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## APPLYING LISA CONCEPTS ON SOUTHERN FARMS OR CHANGING FARM PHILOSOPHIES: DISCUSSION

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**T**he LISA concept has generated tremendous friction between segments within agriculture as well as among consumer, environmental, and agricultural groups. At the root of this friction is poor communication and numerous misconceptions held by nearly all factions in the debate. John Ikerd's paper is representative of the state of information available about LISA, providing an excellent overview of what LISA is, but unfortunately stopping far short of explaining how it might be applied to southern agriculture.

In defining what LISA is, Ikerd points out that "the low input perspective is that farmers *must* reduce their use of commercial chemical inputs as a means of reducing environmental and ecological risks associated with agriculture (emphasis mine). This implies that the use of any commercial chemical poses an environmental risk, and, more importantly, that when chemical use is reduced, the environmental risk posed by agriculture is reduced. This statement is at the center of the friction and is in general insupportable. Two relative questions beg to be answered. Are there any commercial chemicals which pose no environmental risk? Does the environmental risk posed by the use of some chemicals more than offset the environmental risks associated with alternative practices used to substitute for these chemicals?

Those who espouse the low-input perspective might more effectively argue that farmers should seek to use commercial chemicals more efficiently, thereby reducing any potential threat to the environment. This is a subtle difference, but one not lost on farmers and agribusinesses. The inability or unwillingness of USDA, and other agricultural entities (e.g. land grant universities) to educate environmentalists and the general public regarding the fallacies of the "low-input" position has led to the nearly complete dismissal of the "low-input" concept. And in fact, as Ikerd points out, the sustainability concept has emerged as the dominant aspect in LISA. Removing the term low-input and focusing only on sustainability may aid in obtaining a consensus on the program objectives.

Webster defined sustainability as the ability to keep in existence, maintain or prolong, while Pearce maintains that sustainability is about being fair to the future, leaving the next generation a similar, or better, resource endowment than that which we inherited. From a broader perspective, Pearce and Turner argue that a sustainable system must follow four basic rules:

- (1) Use renewable resources at a rate less than the natural rate of generation.
- (2) Maintain wastes from production at a level below the assimilative capacity of the environment.
- (3) Ensure that the reduction of stock resources is compensated for by increases in renewable resources.
- (4) Depletion of stock resources should occur with an increased standard of living.

Ikerd, on the other hand, defines sustainability as "the ability to keep farms both ecologically sound and economically viable." Surely a family-owned farm passed through several generations could be viewed as economically viable. The question then, from Ikerd's perspective, becomes, is the farm ecologically sound? Again, from the LISA perspective, the reduced use of commercial chemicals is seen as a move toward ecological soundness. But, so too is less intensive tillage, substitution of labor and/or draft animals for machinery, and the production of native crops (e.g. grass in the prairie). Under Pearce's concept of sustainability, the relevant question is whether the research-extension-production system in agriculture has fostered resource endowments equal to those available in the past. Also, will it provide for an equal endowment in the future?

Ikerd describes a conventional farming paradigm among southern agriculturalists as the "conventional mind-set regarding the difficulty of producing conventional southern crops by conventional farming methods without conventional pesticides and fertilizer." This paradigm more accurately describes the real situation confronting farmers rather than a "mind-set." Environmentalists, misled by LISA proponents to believe that information on the successful use of LISA technology is readily available, continue

to push farmers to implement "less environmentally adverse" production systems. Unfortunately, LISA information is not readily available and adopting a concept (philosophy) is often more difficult than adopting a practice.

"Sustainable agriculture" is not a novel concept but rather the means by which American farmers have continuously operated to insure that the family operation may be passed down from generation to generation. Farmers continue to adopt the set of technologies with the best proven record for providing the greatest profitability for both long and short run success of the farm operation. As new information becomes available, farmers adjust their choice of production technologies. What is novel about the concept is the broadened perspective on what threatens agricultural sustainability. Also new is the recent and subtle shift to the "polluter pays" principle in agriculture, where the agricultural industry is being held accountable for a new set of external costs such as ground and surface water contamination. This subtle shift in property rights may induce farmers to change their production systems to more effective and efficient use of commercial chemicals.

Society must decide whether to accept the risks and benefits posed by the current set of conventional agricultural technologies or pay for the development of an alternative set of agricultural technologies with less risk and (presumably) an equal level of benefits. If this new set of technologies increases farm profitability, adoption (over time) is almost certain. But as the studies by Knutson et al. and Richardson and Smith point out, immediate yield reductions will occur at a rate exceeding any cost savings. Thus farm incomes will decline. The increased farm incomes estimated by these studies assume that all farms are required to simultaneously reduce agricultural chemicals. A firm acting alone would not receive increased farm prices and thus would be unable to remain competitive. More importantly, the studies indicate that the best LISA information currently available will lead to immediate and dramatic changes in farm income, with extreme variation among regions and crops. Ikerd argues that the Knutson et al. study provides "little if any positive information regarding the potential impacts of adopting LISA farming concepts" because the LISA concept does not suggest reducing inputs without "acceptable alternative means of controlling pests and maintaining soil fertility." While Ikerd may be correct on this point, the estimates of cost and yield changes in

the Knutson et al. study are extremely valuable in describing the capacity of currently known LISA technology. The absence (or lack of availability) of good information on LISA technology is again evident from the study by Pimentel and others. The Pimentel et al. study indicates that total pesticide use could be reduced by 50 percent through substitution of integrated pest management, biological pesticides and mechanical control, with no decline in yields. But two important questions are left unanswered: will these methods increase profitability and will they provide net increases in environmental benefits?

Ikerd's paper represents the very essence of the LISA debate. The title "Applying LISA Concepts on Southern Farms" entices the reader to discover how southern farmers can change their farms by utilizing LISA techniques. Unfortunately, the reader first discovers that the only difference between the currently used conventional technology and sustainable technology is more a "difference in farming philosophy than of farming practices or methods." Later, the reader finds that "LISA farms rely less on commercial inputs and more on intensive management of land and labor." This appears to be more than a philosophical change, but the difference is hard to assess without actually analyzing the comparable conventional and LISA farming systems. U.S. farmers need more than a concept. Faced with considerable risk in their current conventional operations, farmers need information on sustainable technology which clearly identifies production risks and expected benefits. Ikerd seems to imply that a comparison of specific conventional and LISA farming practices is inappropriate because LISA is a systems approach with each system "very much individual farmer and farm site specific." However, to develop a LISA farming system will require farmers to select from amongst the best set of available technologies. Information comparing LISA and conventional practices must be available if farmers are to adopt the practices. In short, all sides in the LISA debate simply need to eliminate rhetoric on what the concept is and what it will do, and get on with the task of conducting solid research to enable U.S. farmers to reduce costs, increase yields (or both) and minimize any potential adverse impacts on the environment. Hopefully, future discussions pertaining to LISA will focus on the technical rather than the philosophical differences between LISA and conventional production systems.

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