REACTION OF RICE VARIETIES AND STRAINS TO BLAST IN THE UNIFORM BLAST NURSERY*

by

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INTRODUCTION

Rice blast is the most prevalent and destructive disease of rice in Taiwan, particulary in the first crop when the environmental conditions are favorable for its occurrence. The annual loss from this disease was estimated to be not less than 5% of the total production (Ou and Lin, 1959). The problem of effective control of the blast is, therefore, very important on this island. Chemical control of blast in rice is not only expensive but provides only temporary protection, even though it is widely practiced by farmers. The development of resistant varieties offers a more satisfactory and permanent solution to this problem.

Uniform blast nurseries have been grown annually in Taiwan since 1956 as a part of the breeding program for blast disease resistance in rice to facilitate the development of resistant varieties. Several District Agricultural Improvement Stations in the principal rice growing areas have participated in this cooperative program. The Chiayi Agricultural Experiment Station has been an active cooperator of this program since its implementation. In the nursery of this Station, severe natural epiphytotics of blast occurs every season. Hence, an intensive program for testing and breeding for blast resistance in rice has been carried out at this Station during the past decade. This report summarizes the data obtained at this Station during the 9-year period, 1956-1964.

MATERIALS AND METHODS

The materials grown in the uniform blast nursery each year were chosen by the cooperating plant breeders and plant pathologists of the participating stations. They included (1) commercial varieties of each district, (2) promising lines from crosses that were already or about to be included in the advanced yield trials of the stations, (3) varieties or selections found to be blast resistant at some of the stations, and (4) resistant materials newly introduced from foreign countries. In addition to the materials supplied by cooperators, check rows of the resistant

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variety Chianung 242 and of the susceptible varieties Taichung 65 and/or Kung-shan-wu-hsiang-ken were included. The number of entries in the nursery varied from 20 in 1957 to as many as 47 in 1964.

During the period of 1956–1962, each entry was planted in a 4-row plot with 19 hills in each row. The distance betweem rows was 25 cm while that of hills, 20 cm. Approximately 3 seedlings were planted in each hill. A total of 20 hills (5 per row) were selected from each plot for recording disease incidence. In 1963 and 1964 each entry was reduced to a 2-row plot with 7 hills for each row and reading was made on the 10 center hills. Susceptible varieties were interplanted among the test materials to insure a uniform spread of the disease. The experiment was arranged in randomized blocks with two to three replications.

The nursery was fertilized with 160–240 kg/ha of nitrogen in the form of ammonium sulphate, 40–50 kg/ha of P_2O_5 in the form of calcium superphosphate and 40–50 kg/ha of K_2O in the form of potassium sulphate to provide favorable conditions for blast development. In addition, the fields were frequently drained to induce heavy disease incidence. To further insure a sufficient supply of spores to start the disease, several rows of susceptible check varieties were planted arround the nursery.

Leaf blast susceptibility was graded several times with an interval of 10 days starting from 30 days after transplanting. The percentage of leaf surface covered by lesions was recorded (Table 1). For neck blast reaction, the rating of resistance is as follows: 0–10%, highly resistant (HR); 11–30%, resistant (R); 31–50%, moderately resistant (MR); 51–70%, moderately susceptible (MS); 71–90%, susceptible (S); 91–100%, highly susceptible (HS).

Table 1. Index and classification of leaf blast reaction.

% of diseased leaf area	0	0.2	0.5	1	2	5	11	25	55	80	100	120*
Index number	0	1	2	3	4	5	6	7	8	8.5	8.8	9
Class number	0	1		2		3		4			5	
Rating of resistance**	HR	R		MR		MS		S			HS	

* Complete killing of the leaves and with lesions extended to leaf sheaths.

** HR: Highly resistant, R: Resistant, MR: Moderately resistant
MS: Moderately susceptible, S: Susceptible, HS: Highly susceptible.

The uniform blast nursery was grown only in the first crop of each year, since the disease is more serious in this crop season. Climatic data related to the blast occurrence during the 9-year period covered by this report are presented in Table 2.

EXPERIMENTAL RESULTS

A total of 161 varieties and strains were tested for 1 to 9 years during the period of 1956 to 1964.. To shorten the table, entries with higher average infection for leaf blast than the resistant check variety, Chianung 242, are omitted, and only

Table 2. Climatic data recorded at the Chiayi Agricultural Experiment Station during the 9-year period, 1956–1964.

