

The Kerr
Center for
Sustainable
Agriculture



FUTURE FARMS

*New Ideas for
Family Farms and
Rural Communities*

FEBRUARY 8TH AND 9TH

2000

CONFERENCE PROCEEDINGS

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definition, concerns for
sustainability imply concerns
for the long run, for
intergenerational equity –
meeting the needs of our
current generation while
leaving equal or better
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generations to follow.

The three cornerstones of
sustainable agriculture –
ecological soundness,
economic viability, and social
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the Golden Rule across
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– John E. Ikerd from

"Sustaining America's Rural Communities"

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and Rural Communities*



PROCEEDINGS

February 8 and 9, 2000

Metro-Tech, Oklahoma City, Oklahoma

Conference sponsored by
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FUTURE FARMS PROCEEDINGS

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PREFACE

Two Roads

What will American agriculture be like in the new century?

It depends on which road we take. If we continue down the road we have been traveling, there won't be much of a future in farming or ranching. This road leads us to a dead end— a place where there are fewer independent farmers, where there are scant profits, and many environmental headaches. With the farmers gone, rural communities will be hard-pressed to support schools and businesses.

But there is another road, a better road, to travel into the future. This is the road we decided to explore at our *Future Farms* conference on February 8 and 9, 2000, in Oklahoma City. It is our hope at the Kerr Center that this road will lead us to a place of independent, profitable family farms and ranches, where families protect the environment and conserve natural resources. These farms will grow a variety of crops marketed in ways that return the maximum profit to the producer, while providing consumers with healthy choices. Some of the farmers along this new road will be adding value to their crops, forming cooperatives, and finding new ways to make agriculture work for them.

This brave new world of profitable, environmentally-friendly agriculture will support thriving rural towns, where children receive a good education and can choose to stay in the

community, even choose to be farmers, a choice not easy to make today.

It was a privilege for the Kerr Center to present this distinguished line-up of farmers, ranchers, researchers, and educators from Oklahoma and around the United States who were able to point us in the right direction. These are folks who have already started down this better road into the future.

Oklahoma is a state populated by the descendants of hardy, independent people— pioneers of all races and ethnic backgrounds and Native Americans from a myriad of tribes— who started a new life in a new "land of the red people," as Oklahoma means in Choctaw. Oklahomans know all about hard roads— from the Trail of Tears to the Dust Bowl migration along Route 66. In the past one hundred years, the farmers and ranchers of Oklahoma have suffered from the uncertainties of weather, prices, and government policy. But they have also raised many abundant crops and love for the land remains strong.

We at the Kerr Center hope that this conference helped those who attended (or you who read these *Proceedings*) gather ideas and inspiration for the journey down this new road in a new century.

Jim Horne, Ph.D.
President and CEO
Kerr Center for Sustainable Agriculture

Emotionally-, Economically- and Environmentally-Enhancing Agriculture

Joel Salatin, Polyface Farm, Shenandoah Valley, Virginia

As farmers, we are in the landscape business. Whether we have a window box, a backyard or a million acre ranch, the more we can intersect the three basic environments of open land, forest land, and water, the greater the diversity of plant and animal life. The greater the diversity, the more stable the ecosystem.

All three of these environments must justify their stewardship by being independent profit centers, and it's up to us to figure out how to have multiple, balanced profit centers. Usually a farm will have at least one centerpiece enterprise, but the trick is to hang multiple complementary enterprises synergistically and symbiotically off that primary profit center.

We sell firewood and mill logs on a portable bandsaw mill to generate income from the forest. Of course, the forest enhances our hydraulic cycles, buffers climate extremes, produces biomass and generates oxygen. Branches run through a chipper produce carbon to lock up nutrients produced in livestock housing situations.

In the winter, when we run out of stockpiled forages and feed hay, the cattle lounge and eat in a hay shed with a vertically adjustable V-slotted feeder gate. We add whole corn to the carbonaceous bedding and let the entire bedding pack build up to four-feet deep. This bedding pack ties down all the 50 pounds excreted daily by the cattle and keeps it from leaching into the groundwater or running off into streams.

The anaerobic bedding pack, containing fermented corn, receives pigaerators in the spring after the cows go back out on pasture.

The pigs turn the pack, injecting oxygen and creating aerobic compost. By letting appreciating livestock do the work, the profit potential is size neutral because we do not have to generate the income to capitalize things that rot, rust, and depreciate.

Intensive controlled grazing maximizes nutrient cycling and cattle performance on pastures. We produce salad bar beef, and believe that no multi-stomached animal needs grain--ever. The only reason to feed grain to a multi-stomached animal is to compensate for improper pasture management.

Moving the cattle daily to new paddocks mimics natural herbivore grazing through short duration, high density patterns. We have not used an ounce of chemical fertilizer since coming to the farm in 1961, and yet average 250 cow-days per acre compared to the county average of 70 in our 31-inch rainfall area.

Two eggmobiles hooked together housing 800 layers follow the cattle in their grazing. The layers free-range a couple of days behind the cattle and scratch through cow paddies to remove fly larvae and spread the dung. In addition, the birds harvest grasshoppers, crickets and other bugs, producing nearly \$15,000 worth of eggs annually as a byproduct of pasture sanitation and livestock hygiene. We use no systemic parasiticides.

Pastured broilers housed in 10 foot x 12 foot x 2 foot high portable, floorless pens move across the pasture at about 500 birds per acre per five-week period. We prepare the pasture for the broiler with the cattle. The pens protect the Cornish Cross birds from weather and predators; but offer a fresh daily salad bar to

The more plants and animals a farm can integrate in close proximity, the better.

One person
working seven
hours per week on
five acres can net
\$15,000 per year
with this system.

produce a bird that is light-years superior to fecal factory fare in all measurable areas: taste, nutrition, humaneness, odor, texture, cleanliness and safety. We raise about 8,000 birds a year, processing the first in May and finishing in early October, yielding about \$50,000.

The feathernet is another pastured egg model in addition to the eggmobiles. Each model has assets and liabilities. The feathernet utilizes highly-portable electrified poultry netting to keep the birds in and predators out, along with hoophouses on skids for shelter and laying boxes. A feed sled holds enough feed for a month, and the water trough is plumbed into a farm-wide gravity water system. The feed sled and houses are all hooked together with chains in train fashion for ease of moving.

Three 150-foot sections of the netting enclose a quarter acre, which is plenty large for 1,000 birds for three days. One person working seven hours per week on five acres can net \$15,000 per year with this system. Of course, marketing gets to be a major factor, and that is addressed in the *Relationship Marketing* section.

We raise turkeys in the broiler pens as well. This acts as a season extender for the infrastructure and stacks an additional enterprise on the pasture. The stacking creates incredible income opportunities and can be done with many different plants and animals. The same acre of pasture on our farm, for example, sees cattle, pastured broilers, eggmobiles and turkeys during the season, adding up to nearly \$5,000 per acre, per year.

Our biniary is another example of this. It is a combination production system integrating bunnies, vineyard, and aviary, hence biniary. A totally enclosed 100 foot x 100 foot area divided into four quadrants, it contains twelve grape vines per quadrant. The trellis poles hold up the overhead netting, which protects free-ranging rabbits from predators and keeps jumbo white pheasants in. The rabbits mow

the forage under the grape vines and the pheasants debug. The quarter acre can net \$5,000 per year because of the synergism of the multiple enterprises.

In the winter, the layers come into hoophouses. The rabbits come in as well, in pens at eye level. The chickens keep the bedding aerated and clean under the rabbits and the combination more fully utilizes the vertical airspace in the facility. When the animals come out in the spring, we plant vegetables into the composted bedding to jumpstart the gardening season and produce premium-priced produce.

When pigs are not doing their aerobic compost turning, they go out on pasture. Quarter-acre paddocks divided by two strands of electric fencing control the pigs, which we move from paddock to paddock. We train the pigs to electric fence in a corral near the house before taking them out to the fields. Portable nipple-waterers and self-feeders round out the pasturage. This system yields around \$3,000 per acre per year.

Guiding principles are:

1. All food production and processing models must be aesthetically and aromatically pleasing, period. Otherwise, it's not good farming.
2. All plants and animals must be produced domestically in a way that most closely approximates their natural setting.
3. All plants and animals should be allowed to express their physiological distinctiveness.
4. The more plants and animals a farm can integrate in close proximity, the better.
5. A farm is a solar collector and should run on current solar dollars; it should generate far more energy than it uses.

Building Sustainable Communities and Schools

W. Joe Lewis, ARS, Tifton, Georgia

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Introduction

The USA is the highest producer and consumer of goods, and the largest producer of wastes on earth (President's Council on Sustainable Development, 1996). Not only the well-being of future generations, but also our own welfare, is increasingly at risk by our failure to manage our economic, social, and natural resources holistically. Solid and lasting solutions must be found and rapidly implemented. In this presentation we offer a foundational map to guide our pursuit of sustainable communities. To that end we examine how technology and reductionist trends are impacting our society and propose conceptual models and guidelines for healthy communities drawn from natural ecosystems. Our central position is that achievement of true sustainability will require a redirection of our technological advances and professional pursuits to an application of ecologically-based approaches directed at local community levels.

Premise

A well known ecological principle is that the universe is made up of systems within systems. Certain unifying principles of the universe,

including transfer of energy and cycling of materials, are known to govern the functional mechanisms of these systems at all levels from individual organisms and ecosystems to the biosphere. The human race and associated activities, including local communities, are a part of this design and are ultimately subject to these natural guidelines. Thus, the elucidation and understanding these principles is the basis for sustainable living practices.

The basic ecological definition of a community is a group of interacting and interdependent population of organisms, which share a common environment and form a fairly complete structure for the capture and release of energy and cycling of materials. For the purposes of our discussions, we define a local community as the people living in an area along with the environment and associated natural resources. See basic ecology textbooks e.g. Odum (1971), Krebs (1972) for further discussion of this subject. These local communities evolved through people coming together for mutual benefit and to meet interdependent needs for energy, materials and

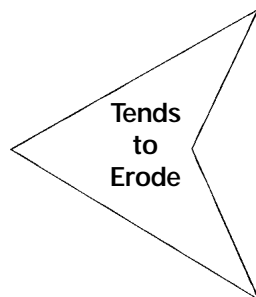
Figure 1. **Premise**

From the study of ecology we can identify five inherent strengths that promote health and balance of communities and other natural systems. Unbridled practice of modern trends and technology can erode the health of community and other systems. We must redirect community planning and development so that our technology is better aligned with fundamental systems principles.

Strengths of Healthy Systems

(including local communities)

- Interdependency
- Self-sufficiency
- Self-regulating
- Self-renewing
- Efficiency
- Diversity/versatility



Modern Technology & Trends

- Specialization/centralization
- Interventionist Paradigm
- High input/export
- Therapeutic Approach

...we can redirect
our community
management and
development
strategies...to an
ecologically-based
approach.

relationship.

