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# EVALUATION OF CERTAIN RICE ENTRIES TO WEED-ALLELOPATHY POTENTIAL AND RICE BLAST (*Pyricularia grisea)* UNDER EGYPTIAN CONDITIONS

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## ABSTRACT

Twenty-seven F4 lines and their parents (Rikuto Norin 22 and Sakha 101) were evaluated to blast disease (caused by *Pyricularia grisea)* and allelopathy under greenhouse and field conditions at Rice Research and Training Center, Sakha, during 2001 growing season.

The results indicated that, six of 27 F4 lines had more than 85% allelopathic potential to the barnyardgrass against *Echinochloa Crus-galli* comparing with the check variety Giza176 (zero allelopathic potential). However, four lines from the six had more than 94.4% weed control. On the other hand, twenty-four, twenty and fourteen entries were resistant to blast races ie. II (avirulent), IA-79 (moderately virulent) and IA-107 (virulent), respectively. The rest of lines were moderately resistant or susceptible to blast under greenhouse conditions. The same trend was obtained under field conditions, seventeen entries were resistant, two moderately and eight susceptible to leaf blast disease. Highly significant positive correlation were found between weed control percentage and each of grain yield and harvest index. Insignificant negative correlation were obtained between weed control and each of days to heading and blast disease in green house and field conditions. In general, no relationship was found between allelopathic effect and blast resistance. Accordingly, selection to blast resistance or allelopathic potential should be done separately.

**Keywords:** Echinochloa crus-galli, Allelopathy, Pyricularia grisea, Blast disease

## INTRODUCTION

Weeds and plant diseases are major constraints of rice production. They separately, or combined, can result in tremendous losses if no control measures were applied. One of the new approaches to avoid, or reduce, herbicidal application is the benefit of the plant-allelopathic character. Genetic studies revealed that allelopathy is a polygenic characteristic, weakly correlated with rice yield, or other important agronomic features (Olofsdotter *et al* 1995). Since herbicides could not be completely forbidden, because of aquatic conditions that encourage weed growth in rice ecosystem, the sound combination between herbicides and other means of control, e.g. allelopathic activity should be put in practice.

Rice blast caused by *Pyricularia grisea* can be controlled by planting resistant varieties. However, these varieties do not necessarily remain resistant for a long time, and often succumb to new races of blast due to selection pressure in pathogen populations (Singh *et al.,* 1998). Resistance to blast has been already broken down within years after release because of increase in new blast races virulent to the resistance (Kiyosawa 1974 and Ahn 1994). Also, Yamada (1965) and Chang (1994) reported that newly introduced major genes for blast resistance were easily broken down within several years of intensive cultivation in blast prone areas.

Research has developed rice entries resistant to blast, and others with allelopathic effect against weeds. However, it is not necessarily to find rice entries resistant to blast, and meanwhile have alellopathic effect against weeds.

The current study was undertaken to investigate whether there is a relationship between resistance of rice entries to blast, and their allelopathic potential against weeds.

## MATERIALS AND METHODS

Twenty-seven F4 rice lines and their parents (Rikuto Norin 22 and Sakha 101) were planted as pregerminated seeds on mid-June, 2001. The seeds were drilled in 1x1 $m^2$ plots (15 g seeds / plot) each of five rows, 20 cm apart. The plots were distributed in a randomized complete block design with three replicates. Rice plots were infested by seeds of barnyardgrass, *Echinochloa crus-galli* prior to rice seeding. Two parents were used:

Rikuto Norin 22 (strong-allelopathic activity) was taken from the genetic stock preserved at Rice Research and Training Center (RRTC), Sakha. Sakha 101 is a local cultivar (cross between Giza 176 and milyang 79).

