

# How Genetically Engineered/Modified Plants Violate the Four System Conditions

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The 4 Systems Conditions of **The Natural Step** are based on a consensus of scientists including physicists and chemists. They are very 'top down' in nature and express generic ideas which require a great deal of thought and expert knowledge to apply. The laws of thermodynamics are clearly involved and well stated. It is a very simple qualitative metric that can clearly illustrate if some action is in accordance with the 4 systems conditions. ("Is this chemical found in nature? If no: Is this chemical increasing in nature? If yes: don't use it".)

*In a sustainable society, nature is not systematically subject to...*

## 1. ... increasing concentrations of substances **extracted** from the earth's crust

And although promises of feeding the world in the face of climate change is a favorite topic for biotechnology industry ads yet analysis shows that 75% of the GM crops on the market are simply bred to withstand the application of Roundup herbicide. The majority of the remaining crops are bred to produce Bt, an insecticide, in their DNA. Not only do these traits offer nothing in the way of better yields, tolerance, or nutrition, but also evidence suggests that they are responsible for the emergence of so-called "super" weeds and bugs. These pests, which have evolved to resist Bt and/or Roundup, are necessitating the use of additional, stronger herbicides and insecticides, at an increased cost to both farmers and to the environment. All of these herbicides and pesticides are derived from fossil (mined) sources.

## 2. ... increasing concentrations of **substances** produced by society

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## 3. ... **degradation** by physical means

The methods used by industrial agriculture degrade topsoil, demanding more and more artificial inputs to maintain yields. By Not building top soil, industrial methods use more and more water to increase yields. Creates a monoculture landscape and reduces seed genetic diversity (contamination and patents), which threatens plant and animal biodiversity.

## 4. ... **unfair and inefficient practices** and people's ability to meet their needs is not systematically undermined

GMO seed companies will not allow a farmer to save their seed. This is both because the seed themselves create an unpredictable progeny, and because the patent-owner can have an annual sale to the 'hooked' farmer.

The GE farming method becomes more-and-more expensive, as more Round-up needs to be used over time.

Industrial agriculture, with its political connection, gives subsidies unevenly to larger farms- squeezing smaller farmers out of the market.

Monoculture and loss of genetic diversity threatens human food supplies into the future.