Year	Temperature (°C)						Relative humidity (%)						Rainfall (mm)					
	Jan.	Feb.	March	April	May	June	Jan.	Feb.	March	April	May	June	Jan.	Feb.	March	April	May	June
1956	16.4	17.4	21.4	26.5	29.8	31.0	79	80	74	66	81	64	79.7	41.9	24.2	0.6	76.6	372.2
1957	18.1	14.9	19.3	25.9	28.4	29.2	78	86	79	71	69	74	14.4	59.3	72.8	103.9	400.6	442.3
1958	17.7	17.0	23.0	27.2	29.6	29.8	77	77	68	64	67	69	38.2	45.3	95.3	8.4	162.1	188.2
1959	16.4	20.9	21.6	26.2	26.5	30.5	78	81	74	74	69	85	2.2	58.7	5.9	187.7	26.9	329.2
1960	18.2	18.9	24.9	24.8	28.3	30.5	75	72	67	75	64	90	7.0	1.8	28.4	95.7	127.1	376.5
1961	17.1	18.0	21.1	25.8	28.4	31.2	72	76	75	68	70	65	6.1	24.5	47.9	97.3	133.6	254.0
1962	15.5	19.5	19.8	23.8	29.9	31.4	71	75	73	75	67	68	14.2	23.9	91.2	33.3	16.0	338.8
1963	14.6	17.1	21.7	26.3	30.4	29.8	60	67	63	59	59	71	105.1	17.6	36.7	9.5	9.7	129.5
1964	17.8	16.9	20.2	28.0	28.8	29.5	81	80	74	66	75	71	106.4	5.0	14.0	7.8	231.0	303.3
Average	16.9	17.8	21.4	26.1	28.9	30.3	74.6	77.1	71.9	68.7	69.0	73.0	41.5	30.9	46.3	60.5	131.5	303.8

Table 3. Reaction of varieties and strains to blast in the uniform blast nursery of the Chiayi Agricultural Experiment Station, 1956–1964.

Variety or strain	Source	Parents	Years tested	Reaction to leaf blast		Reaction to neck blast	
				Average index number	Rating of resistance	Average percentage (%)	Rating of resistance
Kanto 51	Japan	—	1956–1959	0.5	HR	4.6	HR
Pi No. 1	Japan	—	1956–1959	1.0	R	75.5	S
CI 9155	USA	—	1956–1962	0.7	R	39.0	MR
Chianung 242*	Chiayi AES	(Hsinchu 4×Taichung 150)×(Taipei 7×Tainung 45)	1956–1964	3.4	MR	15.1	R
Chiaung-yu 280	Chiayi AES	(K_2×Tainung 45)×(Taichung-yu 12×Cheu-we-tze)	1956–1960	0.6	R	2.9	HR
C 111	Chiayi AES	Chianung-Yu 450×Chianung 242	1961	1.0	R	6.0	HR
C 113	Chiayi AES	Chianung-yu 450×Chianung 242	1960, 1962	2.0	R	17.2	R
C 115	Chiayi AES	Chianung-yu 450×Kaohsiung 27	1961–1962	1.5	R	2.0	HR
Taipei-yu 19	Taipei DAIS	Miaoli 37×Kwangfu 401	1962–1963	3.0	MR	1.0	HR
Taipei-yu 45	Taipei DAIS	Miaoli 37×Taipei 177	1962–1963	3.0	MR	5.5	HR
Taipei-yu 171	Taipei DAIS	Kanto 51×Taipei 127	1962	3.0	MR	—	—
Taichung native 1	Taichung DAIS	Tie-cha-o-chien×Tasi-yuan-chung	1959–1964	1.0	R	31.5	MR
Taichung 176	Taichung DAIS	Taichung 65×Cutsugulcle	1962	3.0	MR	—	—
Taichung 181	Taichung DAIS	Taichung 65×Kanto 55	1959–1962	0.7	R	6.0	HR
Taichung-yu 76	Taichung DAIS	Taichung 65×Kanto 55	1962	2.0	R	—	—
Taichung-yu 80	Taichung DAIS	Taichung 65×Kanto 55	1962	2.0	R	—	—
Taichung-yu 182	Taichung DAIS	Taichung 65×Kanto 55	1961–1962	1.5	R	4.0	HR
Taichung-yu 183	Taichung DAIS	Taichung 65×Kanto 55	1961–1962	2.0	R	4.0	HR
Taichung-chao-yu 50	Taichung DAIS	Taichung 65×Kanto 55	1962	3.0	MR	—	—
Taichung-si-pi 13	Taichung DAIS	Taichung 65×Cutsugulcle	1956	1.0	R	12.9	R