**Data collection:**

**Weed control and agronomic traits**:

Percentage of weed control, due to allelopathic phenomenon, was estimated by comparing numbers of barnyardgrass plants in the artificially weed infected plots to numbers of the naturally weed occurring in the plots of the check variety Giza 176 (without allelopathic activity). Reduction percentage in weed number was considered as the capability of an entry to control the weed. Heading date of an entry was determined as number of days elapsing from date of sowing of the entry to date of exertion of the first panicle in a plot. Grain yield of rice plants per $m^2$ was estimated. Then, Harvest Index % (HI %) was calculated according to Donald and Homblin (1976), and Yosheda (1981):

$$\text{Harvest Index }(\%) = \frac{\text{Grain yield (economic yield )}}{\text{Total dry matter (biomass)}} \text{ x}100$$

**1- Rice blast (*Pyricularia grisea*) infection and evaluation:**

**a- In the greenhouse:**

The tested rice entries were seeded in plastic trays (30 x 20x 15 cm), each tray comprised 30 rows representing: 27 $F_4$ lines, two parents (Rikuto Norin 22 and Sakha 101) and one row of Giza 171 (susceptible check and spreader). The trays were kept in the greenhouse at 25-30 ºC, and fertilized with Urea 46.5% (5 g/tray).

Three *Pyricularia grisea* races were used for infecting the entries in the trays. The isolates used were identified as virulent No.366 (IA-107), moderately virulent No. 308 (IA-79), and avirulent No. 351 (II) races. Isolates were collected from rice plants grown in the previous season. The isolates were grown and multiplied on banana medium (200g Banana, 10g Dextrose, 20g Agar) at 28 ºC. The spores were harvested at a density of at least 25 spores/microscopic field, examined by 10 x objective. Rice seedlings of 20-day old, grown in the trays, were infected by spraying the spore suspension of each isolates. A suspension (100 ml.) of *P. grisea* was sprayed per 3 trays (representing one replication). The spray ($5 \times 10^4$ spores/ml) was practiced in the evening to avoid the retarding effect of light on both spore germination and germ tube growth. The reaction of the tested entries to blast infection was estimated according to IRRI scale (1996) seven- days after inoculation.

**b- In the field:**

The considered entries as well as their two parents were field evaluated for *P. grisea* at blast nursery. Seedbeds were manured (8 $m^3$/fed.) and prepared for seeding the entries. Width of a seedbed was 1 m. At the beginning of the seedbed, 5 rows of Giza 159 (blast spreader) was sown, then five of the considered entries, and again one row of the spreader. Rows were 15 cm apart. Another five entries were sown, followed by one row of resistant check (Sakha 101). The susceptible and resistant checks were sown alternatively, surrounding five of the considered entries. The entries were left exposed for natural infection by blast fungal pathogen at seedling stage. The typical blast lesions were scored according to IRRI scale (1996).

## RESULTS AND DISCUSSION

A total of twenty-seven lines were chosen randomly from 39 families ($F_3$ generation) and grown as $F_4$ lines from the cross between Sakha 101(poor allelopathic activity)/Rikuto Norin 22 (strong allelopathic activity). Performance of F 4 lines for some characters are given in Table (1).

Six lines had more than 85 % of weed control against *E. crus-galli* comparing with the check variety, Sakha 101 (considered as zero allelepathic potential). However, four lines from the six had more than 94.4 % of weed control against *E. crus-galli*. These four entries produced the highest values of grain yield. These results agree with those of Hassan *et al* (1998) who found that forty (out of 1000) varieties showed 20-90 % allelopathic activities against *E. crus-galli*, 75 % of the varieties with allelopathic potential suppressed *E.crus-galli*. In addition, Park and Lee (1996) reported that cultivars Tang Gan, Kouketsumuchi and PSBRC 10 exhibited 70% weed control or more under Korean transplanted rice conditions.

