



Windy Ridge Natural Farms

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FYI – How are crop plants propagated?

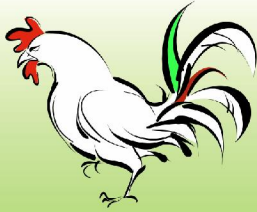
There are many methods of propagation including Cuttings, Budding, Cuttings, Division, Layering, Grafting, Tissue Culture, Bulbs, Corms, Offsets, Rhizomes, Runners, and Seeds, but this quick primer focuses on the different primary methods of food crop (cereal grains and corn) plant propagation. It is not intended to be a comprehensive volume.

Open-pollinated - Open pollination is pollination by insects, birds, wind, or other natural means without man's intervention. The seeds of open-pollinated plants will produce new generations of those plants; however, because breeding is uncontrolled and the pollen (male parent) source is unknown, open pollination may result in plants that vary widely in genetic traits. Open pollination increases biodiversity.

Heirlooms - An heirloom plant, heirloom variety, or heirloom vegetable is a cultivar that was commonly grown during earlier periods in human history, but which is not used in modern large-scale agriculture. Many heirloom vegetables have kept their traits through open pollination, while fruit varieties such as apples have been propagated over the centuries through grafts and cuttings. They are typically perpetuated by selecting seeds from the plants with desired traits.

Hybrids - Hybridizing is a natural process facilitated by man. Plant species hybridize more readily than animal species, and the resulting hybrids are more often fertile hybrids and may reproduce, though some hybrids are sterile. Plants hybridize frequently without much work. They are often created by humans in order to produce improved plants. These improvements can include the production of more or improved; seeds, fruits or other plant parts for consumption, or to make a plant more winter or heat hardy or improve its growth and/or appearance for use in horticulture. Hybridizing can be a complex process, but has been a commercially effective means of producing a plant with desirable traits for many years. There are Single cross, Double cross hybrids, Three-way cross hybrids, Triple cross hybrids and Population hybrids.

GMOs - A genetically modified organism (GMO) is an organism whose genetic material has been altered using genetic engineering (GE) techniques. These techniques, generally known as recombinant DNA (rDNA) technology, use DNA molecules from different sources, which are combined into one



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molecule to create a new set of genes. This DNA is then transferred into an organism, giving it modified or novel genes. Transgenic organisms, a subset of GMOs, are organisms which have inserted DNA that originated in a different species. Some GMOs contain no DNA from other species and are therefore not transgenic but cisgenic.

GMOs cannot be created by nature. Most GMO food crops are transgenic and transcend nature's barriers, ie: fish genes in a tomato (Flvr Savr tomato), or bacterium genes in soy (Roundup Ready Soy) or corn (Bt Corn). These genetic modifications impart some desired trait, such as longer shelf life (Flvr Savr tomato), resistance to herbicides (Roundup Ready Soy), or production of their own pesticide (Bt Corn).

There are many problems with GMOs, some of the most concerning being; Unintended and unexpected consequences. These new genes can activate other undesirable proteins creating novel (new) allergens. Future generations of the crop are often likely to significantly mutate, producing what is basically a new plant with a new set of novel allergens. What is OK today may not be in next year's crop. GE is at best a very imprecise process with unpredictable results. It is clear from scientific study, that many GMOs have an adverse effect on human and animal health.

It is a violation of patent law to save the seeds from GMOs and replant them without the express permission of the patent holder. GMO seeds typically cost 4-5 times the cost of normal seed. When an expensive GE crop fails, it creates financial ruin, as with Bt cotton farmers in India. When faced with financial ruin, tens of thousands of these farmers have committed suicide. With GMOs, agriculture in the US has seen an increase in pesticide use (includes herbicides) of hundreds of millions of pounds over the last decade, making environmental contamination more of a health issue than ever.

The most common GMO crops are Soy, Corn Cotton and Canola, but there are many others including zucchini, papaya, tomatoes, potatoes and more with many more in development. Soy and/or corn and their derivatives are in more than 75% of all processed foods. More than 95% of soy grown in the US is GMO and more than 80% of corn grown in the US is GMO.