Genetic evaluation and utilization
OVERALL PROGRESS

Portable vacuum emasculator

W. R. Coffman, plant breeder, International Rice Research Institute

The first vacuum emasculator was developed by L. E. Kirk in 1930. J. G. Van der Meulen first used one with rice in 1933 in Indonesia. The vacuum emasculator was not used extensively on rice (except in the US) until it was modified by R. M. Herrera and the author in 1974. Since that time several major rice improvement programs in Asia have obtained emasculators through IRRI and used them effectively in their crossing programs. But the IRRI model is expensive (more than US$500) and not portable. Essentially, its use is limited to greenhouses or screenhouses with 220-V AC. That makes the vacuum emasculator impractical for many smaller programs.

The first portable vacuum emasculator for rice was designed in the early 1950s by L. E. Crane and H. M. Beachell of Beaumont, Texas; it was later modified by J. E. Scott of the Beaumont station. Many of their ideas were used in the construction of a newer portable emasculator (Photo 1). The new model consists of a rotary vane vacuum pump that develops a continuous vacuum of 508 mm/Hg. The 12-V DC electric motor that develops 1/25 hp at 4,000 rev/min is powered by a small 12-V motorcycle battery that must be recharged periodically. Accessories include an air filter, an anther trap, tygon tubing, disposable pipette, and appropriate fittings.

The pipette is breakable. If a ready supply is not available, a large bore (#16) veterinary needle may be used instead.

The assembled unit, including the
battery and carrying box, weighs 4.4 kg. It can be carried in any convenient small box. A plastic box (Photo 2) will permit the unit to float in the paddy water, although the position of the battery must be adjusted for proper balance. One operator can emasculate 12 panicles/hour with the unit, depending on the operator's skill and other variables.

The entire unit (including the box and small battery charger) costs about US$150. Prices may vary, depending on the local availability of the components. The pump, motor, filter, and trap are manufactured by Gast Manufacturing Corp., Benton Harbor, Michigan, US. Units may be purchased at cost through the Plant Breeding Department, IRRI.