of rice (*Oryza sativa* L.) breeding lines require that the milled samples be thoroughly cleaned of adhering foreign particles before laboratory analysis. For this purpose, a rice-polishing machine was constructed for use in conjunction with the small-sample test-tube miller described by Scott et al.\(^3\) In 10 to 20 seconds the rice-polisher removes adhering particles of bran, germ, floury bits of endosperm and abrasive material, leaving a clean and highly polished sample of milled rice. Previously, small samples of rice were polished by hand rubbing in small cloth towels. This operation was time-consuming and uniform polishing and cleaning of samples was difficult to obtain.

The electrically powered "polisher" consists of a leather rotor that revolves inside a steel screen cup. The apparatus is shown in Figure 1. The rotor consists of a 2 1/2- \(\times\) 8-inch leather strip attached to the end of a 1/2-inch diameter steel shaft. The leather (soft-chrome) is similar to the type used on commercial rice brushes. A flat surface for attaching the leather was made by filing away half of the lower 2 inches of the shaft. A 1/2- \(\times\) 2- \(\times\) 1/2-inch metal plate, fastened to the flat portion of the shaft with 3 screws, holds the leather firmly in place. The leather extends 1/2-inch below the end of the shaft so that the rotor brushes firmly against the bottom as well as the sides of the screen cup during the polishing operation. The rotor shaft is mounted on a metal frame measuring 20- \(\times\) 15- \(\times\) 32-inches, and is held in position with two 1/2-inch pillow blocks. The rotor revolves at a speed of approximately 1000 rpm and is powered by a 1/6-hp. electric motor.

The cup (sample container) is 3 3/4 inches in diameter and 8 inches deep. Material for the cup was woven steel screen of 14- \(\times\) 14-mesh (.035-inch diameter wire), similar to that used on commercial rice brushes. The cup was formed around a section of 3 1/2-inch pipe and the seam was welded, using an acetylene torch and bronze rod. Solder was not used because of possible discoloration of the rice sample during the polishing operation. The smallest bead (weld) possible was made to prevent formation of pockets that might hold excessive amounts of broken particles of rice. A steel wire brush is used for cleaning the cup of any rice particles lodged in the woven steel screen. On continued use the leather rotor will become caked with bran and should be cleaned periodically with the wire brush to obtain a highly polished sample of rice.

The polishing operation involves: (1) emptying a sample test-tube containing the mixture of milled rice, bran, germ and abrasive material from the test-tube miller\(^3\) into the cup; (2) shaking the cup lightly over a discard pan at the base of the machine to allow most of the loose particles to sift through the bottom of the screen cup; and (3) positioning the cup over the rotor and polishing the sample for 10 to 20 seconds. The polisher is left running between samples to avoid delays and reduce wear on the motor from too frequent starting and stopping. Broken particles of polished rice may be removed from the sample with the rice-sizing device\(^2\) using a Number 7 indented plate.

The rice-polishing machine was designed and constructed in the workshop of the Rice-Pasture Research and Extension Center. The labor and much of the material required in constructing the apparatus were available in the shop and involved no direct expenditure. Materials which might require purchasing for constructing a similar device are: a 1/6-hp. electric motor; two 1/2-inch V-belt pulleys; a 1/2-inch V-belt; two 1/2-inch pillow blocks; and a section of 1/2-inch diameter steel shaft. The cost of these materials, purchased locally, would be approximately $30.00.

**Figure 1. Small-sample rice polisher.**

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**PROMISCUITY IN BARLEY AND WHEAT**

C. A. Suneson and E. L. Cox

PLANT breeders interested in hybrid barley (*Hordeum vulgare* L.) or hybrid wheat (*Triticum vulgare* (Vill.) Host) covet information on outcrossing in many situations. At Davis, California, in 1962 and 1963 the promiscuity of both the males and females of barley and wheat under both selfing and outcrossing management was investigated. The studies complement those reported from another area (5).

Estimates of outcrossing both within and between barley populations were obtained for paired isogenic lines grown in mixtures. The plots were 1/50 acre and were separated from adjacent plots by 4-foot guards and 7-foot alleys. The percent of heterozygosity that was found is reported in Table 1. Both proximity and foreign outcrosses were generally present and distinguishable in the isogenic backgrounds. Though obviously crossing-prone, the dominant hooded and 2-row barley types were rapidly eliminated under competition (3). At these loci the heterozygosity from natural crossing has not been a potent evolutionary force. It has been established, however, that where hooded

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