Future Prospects in Genetic Improvement in Yield of Wheat

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CONVENTIONAL BREEDING METHODS

Population management with few, if any, exceptions is a compromise between what the breeder perceives as theoretically most sound and what is practically feasible. The latter involves such considerations as research funds, land, facilities, specialized equipment, and technical assistance. Strategies, then, for population management and selection will vary greatly. Because of the difficulties of achieving desired recombinations for important but complex traits within reasonable plot numbers and size, the particular strategy followed by the breeder becomes highly important to the success of his program. Each program will differ according to the breeder's perception of breeding objectives and priorities and how they can best be achieved within practical limits.

Efficient breeding systems, while differing in details, require alternate or simultaneous recombination and selection procedures. Perhaps the most difficult and time-consuming component of a wheat-breeding program involves identifying superior segregates and determining their worth and acceptability as commercial cultivars. Clearly, there is no single best breeding system due to the diversity of breeding objectives and priorities dictated by production environment and support facilities available to the breeder.

Broad-based resistance, slow rusting, and multilines were identified as particularly useful approaches to future improvement of wheat for resistance to the rusts. All can effectively remove or diminish the effects of rust pathogens as major environmental constraints to maximum expression of genetic potential for yield in wheat. The multiline approach may be hampered in developing countries by lack of seed multiplication and management systems essential to the success of multilines. As yields

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