

The Total System Approach and Biodiversity

The **total system approach** discourages “treat-the-system” applications that don’t provide sustainable solutions for ongoing pest management that mimics nature. The key to sustainable biodiversity within agroecosystems denotes a balance of natural effectiveness by indigenous populations, multitrophic level interactions, plant mixtures, soil microbes, existent plant defenses, and species (W.J. Lewis et al. 1997).

The total system approach encapsulates the management of the entire ecosystem on the farm to include minimal soil disruption, sufficient water uptake, cropping solutions, and weed availability to allow flora and fauna synergy within the environment and surrounding communities. The biological compositions of plants trigger responses to herbivores and their enemies. While some release natural toxins to discourage uptake, others exert chemicals that attract beneficial insects and parasites to dismember their opponents (W.J. Lewis et al. 1997).

The total system approach also complements the diversity of the landscape, promotes energy conservation and nonrenewable resources, sociological benefits for employment, public health, and a farmer’s quality of life. The overall downside of pest management strategies are that biological, chemical, and physical therapeutic tools are our leading solution for managing pests, instead of using natural methods that neutralize problems over time. Being patient

enough to balance pest organisms by embracing naturally recurring synergies within biodiverse environments long enough to allow them to naturally adapt, instead of eliminating pests all together, is one of the biggest challenges that we face when taking on the total system approach (W.J. Lewis et al. 1997).

While the total system approach would be extremely beneficial to my bioregion and Texas in general, agricultural traditions in my life place are not necessarily privy to sustainable techniques. Due to the fact that sustainability is misinterpreted and not enough research substantiates why it is better (Becker 1997, 6), I think that many conventional farmers in Texas just want a quick fix so that they can turn a profit. Perhaps through their eyes, the total system approach doesn't make the same guarantees that other pest management strategies do so they fear that it's just too risky.

Works Cited

Becker, Barbara. "Sustainability Assessment: A Review of Values, Concepts, and Methodological Approaches." *Issues in Agriculture* 10. Washington, D.C.: Consultative Group on International Agricultural Research, February 1997.

W.J. Lewis, J.C van Lenteren, Sharad C. Phatak, and J.H. Tumlinson III. "A total system approach to sustainable pest management." *The National Academy of Sciences* 94 (November 1997): 12243-12248. Photo additionally credited from their scholarly journal publication <http://www.pnas.org/content/94/23/12243>.

The Dust Bowl Demanded Sustainable Agriculture

Our first records of weather tracking from the U.S. Weather Bureau were from 1898 for relative humidity, winds and temp. It wasn't until radiosonde initiatives were launched in 1938 that we were able to test temperature, humidity, pressure, and transmit information during inclement weather (Service 2007). But by then it was too late to see what New York City already had (A&E Television Networks, LLC 2015). The **Dust Bowl** was an ecological disaster that hit over 150 million acres and drove "exodusters" to urban life east or as far west as California (Eric Foner and John A. Garraty 1991). In 1931 the drought that swept the plains was the onset of the Dust Bowl (Hurt 2002). The Dust Bowl was a direct result of what happens when you mess with science and nature over a degradingly long period of time.

Several generations of farmers monocropped the grasslands of the Great Plains and planted seed into fertile topsoil which became the means to earn a meager wage. They didn't understand sustainable agriculture, biointensive growing, companion planting, or cultivating drought tolerant seeds. Cattle ranching and wheat farming contributed to the ecological imbalance of earth and sky because they stripped the grasslands dry and left them structureless too. Topsoil stripped of beneficial nutrients and moisture prompted soil erosion. Drought and wind erosion set in parching the dirt even more. After a period of time with no rain, the wind hit the prairies, statically lifting up dust up to 10,000 feet, traveling 65 miles an hour, and

causing enough electricity to power NYC (A&E Television Networks, LLC 2015).

