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The Language of Seeds

By Ellen Solomon

From time immemorial human beings have interacted with the plant world for food. In a sense, we have evolved together, influencing each other. We observed the life cycles of plants, we selected the best or biggest seed plant to put back into the ground, and thus we encouraged the plant's evolution.

Since the 17th century, farmers and biologists have created hybrids of many creatures (the first known intentional "hybrid" was a cross between a wild boar and a domestic sow.) In the 20th and 21st centuries, we find a bewildering language referring to seeds: *open-pollinated*, *self-pollinated*, *heirloom*, *hybrid* and *GMO*. This article is a brief explanation of the meaning of these words, illustrated by the tomato. Except for GMO, this language refers to the means of pollination, the process whereby the *stamen* (male part) of the flower unites with the *pistil* (female part) to create the fruit and initiate the formation of seed.

Open-pollinated

In open-pollination the stamen and pistil come together naturally on wind and insects. The resulting plants may resemble the parent plant or vary in size, color, drought-resistance, etc.

Open-pollinated seeds may be stabilized or "fixed" in certain characteristics by multiple generational breeding and by selecting only those seeds from plants with the desired characteristics.

Self-pollinated

Some open-pollinated seeds are self-pollinated, in which a plant flower is pollinated by itself. These plants presumably reproduce the parent exactly; in other words, the traits or characteristics of the parent and the children are the same.

Heirloom

Heirloom seeds are open-pollinated seeds of plants that were grown in the past and not adopted by large-scale agriculture. Some people say they are "at least 50 years old", and some say "at least 100 years old". Some growers maintain that heirloom tomatoes are self-pollinated, others list them as open-pollinated.

Hybrid

Hybrid seeds are created through a cross by natural means between two parent plants. Hybridization can occur in the wild, or in your garden, or it can be arranged by humans.

Interested in new flower colors, farmers in Europe and America first created hybrid plants in the 17th Century. An unexpected result was that hybrid plants generally proved to be

more vigorous than their parents.

Parent plants of vegetables are crossed to produce desired characteristics, such as early bearing (Early Girl tomato), disease resistance, color, shape (Sweet 100 tomato), sweetness, etc. The resulting hybrid plants may be designated "F1 Hybrid," which refers to the seed being the first generation cross. The seeds developed on hybrid plants are not sold, as they do not consistently reproduce true, but will produce plants with the grandparents' characteristics.

GMO

GMO refers to "Genetically Modified Organisms" (also called GE or "Genetically Engineered".) In a GMO, the gene has been altered in a laboratory; with bio-technology, the genes inside the nucleus are altered. In succeeding generations the "modified" plant may reproduce by natural means, passing on the new characteristics.

The technology of genetic engineering was first used in 1978 to create insulin. In agriculture, the first expression of GMO technology was the development of herbicide-resistant tobacco in 1986. Since the 1990's, genetically engineered corn and soy are widely planted in the United States. GMO in agriculture focuses on drought tolerance, herbicide resistance, growth rate, and yield.

The use of genetically engineered plants is highly controversial because of many issues: environmental concerns, legislative control and regulation (or lack of) by government, the application of patent law, and the long term health effects on humans, animals, and insects. Practices of industrial agriculture, e.g. monoculture vs. diversity, are linked to, but not necessarily tied to, hybrid and GMO seed production.

Unknown health issues may arise from eating GMO products, either due to the "carrier" used in genetic modification technique, which is in the biological form of a virus, or to the herbicidal agent incorporated in the genes.

Environmentalists are concerned with herbicide-resistant strains producing herbicide-resistant weeds, and the unknown consequences as pollen of GMO plants escape to neighboring fields and the wild. Such developments may permanently alter and disrupt the life of the soil, patterns of interdependence between pollinators and plants, and ultimately the entire web of life.

Information from Kingsbury, Noel; Hybrid, University of Chicago Press, 2009; Hartmann, Hudson et. al. Plant Propagation, Prentice Hall, 7th Ed. 2002; and Peaceful Valley, Territorial Seeds.

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