

## Resistance to the Lesser Grain Borer<sup>1</sup> in 'Dawn' and 'Labelle' Varieties of Rice<sup>2</sup>

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Tests conducted at the Stored-Rice Insects Research Laboratory, Beaumont, Tex., to evaluate chemical protectants for rough rice have consistently shown that the lesser grain borer, *Rhyzopertha dominica* (F.), will produce significantly fewer progeny in 'Dawn' variety. Therefore, laboratory tests were made to determine the suitability of rough, brown, and reasonably well-milled Dawn (Bollich et al. 1968b) for reproduction of lesser grain borers, compared with that of 'Bluebelle' (Bollich et al. 1968a), 'Belle Patna' (Bollich et al. 1965), and 'Labelle' (Bollich et al. 1972) varieties. All are long-grain varieties, and Labelle is a cross between Dawn and Belle Patna.

**METHODS AND MATERIALS.**—Samples of the 1971 production of each variety were tempered to 12–13% moisture content. The brown rice was obtained by removing the husk from rough rice with a McGill sample rice sheller. Reasonably well-milled rice (official USDA designation by classification of the Grain Division, Consumer and Mark. Serv., USDA) was obtained by removing 70% of the bran from brown rice with a model OM-2B Satake rice mill. Repeated trials demonstrated that this degree of bran removal would result in rice of that milling class. Broken kernels and dockage were removed from all samples with sieves.

Samples (150 g) of each preparation of each variety were then infested with 50 unsexed adult lesser grain borers, placed in mason jars, and held at 27°C and 60% RH. Parent insects and progeny were removed with sieves after 10 weeks, then counted.

**RESULTS AND DISCUSSION.**—Table 1 reports the average numbers of progeny emerging from each preparation of each variety, showing the significance (1% level) of differences between varieties indicated by subscripts (Duncan 1955). More progeny developed with brown rice, but the varieties did not differ significantly. In contrast, varietal differences were highly significant with rough rice and with reasonably well-milled rice. Thus, at the 1% level of confidence, Dawn and Labelle rough rice produced significantly fewer progeny than Belle Patna or Bluebelle, and at the 5% level all 4 varieties differed significantly. Also, at the 1% level Dawn reasonably well-milled rice produced significantly fewer progeny than the other varieties.

The reason for resistance of Dawn rice has not been determined. Breese (1960) suggested that morphological characteristics of the husk determined the susceptibility of rough rice to the lesser grain borer and to the rice weevil, *Sitophilus oryzae* (L.) (formerly *sasaki* (Takahashi)). Cohen and Russell (1970) and Russell (1968) came to the same conclusion in tests with the Angoumois grain moth, *Sitotroga cerealella* (Olivier); the rice weevil; and the maize weevil, *S. zeamais* Motschulsky. I (McGaughey 1970) observed resistance in other classes of Dawn milled rice. However, effects of kernel weight and shape, which also

**Table 1.**—Average numbers of progeny developing in 150-g samples of 4 varieties of rough, brown, and reasonably well-milled rice, each infested with 50 unsexed adult lesser grain borers.<sup>a</sup>

Variety	Rough rice	Brown rice	Milled rice
Dawn	209 a	1198	130 a
Labelle	103 a	1225	291 b
Belle Patna	531 b	1149	286 b
Bluebelle	620 b	1221	342 b
Avg	366	1198	262

<sup>a</sup> Means followed by the same letter do not differ significantly at the 1% level (Duncan 1955). Values are avgs of 4 replications.

differ slightly in these varieties, have not been examined. Nevertheless, the appearance of resistance in milled rice suggests that factors other than husk morphology must be involved, although lack of resistance in brown rice may render this factor economically insignificant, because the lesser grain borer is primarily a pest of rough and brown rice.

Further tests should be made to determine the level of resistance of all varieties of rough rice to the lesser grain borer and to other stored-rice pests. Then those showing resistance could be incorporated into rice-breeding programs.

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<sup>1</sup> Coleoptera: Bostrichidae.

<sup>2</sup> Mention of a proprietary product in this paper does not constitute an endorsement of this product by the USDA. Received for publication Jan. 22, 1973.

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