By 1934, 300 million tons of top soil had been removed by the Great Plains which touched Kansas, Northeast New Mexico, Southeast Colorado, Oklahoma Panhandles, and parts of Texas (Hurt 2002). Roosevelt enacted “practical measures” to remediate drought, dust, and depression beginning with the Great Plains Drought Area Committee (Hurt 2002). Several organizations were formed to assist with the Dust Bowl and Great Depression including land and social services relief. Most of the Great Plains farmers were in some form of federal agricultural relief program. The AAA, RA, CCC, and FSA couldn’t help enough and someone had to pay for it (Hurt 2002).

The goals for New Deal Agricultural Conservation included removing excess and marginal acreage from crop production, preventing soil erosion with improved agronomic practices, rural zoning, grassroots involvement, eliminating farm poverty, and practicing ecological resource management (Worster 1979). Conservation efforts that were enacted on behalf of the government to plant 220 million trees through the Shelterbelt Program of the Forest Service or let land grow fallow through the Taylor Grazing Act, were just a few attempts to help the Great Plains flourish again (Danbom 1995).

Rexford Tugwell, Lewis Gray and Henry Wallace were detrimental towards sustainable improvements during the 1930s (Worster 1979). Although there were a lot of initiatives in place to alleviate the pressures at the time there wasn’t a consistent foothold in all acts because different people were in control of governmental legislation. The Soil Conservation

Service (SCS) was initiated to teach about soil conservation but one had to sign a five year contract in order to reap rewards. Sustainable education on behalf of agriculture and the environment should have been included in all relief efforts and initiatives. That would have helped prevent future reliance on government assistance and fueled a more sustainable economy. Perhaps they would have been more prepared for a “fundamental environmental reform,” if they were educated along the way (Worster 1979). If our government continued to integrate conservation with sustainable agriculture as part of the New Agricultural reform then and implemented it into sustainable mandated policies to this day, our country would be a lot better off. We’ve come a long way since the Dust Bowl, but our sustainable challenges in agriculture in the twenty first century are far more difficult.

Bibliography

A&E Television Networks, LLC. *Dust Storms Strike America*. A&E Television Networks, LLC, 2015.

Danbom, David B. *Born in Country*. Baltimore: The John Hopkins University Press, 1995.

Eric Foner and John A. Garraty, Editors. *The Dust Bowl*. Summary of the Dust Bowl, New York: Houghton The Reader’s Companion to American History. Eric Foner and John Houghton Mifflin Harcourt Publishing Company, 1991.

Hurt, R. Douglas. *Agriculture: A Brief History*. West Lafayette: Perdue University Press, 2002.

Service, National Ocean. “A History of Observing the Weather.” *NOAA Celebrates 200 Years of Science, Service, and Stewardship*. May 31, 2007.

http://celebrating200years.noaa.gov/foundations/weather_obs/welcome.html#earlyyear (accessed January 22, 2015).

Worster, Donald. *Dustbowl: The Southern Plains in the 1930s*. New York: Oxford University Press, 1979.

Spring Fever!

Here in Texas we've experienced spring weather for quite some time. You can really tell it's spring when all the plants are blooming like crazy and there is green growth everywhere!

My lemon balm is crazy right now! Thank goodness the chickens love it and it smells incredible. Lemon balm, or Melissa, is excellent to grow anywhere in your garden. It's great to promote beneficial insects and deter pests. It's in the mint family.

I wanted to update you on some of our latest projects and with pictures because there have been so many this past year that the website doesn't do our backyard justice! So bare with me, I'm on my one week vacation from school, thank goodness! However the week isn't ever long enough, because the intensive six weeks classes can sometimes be pretty brutal. Just being honest and from me, you get nothing less. I don't sugar coat it, I'm sorry if that's what you wanted. This website is based on honesty.

Moving right along. I will attempt to blog more often, in my defense, I'm engaged in lengthy discussions online with school, so I will continue to share some of those blogs because often times I've done a bit of research and you may

find them a lot more interesting since they are very informative in the food movement. My next class is vegetables to table, 5050.