Certain inherent features are central to the healthy functioning of communities and other natural systems and enable them to maintain balance and minimize the impact of adverse encounters. From the knowledge of natural systems we suggest six such inherent pillar strengths that should be fostered in communities to assure their health (*Figure 1*). These strengths are: Interdependency, Self-sufficiency, Self-regulating, Self-renewing, Efficiency, and Diversity/versatility.

Modern science and associated technologies has brought about a way of thinking and an array of interventions that offer serious challenges to these inherent attributes of healthy communities (see Flint and van den Bosch, 1981 for a basic discussion of this subject as it relates to pest outbreaks and management). Science by traditional design is based on reductionism, which requires subdividing things into parts for specialized study, versus holistic views. Reductionist perspectives together with technological advances have brought many short-term benefits such as the flexibility for modifying our surroundings and for the production of goods for subsistence (food, clothing and shelter) and various pursuits of happiness (transportation, communication, medicine, fine arts). However, the over-reliance on these technologies has given us a false sense of freedom from the connectedness and accountability to the governing principles of the natural world. We have identified four modern trends that place us in undue confrontation with the six important strengths of communities mentioned above, and that threaten the balance and well being of our communities. The four trends are: Specialization/centralization, Interventionist paradigm, High import/export, Therapeutic approach.

The development of healthy communities will require a redirection of our paradigm and practices so as to maximize the six core

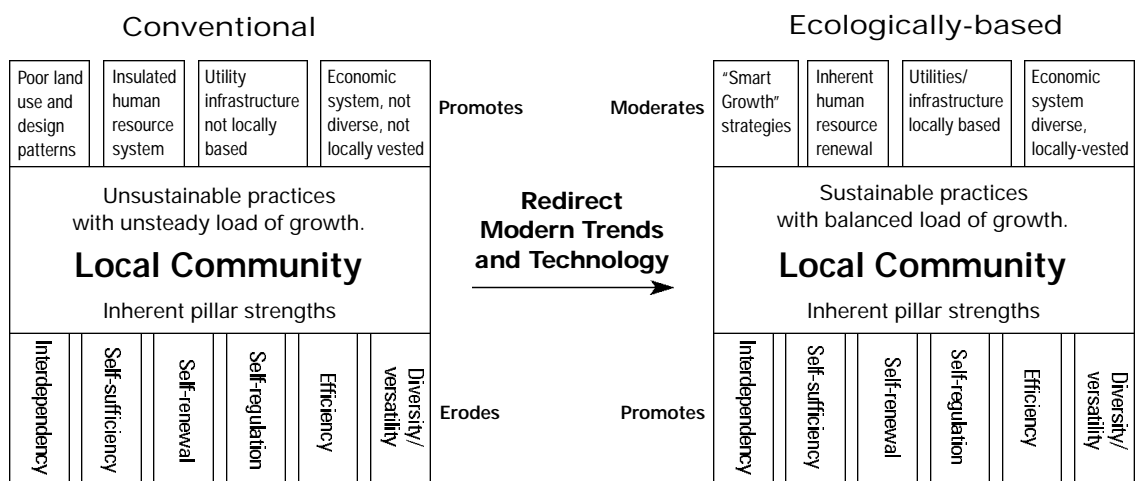
principles drawn from natural systems while moderating the adverse impact of modern trends. These communities are the building blocks of our society and it is at this level that all of our professional, social and cultural interactions are ultimately expressed. Above the family level, local communities are the only truly natural assemblage in our social structure. State, national, and sometimes county groupings, though usually based on certain historical, cultural and other parameters, are relatively arbitrary as compared to local communities. To borrow a quote from Bucky Fuller (1981), "Think globally, act locally." In accordance to these principles similar redirections need to guide the practices of our respective professions such as agriculture, education, healthcare, and manufacturing. Readers are referred to Lewis, et al. (1997) Senge et al.(1994), and Lewis and Jay (2000) for further discussion of such redirections among these professions.

Challenges to Local Communities

The modern technology and trends reflected in figure 1 challenge the sustainability of local communities in a variety of ways. With the industrial age, came the emergence of high technology, specialized tools, knowledge and an expanding array of goods and services, including homes with a host of appliances, luxury automobiles, and spectacular entertainment devices. The marvels of communication and transportation technology allow us span the earth in a matter of hours. Powerful machinery enable us to literally reshape large portions of the landscape of entire communities and to transport natural resources, services and manufactured goods around the world in a matter of days. The growth in the global market for these goods, services, and lifestyles has enhanced the rate of specialization and centralization of organizations and management structures.

A result of this phenomena is increased

Figure 2. **Community Management and Development Strategies**



We must redirect our technology and operating paradigm so as to base our economic development and management on principles that promote inherent strengths and moderate the load of growth on communities. Such a redirection will emphasize practices shown in the right-hand boxes that are based on the "built-in" renewable strengths of community.

insulation of organizations from accountability at the point of delivery which is the local communities. High-volume-based organizations tend to "crowd out" the local businesses and providers. Because of minimal interdependence of the large organization on an individual local community and in the absence of reduced competition, the community's influence regarding the organization's service becomes limited.

These developments and trends have led to numerous unwise and unsustainable practices that must be redirected in order for our local communities to deal with the realities of our modern world in a sustainable fashion. We class these unsustainable practices, as seen in figure 2, into four major categories: Poor land use and design patterns, insulated human resource service system, core utility and infrastructure services not locally-based, economic system not adequately diverse and locally-vested.

By shifting our operating paradigm and use of modern technology, we can redirect our community management and development strategies as depicted in figure 2 to an ecologically-based approach. The redirection should be guided by principles that promote rather than erode the inherent pillar strengths

of community systems, and moderate rather than promote the load of growth. Basically, by design, these growth and maintenance processes should be based on promoting and using the "built in" renewable strengths of the community as depicted by the ecologically-based model of figure 2. On the right are four ecologically-based counterparts to the four unsustainable practices mentioned above and shown in the conventional model on the left. They are: "Smart growth" strategies, inherent human resource renewal, utilities/ infrastructure locally-based, economic systems diverse and locally-vested.

We must redirect our technology and operating paradigm so as to base our economic development and management on principles that promote inherent strengths and moderate the load of growth on communities. Such a redirection will emphasize practices shown in the right-hand boxes that are based on the "built-in" renewable strengths of community.

Ecologically-based Guidelines:

The management of communities in accordance to ecological principles is in essence applied ecology. We recognize that such a process is complex and cumbersome. In fact, in accordance with the same ecological

The management of communities in accordance to ecological principles is in essence applied ecology.

principles, the process has to be customized to each local community. Thus, no "cookie cutter" prescription can be given. However, we do feel that these general ecological guidelines are appropriate and can be effectively used as a baseline tool for individual community decision-making. Refer to the more detailed publication of Lewis and Jay (2000) for more detailed suggested guidelines in this regard.

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Sustaining America's Rural Communities

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The trend toward fewer and larger farms in the U.S. is but a phase of a cycle that may well be nearing an end.

The historic purpose for settling most rural communities in the U.S. was to realize the value that was inherent in the land. Some early towns were mining and timber towns, but most were farming towns. The density of farm population across the land was determined in large part by the number of farmers or ranchers needed to realize the benefits from the land. The range lands of the West were sparsely populated because one rancher could manage a herd of cattle roaming over hundreds, or even thousands, of acres. Areas suited for truck farming and dairy operations were more densely populated because of higher labor and management requirements. The Midwest was covered with diversified family farms with a corresponding rural population density.

The numbers and types of farms in the surrounding community determined the nature of activities carried on in town. More farm families translated into more health care, more education, and other social services. Business activities in rural communities reflected not only the number of farm families, but also the need for markets and farm inputs, such as credit, machinery, feed, and fuel. Rural service communities evolved into trade centers as early farmers moved beyond self-sufficiency and began to specialize and trade among themselves. These communities became agribusiness centers as more consumers left nearby farms for distant urban areas and farmers became more reliant on mechanization and purchased inputs.

However, during the last two-thirds of the

twentieth century, the industrialization of agriculture has resulted in fewer, larger, and more specialized farms. Fewer farm families meant fewer people to support local retail stores, fewer people to attend local churches and schools, and fewer people to pull their weight in civic activities. Larger farms also tend to bypass the local community when buying production inputs and marketing their products. The industrialization of agriculture has caused many rural communities to wither and die. Some communities have diversified to reduce their dependence on agriculture. But many rural communities continue to be dependent on agriculture and suffer with farmers through every agricultural crisis.

If past trends affecting food and farming were to continue into the future, there will be little hope for rural agricultural communities. But trends never continue, at least not indefinitely. A few years back, a couple of scientists proposed a list of the top twenty "great ideas in science" in *Science* magazine, one of the two most respected scientific journals in the world. Their top twenty included the proposition that "everything on the earth operates in cycles." Some scientists responding to the *Science* survey disagreed with the proposed theory of universal cycles, but most left it on their list of the top twenty great ideas in science (Culotta).

In essence, the theory of universal cycles claims that trends never continue forever. Trends are nothing more than phases of longer-term cycles. In reality, it's just common sense – everything that goes up eventually comes down, everything that goes around eventually comes around. The theory of cycles implies that farms will neither get larger nor smaller forever, but instead will cycle between larger and smaller over time.

The trend toward large-scale, industrial agriculture might seem destined to go on forever. But in fact, there are growing signs that it is nearing an end. Any future benefits

from the further industrialization of agriculture are questionable, and it is coming under increasing environmental and social challenges all around the globe. Much of the rest of the economy of the developed world is moving beyond industrialization to something fundamentally different – a post-industrial era of development. Agriculture became fully industrialized last, because it was least well-suited for the specialization, standardization, and centralization processes that characterize industrialization. The benefits have been fewer and the problems greater than for any other sector of the economy. Thus, for agriculture the period of industrialization quite likely will be shorter. The trend toward fewer and larger farms in the U.S. is but a phase of a cycle that may well be nearing an end.

The theory of cycles also implies that people will not continue to migrate from the country to cities forever, but instead, will cycle between rural to urban and urban to rural migration over time. In fact, human history is marked by such cycles in spatial dispersion and concentration of people in general. Anthropological evidence indicates that people have concentrated in large cities in centuries past, but later, for a variety of reasons, have abandoned those cities and dispersed themselves across the countryside. Thus, there is reason to believe that migration from rural areas to U.S. cities during the twentieth-century was simply a phase of a cycle.

Most large center-cities are already losing population as people move to the suburbs in increasing numbers. A further migration back to rural areas might be a logical continuation of the dispersion phase of this cycle. The phenomena we call urban sprawl today eventually may lose its ties to the city and evolve into patterns of dispersed rural resettlement.

