EFFECT OF THE CONTINUOUS SELECTION OF LARGE AND SMALL WHEAT SEED ON YIELD, BUSHEL WEIGHT, VARIETAL PURITY, AND LOOSE SMUT INFECTION

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A varietal comparison of any crop presupposes that the varieties are definite. With many crops, especially those propagated by seeds, there is opportunity for the mechanical mixing of varieties in seeding, harvesting, threshing, and cleaning. There exists, furthermore, in such crops as the more important small grains, the chance for a varying degree of mixing of varieties by natural crossing. Roguing serves to maintain varietal type, though not necessarily varietal purity.

In wheat those off types which differ from the variety in such outstanding spike characters as color or covering of chaff, shape of head, or awnedness, usually are recognized and removed at roguing time. Mixtures between varieties with similar spike characters and mixtures due to natural crossing between similar varieties and the following segregation probably are generally unrecognized. For example, a mixture of the wheat varieties Purplestraw and Fultz would escape the average roguing as both are awnless, with white glabrous chaff, yet they are distinct as the reaction of Purplestraw when spring sown is that of a spring wheat, whereas the reaction of Fultz when spring sown is that of a typical winter wheat. It is probable that the older varieties, as Purplestraw, Pulcaster, and Fultz, grown in the varietal experiments at the Arlington Experiment Farm near Washington, D.C., are in reality each a composite variety composed of strains of one general and apparently high-yielding type. As the origin of the strains making up the variety probably is due to natural crossing and some mechanical mixing, it is possible that the Arlington varieties, when compared for yield or physiological or pathological reactions, would respond differently from varieties with the same name from other sources, particularly from stations where varietal experiments are conducted. Stadler found that different strains of certain wheat and oat varieties obtained from different sources showed decided variability in their yield performance.

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