Taichung-si-pi 31	Taichung DAIS	Taichung glut. 46×Shinriki	1956	2.0	R	12.6	R
Taichung-si-pi 33	Taichung DAIS	Taichung glut. 46×Shinriki	1956–1959	3.0	MR	40.8	MR
Taichung-si-pi 47220	Taichung DAIS	Taichung 65×Kanto 55	1959–1962	1.0	R	32.0	MR
Taichung-si-pi 48212	Taichung DAIS	Taichung 65×Kanto 55	1960–1962	1.0	R	12.2	R
Taichung-si-pi 48213	Taichung DAIS	Taichung 65×Kanto 55	1960	1.0	R	8.5	HR
Taichung-si-pi 48214	Taichung DAIS	Taichung 65×Kanto 55	1960	1.0	R	12.5	R
Taichung-su 84	Taichung DAIS	Taichung 65×(Taichung 65×Cutsugulcle)	1963–1964	3.0	MR	7.8	HR
Kaohsiung 135	Kaohsiung DAIS	Kaohsiung 24×Lit-chi-hung	1960–1962	2.0	R	9.0	HR
Kaohsiung-si-pi 137	Kaohsiung DAIS	Kaohsinug 22×kwangfu 1	1961–1962	2.5	R	6.8	HR
Taitung-yu 73	Taitung DAIS	Kwangfu 1×Chianan 8	1962	3.0	MR	—	—
Taitung-yu 83	Taitung DAIS	(NC 4×Hung-chueh-chu)×Taichung 65	1961–1962	2.5	R	22.0	R
Taitung-yu 85	Taitung DAIS	(NC 4×Hung-chueh-chu)×Taichung 65	1962	3.0	MR	—	—
Pai-kan-tao	Miaoli	—	1956–1962	1.0	R	99.3	HS
Pai-mi-fen	Taiwan native	—	1956–1962	1.0	R	25.3	R
Wu-chien 2	Taiwan native	—	1956–1959	0.5	HR	9.4	HR
Kaohsiung-ta-li-chin-yu	Taiwan native	—	1956–1960	0.4	HR	20.9	R
I-kung-pao	Taiwan native	—	1956	0	HR	60.6	MS
Tsai-yuan-chung	Taiwan native	—	1956	0	HR	14.6	R
Bayaibatos	Taiwan mountain	—	1956–1959	1.8	R	20.3	R
Natabasme	Taiwan mountain	—	1956–1959	1.0	R	79.8	S
Taichung 65**	Taichung DAIS	Kameji×Shinriki	1956–1963	7.3	S	74.0	S
Kung-shan-wu-hsiang-ken**	China mainland	—	1964	8.8	HS	100	HS
Lomello**	Italy	—	1964	8.8	HS	100	HS

* Resistant check variety.
** Susceptible check varieties.

those with an average index number of 3.4 or less are listed in Table 3. In addition to the resistant entries, three susceptible check varieties are also included in the table. Neck blast infections for these entries were also recorded.

The data in Table 3 show that I-kung-pao and Tsai-yuang-chung were free from leaf blast infections, while only a trace was recorded for Kaohsiung-ta-li-chin-yu, Wu-chien 2, Kanto 51, Chianung-yu 280, CI 9155 and Taichung 181, all with average index number of less than 0.7. The average index numbers of leaf blast for susceptible check varieties were extremely high, ranging from 7.4 to 8.8. Among 40 entries resistant to leaf blast, 5 fell into the category of being highly resistant, 25 into the resistant group and the remaining 10, moderately resistant. Twenty nine out of 33 entries resistant to leaf blast were also found to be resistant to neck blast, ranging from highly resistant (2%) to moderately resistant (40.8%). Pi No. 1, Pai-kan-tao, Natabasme and the three susceptible check varieties were either susceptible or highly susceptible to neck blast with average percent affected areas ranging from 75.5 to 100%.