The four lines of strong allelopathic potential (Table 1) numerated as 22, 25, 26 and 27 produced high yields of 8.6, 9.7, 7.6 and 9.5 ton/ha, respectively. These lines had also high values of harvest index %. The lines No. 22, 25, 26 and 27are considered as early maturing ones comparing with the later parent (Sakha 101). In a similar study, Dilday *et al.* (1998) reported that Sag 94L-42-130, a cross between PI 338046 (strong allelopathy) and Katy (poor allelopathy) produced the highest yield, this cross yielded 9.88 t/ha, about 2 tons more than Katy (7.87 t/ha).

**Correlation coefficients**:

Highly significant positive correlation coefficients were calculated between weed control percentage and each of grain yield and harvest index (Table 2). These results agree exactly with those of Abo yousef (2001). Insignificant negative correlation were obtained between weed control and each of heading date and blast disease in the greenhouse and field. Accordingly, selections for weed control, heading date and blast resistance can not be achieved at the same time. Of course, allelopathic-active lines are closely related with the high yield. It was indicated that varieties could express allelopathic properties at the 3 to 4 leaf stages, Hassan *et al.* (1998).

Insignificant positive correlations were found between heading date and each of grain yield and harvest index. On the other hand, these correlations were insignificantly negative with blast reaction in both greenhouse and field conditions.

The grain yield correlated as positively high significant with harvest index, negative by significant with blast in the field, negative by insignificant with blast in the greenhouse. Highly significant negative correlations were recorded between harvest index and blast reaction in greenhouse and field. Highly significant positive correlation was obtained between blast reaction in greenhouse and field conditions.

Twenty-seven entries as well as their parents (Rikuto Norin 22 and Sakha 101) were tested under greenhouse and field conditions with susceptible check, Giza 171. The results in Tables (3&4) indicated that out of 27 F 4 lines, twenty-four, twenty and fourteen entries were resistant to rice blast races of II, IA-79 and IA-107 respectively. On the other hand, two, four and twelve entries were susceptible, while one, three and one entries were moderately resistant for races II, IA-79 and IA-107, respectively. Parents were resistant under all tested races except Sakha 101 that was moderately resistant with virulent race IA-107.The susceptible check for Giza 171 was susceptible with all tested. Varieties Giza 171, Giza 172 and Giza 159 were susceptible to 20 blast isolates in a greenhouse test (Sehly *et al* 1990). The authors found that 9 of 27 entries were susceptible to one or more of the 20 purified isolates tested. Bidaux (1976) and Notteghem (1981) observed that virulent strains were existed for all the identified genes of vertical resistance and most of the strains possessed virulent genes, which were not necessary for their survival.To avoid this risk, it is important to involve field resistance in the gene background of resistant varieties. In strict sense, it is measured only under a condition when the effects of the major gene resistance(s) are excluded for the evaluation of the field resistance of the varieties, (Imbe *et al.,* 1997).