As we enter the new century, futurists are talking and writing of a shift in worldview from the mechanistic, industrial era where

Sustainable agriculture, with attention to equity, stewardship, and high levels of management skills is consistent with post-industrial trends in the broader economy.

people derive power from control of capital and the technical means of production, to a post-industrial era where the source of human progress becomes knowledge. People will enhance their quality of life by learning to live better with what they have rather than by acquiring more "stuff." Knowledge is biological rather than mechanical in its fundamental nature – it changes, grows, and multiplies over time. The transitions in agriculture and rural communities are but small parts of the great transition that is taking place all across society. The questioning that is driving changes in agriculture, however, exemplifies the broader questioning of society that is fueling the great transition. The question invariability is one of sustainability.

Using almost anyone's definition, concerns for sustainability imply concerns for the long run, for intergenerational equity – meeting the needs of our current generation while leaving equal or better opportunities for those of generations to follow. The three cornerstones of sustainable agriculture – ecological soundness, economic viability, and social responsibility – rest upon a foundation of intergenerational equity. Sustainability applies the Golden Rule across generations.

Sustainable agriculture, with attention to equity, stewardship, and high levels of management skills is consistent with post-industrial trends in the broader economy. The increased knowledge needed to manage resources sustainably suggests a trend toward smaller family farms that allow farm families to remain personally connected to the land. Sustainable agriculture strategies provide more opportunities for local ownership, hands-on management, and long-term commitment to the local community. A high level of farming skill increases returns to management and leads to greater profitability for small farms. Farming becomes profitable for farmers and for rural communities as more dollars remain in the community.

Wendell Berry, a Kentucky farmer, has clearly articulated the connections among people, quality of life, and a sustainable agriculture. *"...if agriculture is to remain productive, it must preserve the land and the fertility and ecological health of the land; the land, that is, must be used well. A further requirement, therefore, is that if the land is to be used well, the people who use it must know it well, must be highly motivated to use it well, must know how to use it well, must have time to use it well, and must be able to afford to use it well."* (p. 147).

Sustainable rural communities, like sustainable farms, must maintain the productivity of their local resources while protecting their physical and social environments. Sustainable communities must also provide an acceptable level of economic returns and otherwise enhance the quality of life of those who live and work in the community. Strategies that rely solely, or even primarily, on local natural resources are unlikely to fulfill these latter requirements. However, rural people can overcome the obstacle of limited local resources through a clear vision of the new realities of post-industrial development and a firm commitment to the concept of community. As the local economy continues to grow, its natural resource "equity" will become a smaller proportion of its total economy, but no less important than is equity capital to a business in ensuring its survivability and sustainability.

Thus, sustainable community development must be linked to something that cannot easily be moved. For some communities, the foundation for development may be scenic landscapes, recreational opportunities, or proximity to urban areas, but for development to be sustainable for most communities it must be linked to the land. In addition, sustainable development strategies must give local workers and investors a logical reason for investing, working, and spending in the communities where they live. Communities

cannot be sustained without strong economic interdependencies among those within communities. But, people must have strong logical reasons for developing interdependent relationships.

Many people have strong ties to rural areas; however, rural communities cannot depend on an allegiance of rural residents to their communities to keep productive people from moving to town. People can and do move freely among communities within the U.S. Thus, it will be critically important for sustainable communities to be able to attract new knowledge workers, if there are to be places where "home-grown" mind workers will want to stay. The primary attraction of rural communities for current and future knowledge workers will be the promise of a desirable quality of life.

Quality of life is a product of human relationships -- relationships among people and between people and their environment. Obviously, other things such as employment, income, personal safety, economic security, and access to health care are important aspects of quality of life. However, quality of life also includes peoples' subjective judgments regarding self-determination, freedom to participate, individual equity, freedom from discrimination, economic opportunity, ability to cope with change, social acceptance, and treatment according to accepted social principles of one's culture.

Rural communities that survive and prosper in the future will be culturally diverse. Successful rural communities will be made up of long-time rural residents, bright young people who choose to stay, returning rural residents, those born in urban areas of the U.S., and those born in other countries. They may also be Anglo-American, Afro-American, Asian, Mexican, and Canadian. Male and female, young and old, rich and poor, educated and less well-educated may be viewed as different, but they must be respected

for their differences in the workplaces and in the town halls of rural renaissance communities. This diversity will be an important source of creativity, innovation, and synergistic productivity, and will be an important aspect of quality of life in rural areas. In such rural communities, people will have an opportunity to know each other individually rather than simply accept the stereotypes of their cultural groups.

The most important single step toward success may be for those in the community to develop a shared vision of hope for their future -- for a better way of life and a brighter future for their community. The vision of each person in the community will be different from the vision of others in many respects and not all will be hopeful. However, the people of a community must search for and find some common positive elements among their different visions to provide the nucleus for a shared vision of hope. Otherwise, the group is not really a community but rather a collection of people who happen to live in the same general area. A community that has found its shared vision has made its first critical step toward self-revitalization and community sustainability. Hope then can begin to transform reality. To paraphrase Jesse Jackson, the articulate civil rights leader, "if they can conceive it, and believe it, they can achieve it." The future of rural America belongs to those who have a vision of hope and courage to seize it.

Notes

1. Culotta, Elizabeth. 1991. "Science's 20 greatest hits take their lumps," *Science*, American Academy of Science, March 15, 251:4999, p. 1308.
2. Berry, Wendell. 1990. *What are People For*. San Francisco: North Point Press, p. 147.

The most important single step toward success may be for those in the community to develop a shared vision of hope for their future....

A Profitable, Sustainable Ranch

Walt Davis, Davis Ranch, Bennington, Oklahoma

We now expect to be profitable every year, and the condition of our land has steadily improved.

Davis Ranch is a commercial ranching operation located in southeastern Oklahoma. Founded in 1950, it was operated until the mid-1970's as a high-tech cattle and pecan production unit. Management decisions were made based upon the recommendations of the land grant college system and were aimed at maximum production. A system of production evolved using the "best" practices of soil fertilization, pasture production, animal breeding, animal health, supplemental feeding and pecan production. Pecan production was a constant fight with some new pest exploding as soon as we finished spraying for the last pest. Beef production was very high with large numbers of cattle carried with high individual performance. The inputs required to achieve this level of production were also extremely high and the operation was profitable only when beef prices were at the high point of the cattle cycle. The cattle market crash of 1974 served as a wake-up call to emphasize just how out-of-balance cost of production was, relative to realistic potential returns.

We realized that if we were to remain in business, cost of production had to come down. The obvious place to start was where expenses were highest. The farming operation, intended to provide year-round quality grazing for the cattle, was phased out, greatly reducing machinery, fuel, and labor costs. Nitrogen fertilizer was replaced with forage legumes, which also had the effect of reducing weed pressure. Supplemental-feed costs were reduced by adjusting calving season and thus nutritional demand to more closely fit the season of best forage production. Animal health and nutrition were improved by closer attention to providing forage at the proper stage of growth and "on a clean plate" through good grazing management. The need for toxic pest control materials dropped and general

animal health improved dramatically after a program of planned high-stock-density grazing was established. Part of this was due to better hygiene and to leaving the pest organisms behind as the stock moved.

The major benefits came when life in all of its diverse forms returned as the effects of years of poisoning and tillage began to be healed. Pests such as horn flies and internal parasites, which spend part of their life cycle in dung, were greatly reduced when exploding populations of dung beetles quickly buried the dung. All of the predator species from spiders to sand wasps to carnivorous nematodes returned to control their prey species and the populations of pest species from horse flies to heel flies to pecan case bearers dropped and stabilized.

What began as a cost-cutting program became a fascinating learning process that continues to this day. The program has been successful by all standards. Profitability has increased dramatically, labor requirements are reduced, and most important, the health of our soils, our animals, and ourselves continues to improve.

Changes Made in Program

I. Get our production schedules in harmony with the natural cycles; to work with nature instead of against her. This led us to make such changes as:

1. Moving our calving season from fall and winter to late spring-- to calve when pasture conditions are best and reduce the need for supplemental feed. Since late calving meant light calves, we started to carry our calves through the winter and market them as heavy feeders the next summer.
2. Changing our wheat pasture-based stocker program to one based on maintenance-only gains through the winter and cheap gains during spring and summer.

II. Lengthen the quality grazing season by replacing monoculture pastures with mixtures of grasses and legumes both warm and cool season. At one time we had over 1000 acres of hybrid Bermuda that we fertilized annually with 100-150 pounds of actual N per acre. This gave us a tremendous amount of pasture from about May 15 to July 15 and 10 months of junk. We needed to flatten and lengthen our pasture production curve. Cows eat every day and the cheapest way to provide that daily feed is with pasture.

III. Replace nitrogen fertilizer with forage legumes and a functioning nutrient cycle.

This gave us a pasture sward that is cheaper, higher quality, and longer lasting. When high levels of extraneous nitrogen are stopped, soil life increases and the natural processes that supply nitrogen to a healthy soil-plant complex again become active. High biological activity in the soil is the foundation of soil productivity. We know that an area is coming around when we see earthworms in quantity. These are the elephants of soil life and good indicators of a healthy soil. At times some of our pastures will have a layer of earthworm castings three-quarters of an inch thick on the surface.

IV. Improve the production of our pastures and our cattle through good grazing management.

To do this we must understand the relationships between forage plants and grazing animals and manage our grazing so that both plants and animals benefit. The stage of growth when grazing least damages forage plants is also the stage when these plants are most valuable to the animals. We need to be able to tightly control the physiological age of the forage that is presented to our animals at all times and to do this in a manner that is not stressful to the animals. In humid areas like Bryan County we would like to have 24-30 paddocks available for each cow herd and 30-40 paddocks for each stocker herd. We started out thinking that 12-16 paddocks per herd were enough but find that results are much better with more subdivisions.

V. Use as little toxic material as possible and instead manage around the need for these materials.

Herbicides, insecticides, wormers, fungicides, and antibiotics all have effects beyond the ones we expect from them. These materials are the tools of crisis management and seldom needed if we manage to avoid the crises. Good grazing management can greatly reduce both internal and external parasites. Moving stock regularly to clean pasture, keeping pasture height above the level of most infection by stomach worms and providing clean water are practices that reduce parasite problems. Beneficial insects can be a tremendous help if they are allowed to flourish. Dung beetles bury or desiccate the majority of the manure from our cattle within 48 hours from June through October. Sand wasps reduce horse fly and face fly populations to low levels by early June. We still have horn flies but not as many as when we were spraying every 21-28 days and we don't have a "horn fly problem" very often. We no longer routinely worm our grown cattle after years of worming everything twice a year. We check for worm load with fecal samples and have not found a need to worm for several years.