The entries resistant to leaf blast include 2 introductions from Japan, 1 from United States, 5 native *indica* varieties, 2 Taiwan mountain varieties, 1 developed by a private breeder, and 29 varieties or strains developed by local breeding stations. Among those developed by the breeding stations, only 5 are named varieties while the rest are all unnamed selections.

A total of 22 commercial varieties currently under cultivation in Taiwan were also included in the nursery for one or more years during the period of 1956–1964. The average infections for both leaf and neck blasts are summerized in Table 4. As shown in Table 4, the average index numbers of leaf blast differed greatly among these varieties, ranging from 1 (resistant) for Taichung native 1 to 9 (highly susceptible) for Taichung 178. Only 3 varieties were resistant while the other 19 varieties or more than 86% of them were susceptible to leaf blast infections. The average percentages of neck blast ranged from 7.7% to 100%. Twelve varieties were classified as resistant while the other 9, susceptible.

DISCUSSION

Under the growing conditions of this Station, lesions of blast normally begin to appear in late March or in early April and severe epidemics of leaf blast develops in late April or in early May. Togari and Matsuo (1963) reported that the optimum temperature for maximum sporulation of the blast fungus ranged from 18 to 30°C. As shown in Table 2, average temperature recorded at the Station started to rise up to 18°C in March, indicating that the occurrence of leaf blast at this Station was under the influence of mean temperature. Satisfactory tests of leaf blast were obtained during the 9-year period except in 1963 when an unusual drought reduced the occurrence of natural epiphytotics.

It was shown in Tables 3 and 4 that most of entries resistant or susceptible to leaf blast were also resistant or susceptible to neck blast infection, suggesting that

Table 4. Blast infection of commercial rice varieties grown in the uniform blast nursery of the Chiayi Agricultural Experiment Station, 1956–1964.

Variety	Breeding station	Years grown	Leaf blast infection		Neck blast infection	
			Average index number	Rating of resistance	Average percentage (%)	Rating of resistance
Chianung 242	Chiayi AES	1956–1964	3.4	MR	15.1	R
Taipei 306	Taipei DAIS	1960–1964	8.0	S	33.0	MR
Hsinchu 56	Hsinchu DAIS	1961	8.0	S	27.0	R
Taichung 65	Taichung DAIS	1956–1563	7.3	S	74.0	S
Taichung 122	Taichung DAIS	1956	7.0	S	68.1	MS
Taichung 150	Taichung DAIS	1956	5.0	MS	96.4	HS
Taichung 153	Taichung DAIS	1956	6.0	MS	67.6	MS
Taichung 170	Taichung DAIS	1956	6.0	MS	100	HS
Taichung 178	Taichung DAIS	1960	9.0	HS	Died	—
Taichung native 1	Taichung DAIS	1959–1964	1.0	R	31.5	MR
Chianan 2	Tainan DAIS	1956–1959	6.8	S	38.3	MR
Chianan 8	Tainan DAIS	1956	4.0	MR	7.7	HR
Tainan 1	Tainan DAIS	1960–1961	8.3	HS	54.0	MS
Tainan 3	Tainan DAIS	1960–1961	7.5	S	83.0	S
Tainan 4	Tainan DAIS	1961–1962	6.0	MS	72.9	S
Kaohsiung 22	Kaohsiung DAIS	1956–1959	6.3	MS	26.8	R
Kaohsiung 24	Kaohsiung DAIS	1956–1959	7.9	S	28.7	R
Kaohsiung 27	Kaohsiung DAIS	1956	6.0	MS	13.1	R
Kaohsiung 53	Kaohsiung DAIS	1960	8.5	HS	44.9	MR
Kaohsiung 64	Kaohsiung DAIS	1960–1961	8.7	HS	48.0	MR
Kaohsiung 68	Kaohsiung DAIS	1960–1961	8.4	HS	67.0	MS
Kaohsiung 122	Kaohsiung DAIS	1960–1962	4.7	MS	18.0	R

