INFLUENCE OF CERTAIN OAT VARIETIES ON THEIR F₁ PROGENY

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THE ability of a parent to transmit uniformly a desirable character to its offspring has been recognized and highly prized by breeders of livestock for generations. Plant breeders, however, have given comparatively scant attention either to the existence of this phenomenon in plants or to its possibilities in plant improvement.

Among plant scientists, corn breeders have far outdistanced all others in recognizing and making use of the fact that certain strains of their crop have the ability to induce increased vigor in hybrid progeny. Kiesselbach (8), Richey (11), Richey and Mayer (12), Nilsson-Leissner (10), Jorgenson and Brewbaker (7), Jenkins (5), Richey and Sprague (13), Lindstrom (9), and Jenkins (6) present data in this connection on studies in corn, but except for data published by Coffman and Wiebe (3), and Coffman and Davis (1, 2) on oats, and a paper by Engledow and Pal (4) on wheat, which touch upon this subject, no reports of studies of prepotent influence in small grain seem available.

The ability of a parent to impress its progeny with certain of its characters is frequently spoken of as prepotency. Prepotency usually is considered as being due to the presence of dominant genes in the homozygous condition. Study of the influence of certain oat varieties on their F₁ progeny was prompted by the observation that some varieties usually produce excellent progeny whenever crossed, whereas others produce little of value.

Studies of the vigor of plants of F₁ hybrids and of their parental lines have been conducted for several years at Aberdeen, Idaho. Since the publication of previous reports additional data have accumulated and are presented herewith.

EXPERIMENTAL DATA

Oats are grown at Aberdeen, Idaho, under irrigated conditions. Data were obtained on plants grown under irrigated conditions at Aberdeen in 1927, 1930, 1931, 1932, 1933, and 1934. Experimental procedures were the same in all years. The seed was space planted at 1-foot intervals in rows 1 foot apart. The hybrids were grown adjacent to their respective parental lines similarly spaced. Wherever blanks occurred, a plant of the Richland variety was grown as a "space filler".

Oats are recognized as especially difficult to hybridize, consequently comparisons of F₁ plants with their parents are limited by the difficulty

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3Numbers in parentheses refer to "Literature Cited", p. 323.