VI. Improve our stockmanship in order to reduce stress on our animals.

This may be the most overlooked of our management tools. Stress causes poor animal performance, sickness, and even death and most of the time can be reduced or prevented with changes in management. We now wean our calves with only a hot wire between them and their mothers. The trauma of weaning is mostly because both cow and calf are terrified and unable to locate each other in the bawling turmoil that usually takes place around a weaning lot. If both cow and calf can see and more important smell each other just across the fence, the weaning process is much easier for both. We usually wean now with no sickness and no weight loss on the calves. We look on our job as being able to make our stock as comfortable as possible at all times.

What began as a cost-cutting program became a fascinating learning process that continues to this day.

Results of Changes in Program

1. Production per acre of pasture, measured as animal unit days per year, has increased 50 to 150 percent while the cost to produce this pasture has been greatly reduced.
2. Production per mother cow has gone down due to weaning at younger ages, but the cost to maintain a mother cow has gone down so that profit has increased.
3. The season of quality grazing has lengthened on both ends so that the need for supplemental feed has decreased. We no longer plan to feed additional protein to the cow herds. The stability of our pastures is much higher, and we are less affected by bad weather. Production holds up longer into dry spells and recovers quicker when conditions improve.
4. Production both per head and per acre has gone up for our stocker cattle while costs have gone down dramatically.
5. We now expect to be profitable every year and the condition of our land has steadily improved.
6. Maybe most important, ranching is a whole lot more fun than when we were "doing it right."

Permanent Cover: A New Generation Cropping System

Steve Groff

Cedar Meadow Farm, Holtwood, Pennsylvania, www.cedarmeadowfarm.com

SOIL IS
MEANT TO
BE COVERED!

I started no-tilling in the early '80's on about fifteen corn acres because we had some erosion problems. I didn't like having to fill in gullies before harvesting corn; I felt that wasn't right. In 1991 I began using a rye cover crop as another soil conservation measure. In 1994 we started no-tilling tomatoes and in 3 years, all of our 175 acres of fifteen different crops were no-tilled. This "Permanent Cover Cropping System" is done successfully by using cover crops, intensive crop rotation, and maintaining a permanent mulch cover. No-till is not the "magic bullet." It is an equal partner with cover crops and rotation. It is a "system" and has to be managed as a system. I use this system for 3 reasons:

- **Increase profits**
- **Enhance soil quality**
- **Reduce pesticides.**

Increase profits

The economics of this system are positive. Total savings when no-till transplanting tomatoes amounts to \$675 per acre. Nearly \$500 of the cost reduction is from material, labor, and time savings when eliminating the use of plastic mulch. Bear in mind that plastic mulch would still be needed for early-season tomatoes, but I'm experimenting with the use of row covers to get the earlier plantings off to a good start. A saving in tillage is \$50/A and \$125/A for pesticides (average of the last 4 years). Increased costs are \$50/A for establishment and seed of a cover crop, and \$10/A for controlling the cover crop.

It's hard to put a dollar value on the other benefits cover crops give, such as erosion control, better soil quality, and increased organic matter, but it has to be factored in at

least indirectly. On my farm I've been able to grow my own cover crop seed and use a rolling stalk chopper to control the covers. This allows me to further reduce expenses. Our yields have increased the last several years and this adds to the profit.

Enhance Soil Quality

Soil erosion is the most detrimental aspect of agriculture. We can't turn our backs on soil erosion and call ourselves sustainable! No-till has some very attractive attributes especially when combined with cover crops. SOIL IS MEANT TO BE COVERED! Soil erosion on Cedar Meadow farm has been cut from 14 tons per acre per year to almost nothing. With the ground covered by plant residues and not loosened by vigorous tillage, the soil stays rather than getting washed away during heavy rainfall. We are growing vegetables in a way that is comparable to a well-managed pasture system!

The combination of cover crops and no-tilling does more than cut erosion -- it improves soil tilth, increases organic matter levels, enhances water infiltration and lessens pest problems. Organic matter has gone from 2.7% to 4.3% in the last 11 years. Soil aggregate stability in fields tilled recently (less than 10 years) is 16% and fields that have not been tilled for over 10 years is 67%. Soil microbial biomass has tripled. These results are proof to me that this system is working. Yields have increased 10% over the last several years.

Reduced Pesticides

Total pesticide use on tomatoes has dropped from \$200/A to \$75/A. This is mainly due to fewer fungicides for early blight and insecticides for Colorado Potato Beetle. Consistent with what Dr. Aref Abdul-Baki (USDA Researcher) and Dr. Ron Morse have found, as well as others who have tried no-till tomatoes, the onset of early blight has been delayed. Penn State has a weather station

(FAST system) near Cedar Meadow Farm that forecasts favorable early blight susceptibility. The last three years I was able to wait 3-7 weeks to spray after the FAST system recommended a protective fungicide. We've experienced 4 years of extremely different weather conditions -- wet, dry, and near normal. In every year, early blight has been delayed with this system. I've also noticed healthier plants even to the end of the season. I've planted a cumulative total of 100 acres of no-till tomatoes the past 5 years and have yet to spray for Colorado Potato Beetles. Rarely do I use any insecticides on tomatoes. A good thick mulch helps control weeds as well and has really cut down on my herbicide bill. It's very important to have a consistent cover crop to make this work. Herbicide use for corn and beans has dropped from \$25/A to \$18/A. Total pesticide usage on the whole farm has decreased 50%. Beneficial insects have increased.

How the System Works

The foundation of this system is the establishment of a cover crop in the fall. I've gone mainly to a rye/vetch mix (25 lbs. vetch and 30 lbs. rye). After the average first fall frost date, I can no longer plant vetch because it might not overwinter. Two bushels of rye are used. I also plant spring oats in the fall that will winter-kill and provide a nice dead mulch to plant early crops into in the spring. I have successfully no-tilled vegetables into corn and soybean residue with excellent results, however more herbicides, fungicides and fertilizers are needed to control weeds and diseases. I credit rye/vetch giving #50 lbs. of N and straight vetch #75 lbs. of N. Vetch seed is expensive so I grow my own with rye. I now have seed to sell.

I wanted to control covers mechanically and in a way that flattens them near the soil to help their decomposition. I ended up buying a 10-foot Buffalo Rolling Stalk Chopper in 1996. It's designed to flatten and chop cornstalks, on

Think of one idea
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a scale between a flail mower and a disk. The machine has two rows of rollers, four in front and four in back, with eight 23-inch blades per roller. The turning rollers crimp up the cover and push it right down. It can be run at eight to ten miles per hour, so it's fast and economical. I added parallel linkage so each roller floats independently.

The versatile machine has been used on 500 acres in four years. I roll the covers with it, and get good control of hairy vetch and rye if it has flowered. Vetch that hasn't bloomed yet will give some regrowth and needs a low rate of post-emergent spray. Then after the pumpkin harvest, I use the machine to chop and disperse the remaining pumpkins.

A customized Holland transplanter is used for no-till transplanting of vegetables into killed cover crops. Dr. Ron Morse, Virginia Tech., developed the No-Till Sub-Surface Tiller Transplanter. The transplanter has a spring-loaded 20-inch, straight-bladed coulter, followed by a subsurface tiller that gently opens a slot to place the transplant in. The package leaves virtually no soil showing after the crop is planted, giving good full coverage mulch for the whole season. Work is being done on making a new planter to further improve the performance.

Fertilizer management evolves, as you become more committed to the use of no-till, cover crops and the overall concept of sustainable ag. Any synthetic N I use is mainly ammonium sulfate. I need the sulfur it supplies, as well as its low volatility. I side dress and have gone back to broadcasting dry rather than dribbling liquid N. I tend to credit my higher organic matter soils for giving me 25 lbs. of N or so from release of additional N. Manure is all surface applied and is spread as fine as possible. I have the manure tested and use that as a guide to determine additional fertilizer needs. I do some foliar feeding as well.

Soil compaction is to be avoided at all costs! However, once you've no-tilled for

several years the soil becomes noticeably less susceptible to compaction. Cover crops are key to this in building soil structure. I'm real fussy about when lime and manure trucks can get on my fields. If you ever need to alleviate compaction, do so with as little surface disturbance as possible. I like the DMI no-till shanks with the berm tuckers to go through my field driveways after harvest.

Controlling perennial weeds can be a challenge in no-till, but I have found that with intensive crop rotation and occasional spot spraying, weeds can be managed effectively. Perennial weeds are not a problem on our farm.

In wet years, you might notice more slugs, but they haven't chewed our fresh-market tomatoes unless the crop is in contact with the soil. Aphid pressure has remained the same.

I have had success no-tilling pumpkins, sweet corn and peppers, as well as fall broccoli. Pumpkins, in particular, are a lot cleaner, because the soil doesn't splash up on them when it rains. The University of Maryland is doing all its pumpkin research using the no-till method. Eggplant, melons, and even snap beans can be no-tilled.

Some organic farmers are no-tilling tomatoes and pumpkins. In 1997 I left one acre of pumpkins unsprayed with herbicides and had excellent results. The cover crop of hairy vetch kept weeds from growing. Then in 1998 I did the same test and got unsatisfactory weed control. The problem was that the cover crop was not thick enough. This past year was another good showing for using no herbicides in pumpkins. I think no-tilling can be done organically on a small scale with a good cover crop and for later planted vegetables.

F Day

We have held an annual field day at Cedar Meadow Farm since 1994. In 1999, 350 people attended to view the "Permanent Cover Cropping System" as well as see various agri-businesses and equipment dealers

demonstrate their machinery. This year promises to be even better as a soil pit, wagon tours, and soil health research results from Cedar Meadow Farm will be discussed on July 26th, 2000. Penn State University, NRCS, and University of Maryland are testing the soils and observing the changes that are taking place with this system.

Video and Web Site

We have produced a video titled, *No-Till Vegetables: A Sustainable Way to Increase Profits, Save Soil, and Reduce Pesticides*. It covers the basics of sustainable no-till vegetable production. Cost is \$21.95 plus \$3.00 S/H. To order call: (717) 284-5152, e-mail:

sgroff@epix.net, or web site: www.cedarmeadowfarm.com. Credit cards accepted.

These examples of the use of cover crops, crop rotation, and long-term no-till are what sustainable agriculture is all about. Don't try and adopt exactly what I have done. You need to adapt these principles to your operation in accordance with the resources, equipment, and experience you've attained. Start small. Learn as you go. Network with researchers, extension agents, and other growers who have been successful. Go to field days or research tours. At the very least, think of one idea you can implement on your farm to make it more environmentally friendly, yet still maintain profitability.

