

# 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>.