**Table (1): Performance of F4 lines resulting from the cross Rikuto Norin 22 / Sakha 101 under the field conditions.**

| Entry | Weed control (%) | Days to heading | Grain yield t/ha | Harvest index ( % ) |
|---|---|---|---|---|
| Rikuto norin 22 | 86.8 ± 0.62 | 87.0 ± 2.13 | 3.4 ± 0.12 | 32.8 ± 0.72 |
| Sakha 101 | 28.2 ± 1.66 | 102 ± 2.65 | 0.82 ± 0.18 | 12.4 ± 0.87 |
| F4 line 1 | 55.5 ± 0.82 | 90 ±1.25 | 4.45 ± 0.15 | 25.5 ± 0.95 |
| F4 line 2 | 75.9 ± 0.68 | 93 ± 0.94 | 2.5 ± 0.12 | 16.2 ± 0.68 |
| F4 line 3 | 76.9 ± 0.94 | 98 ± 0.82 | 4.4 ± 0.09 | 37.8 ± 0.66 |
| F4 line 4 | 78.5 ± 0.64 | 97 ± 0.64 | 4.9 ± 0.06 | 23.5 ± 0.84 |
| F4 line 5 | 63.9 ± 0.52 | 103 ± 1.13 | 5.1 ± 0.07 | 29.0 ± 0.99 |
| F4 line 6 | 62.5 ± 0.74 | 109 ± 1.07 | 4.5 ± 0.05 | 22.6 ± 0.78 |
| F4 line 7 | 57.7 ± 0.83 | 79 ± 0.88 | 3.53 ± 0.07 | 16.5 ± 0.93 |
| F4 line 8 | 61.8± 0.54 | 92 ± 0.65 | 1.8 ± 0.10 | 11.5 ± 1.10 |
| F4 line 9 | 61.8 ± 0.67 | 96 ± 0.62 | 2.8 ± 0.72 | 20.9 ± 0.85 |
| F4 line 10 | 61.7 ± 0.58 | 87 ± 0.89 | 3.9 ± 0.17 | 20.08± 0.74 |
| F4 line 11 | 62.3 ± 0.48 | 94 ± 1.02 | 4.2 ± 0.13 | 18.33 ± 1.40 |
| F4 line 12 | 68.2 ± 0.58 | 96 ± 1.42 | 5.3 ± 0.09 | 30.4 ± 0.91 |
| F4 line 13 | 64.4 ± 0.76 | 94 ± 1.12 | 4.2 ± 0.14 | 32.1 ± 0.87 |
| F4 line 14 | 65.9 ± 0.82 | 98 ± 1.68 | 4.11± 0.08 | 17.4 ±0.94 |
| F4 line 15 | 69.1 ± 0.57 | 99 ± 1.42 | 4.3 ± 0.10 | 33.9 ± 1.09 |
| F4 line 16 | 67.9 ± 0.62 | 86 ± 1.45 | 3.5 ± 0.18 | 21.9 ± 1.20 |
| F4 line 17 | 65.8 ± 0.74 | 95 ± 1.22 | 3.6 ± 0.14 | 14.6 ± 0.98 |
| F4 line 18 | 66.9 ± 0.54 | 95 ± 0.91 | 4.7 ± 0.05 | 27.3 ± 0.66 |
| F4 line 19 | 57.7 ± 0.59 | 97 ± 1.20 | 1.7 ± 0.14 | 9.5 ± 0.84 |
| F4 line 20 | 55.2 ± 0.68 | 96 ± 1.12 | 1.8 ± 0.17 | 10.5 ± 0.73 |
| F4 line 21 | 52.8 ± 0.73 | 98 ± 1.02 | 1.2 ± 0.21 | 14.6 ± 0.98 |
| F4 line 22 | 94.4 ± 0.18 | 97 ± 1.48 | 8.6 ± 0.05 | 21.9 ± 1.08 |
| F4 line 23 | 86.3 ± 0.23 | 93 ± 1.48 | 4.7 ± 0.15 | 27.0 ± 0.88 |
| F4 line 24 | 88.7 ± 0.35 | 96 ± 0.65 | 6.5 ± 0.10 | 29.4 ± 1.02 |
| F4 line 25 | 97.1 ± 0.27 | 96 ± 0.87 | 9.7 ± 0.03 | 36.5 ± 0.97 |
| F4 line 26 | 95.8 ± 0.26 | 97 ± 0.74 | 7.6 ± 0.12 | 28.3 ± 0.64 |
| F4 line 27 | 97.8 ± 0.23 | 99 ± 1.04 | 9.5 ± 0.04 | 24.4 ± 0.87 |

**Table (2): Correlation coefficients, among the considered characters.**

| Components | Weed control | Days to heading | Grain yield (t/ha) | Harvest index (%) | BR in Greenhouse | BR in Field |
|---|---|---|---|---|---|---|
| Weed control (%) | 1 | -0.022 | -0.818** | 0.547** | -0.278 | - 0.286 |
| Days to heading | | 1 | 0.0143 | 0.078 | -0.241 | - 0.019 |
| Grain yield (t / ha) | | | 1 | 0.605** | 0.428* | 0.256 |
| Harvest index ( % ) | | | | 1 | -0.473** | -0.486** |
| BR in greenhouse | | | | | 1 | 0.655** |
| BR in field | | | | | | 1 |