leaf blast resistant materials may either have genes resistant to both leaf and neck blasts or genes resistant to leaf blast may have a pleiotropic effect on neck blast resistance. An association between leaf and neck reaction was also found in a large number of varieties and lines (Chang *et al.*, 1965). Hsieh (1965) suggested that genes for blast resistance might control neck blast as well. The phenotypic and genotypic correlations between leaf and neck blast resistances were also shown to be generally high in most cross combinations. Meanwhile, susceptible varieties may lack genes for blast resistance. It is of interest to note that certain varieties highly resistant to leaf blast were found to be highly susceptible to neck blast and *vice versa*, indicating that such particular varieties may have genes resistant only to either leaf or neck blasts. However, it was generally observed that late maturing varieties developed less neck blast than the early ones. Possibilities of disease escape are considered to be likely since the infection of neck blast is nearly limited to the period one week before and after heading. Therefore, it seems doubtful if data obtained for neck blast in this test are fully reliable. Further improvement in the method of testing neck blast resistance is needed if more accurate results are to be obtained.

The existence of physiological races of *Piricularia oryzae* in Taiwan has been reported by Hung *et al.* (1961) and Chien *et al.* (1963). The distribution of the races was found to differ at various places. A total of 12 races were reported to be present at this Station during 1960–1962 (Chiu *et al.* 1965), among them, races #12 and #13 were the predominant ones (Chien *et al.* 1963). In 1964, 10 races were found at this Station with races #24, #1, and #26 dominating (Chien, 1965). Since varieties were shown to have different responses to different races, it should be emphasized that data obtained for leaf blast in this test represented only the reactions of varieties to races present at this Station. It seems obvious that a good measure of resistance was obtained in this study since many physiological races were present and a high level of infection occurred.

The results recorded for the period during 1956 to 1964 inclusive show that 40 out of 161 entries tested has high to moderate resistance to leaf blast. Thus, there is a large reservior of resistance to leaf blast for use in rice breeding program. Most of the commercial varieties listed in Table 4 were susceptible while newly developed lines in Table 3 were resistant, indicating that progress in breeding for blast resistance has actually been made in recent years. Among resistant varieties, Chianung 242 appeared many times as a parent of the resistant lines. The varieties Kanto 51, 55, Miaoli 37, Taichung glut. 46, Kwangfu 1, NC 4, Cutsugulcle, Tsai-yuan-chung, and Lit-chi-hung also appeared to be the important sources of resistance. Blast resistance for these varieties were also reported by Wang and Yang (1956, 1960). It seems apparent that these varieties carry high resistance to blast and transmit it readily to progenies of crosses in which they are a parent. Heritability estimates for leaf and neck blast reactions were shown to be quite high, ranging from 36 to 95% (Hsieh, 1965), suggesting that selection for blast resistance should

be effective in relatively early generations. Meanwhile Taiwan's native *indica* varieties may be useful only as a source of resistance for breeding *indica* type varieties, since breeders in Taiwan have repeatly experienced difficulty in combining the high yielding ability of the *japonica* parent with the blast resistance of the *indica* one.

It may be noted that very few resistant selections developed by various experiment stations in the past years had been successfully released as commercial varieties simply because most of the resistant selections were associated with one or two poor agronomic traits. Under the present breeding program for blast resistance, segregating generations are exposed to severe epidemics of blast as early as F_2 and resistant individuals or lines are selected. Thus, it appears likely that less resistant individuals or lines with desirable agronomic traits may eventually be lost. As a result, it is difficult to combine blast resistance and desired agronomic characteristics in one variety. Ota *et al.* (1962) also suggested that resistant individuals selected at early generations tend to loss its yielding ability. On the other hand, Chang *et al.* (1965) pointed out that the relative prevalence of physiological races is changing rapidly and the resistance of a given resistant variety may disappear within quite a short span of time. Therefore, it would appear difficult and costly to breed a variety with high level of resistance to blast. Usually, a veriety moderately resistant to blast is considered to be commercially acceptable when chemical control is also practiced. Certain adjustments on current breeding methods seem necessary if further improvement in efficiency is to be expected.

