



2. Response of generations of Cheng-Tu-232/Xue-He-Ai-Zao to GA<sub>3</sub>. P<sub>1</sub>= Cheng-Tu-232, P<sub>2</sub>= Xue-He-Ai-Zao, F<sub>1</sub>= P<sub>1</sub>/P<sub>2</sub>, DW= dwarf.

were insensitive, at a 3:1 ratio (9 *Sd*<sub>1</sub>-*Sd*<sub>8</sub>:3 *sd*<sub>1</sub>*sd*<sub>1</sub>*Sd*<sub>8</sub>:3 *Sd*<sub>1</sub>-*sd*<sub>8</sub>*sd*<sub>8</sub>:1 *sd*<sub>1</sub>*sd*<sub>1</sub>*sd*<sub>1</sub>*sd*<sub>8</sub>). The F<sub>2</sub> of Xue-He-Ai-Zao/Xue-4 did not segregate and was insensitive.

Dwarf plants (height less than 40 cm),

probably having both *sd* genes, were found in the F<sub>2</sub> of every combination (Fig. 2). Response of the dwarfs was similar to that of Xue-He-Ai-Zao.

## Breeding methods

### A high-yielding early hybrid rice with multiple resistance

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Wei-you 481 is a newly released early indica hybrid of V20A/Qian-hui 481.

Qian-hui 481 is an isocyttoplasmic R-line derived from Zhen Xian 97A/Tai Yin 1//Xiankengnuo///Gui 6/IR26///IR24/Liuganjianye (an indica/japonica combination). Indica varieties Tai Yin 1 and IR26 have bacterial blight (BB) resistance and IR24 and IR26 have blast (B1) resistance in Guizhou. Japonica varieties Liuganjianye and Xiankengnuo (a

Table 1. Some agronomic characteristics<sup>a</sup> of Wei-you 481, Guizhou, China.

Variety	Duration (d)	Plant ht (cm)	Panicles (no./m <sup>2</sup> )	Grains (no./panicle)	1,000-grain wt (g)	Seed set (%)	Yield (t/ha)	Yield/d (kg/ha)
Wei-you 481	162	88.5	342.0	118.2	27.0	78.2	8.4	52.2
Wei-you 64	153	76.7	394.5	108.5	28.4	77.5	7.7	51.1

<sup>a</sup> Mean of 4 sites (1100-1500 m above sea level) in the regional trials of hybrid rice in Guizhou Province, 1987.

Table 2. Reaction<sup>a</sup> of Wei-you 481 to B1, BB, and cold, Guizhou, China, 1987.

Variety	Reaction to B1		Reaction to BB	Reaction to cold	
	Leaf B1	Neck B1		Seedling stage	Flowering stage <sup>b</sup>
Wei-you 481	2.0	1.5	3.0	3.0	++
wei-you 64	4.5	5.0	7.0	7.0	+

<sup>a</sup> Mean of 4 test sites in Guizhou Province. Scoring according to Standard evaluation system for rice scale: 0-9. <sup>b</sup> ++ = moderate cold resistance, ++ = strong cold resistance.

Guizhou indigenous variety) have strong cold tolerance.

Wei-you 481 performed well in 1988 regional trials for single, mid-season rice cropping areas 1,100-1,500 m altitude in Guizhou Province. Average yields were 8.4 t/ha, 9% higher than that of popular hybrid rice Wei-you 64 (Table 1).

An outstanding characteristic of Wei-you 481 is its multiple resistances (Table 2). In artificial inoculation tests in 1988, it was resistant to 102 *Pyricularia oryzae* isolates belonging to 21 races. ■

### Effect of gibberellic acid on pathogen infection in hybrid rice seed

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Hybrid rice seed may be infected with glume spots caused by pathogens, primarily *Alternaria*, and kernel smut caused by *Tilletia barclayana*. Serious infection results in low seed viability.

We studied the effect of six levels of gibberellic acid (GA<sub>3</sub>) spray on incidence of glume spots and kernel smut on hybrid seed produced on CMS line V20A. The experiment was laid out in a randomized complete block design with three replications. Both glume spots and kernel smut incidence decreased with GA<sub>3</sub> application (see table). Application

Effect of GA<sub>3</sub> application on pathogen infection of hybrid rice seeds.<sup>a</sup> Hunan, China, 1988.

GA <sub>3</sub> level (g/ha)	Glume spot (%)	Kernel smut (%)
0	44.0 d	22.1 b
90	25.0 b	6.0 a
180	23.9 a	7.7 a
240	23.4 a	3.9 a
360	26.5 c	6.8 a
450	27.6 c	4.8 a

<sup>a</sup> In a column, mean followed by different letters are significantly different at the 5% level (DMRT).

level did not show significant differences in kernel smut incidence, but glume spots decreased up to 240 g GA<sub>3</sub>/ha. Higher application increased glume spot incidence. ■