***** : Significant at 0.01 * : Significant at 0.05 BR: Blast reaction***

**Table (3): Reaction of leaf blast disease on rice entries to *Pyricularia grisea* under greenhouse and field conditions.**

| No. | Entries | Greenhouse test | | | Field Reaction |
|---|---|---|---|---|---|
| | | Race-II | Race IA-79 | Race IA-107 | |
| Parent | Rikuto norin 22 | R | R | R | R |
| Parent | Sakha 101 | R | R | MR | R |
| 1 | F4 line 1 | R | R | R | R |
| 2 | F4 line 2 | S | S | S | MR |
| 3 | F4 line 3 | R | R | R | R |
| 4 | F4 line 4 | MR | MR | R | R |
| 5 | F4 line 5 | R | R | R | R |
| 6 | F4 line 6 | R | R | S | R |
| 7 | F4 line 7 | R | R | S | S |
| 8 | F4 line 8 | R | R | S | S |
| 9 | F4 line 9 | R | R | S | S |
| 10 | F4 line 10 | R | R | S | S |
| 11 | F4 line 11 | R | R | S | R |
| 12 | F4 line 12 | R | MR | R | R |
| 13 | F4 line 13 | R | R | R | MR |
| 14 | F4 line 14 | R | R | R | R |
| 15 | F4 line 15 | R | R | R | R |
| 16 | F4 line 16 | R | R | R | R |
| 17 | F4 line 17 | R | R | R | R |
| 18 | F4 line 18 | R | R | R | R |
| 19 | F4 line 19 | S | S | S | S |
| 20 | F4 line 20 | R | S | S | S |
| 21 | F4 line 21 | R | R | S | S |
| 22 | F4 line 22 | R | MR | R | R |
| 23 | F4 line 23 | R | R | MR | R |
| 24 | F4 line 24 | R | S | S | S |
| 25 | F4 line 25 | R | R | S | R |
| 26 | F4 line 26 | R | R | R | R |
| 27 | F4 line 27 | R | R | R | R |
| Check | Giza 171 | S | S | S | S |

***R = Resistance*** ***S = Susceptible*** **MR= Moderately Resistant**

**Table (4): Number of resistant and susceptible entries and parent which were evaluated against three different isolates of *Pyricularia grisea* under greenhouse condition.**

| Reaction | Entries | Number of entries as infected by races | | |
|---|---|---|---|---|
| | | II | IA-79 | IA-107 |
| Resistant ( R ) | Lines | 24 | 20 | 14 |
| | Parents | 2 | 2 | 1 |
| Moderately resistant (MR ) | Lines | 1 | 3 | 1 |
| | Parents | 0 | 0 | 1 |
| Susceptible ( S ) | Lines | 2 | 4 | 12 |
| | Parents | 0 | 0 | 0 |

| | | | | |
|---|---|---|---|---|
| Susceptible check | Giza 171 | S | S | S |

In Table (5), total number of lesions / 10 plants ranged from 2 to 5, from 4.4 to 22 and from 2.5 to 25 lesions with races I I, IA-79 and IA-107 respectively, while susceptible check Giza 171 had 5 to 30 lesions / 10 plants

Concerning natural infection under field conditions, data in Table (6) show that seventeen entries were resistant, two moderately resistant, and eight susceptible to leaf blast, while both parents were resistant. The check performed as susceptible to blast.

