improve the germination of those other species which germinate slowly but are commonly spring sown without pretreatment. It is believed that this matter deserves further study.

ACID SCARIFICATION

In connection with these observations, some points were noted in the technique of acid-treating small quantities of a few ounces of *Panicum anceps* and *Paspalum notatum* seeds, as follows: (a) The seeds should be thoroughly dry before treatment; (b) the treating container should be about 3 or 4 times the volume of the batch of seed; (c) the container should be placed in a water bath and kept cool while the seed-acid mixture is gently and continuously stirred throughout the process; and (d) after treatment, the seed-acid mixture should be emptied immediately into a large pan of fresh water and the acid washed out as rapidly as possible. It was observed also that most of the immature seeds immediately floated in water, whereas the mature ones sank to the bottom of the pan. However, if charring occurred during treatment, mature and immature seeds clumped together and floated. Continuous stirring helps keep the seed-acid mixture relatively cool during treatment and provides greater uniformity and a higher rate of scarification.

Microscopic examination of properly acid-treated seed shows that all glumes and sterile lemmas have been removed. In addition, a tiny opening about pin-point size occurs in the seed hull at the adaxial end of the fertile lemma near the embryo radicle, or the lemma is very thin at this point. Small openings may also occur at the abaxial tip of the seed, and considerable transverse etching of the hulls is common throughout the treated sample. These mechanical weakenings of the hull permit an easy entry of moisture to the caryopsis. —ANDREW C. MATHEWS, U. S. Forest Service, Tifton, Ga.

HEAD-HILL METHOD OF PLANTING HEAD SELECTIONS OF SMALL GRAINS

Seed from head selections of wheat and oats has been grown in hills rather than in head-rows as one of the steps of nursery procedure in the small grain breeding project at the Illinois Agricultural Experiment Station, Urbana, Ill., since 1941 (Fig. 1, A and B). Head-hill planting has proved to be a satisfactory technic and it is preferred to the head-row method.

Before planting, the field is furrowed out with a bean cultivator equipped with nine cultivator shovels so that 18 furrows are made each round. The furrows are about 3 inches deep and 1 foot apart (Fig. 1E). Planting head-hills in a furrow reduces winterkilling in winter wheat and it has also been observed that winterkilling is less in the head-hill than in the head-row.

A cotton cord with dyed sections spaced the same distance apart that the head-hills are to be planted was used as a guide for spacing the head-hills in the row (Fig. 1, D and E). The cord is stretched across the field on top of the ridge between the furrows. Each tenth