Size, Variability, and Identification of Grass Pollen

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INFORMATION concerning the means of identifying different kinds of grass pollen would be of considerable value in studies of pollen dissemination. Pollen dispersal is of particular scientific interest to the botanist and the plant breeder in their consideration of the phenomena of pollination, fertilization, and seed setting, and to the medical profession in the treatment of asthma and hay fever susceptibles. Studies of grass pollen identification were initiated at the Nebraska Agricultural Experiment Station in 1944 as an aid to the study of pollen dispersal in its relation to the production and maintenance of pure seed stocks of the cross-pollinated grasses. An evaluation is presented of the data collected and methods used in pollen identification during two years of these studies.

REVIEW OF LITERATURE

In their studies concerning the distance of dispersal of pollen, Jones and Newell (4) state that grass pollen is easily distinguished from the pollen of other families of plants, and from dust particles and rust spores which are the chief contaminants caught on exposed vaseline-coated slides. Aids used in identifying intruder pollen included size and shape measurements, knowledge of which kinds of plants were shedding pollen at the same time of the year, the time of day that each kind of plant sheds its pollen, and the mass effect of the pollen under study.

Many investigators working with corn, small grains, or important forage grasses have reported a description of the pollen of the crop with which they have worked. However, no extensive studies of the pollen of many grasses grown at the same time under similar environmental conditions have been reported.

According to Wodehouse (6), the pollen grains of the Gramineae are remarkably uniform in shape throughout, ranging in diameters from 28 to a little over 100 microns. He designates the tribe Hordeae, which includes the most important small grain cereals, as having large pollen grains. The pollen of cultivated corn has long been known to be the largest pollen of the grasses.

Grasses have been placed by Erdtman (1) into two groups according to pollen size. He divides them into the wild-grass type which ranges from 25 to 35 microns in diameter and the cultivated type in which the pollen grains measure from 35 to 50 microns with the modal peak at 40 microns.

Many of the pollen studies reported in the literature have been made for the purpose of identifying pollen found buried in bogs. The presence of large amounts of grass pollen in different layers has usually been interpreted as proof of a previous prairie invasion. Keller (5) has attempted to compare size frequency of grass pollen found in bogs with pollen frequency of modern grasses. The results of his measurements forced him to the conclusion that the predominating pollen present in bogs is not that of prairie species but of Calamagrostis canadensis.

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3Figures in parenthesis refer to "Literature Cited", p. 143.