**Table (5): Severity of leaf blast infection of susceptible entries under greenhouse conditions.**

| No. | Entry | Number of lesions / 10 plants | | |
|---|---|---|---|---|
| | | Race-II | Race IA-79 | Race IA-107 |
| Parent | Rikuto norin 22 | 0 | 0 | 0 |
| Parent | Sakha 101 | 0 | 0 | 0 |
| 2 | F4 line 2 | 2.9 | 4.4 | 11.4 |
| 6 | F4 line 6 | 0 | 0 | 25.0 |
| 7 | F4 line 7 | 0 | 0 | 15.0 |
| 8 | F4 line 8 | 0 | 0 | 20.8 |
| 9 | F4 line 9 | 0 | 0 | 8.3 |
| 10 | F4 line 10 | 0 | 0 | 27.1 |
| 11 | F4 line 11 | 0 | 0 | 4.2 |
| 19 | F4 line 19 | 2 | 16.3 | 2.5 |
| 20 | F4 line 20 | 0 | 22.0 | 12.3 |
| 21 | F4 line 21 | 0 | 0 | 12.0 |
| 24 | F4 line 24 | 0 | 13.0 | 5.0 |
| 25 | F4 line 25 | 0 | 0 | 5.8 |
| Check | Giza 171 | 5.0 | 15.0 | 30.0 |

**Table (6): Number of resistant and susceptible entries and parents to blast which were evaluated under field conditions.**

| Entries | Resistant | Moderately resistant | Susceptible |
|---|---|---|---|
| Parents ( 2 ) | 2 | 0 | 0 |
| Lines (27) | 17 | 2 | 8 |
| Check Giza 171 | 0 | 0 | 1 |

## REFERENCES

Abo yousef, M.I. (2001). Genetic studies of allelopathic effects on weeds and some yield components in rice (*Oryza Sativa* L.) Ph.D. Thesis, Fac. Agric., Kafr El-Sheikh, Tanta University, Egypt.

Ahn S. W. (1994). International collaboration on breeding for resistance to rice blast. R.S. Zeigler, S.A. Leong and P.S. Teng (eds.), Rice Blast

Disease. International Rice Institute (IRRI), Manila, Philippines P. 173-153.
Bidaux, J.M. (1976). Screening for horizontal resistance to rice blast *Pyricularia oryzae* in Africa. Academie Press, Landon, 159-172.
Chang K.K. (1994). Blast management in high input, high yield potential, temperature rice ecosystem in R.S. Zeigler, S.A. Leong and P.S. Teng (Eds.),Rice Blast Disease. International Rice Institute (IRRI), Manila, Philippines, 451-463.
Dilday, R.H.; W.G. Yan and K.A.K. Moldenhauer (1998). Allelopathic activity in rice ( *Oryza Sativa* L. ) to major aquatic weed species. Proceedings of the Workshop on Allelopathy in Rice, Chapter2, (IRRI).
Donald C.M. and J. Homblin (1976).The biological yield and harvest index of cereal as agronomic and breeding criteria, Advan. In Agron., 28: 361-404.
Hassan, S.M.; I.R. Aidy and A.O. Bastawisi (1998). Allelopathic potential of rice varieties against major weeds in Egypt. Paper presented at annual meeting of weed science society of America, Seattle, Washington.
Imbe T.; S. Oba; M.J.F. Yanoria and H. Tsunematsu (1997). A new gene for blast resistance in rice cultivar, IR 24. Rice Genet. Newsl., 14, 60-62.
IRRI (1996). Standard evaluation system for rice. 3rd Ed. International Rice Research Institute, Los Banos, Philippines.
Kiyosawa S. (1974). Studies on genetics breeding of blast resistance in rice, Misc. Publ. Bull. Natl. Agric. Sci. D1, 1-58 (in Japanese, English Summary).
Notteghem. J.L. (1981). Analyse des resultats dinoculation de 67 varieties de riz par 15 souches de *Pyricularia oryzae*. In proceedings of the symposium on rice resistance to blast, IRAT, Montpellier, pp: 301-318.
Olofsdotter, Maria; Domingo Navarez and Keit moody (1995). Allelopathic potential in rice ( *Oryza sativa* L.) germplasm. Annal. Appl. Biol., 127:543-560.
Park,K.H. and M.H Lee ( 1996). A potential weed control by allelopathic rice germplasm. Kor.J. Weed Sci., 16: (1) 21-23.
Sehly M.R.; Z.H. Osman; H.A. Mohamed and A.O. Bastawisi (1990). Reaction of some rice entries to *Pyricularia oryzae* Cav. and rice picture. Sixth Congress of Phytopathology. March, 5-7, 1990, Cairo,Egypt, 154-170.
Singh B. N.; M. P. Jones; S.N. Fomba; Y. Sere; A.A. Sy; K. Akator; P. Ngninbeyie and S.W.Ahn (1998). Breeding for blast resistance in rice in West Africa Proceedings of the 2nd International Rice Research Conference 4-8 August 1998, Montpellier, Feance.
Yamada M. (1965). Breakdown of highly blast resistant foreign varieties. Plant Protection, 19: 231-234.
Yosheda, S. (1981). Fundamentals of rice crop. Science, 269p.

