EXPERIMENTS ON ARTIFICIAL HYBRIDIZATION OF RICE

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Rice is an attractive crop for genetic studies, displaying fully as many variations as any other of the small grains. The scope of plant breeding and genetic investigation with rice might be enlarged if a rapid and effective method of controlled pollination were available. The hybridization technic described by Jones (5) is widely used and sufficient hybrid seed may be obtained for the usual studies of segregating populations, but the seed set is too low for extensive backcrossing or studies requiring large numbers of crossed seeds.

REVIEW OF LITERATURE

BLOOMING

The literature on pollination and blooming in rice up to 1929 has been reviewed by Jones (6). Adair (1) made an extensive study on blooming in rice in Arkansas, and Laude and Stansel (7) made observations in Texas under conditions nearly identical with those under which the data here reported were obtained. The writer has tabulated no data on blooming but his general observations are, with some exceptions, in agreement with the results reported for Texas and Arkansas.

The peak of blooming at Crowley, La., in seasonable weather in August and early September when most varieties are at the blooming stage appears to occur between 10:00 and 11:00 a.m. rather than between 11:00 a.m. and noon as reported by Adair (1) and by Laude and Stansel (7). The departure from the behavior in Arkansas may be due to temperature differences. The difference from results obtained in Texas may be due to observing different varieties. Adair suggests that pollen may be shed before the florets open, but the writer's observations indicate that exposure to the open air is normally necessary for dehiscence of the anthers. Laude and Stansel stated that rice florets may remain open from 42 minutes to over 2 hours. The writer found that at Crowley the florets usually opened and closed within an hour or less.

Temperature, as suggested by Adair (1) and by Jones (6), probably is the most important factor influencing the time of blooming in rice. These workers noted differences among varieties in the time of initial daily blooming and the writer has observed differences of as much as 2 hours. No explanation of such varietal differences has been found in the literature, but the writer has observed that varieties having long slender glumes appear to bloom earliest. A slight swelling of the lodicule will open long narrow glumes to a sufficient angle to expose the anthers at the tip of the floret. Short and relatively wide glumes must be spread at a wider angle to expose the anthers, hence more time may be required for the lodicel to swell sufficiently to open the floret fully.

1Contribution from the Division of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Dept. of Agriculture, in cooperation with the Louisiana Experiment Station. Experiments conducted at the Rice Experiment Station, Crowley, La. Received for publication December 30, 1937.
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3Figures in parenthesis refer to "Literature Cited," page 305.