**The Sustainable Ag Movement Begins**

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|   | Wes Jackson helped start the sustainable ag movement |   |
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At the same time that the Green Revolution was exporting modern high-technology agriculture around the world, a counter movement was beginning – the Sustainable Agriculture Movement. The movement grew in fits and starts during the last half of the 20th century.

While there are differing ideas about what sustainability in agriculture means, there are several factors that advocates within the movement are concerned about –

* Non-renewable resources. During the 50s, the production of fertilizers took off. Oil and natural gas were used to produce ammonia. Minerals like potash were mined. Some scientists began to point out that there is a limit to the amount of oil and minerals that exist in the world, so agriculture cannot sustain itself in the long term if we use up these resources.
* Water resources may be unsustainable if we "mine" water – pumping underground aquifers faster than they can be recharged by rain. Water resources are also misused when we allow salt to build up or when we pollute the soil with pesticides or too much fertilizer.
* Environmental concerns. Rachel Carson's book, [*Silent Spring*](https://livinghistoryfarm.org/farminginthe50s/pests_08.html)*,* came out in 1962 and helped found the environmental movement. She was concerned with the long-term effects of agricultural chemicals on the ecology.
* Conservation of soil, water and nutrient resources. For many years, conservation advocates had argued that farmers could not continue to survive if they allowed topsoil to erode away. These advocates pushed conservation tillage methods, efficient uses of irrigation and crop rotation practices to maintain the resources.
* Economic and societal effects. Many sustainable agriculture advocates are also concerned about the concentration of farming into larger and larger units and the resulting decrease in rural communities and the family farm structure.

One of the earliest organizations formed to promote sustainable agriculture was the Ontario-based group, The Land Fellowship, established in the early 1950s. During the 50s and 60s, there were a number of academic studies on sustainable issues.

In 1978, Wendell Berry published *The Unsettling of America* that questioned the tenets of industrial agriculture. In 1980, Wes Jackson published *New Roots for Agriculture* which argued that monoculture farms with annual plants that require a lot of external inputs to grow – like huge fields of corn fertilized by ammonia – should be replaced by "polycultures" of perennial plants where one species would complement another. In 1987, Miguel Altierri coined the term *Agroecology* in his book by the same name. And in 1988, the National Academy of Sciences published its own study of Alternative Agriculture featuring 11 farmers in the U.S. who had adopted ecologically based production methods.

U.S. lawmakers also responded by funding research initiatives. The 1985, Food Security Act authorized sustainable agriculture research. In 1989, $4.45 million was allocated for the Low-Impact Sustainable Agriculture (LISA) program in the USDA. LISA later became SARE, the Sustainable Agriculture Research and Education program.

**Organic farming** is a related concept that has actually been defined legally as the market for "organic" food has grown. Organic crops are actually defined by what they are not – they are NOT grown using commercial pesticides, artificial fertilizers or sewage sludge, and they are NOT processed using food additives or ionizing radiation. Organic animal products are NOT produced using antibiotics routinely or using growth hormones. At all levels, organic food is produced without using genetically modified organisms.

**A critique of sustainability.** As the sustainable agriculture movement grew, the green programs took note and funded research projects into sustainable practices. And they have all emphasized new techniques and varieties of traditional crops that the poorest farmers can produced with limited training.

Dr. Norman Borlaug, father of the Green Revolution, has argued that the need is so great that the world must use all of the tools at its disposal, including genetically modified organisms. "Biotechnology is a bad word for many people, now, because we can make crosses that we couldn't make before," he says. "But as long as the population monster is pushing on us, what choice do we have?"

Borlaug points out that human beings have been genetically modifying plants for thousands of years by simply choosing the best looking plants to plant and encourage. Understanding the structure of DNA shortens the time needed to produce new varieties.

He also offers a reality check for advocates of organic farming techniques that don't use commercial nitrogen fertilizers. "It's impossible to produced the food for 6.4 billion people with chemical nitrogen," he says. Here are the numbers he uses.

* Right now, we use 87 million metric tons of nitrogen fertilizer to feed 6.4 billion people. Crops won't grow without nitrogen.
* The "organic" source of nitrogen is manure that is about two percent nitrogen. So, it would take 50 tons of manure to get one ton of nitrogen. That means that the world would need 4.5 Billion tons of manure to feed the current population.
* If we turned to cattle alone to get that much more manure, Borlaug says it would take 6 to 7 billion cattle. The current number of cattle in the world is 1.5 billion.
* Finally, there isn't enough livestock feed in the world to feed that number of cattle, so either food would be redirected from human consumption or huge forest would have to be converted to agriculture to feed them.

"A lot of nonsense!" Borlaug says.

Nebraskan Don Reeves has been an activist for most of his life and on this issue, he agrees with Borlaug. "Use every bit of organics that you can lay your hands on," he says, "When you get to the end of what's possible with organics you're still going to be short. And if you're going to produce enough food in the food-short world, you're going to have to add chemical fertilizers."

Despite this criticism, researchers are working to develop the best management practices that will allow farmers to produce food profitably in ways that will sustain the resources, environment and local communities.