Less Tillage is Best

Max Carter, Douglas, Georgia

I started farming on my own in the 1950's on the 400-acre home place in Coffee County, near Douglas, Georgia. Coffee County is in the Southern Coastal Plain area of southeast Georgia. Timber was grown on the steepest 200 acres and row crops were produced with conventional tillage on the remaining acreage. At first I thought the main problems on the farm were dead batteries, bank overdraft, flat tires, etc. I then realized that my farm had a serious soil erosion problem. None of my farm is classified as being highly erodible (HEL) and there were no gullies on my farm, but I knew there was a big problem when I was able to step over 48-inch woven wire fences while bird hunting. One-half of the fence was covered with sediment, my valuable topsoil.

After growing tired of seeing my valuable topsoil wash and blow away, I decided to try no-till in 1974. Although we did not have the planting and weed control technology of

today, we were persistent in trying many different planting and herbicide methods. We purchased used equipment and gradually developed the right choices of coulters, subsoiler shanks, press wheels, etc., that will work well with large amounts of crop residue.

All of my crops are now grown with no-till. I now produce corn, cotton, peanuts, soybeans, and other crops all no-tilled and double-cropped with small grain cover crops, which are planted with a no-till drill. Soil erosion has been eliminated on my farm. My crop yields either meet or exceed those I was making with conventional tillage. Also, many unexpected advantages have occurred on the farm. Due to 25 years of no-till, residue management, cover crops, and double cropping, my soil has changed. We have increased the amount of soil organic matter, something that many say cannot happen in our sandy-textured soils. The increased soil

"If I can reduce costs, maintain or increase crop yields, and protect the soil, water, air, and wildlife, I will be better off."

organic matter has increased the amount of water infiltration and has basically eliminated runoff. The increased amount of soil water greatly benefits our crops. Also, the presence of crop residue throughout the year reduced the evaporation of the soil moisture. I sold my irrigation equipment many years ago.

We now have high populations of beneficial insects on the farm. The crop residue provides habitat for many beneficial organisms, including ladybugs, pirate bugs, big-eyed bugs, and fire ants. The beneficial insect populations reduces the need for insecticide applications.

Many of my neighbors complain that they don't have wildlife on their farms anymore. In fact, the state of Georgia is losing about three percent of its quail population each year. The reason for this loss is the lack of habitat. Many wildlife species are abundant on my farm, especially bobwhite quail. We have found that crop residue provides excellent nesting and growth habitat for bobwhite quail.

Time savings is also a great benefit of no-till farming. While my neighbors are busy plowing their fields in the winter and early spring, I am watching my cover crops grow, fishing, and playing golf. This also gives me adequate time to get my planting and spraying equipment ready for spring.

The key to no-till on my farm is crop residue management. You must start preparing for the next crop during the harvest of the current crop. If the crop residue is spread properly, the following crop can be planted without difficulty with a no-till row planter or a no-till drill.

All of this adds up to economics, the bottom line. If I can reduce costs, maintain or increase crop yields, and protect the soil, water, air, and wildlife, I will be better off.

Good topsoil is your best asset. Crop residue and cover crops mean improved topsoil, more organic matter, clean water, and less soil erosion from rain and wind. Keep your land covered with crop residue and cover crops.

Incorporating Wildlife into Your Operation

Russell L. Stevens

Wildlife and Range Specialist, Samuel Roberts Noble Foundation, Ardmore, Oklahoma

How many enterprises do you have working for you on your ranch or farm? One way to be successful in ranching or farming is to operate as many profitable enterprises as possible. Most ranchers and farmers focus on cattle and crop enterprises. Additionally, most farmers and ranchers have not considered wildlife or outdoor recreation as a viable economic enterprise. There are many people in our cities and towns who will pay for the opportunity to recreate on private, rural lands.

In some situations, opening your gates to the public for recreational privileges can be profitable. It may pay handsome dividends to determine if your ranch or farm falls into the right situation. Things to consider include: family approval, willingness to deal with the public, size of property, location of property, liability, habitat quantity and quality, game species available, and type of lease, i.e., daily, seasonal (by species or time of year) or year-round. The possibility of non-consumptive recreational uses such as camping, hiking, trail rides, cattle drives, photography, etc. should also be considered.

The only limitation to the activities available on your ranch or farm is your own imagination. Marketing and demand limit income from recreational leases. When advertising, it is essential to target a specific audience that has interests in your farm or ranch's specific resources. Knowing where to advertise your recreational activity is often difficult, especially for the rancher or farmer who has not had much time for recreation and is "out of touch with the recreational lifestyle." However, for a fee, there are several outdoor publications and web sites that will advertise

recreational activities. Demand often varies from location to location. Typically, demand is best if your ranch or farm is near a major metropolitan area. Demand may also vary depending on the type and duration of activity offered. As with most enterprises, marketing and demand may be difficult obstacles to overcome.

Incorporating a recreational enterprise on your farm or ranch may require change in your operation's management practice. This change may mean altering brush and weed (forb) control methods. It may also mean developing and maintaining campsites or selling part of the good cows and replacing them with old, gentle ones that the "city dudes" can herd. Whatever activity you offer, some sort of change in management should be expected.

The following is a description of a year-round recreational lease that I have been involved with since 1993. The lease was set up to demonstrate management techniques and income potential to area ranchers and farmers.

Noble Foundation Coffey Ranch Wildlife Management and Hunting Lease

The Coffey Ranch, located five miles west of Marietta, Oklahoma, is managed by the Noble Foundation for wildlife habitat and livestock production by attempting to influence ecology toward desired goals. This management is conducted throughout the entire ranch. Specifically, wildlife habitat management is coupled with grazing management. Unlike many ranch managers, we feel that efficient management requires consideration of both wildlife and livestock in

There are many people in our cities and towns who will pay for the opportunity to recreate on private, rural lands. The only limitation to the activities available on your ranch or farm is your own imagination.

each decision.

Diversity, forbs, timber, brush, and good water quality are important to wildlife, livestock, and the ecology of the ranch as a whole. Land management practices that would sacrifice these values over large portions of the ranch are avoided. Many landowners are interested in wildlife and like to have wildlife on their ranch, but make land management decisions without considering wildlife. Since wildlife goals are considered in each land management decision, the Coffey Ranch supports adequate populations of both game and non-game wildlife species without the expense of intensive habitat management practices such as food plots, feeders, and woody plantings.

Wildlife habitat is managed primarily through livestock impacts, rest periods, and prescribed burning. Livestock impacts are identified as stock density and rotational stocking. We have found the combination of stock density and rotational stocking to be an excellent tool for habitat manipulation. For example, high stock density can be used to severely graze (<3 inch forage stubble height) a paddock during late fall to improve quail habitat by creating an abundance of forbs the following year. If an increase in diversity in the herbaceous component of a certain paddock is desired, high stock density can be used to create a significant disturbance to the soil surface that, in turn, may increase the diversity of that paddock. High stock density may also be used to discourage brush encroachment and to create openings within thick stands of brush. This enables a variety of plants to express themselves.

Rest from grazing is also used to enhance wildlife habitat. The definition of rest is to leave an area of grazing land unharvested, or ungrazed, for a specific time, such as a year, a growing season, or a specified period required within a particular management scheme. Rest enables wildlife to utilize portions of the ranch

at different times of the year without livestock confrontation. Prolonged rest can be used to encourage woody plant growth where it may be needed for food and/or cover for wildlife.

Prescribed burning can also change plant composition toward our management objectives by creating and maintaining openings in timbered areas. Fire is also used in combination with livestock impacts, and to a certain extent rest, to help us reach our habitat goals. Livestock impacts, rest, and fire are the primary tools used on the Coffey Ranch. Each is used in accordance with our understanding of ecology to modify the landscape toward our wildlife and livestock goals.

In addition to general land management for wildlife habitat, we also manage game harvests to maintain or develop desirable game population parameters. State and federal game laws adequately conserve populations of most species. However, prevailing harvest practices may negatively affect white-tailed deer, turkey, and largemouth bass populations. Deer and turkey populations are also influenced by hunting and harvest pressure on surrounding properties. Thus, annual harvest quotas more restrictive than state law for white-tailed deer, turkey, and largemouth bass have been established.

Wildlife populations fluctuate each year due to a variety of positive or negative influences. Through monitoring activities on the ranch, we are able to recognize some of these influences and assess their effects on wildlife. However, some influences remain unknown and make wildlife management a real challenge. We establish harvest quotas annually by monitoring populations of deer, turkey and fish with several techniques.

It is our goal to maintain deer numbers at, or slightly below, carrying capacity. Spotlight surveys, daylight cruise surveys, and detailed harvest records are used to monitor progress toward these goals. Spotlight surveys and daylight cruise surveys are conducted in

September and early October. Data collected on the spotlight surveys include number of mature and immature bucks, number of does and fawns, and number of unidentified deer. Visibility estimates are also recorded to obtain an estimate of the number of acres observed along the route. Deer sightings are recorded by location in order to indicate areas of deer concentration. Daylight cruise surveys are useful in providing data during a different activity period. Daylight data provide better estimates of age and sex than spotlight surveys. These data are then combined with spotlight survey data to determine harvest quotas for the upcoming season. Data on harvest records are compiled during the hunting season. This information is used in conjunction with spotlight and daylight cruise data to estimate white-tailed deer population parameters. Harvest data include age, sex, weight, and antler measurements.

Fall and winter flock counts and detailed harvest records have been used to monitor wild turkey populations. Data collected include total numbers, location, number of mature and juvenile toms and number of hens. Spring and summer surveys record the number of mature and juvenile hens, location of sightings, and harvest records. However, spring and summer data are incidental and are not always used to establish harvest quotas.

Seine samples and catch and harvest records are used to monitor fish populations in eighteen ponds at the Coffey Ranch. Ponds vary in size; therefore, use and production potential differ. Seine sampling is done in the summer and provides data on fish species, sizes, and numbers. Catch and harvest records accurately estimate how many of each species are removed from a given pond. All of this information is vital for future management of the ponds.

During the initial management phase of the Coffey Ranch, methods were established to pursue economic returns from the wildlife and

fish. For a short time during 1987, a recreational lease was advertised in two local newspapers, *The Daily Ardmoreite* and *Marietta Monitor*, and one statewide sportsman's newspaper, *Outdoor News*. Seventeen groups inquired about the lease. Several groups toured the property and five offered bids. The high bid was \$1.25/acre/year (about \$3,200), from a local group of 11 sportsmen. Essentially the same group leases the property today, but there have been some changes in lease members and price.

The value of the lease has appreciated since 1987. Therefore, in 1996 we proposed increasing the lease price from \$1.25 to \$2.50 per acre. Many comparable leases go for \$3.00 per acre or more, with many leases charging more depending on the extra frills offered.

