08</b>
<i>Xwmc173</i>	1D,3A,4AS,5A	0.0126	0.0874				
<i>Xbarc10.2</i>	2B,4B,5A,7B			0.0372	0.054		