# تقييم لبعض سلالات الأرز التي لها ألقدره علي المقاومة الذاتية للحشائش عاي مقاومة مرض اللفحه تحت الظروف المصرية

**صلاح محمود الوحش ، محمود إبراهيم أبو يوسف**
**معهد بحوث أمراض النباتات ومعهد بحوث المحاصيل الحقلية مركز البحوث الزراعية - الجيزة**

تم تقييم ٢٧ سلالة من سلالات ألآرز فى الجيل الرابع بالإضافة لآبائهم (يكاتو تورين ٢٢/سخا ١٠١) بمركز البحوث والتدريب فىالأرز فى سخا تحت ظروف الصوبه و الحقل لمرض اللفحه المتسبب عن الفطر *Pyricularia grisea* و ذلك خلال موسم ٢٠٠١ .

أظهرت النتائج أن ٦ سلالات من الـ ٢٧ تحتوى على أكثر من ٨٥% كفاءة ذاتية لمقاومة الدنيبة *Echinochloa crus-galli* بالمقارنة بالصنف جيزة ١٧٦ ( الذى يحتوى على صفر مقاومة ذاتية ) . ومع ذلك فإن أربعة سلالات من الستة سالفة الذكر إحتوت على أكثر من ٩٤,٤% قدرة لمقاومة الحشائش ذاتيا.

على الجانب الآخر ، أربعة وعشرون وأربعة عشر سلالة كانت مقاومة للسلالات الفسيولوجية للفطرالمسبب لمرض االلفحة II( شديدة القدرة المرضية) ، IA-79 ( متوسطة القدرة المرضية) ، IA-107 (شديدة المقدرة المرضية) على الترتيب. باقي السلالات كانت ما بين متوسطة المقاومة إلى قابلة للإصابة تحت ظروف الصوبة. نتائج مشابهة تم الحصول عليه تحت ظروف الحقل حيث كانت هناك سبعة عشر سلالة مقاومة وسلالتين متوسطة المقاومة وثمانية أصيب بمرض اللفحة على الأوراق.

لوحظ وجود إرتباط عالى المعنوية موجب بين النسبة المئوية لمقاومة الحشائش وكل من محصول الحبوب ودليل الحصاد، وإرتباط غير معنوى سالب مابين صفة مقاومة الحشائش وكل من تاريخ التزهير ومرض اللفحة تحت ظروف الحقل والصوبة.

عموما لاتوجد علاقة بين المقاومة الذاتية للحشائش والمقاومة لمرض اللفحة فى الأرز. وتطبيقا فإن الإنتخاب للمقاومة لمرض اللفحة والمقاومة الذاتية للحشائش يجب أن يتم كل منها مستقل.