Flowering Habits and Pollen Dispersal in Pensacola Bahia Grass, Paspalum notatum, Flugge

H. J. Hodgson

A KNOWLEDGE of the flowering behavior of the species and/or variety with which he is working is imperative to the plant breeder. Knowledge of the effects of temperature, humidity, light, and various other environmental factors on anthesis and dehiscence of the anthers enables the breeder to accomplish his tasks with a great deal more facility.

The maintenance of purity of superior germ plasm developed by the plant breeder is a problem of great concern for seed certification. In normally cross-pollinated crops this problem becomes one of producing seed under conditions of adequate isolation to prevent serious outcrossing. The various state seed certification associations and the International Crop Improvement Association have adopted standard minimum isolation requirements for the production of foundation, registered, and certified seed. These requirements largely have been made as a result of careful observation and with very little experimental evidence for their justification.

Pensacola Bahia grass (Paspalum notatum, Flugge) is self-sterile and highly cross-pollinated. The production of recombinations between two or more selected clones may be contemplated in the near future. The critical need for experimental data on which to base isolation requirements, for this grass as well as others, is the basis for this investigation.

Review of Literature

The accounts of the early work on the phenomenon of flowering in grasses has been ably reviewed by Vinall and Hein (11)

1Cooperative investigations at Tifton, Ga., of the Division of Forage Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U. S. Dept. of Agriculture, the Georgia Coastal Plain Experiment Station, and the Georgia Experiment Station. Also submitted to the Graduate Faculty of Iowa State College as a partial requirement for the degree of Master of Science. Received for publication February 21, 1949.

2Formerly assistant agronomist, Division of Forage Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U. S. Dept. of Agriculture, the Georgia Coastal Plain Experiment Station, and the Georgia Experiment Station. Also submitted to the Graduate Faculty of Iowa State College as a partial requirement for the degree of Master of Science. Received for publication February 21, 1949.

and by Jones and Newell (9). It is generally agreed that temperature and light exert a much greater influence on flowering than does relative humidity. The latter, however, when viewed in terms of temperature and light, has a pronounced effect on dehiscence and the possibility of this fact by the breeder are obvious. Jones and Burton (2) have recently studied the flow- 

It is a recognized fact that pollen grains, spores, and seeds are dispersed to phenomenal altitudes and distances by air movement. Gregory (7) concluded that the principal factor in this dispersal is mechanical and/or thermal air movement. He stated that the effect of the turbulence is the dissemination of pollen and spores in all directions. The spore or pollen load rapidly diminishes with an increase in distance.

Jones and Newell (9) compared the pollen density of grass fields with that at 5, 15, 25, 40, and 60 rods distant. They conclude, "The chances of maintaining genetic purity in improved strains of cross-pollinated grasses are much greater when the seed is produced under isolations of 60 rods or more distances".

Gacita (6) in studies of the dispersal of corn pollen found that at very short distances from the contaminated area, a small increase in distance resulted in a large decrease in concentration but after a distance of approximately 30 rods, further decreases in concentration were negligible. Bonde and Johnson and Dickson (8) in studies of spore dissemination found similar gradients to exist.

Materials and Methods

FLOWERING HABITS

In Bahia grass a number of types are known. One type, on which these studies were made, differs from the common type reported on by Burton (2, 3) in that it is tetraploid. The two types differ in various vegetative characters. Both types flower over most of the season June, 1946, 20 panicles, of uniform age and near flowering, were selected from a block of well-established clones.

Counts were made each hour on the number of florets in which the anthers were extruded. After each count the extruded anthers were removed to prevent recount the next hour. Since this type reported on by Burton (2, 3) in that it is tetraploid. The two types differ in various vegetative characters. Both types flower over most of the season June, 1946, 20 panicles, of uniform age and near flowering, were selected from a block of well-established clones.

Counts were made each hour on the number of florets in which the anthers were extruded. After each count the extruded anthers were removed to prevent recount the next hour. Since this type reported on by Burton (2, 3) in that it is tetraploid. The two types differ in various vegetative characters. Both types flower over most of the season June, 1946, 20 panicles, of uniform age and near flowering, were selected from a block of well-established clones.

Counts were made each hour on the number of florets in which the anthers were extruded. After each count the extruded anthers were removed to prevent recount the next hour. Since this type reported on by Burton (2, 3) in that it is tetraploid. The two types differ in various vegetative characters. Both types flower over most of the season June, 1946, 20 panicles, of uniform age and near flowering, were selected from a block of well-established clones.

Counts were made each hour on the number of florets in which the anthers were extruded. After each count the extruded anthers were removed to prevent recount the next hour. Since this type reported on by Burton (2, 3) in that it is tetraploid. The two types differ in various vegetative characters. Both types flower over most of the season June, 1946, 20 panicles, of uniform age and near flowering, were selected from a block of well-established clones.

Counts were made each hour on the number of florets in which the anthers were extruded. After each count the extruded anthers were removed to prevent recount the next hour. Since this type reported on by Burton (2, 3) in that it is tetraploid. The two types differ in various vegetative characters. Both types flower over most of the season June, 1946, 20 panicles, of uniform age and near flowering, were selected from a block of well-established clones.

Counts were made each hour on the number of florets in which the anthers were extruded. After each count the extruded anthers were removed to prevent recount the next hour. Since this type reported on by Burton (2, 3) in that it is tetraploid. The two types differ in various vegetative characters. Both types flower over most of the season June, 1946, 20 panicles, of uniform age and near flowering, were selected from a block of well-established clones.

Counts were made each hour on the number of florets in which the anthers were extruded. After each count the extruded anthers were removed to prevent recount the next hour. Since this type reported on by Burton (2, 3) in that it is tetraploid. The two types differ in various vegetative characters. Both types flower over most of the season June, 1946, 20 panicles, of uniform age and near flowering, were selected from a block of well-established clones.

Counts were made each hour on the number of florets in which the anthers were extruded. After each count the extruded anthers were removed to prevent recount the next hour. Since this type reported on by Burton (2, 3) in that it is tetraploid. The two types differ in various vegetative characters. Both types flower over most of the season June, 1946, 20 panicles, of uniform age and near flowering, were selected from a block of well-established clones.

Counts were made each hour on the number of florets in which the anthers were extruded. After each count the extruded anthers were removed to prevent recount the next hour. Since this type reported on by Burton (2, 3) in that it is tetraploid. The two types differ in various vegetative characters. Both types flower over most of the season June, 1946, 20 panicles, of uniform age and near flowering, were selected from a block of well-established clones.

Counts were made each hour on the number of florets in which the anthers were extruded. After each count the extruded anthers were removed to prevent recount the next hour. Since this type reported on by Burton (2, 3) in that it is tetraploid. The two types differ in various vegetative characters. Both types flower over most of the season June, 1946, 20 panicles, of uniform age and near flowering, were selected from a block of well-established clones.

Counts were made each hour on the number of florets in which the anthers were extruded. After each count the extruded anthers were removed to prevent recount the next hour. Since this type reported on by Burton (2, 3) in that it is tetraploid. The two types differ in various vegetative characters. Both types flower over most of the season June, 1946, 20 panicles, of uniform age and near flowering, were selected from a block of well-established clones.

Counts were made each hour on the number of florets in which the anthers were extruded. After each count the extruded anthers were removed to prevent recount the next hour. Since this type reported on by Burton (2, 3) in that it is tetraploid. The two types differ in various vegetative characters. Both types flower over most of the season June, 1946, 20 panicles, of uniform age and near flowering, were selected from a block of well-established clones.