SUMMARY

A total of 161 varieties, selections, and lines were tested for reaction to composites of races of the blast fungus in the uniform blast nursery of the Chiayi Agricultural Experiment Station during the 9-year period, 1956-1964. Forty out of 161 entries were found to have similar or higher resistance to leaf blast than the resistant check variety, Chianung 242. Among these, 5 were highly resistant, 25 resistant, and 10 moderately resistant. Only 3 commercial varieties were resistant while the other 19 varieties were susceptible to leaf blast. Twenty nine out of 33 entries resistant to leaf blast were also resistant to neck blast and the remaining 3 were susceptible. Among 21 commercial varieties, 12 resistant and 9 susceptible entries were recorded for neck blast infection.

In a large number of varieties and lines, the agreement between leaf and neck reactions was found to be generally good, although in certain entries, a lack of agreement was observed.

A number of varieties and selections are resistant to leaf blast and are available for further rice breeding work. Chianung 242, a parent of many resistant selections, appeared to be an important source of resistance.

LITERATURE CITED

(1) Chang, T. T., M. K. Wnag, K. M. Lin, and C. P. Cheng. 1965. Breeding for blast resistance in Taiwan. The Rice Blast Disease. Proceedings of a symposium at IRRI. Johns Hopkins. pp. 371-377.

(2) Chien, C. C. 1965. Studies on the physiological races of rice blast fungus *Piricularia oryzae* Cav. Annual report of TARI, Taiwan to USDA. 40 pp.

(3) Chien, C. C., S. Y. Lin, and S. C. Jone. 1963. Studies on the physiologic race of *Piricularia oryzae* Cav. (II). Agr. Res., Taiwan. 12 (3): 29-39.

(4) Chiu, R. J., C. C. Chien, and S. Y. Lin. 1965. Physiologic races of *Piricularia oryzae* in Taiwan. The Rice Blast Disease. Proceedings of a symposium at IRRI. Johns Hopkins. pp. 245-255.

(5) Hsieh, S. C. 1965. Genic analysis in rice. V. Genes for the resistance to leaf and neck blast disease in rice. Bot. Acad. Sinica 6 (1): 48-60.

(6) Hung, C. S., C. C. Chien, and S. Y. Lin. 1961. Study on the physiological races of *Piricularia oryzae* Cav. Agr. Bes., Taiwan. 10 (1): 27-34. (in Chinese)

(7) Ota, T., K. Sugiyama, I, Itatani, S. Iizuka and H. Okochi. 1962. Studies on the efficiency of selection in the bulk method of rice plants. Shizuoka Prefecture Agr. Exp. Sta. Bull. 7:11-22. (in Japanese)

(8) Ou, S. H. and K. M. Lin. 1959. Preliminary report on rice breeding for blast disease resistance in Taiwan. Rice Improvement in Taiwan. Pl. Ind. Ser. No. 15, JCRR. pp. 23-32.

(9) Togari, Y. and T. Matsuo. 1963. Rice Manual 2. Asakura Ltd., Tokyo. 306 pp. (in Japanese)

(10) Wang, M. K. and S. C. Yang. 1956. Varietal differences in blast resistant ability of ponlai rice in Taiwan and their influences upon rice yield. Jour. Agr. Assoc. China (N. S.). 14:38-41. (in Chinese)

(11) Wang, M. K. and S.C. Yang. 1960. Comparative study on blast resistance of new ponlai rice varieties in Taiwan. Jour. Agr. Assoc. China (N. S.). 31:54-57. (in Chinese)

水稻品種(系)之稻熱病感應性

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摘　　要

嘉義農業試驗分所稻熱病統一病圃，自民國45年至53年，9年之間先後檢定水稻品種及新育成品系計161種，其中有40個品種（系）之葉稻熱病抵抗性，較抗病對照品種嘉農242號爲佳，屬於極抗者5種，屬抗者有25種，中抗者有10種。本省現有主要推廣品種，經本分所檢定者有22個品種，但抗葉稻熱病者僅有3品種，餘外19品種均屬感病。

33個抗葉稻熱病品種（系）中，有29個品種（系）亦可抗穗稻熱病，其餘3品種（系）卽屬感病。21個推廣品種中抗穗稻熱病者有12個品種，另9個爲感病品種，由此概見水稻品種（系）對葉及穗稻熱病之反應大致相同。由檢定結果透露，凡具有高度抗稻熱病之品種（系），均可供爲今後抗病育種之材料。抗病品種嘉農242號已普遍被採用爲雜交親本，自其雜交後代育成之抗病系統頗多，堪稱爲一重要抗病來源。