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Perspective

History and yield enhancement of plant breeding

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DESCRIPTION

Plant breeding is the use of genetic principles to create plants that are more human-friendly. This is done by choosing plants that are economically or aesthetically attractive, managing the mating of chosen individuals, and then selecting specific individuals from the progeny. Such activities can alter the genetic composition and value of a plant population well beyond the natural limitations of previously existing populations if they are repeated over many generations.

The biological aspects behind plant breeding are discussed in the article heredity, which focuses on the application of genetic concepts to plant improvement. See Genetically Modified Organism for further information on transgenic crops.

History

Plant breeding has been practiced for generations, dating back to the birth of agriculture. Humans began to discern degrees of quality among the plants in their fields soon after the first domestications of cereal grains, and preserved seed from the best for establishing new crops. Early plant-breeding strategies were forerunners of such rudimentary selection approaches.

Early plant-breeding processes yielded noticeable effects. Most modern types are so different from their wild ancestors that they can't thrive in the wild. Indeed, in some cases, the cultivated forms are so unlike to their wild counterparts that identifying their forebears is challenging. From an evolutionary standpoint, these amazing alterations were achieved by early plant breeders in a relatively short period, and the rate of change was likely greater than for any other evolutionary event. Gregor Mendel defined the laws of heredity using pea plants in the mid-1800s, laying the groundwork for scientific plant breeding. In the early twentieth century, when the rules of genetic inheritance were increasingly defined, progress was made toward applying them to plant development. One of the most important truths to emerge from the brief history of scientific breeding is that the world's plants have a vast amount of genetic variety, with just a small portion of it being used.

A plant breeder's ideal plant is one that combines the greatest number of desirable features. Resistance to diseases and insects; heat, soil salinity, or cold tolerance; proper size, shape, and maturation time; and many other general and specialized qualities that contribute to increased environmental adaption, ease of growth and handling, higher yield, and superior quality. Plant breeders in the horticultural industry must also consider aesthetic appeal. As a result, the breeder may seldom concentrate on a single attribute, but must consider a variety of qualities that make the plant more beneficial for the purpose for which it is developed. Plant breeding is crucial techniques for ensuring global food security and many key crops rely on it have been evolved to endure the harsh climatic conditions brought on by global warming, including as drought and heat waves.

Yield enhancement

Increasing yield is one of the main goals of almost all breeding programmes. Selecting conspicuous morphological variations is frequently used to achieve this. Dwarf, early maturing rice types are one example. These dwarf cultivars are tough and have a higher grain yield. Furthermore, because of their early maturation, the ground is freed up fast, allowing for the planting of another crop the same year.

Another strategy to boost production is to create disease- and insect-resistant cultivars. In many situations, developing resistant cultivars has been the only viable pest management option. The stabilizing influence of resistant cultivars on output, and hence on stable food supply, is perhaps their most essential trait. Drought-tolerant, heat-tolerant, and cold-tolerant varieties all give the same advantage.

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