Additionally, in 1992 the Coffey Ranch was enrolled in the Deer Management Assistance Program (DMAP) with the Oklahoma Department of Wildlife Conservation. This program allows landowners or managers with more than 1,000 acres to harvest additional antlerless deer. As our deer herd grew, the ability to harvest antlerless deer was becoming more important to keep the deer population within our targeted size. Allowing the deer herd to grow beyond carrying capacity is in direct conflict with our goals. There is a \$100 fee for enrollment in the DMAP program.

In the spring of 1996, we met with our lease hunters and presented the following plan:

- Step 1:** Increase the lease price from \$1.25 to \$1.75 per acre in 1996 and to \$2.50 per acre in 1997.
- Step 2:** Establish three accessible food plots consisting of wheat and oats to be established annually. This will provide hunters and their guests "hot spots" in which to hunt and should result in increased antlerless harvest.
- Step 3:** The ranch will purchase and maintain two tripod deer stands on two of the food plots. A third may be purchased, depending

Many landowners are interested in wildlife and like to have wildlife on their ranch, but make land management decisions without considering wildlife.

on antlerless harvest success.

These steps accomplished several things. The graduated lease price increase was easier for the hunters to accept. The hunters, during previous meetings, had expressed their concern with having a guest foul up their favorite stand location by harvesting an antlerless deer. Food plots, with factory-made tripod deer stands, allow the hunters more freedom to bring guests to harvest antlerless deer. Hopefully, this will increase antlerless harvest effort in coming years.

The leasees are required to complete a form each time they use the property. They are very cooperative in doing this because they realize the importance of this data in helping meet their needs. We have also conducted meetings with the leasees to explain the value of harvest and activity records as well as to give them an opportunity to express their needs and expectations. So far, the leasees seem to be satisfied.

Data on white-tailed deer such as age and weight by sex, lactation, and antler measurements are collected on the Coffey ranch. These data are used to estimate population trends, habitat quality, and to help assist in establishing yearly harvest quotas. These data also tell us about the quality and quantity of our deer herd and enable us to make more informed management decisions.

Yearling male data provide indications of habitat quality from year to year. For instance, the basal diameter of yearling buck antlers is a good indicator of deer physical condition and diet quality. Basal diameter measurements of less than twenty indicate low habitat quality, especially when coupled with other measurements such as low dressed weights.

As you can see, a recreational enterprise should be treated just like any other enterprise, a business. To be successful, it requires proper planning and management.

Stewardship and Profitability

John R. Dunkin, Dunkin Families L.L.L., Tulsa, Oklahoma

Ultimately, the benefits of stewardship far exceed the cost.

John H. Dunkin and his wife, Jane, started the 2,300 acre Dunkin Farms at Wagoner, Oklahoma, in 1938. They bought what became Rafter D Ranch in 1941. The Ranch, encompassing approximately 13,000 contiguous acres is located right outside of Hominy, Oklahoma. John R. Dunkin, the son of John H., became the manager of these operations in 1968 at the age of 30, ten years after the death of his father. Jane R. Dunkin died in 1998.

John's belief since assuming management has been, "The better steward you are for yourself and the habitat that enjoy your place—human beings, wildlife and livestock— the better off everything else becomes. Each

generation is nothing but the steward for that period. Ultimately, the benefits of stewardship far exceed the cost."

At the Rafter D Ranch, carrying capacity increased 150 percent from 700 cow-calf pairs to 1750 cow-calf pairs on the same amount of land. Acres required per unit decreased from 17 acres to 6.85. The major components in this carrying capacity increase were:

- Reclaiming over 1000 acres of abandoned farm fields left after the Dust Bowl and Depression era with Bermuda pasture
- A strategic herbicide application program
- A controlled-burning program
- A cross-fencing program
- A prioritized pond building and

maintenance program

Calf weaning weights increased over 33 percent from an average of 450 pounds to more than 600 pounds. Hay protein increased 15 to 20 percent. At the same time, the Dunkin Farms operation was able to reclaim 33 percent more for tillable production, while reducing soil erosion 87 percent from fifteen tons per acre to less than two tons per acre.

The bottom line success of these operations is spawned by the resource-centered philosophies which define them. Opportunity goes hand-in-hand with responsibility when it comes to land ownership and stewardship.

The single most meaningful environmental practice at both operations has been water management— whether catching it where it falls by building ponds to diversify grazing management at the Rafter D or changing tillage practices that allow the soil to absorb more water at the Wagoner Farm, besides handling the excess water there with terraces, drainage systems, and waterways.

At the Rafter D Ranch there are 68 man-made ponds and lakes which drive efficient forage utilization across the ranch. Using the available resources, attention to improving and maintaining water quality and riparian areas is continuous.

At the Wagoner Farm, there are over 52,000 linear feet of terraces and 50,000 linear feet of drainage systems. Over 20 miles of terraces and waterways moving water off the ground, even in normal years, becomes a priority since over a third of the property is adjacent to the Kerr-McClellan Arkansas River Navigation System. Left unchecked, the erosion in such a river-bottom environment not only takes land out of production, it takes environment away from wildlife. Due mainly to no-till farming practices, more efficient water management, and fuel savings, the amount of tillable land increased by over 33 percent while decreasing farming costs 20 to

40 percent.

With all due respect to the environment and the genetics, the men in these operations have been the secret to success. Since the Rafter D started in 1941, there have been three ranch foremen, and the Farm partnership has had 2 managers since 1961. Technical assistance provided by the Wagoner County and Osage County Conservation Districts has been outstanding. Dunkin Farms was awarded the State's Outstanding District Cooperator in 1992 and The National Cattlemen's Beef Association bestowed an Environmental Stewardship Award in 1998.

It all boils down to making the most of the natural resources you have, not just for today, but for tomorrow as well. There is no question these stewardship efforts are rewarded in the bottom line, courtesy of reduced input costs and increased production. That's after considering the obligation to manage our resources for future generations.

Managing Riparian Areas for Water Quality and Wildlife

by Jim Robinson, Agroforester, National Agroforestry Center, Ft. Worth, Texas

Great Plains riparian woodlands have been reported to contain bird communities that are as much as seven times as rich as those in the surrounding Plains.

Riparian buffers are strips of vegetation adjacent to streams or other bodies of water established principally to protect or improve water quality and improve or enhance wildlife habitat. The principal vegetation is generally trees, grasses, and forbs or a mixture of vegetative types to accomplish the intended purposes.

In the Natural Resources Conservation Service, we have two practices that address these purposes. They are a grass filter strip and a riparian forest buffer. For these practices to achieve their intended purpose they must be properly located and sized (width, length, and area) in relation to the stream or water body and adapted to the existing site conditions. This presentation will discuss the Natural Resources Conservation Service considerations in designing riparian forest buffers for water quality and wildlife habitat.

The health of the stream system often is indicative of the sustainability of the watershed or its contributing area. Riparian buffers considered as an integral part of a total conservation system including nutrient management, pest management, tillage and other erosion control, habitat and management practices, provide a contribution to the resilience and sustainability of the landscape.

When assessing the needs for water quality the questions asked are:

- *how wide does the buffer need to be, and*
- *what vegetative components are needed to achieve the desired results?*

Research has shown that approximately 35 feet of width (flow length) significantly reduces the pollutants entering the buffer. This is what NRCS has set as the minimum riparian

forest buffer for the protection of water quality. Research has not answered how long the buffer can perform these functions before it fails to provide the desired protection. To do this risk assessment NRCS looks at the condition of the contributing area and the hydrology or how water gets to the stream.

In high risk areas for water contamination the width of the buffer should be increased to provide added assurance of the sustainability of water quality protection.

High risk areas might be considered as contributing areas where:

- intensive cropping is practiced;
- animal confinement areas are in the contributing area;
- high-valued streams exist where greater protection is desired;
- other high-sediment producing areas exist;
- anticipated land-use changes may adversely impact the stream.

Buffers are very effective in processing nitrogen. Some generalized averages for average annual nitrogen uptake by trees include: 1) about 60 pounds per acre for deciduous species, and 2) about 35 pounds per acre for conifer species. Estimates for denitrification in natural riparian forests in the U.S. are in the range of 25 to 35 pounds of N per acre per year.

Riparian forest buffers can provide habitat for a tremendous number of wild animals from big game, to owls and songbirds, turtles, frogs, and insects. All of these creatures and many more may find a place to feed, nest, or breed in the riparian forest ecosystem. The forest buffer's benefits may also extend to the

fin fish, shellfish, and invertebrates that inhabit the adjoining water.

Just as in designing for water quality, the species composition, width, and length of the buffer are critical in determining the effectiveness of the buffer in meeting the habitat objectives. The buffer provides shade to lower water temperature, provides organic material and large woody debris for aquatic habitat, and provides food, shelter and nesting cover for many species of birds and other wildlife.

Great Plains riparian woodlands have been reported to contain bird communities that are as much as seven times as rich as those in the surrounding Plains. How well they provide habitat depends to a large degree on how they are designed.

Small streams flowing through exposed reaches can experience increases in temperature of up to 1.5 degrees Fahrenheit for every 100 feet of sun exposure. Maximum daily temperatures can be as much as twelve to fifteen degrees higher in exposed streams, rendering them unfit for many species of fish.

As much as 75 percent of the large woody debris (LWD) in streams comes from trees within the first 50 feet of the stream bank. One study showed that LWD created an additional 43 percent pool volume in one stream and 71 percent in another stream which was very important to fish survival particularly during low flows in summer.

Some general guidelines for widths (which include the total of two-side plantings along streams) for some representative species are:

<u>Species (common name)</u>	<u>Desired width (feet)*</u>
Bald eagle, cavity nesting ducks, herons, sandhill crane	600
Common loon, pileated woodpecker	450
Beaver, dabbling ducks, mink	300
Deer	200
Lesser scaup, harlequin duck	165
Frog, salamander	100

*refer to published state guidelines for more localized information.

While not all objectives can always be achieved without some conflicts, the benefits we derive from riparian buffers to a large degree depends upon how we plan, establish, manage and maintain our riparian buffers.

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Cooperative Marketing Ideas

Dan Nagengast, Director, Kansas Rural Center, Whiting, Kansas

Some people are great at glad-handing customers or are interested in working with chefs. Others are better off out in the field or writing newsletters. Those talents may be better used in a cooperative situation.

Someone once said that "farmers' cooperative" is an oxymoron. These days "independent farmer" is almost the same. If your farm's survival depends on working with others, make sure it is profitable and on terms that you can live and prosper with.

Reasons to market cooperatively:

Insufficient individual production. Often a beginner's problem. You can't grow enough yet to justify the transportation. Or you are interested in Community Supported Agriculture, but you don't have enough consistency or variety.

Shared resources & efficiency. Share that truck. Pay a common stall fee. Often this type of cooperation includes sharing production resources too: a manure spreader; sometimes two tractors are better than one; a large cooler is cheaper than two small ones.

Best use of diverse talents. Some people are great at glad-handing customers or are interested in working with chefs. Others are better off out in the field or writing newsletters. Those talents may be better used in a cooperative situation.

Market insurance: assured production. You have 350 CSA customers or five good restaurants. You get hailed out. If you are marketing in a group, your customers, at any rate, may avoid disappointment because a group is providing the production.

New, larger markets. More production means a wider range of markets are open to you. If you are very small, a farmers' market, or one restaurant, or neighbors may be your only outlet. Combined production can get you into other situations and markets that may be equally profitable.

Support group. Two heads are better

than one. It means more information and more thoughtful solutions.

Some Models:

Rolling Prairie Farmers Alliance. An eight-farm cooperative CSA with 350 subscribers, and three drop-off sites in whole foods stores.

Land to Hand Alliance. A group of sixteen farmers and ranchers from several counties in North Central Kansas formed to direct market beef, pork, lamb, poultry, goat meat, dairy, soap, eggs, animal feed, vegetables, grain, puppies, herbs, honey, and fiber.

University of Northern Iowa Local Food Project. Works with institutions, including UNI, the local hospital, and a restaurant to increase the amount of local food in their meals programs and on the menu.

County Fair Tomato Co-op. A processing, value-added cooperative attempting to return the product to farmers so that they can make the retail sales and reap the rewards.

Tallgrass Prairie Producers. A group of ranchers in the Kansas Flint Hills that spent 5 years developing a grass-fed beef cooperative. They have taken a break from marketing and are working with another group of ranchers to reorganize on a larger level for mass markets.

Kansas Organic Producers. A 60-member marketing cooperative, with 40+ members actually selling all or part of their production through the co-op. Organized in 1992, major marketing efforts focus on soybeans, wheat, corn, specialty crops, and livestock. Individual members do some beef and poultry marketing. Last year, sales were over \$500,000. The co-op has had part-time professional management for the last several years.

Peabody Farmers Market. Seventeen

growers in a small town decided to develop a farmers' market in the park on Main Street. They held monthly meetings through the winter. Charged \$20 per stall and hired a market manager. Advertised in the paper and through press release. They are meeting now, and looking toward their second season.

Karen Pendleton; Friendship Gardens.

Four women growers who craft dried flower arrangements, one each north, south, east and west of Lawrence, Kansas, so that they are

within 20 minutes of each other, but not directly competing. They do a lot of flower trials and arranging together. In addition to moral support, they do craft shows together. This means husbands don't have to come and it's safer, but also, while one talks, another eats, one takes money, and one can go to the bathroom.

Blue Earth. A group of seven farmers who jointly market through one stand at the Manhattan, Kansas farmers' market and to restaurants.

Adding Value Can Improve Your Bottom Line

Rodney B. Holcomb

Agribusiness Economist, OSU Food and Agricultural Products Center, Stillwater, Oklahoma

Value-Added Agriculture

The past fifteen years have seen some dramatic changes for agriculture, many of which adversely affected small-to medium-sized farms. Agricultural prices, and thereby producer incomes, saw greater volatility due to farm policy changes, developments in international trade, and of course, the weather. As a result of instability in the farm sector, several producers left agriculture and countless others began to explore ways for enhancing their income. Because the American lifestyle during this time period became dependent upon "quick and easy" meal solutions, many producers (individuals and groups) turned to value-added processing ventures to provide this extra income. Through these ventures producers developed income streams from new businesses that were, in some manner, tied to their on-farm production.

Adding value to agricultural products is a popular concept because it can provide substantial benefits, including an increased ability to capture a percentage of the farm-to-retail price spread. For example, wheat

represents less than nine percent of the retail value of the typical loaf of bread while the milling, baking, and related activities represent almost 65 percent of the final value (Kohls and Uhl). The opportunities for food manufacturing have also been more profitable in recent years; the return on equity of production agriculture averaged 3.38% while the return on investment for food companies averaged 16.6% during the 1991-95 period (U.S. Dept. of Commerce).

Since 1990, a noticeable phenomenon in U.S. agriculture has been the development of value-added marketing cooperatives (Cook). During the late 1980's and early 1990's, more than \$1.2 billion dollars were invested in various value-added marketing cooperatives (Egerstrom). This value-added philosophy has been particularly evident in the Northern Plains states (North and South Dakota, Minnesota), as shown by the development of farmer-owned efforts such as Dakota Growers Pasta Co., Drayton Grain Processors, North Dakota Bison Cooperative, American Crystal

During the late 1980's and early 1990's, more than \$1.2 billion dollars were invested in various value-added marketing cooperatives

Oklahoma, with its vast agricultural output, has the potential to greatly expand its value-added processing activities. Adding value to agricultural products is a popular concept because it can provide substantial benefits, including an increased ability to capture a percentage of the farm-to-retail price spread.

Sugar Co., and AgGrow Oils. The success of these Northern Plains ventures have increased the interest of Oklahoma producers and cooperatives in value-added processing ventures, resulting in the Saginaw, Texas flour mill partially owned by thirteen Oklahoma cooperatives, and the newly formed Value-Added Products Cooperative in Alva, Oklahoma.

Value-added processing activities offer the state of Oklahoma several possibilities for deriving additional employment, gross state product (GSP) and tax revenues from agricultural commodities currently produced in the state. Typically, most of Oklahoma's agricultural commodities are shipped out of the state as raw commodities, before even primary processing has added value to the state's agricultural outputs. Recent decentralization in the U.S. manufacturing industries, shifts in the U.S. population towards "Sun Belt" states (Gulf Coast states, Arizona, Nevada), and resource allocations towards food processing research made by the state of Oklahoma have created a more friendly environment for the growth of Oklahoma's value-added food and agricultural products processing industries.

Oklahoma, with its vast agricultural output, has the potential to greatly expand its value-added processing activities. In the early 1990's, all livestock and crops (raw agricultural products) produced in Oklahoma directly impacted the state's GSP by slightly over \$1.1 billion and accounted for 5.1% of all Oklahoma jobs. However, the indirect and induced effects of this production, from the state's inputs sector through insurance and affiliated governmental outlays, added an additional \$2.8 billion to Oklahoma's GSP and generated 6.8% of the state's jobs for a total economic impact of nearly \$4.0 billion and 11.9% of the state's total employment (Anderson et al., 1994). On the other hand, Oklahoma's agricultural processing industries and their

related economic activities during this time period accounted for roughly \$1.6 billion in GSP and roughly 10% of the state's employment. Given that the average return to production agriculture from each consumer's food dollar is now roughly 22%, there should be room to develop more processing activities for Oklahoma's raw agricultural products.

Several factors indicate opportunities for future growth of producer-owned value-added processing entities in Oklahoma. First, the state's agricultural output is tremendous and varied, suggesting processing opportunities for several different crops. Second, the state has provided several incentives for producers considering processing opportunities, including research and planning assistance and tax breaks. Third, the state's highway system and central location offer proximity to market centers while also suggesting prime storage and distribution points for coast-to-coast and Canada-to-Mexico marketing.

Planning a Value-Added Processing Venture

Success in developing value-added processing ventures depends upon careful business planning and marketing. In most cases, producing a value-added product is the easiest part of a value-added enterprise. Manufacturing a product that consumers are willing to buy and having a market outlet for that product, however, are the main difficulties for a food business. These problems can be diminished, if not eliminated, through early planning efforts.

Initial planning can be divided into four basic steps. The first step is to compile all available information concerning the quality characteristics of the commodity being produced in the producer's (or producers') trade territory over a period of time. Based on historical quality information, an initial list of potential processed products can be identified.

The second step is to obtain basic industry

and production information for each potential product or product group. This includes market size, market growth, industry concentration, location of competitors within the region, complexity of processing technology, minimum efficient scale of operation, and location of major market outlets and/or distribution points. Obviously, gathering this information is not a simple task, but the combined industry knowledge and compiled market data from the OSU Food & Agricultural Products Center, the Oklahoma Department of Agriculture, and other information sources can provide an appropriate depiction of each product's market trends and competition.

The next, and possibly the most interesting, step in the process is the analysis of the information. This analysis, which needs to incorporate a rating or ranking system, can be a valuable tool for addressing the advantages and disadvantages associated with the list of potential processing opportunities. In essence, this planning tool provides a means for quantifying/ranking each processing possibility, thereby allowing the individual/group to pinpoint one or two ventures that show the greatest promise for the farm/organization.

The final step in the process is the development of a specific action plan for pursuing the "best" processing alternative. Components of this action plan include determining the business structure to be used for the processing venture; the necessary facilities, equipment, and management for the venture; a plan for raising capital (if necessary); and a marketing scheme for contracting production. Parts of this action plan may require the services of industry or marketing experts, especially if the enterprise is considerably large in scope. Very few producers have the time, industry experience, and management/marketing skills needed to oversee the daily operations of a processing

enterprise.

The end result of these planning techniques will hopefully be an enterprise that is both profitable and consistent, providing a steady source of additional income for the producer or producers. Additionally, such ventures are opportunities to capture a significant share of the consumer's food dollar unseen by today's agricultural producers. The resources made available by the state of Oklahoma, several of its state agencies, and Oklahoma State University can serve to meet the needs of those interested in developing these processing entities.

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More Than Just Wheat: Adding Value To Your Crop

Rodney B. Holcomb

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The frozen dough market grew 27 percent in the period 1992-95 and is classified as one of the fastest growing segments among all bakery products.

Hard red winter (HRW) wheat, which comprises approximately 99% of the wheat grown in Oklahoma (Oklahoma Dept. of Agriculture, USDA-NASS, 1990-1996), is typically used in the manufacture of white pan breads, hamburger and hotdog buns, tortillas, pizza crusts (often blended with spring wheat flour), and sweet rolls. The protein levels and dough elasticity of HRW flour are slightly less than those of hard red spring (HRS) flour, which may be a disadvantage in the production of some types of baked items and frozen dough products. However, in many years the wheat belt of Oklahoma produces HRW wheat in the 11.5-13.5 percent protein range, and much of this wheat can provide the desired qualities for frozen dough products.

For the purpose of comparison, consider the following three value-added options for Oklahoma's HRW wheat: commodity flour, tortillas/flatbreads, and refrigerated/frozen dough. It is possible to make all of these alternatives using only HRW wheat. Each alternative may also be a processing alternative for Oklahoma's agricultural producer if market and competitive advantages exist.

Commodity Flour

Growth in the commodity flour market has been small, especially in Oklahoma. Oklahoma has four operating flour mills, of which three are located in north central Oklahoma. These four mills have a combined capacity of about 31,400 hundred weight (cwt.) of flour per day (Oklahoma Dept. of Commerce, 1996), almost exclusively using HRW wheat. The state's baking industry has expanded some in the past few years, but most

of these commercial bakers are utilizing soft wheat flours imported from other states, not the HRW wheat flour generated by existing Oklahoma mills.

Kansas provides the nation with almost ten percent of all domestically-milled flour, most of which is made from HRW wheat (USDOC, Bureau of the Census, 1998). This competitive pressure from a bordering state has further continued to limit the market opportunities for Oklahoma flour milling. A new mill being built near Ft. Worth, Texas, will also attract much of the HRW wheat from southwestern Oklahoma and provide additional competitive pressure for any proposed Oklahoma mill.

Tortillas/Flatbreads

The tortilla/flatbreads industry, which may be the fastest growing segment in the U.S. bakery industry, has realized considerable market growth from consumer desires for flavored and fat-free tortilla varieties. The Tortilla Industry Association states that the overall market for tortillas in 1996 was \$2.87 billion, representing an annual increase of approximately twelve percent more than 1994 figures. In 1996, the western U. S. continued to generate the largest proportion of sales revenue, approximately thirty percent. The Southeast accounted for 26 percent of the 1996 tortilla sales, and the north central region 25 percent (Tortilla Industry Association, 1998).

Tortillas have extended far beyond the Latin American market that used to dictate tortilla sales. It is estimated that non-Latinos consume 60% of the tortilla products manufactured in the United States. Flour tortillas have dominated the market over corn tortillas in the last two years by a proportion

of 2:1. The Tortilla Industry Association estimates that Americans consumed approximately 75 billion tortillas in 1998, not including tortilla chips. A consumption increase of 54 percent is expected during the next five years (Tortilla Industry Association, 1998).

Frozen Dough/Bakery Product

Possibly the largest growth area for value-added wheat-based products is in non-bread frozen bakery products (SIC 2053 "Frozen Bakery Products, Except Bread"). This category includes such items as pizza dough and bulk dough for use by retail food outlets and in-store delis. According to the U.S. Department of Commerce (1992-1998), the value of shipments from domestic SIC 2053 manufacturers increased by 51.7 percent from 1992 (approx. \$1.67 billion) to 1996 (approx. \$2.54 billion). The "value-added" component of those shipments (i.e., the portion of the product's value associated with the manufacturing process) increased by 47.3 percent, from \$919.2 million in 1992 to \$1.35 billion in 1996. As shown by the value-added cooperatives from the Upper Midwest, this is a high-growth industry with rapidly expanding markets in the southeastern and southwestern United States.

In a 1997 report, FIND/SVP (1997a), a market research company for consumer products, indicates that biscuit dough accounts for 41 percent of refrigerated/frozen dough product sales. Biscuit dough sales are expected to have an increase of 6.5 percent annually, with forecasted sales of \$2.2 billion by the year 2000. Rolls and sweet goods, additional alternatives for refrigerated/frozen dough processing, are predicted to show market growth of 9.6% and 16.8% (respectively) between 1993 and 2000 (Faridi and Faubion, 1995). One draw of rolls and sweet goods may be the various forms in which they can be purchased by final consumers (refrigerated dough, frozen dough, par-baked frozen dough, brown-and-serve) and easily baked at home.

Fewer than 15 marketers compete in frozen and refrigerated dough products on a national level, and most dough market segments are dominated by fewer than five players. The frozen dough market grew 27 percent in the period 1992-95 and is classified as one of the fastest-growing segments among all bakery products. The top four firms in this industry are Rich Products Corp., Country Home Bakery, Inc., Hazewood Farms Bakeries, and Pillsbury Co. These firms only control 24% of the overall market, indicating less entry resistance than most segments of the bakery industry (Lou and Wilson, 1998). However, the technological advances made in refrigerated/frozen dough processing, along with the generally higher costs of handling refrigerated/frozen products, result in high market-entry costs.

The VAP Example

In February 1998, Food and Agricultural Products Center (FAPC) representatives met with a group of roughly 25 Woods County wheat farmers, local businessmen, and local bankers in Alva. This meeting, initiated by the Woods Co. Economic Development Committee, was set to discuss opportunities for building a flour mill to process the region's hard red winter (HRW) wheat. A FAPC research project had recently examined opportunities for additional Oklahoma flour milling, but the findings suggested that high regional competition and proximity to large bakeries would limit the opportunities for a successful venture in Woods County. The Alva group and FAPC agreed to examine other opportunities for other wheat-based processing opportunities.

In March 1998, FAPC representatives, representatives of the Oklahoma Department of Agriculture (ODA), and FAPC-recommended food industry experts met once again with the Alva group. The industry experts provided suggestions for processing opportunities and a possible format for organizing a producer-

In all, over two years were required to adequately plan and establish this project, which will cost nearly \$17 million by the time full-scale production begins in September 2000.

owned business entity. The Alva group decided to investigate information provided by these experts, FAPC, and ODA over the next 2 months, at which time a strategic planning session would be held. This information included FAPC-provided historical wheat quality information, product market information, and industry growth estimates to be used in examining processing possibilities.

At the two-day strategic planning retreat in May 1998, all parties met once again in Alva to discuss the various factors that would be pros and cons of any processing venture in northwest Oklahoma. The regional infrastructure (roads, utilities, etc.), employment, support industries (trucking, inputs, services, etc.), and local leadership assets were inventoried. Industry competition and market growth for various products were discussed. In the end, the group decided to further examine three product possibilities that seemed to be a good fit, given the wheat quality and business environment of the region. A request for proposals (RFP) was developed, and FAPC and ODA agreed to submit these proposals to industry members that might be interested in partnering with regional producers to build a processing enterprise in Woods County. FAPC further agreed to review any proposals received and provide objective commentary.

During the next few months, the Alva group formed a limited liability company entitled Value Added Partners, LLC, (VAP) to serve as the business entity overseeing the development of any food processing activity in Woods County. Based upon the proposals submitted and the comments from FAPC, this LLC decided to contract with N.C. Doty & Associates out of Fargo, North Dakota, to help establish a food-processing venture. With FAPC providing a significant portion of the market and industry research at no charge, Value Added Partners agreed to contract with N.C. Doty & Associates for the feasibility study and business planning of a frozen dough

processing operation in late 1998.

Based upon the wheat-quality information provided by FAPC, Value Added Partners and N.C. Doty & Associates set out to research the technology and equipment providers that could generate a wide variety of pre-proofed frozen dough from Oklahoma HRW wheat. Fritsch USA, the American arm of the German-based Fritsch Company, was determined to be the best possible equipment provider after an assessment of their equipment at a distribution point in Olathe, Kansas, and attending an equipment show in Germany. While Fritsch and Doty lined up potential clients for pre-proofed frozen dough products, FAPC researched all aspects of the frozen pizza and pizza crust industries (the fastest growing markets for pre-proofed frozen dough). This information was used by the LLC to determine their comparative advantages in dough processing. The information, along with financial assessments developed jointly by FAPC and Doty, constituted the feasibility study and business plan for the venture.

From the feasibility study and business plan, VAP was developed and over \$7.5 million was raised within a 3-month period. While money continued to come in from participating agricultural producers, VAP purchased an abandoned Wal-Mart facility in Alva to house the processing operations and placed a down payment on the equipment. Pilot-scale equipment was also purchased to meet the demands of contracted clients while the full-scale facility is being completed.

In all, over two years were required to adequately plan and establish this project, which will cost nearly \$17 million by the time full-scale production begins in September 2000. Unfortunately, it took a drastic drop in wheat prices for such an operation to be considered. With proper planning and resource commitments, other such entities could develop in Oklahoma.

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Marketing Experiences on a Small Vegetable Farm

Alex Hitt

Peregrine Farm, Graham, North Carolina

Peregrine Farm began as a Pick-Your-Own (PYO) blackberry and raspberry operation, with two acres of each. This was after extensive market research on PYO operations and their requirements of population, distance from population, and other factors. The first problem was that while raspberries will grow in North Carolina, they are not really well adapted. The second problem was getting all of the berries picked. We were successful in our advertising, in getting numbers of cars, and people to the farm, but they were not picking the poundage of fruit needed. The first marketing lesson was that our population was increasingly two-income families, and they did not have time to pick or preserve large quantities of berries.

During this initial three-year period we also experienced a crop failure due to low temperatures. This combined with the above market shift led us to begin to diversify both in crops and markets. In 1986 we began picking berries and selling them to both small stores and at farmers' market. At the same time we began a small production of mixed

vegetables and cut flowers for farmers' market. Farmers' market was, and continues to be, a great market research vehicle, as well as the majority of our income. The immediate feedback on varieties, kinds of crops, quality, etc., are invaluable to the future direction of our operation.

The first discovery was that people were crazy for cut flowers, and that became the tail that wagged the dog for several years, as we tried to learn about production of cut flowers and to increase production to meet demand. In 1988 our major grocery store account opened and cut flowers, in mixed bouquets, really boomed in that market also. By 1992 we were delivering bouquets to four stores and growing for farmers' market. Since that time we have cut back bouquets to the stores for several reasons. This is primarily due to the labor-intensive nature of making bouquets and the increased sales at farmers' market of single stems.

Vegetables were a harder nut to crack, as to what people really wanted. Farmers' market helped but because of the volume of vegetables at market it was more difficult to

If they can't eat it in a salad or on their ice cream or cereal, we don't grow it!

We have learned that all markets are different and the most important thing to do is to learn what the market wants and then service it relentlessly. Listen to what your customers are telling you and what they want, then grow it for them.

tell what really sold well and why. Part of the answer came from selling to a few high-end restaurants who not only demanded high quality but also were on the cutting edge of new crops coming in either from California or Europe. Once we met their needs for quality and volume, they were great sources of ideas about new crops to try. By the time we learned all of the tricks in producing a new crop, it was now popular in the grocery store and we were ready to increase production to meet that market niche if we wanted to.

In 1990 Alex finally was able to become full time on the farm where Betsy had been all these early years. Two things happened. First we ended our PYO berry operation and sold just in town. At the same time we began to change over the thornless blackberries for earlier and sweeter thorny berries. Second, Alex began, the first of three winters, working part-time in the produce department of the largest store that we sold to. This store's customers were the very customers that we sold to at farmers' market. The insights into the local market and its peculiarities were indispensable. The volumes and sales patterns of different crops became very apparent when you handle hundreds of cases of produce a week.

Now eighteen growing seasons later our marketing consists of twice-a-week deliveries to one grocery store and one restaurant, as well as a twice a week farmers' market. Increasingly, we are moving more of our business to farmers' market for many reasons. The first is that the prices are retail. The second is that the volumes can vary and the pressure of having a certain volume on a certain day is not there, as they are in the wholesale market. Third, the quality of life and enjoyment for us are much higher selling at market when we get immediate response from our customers. We also sell at one of the premium markets in the country, with customers who have high levels of income and education. We are also only twenty minutes from our market. These are all

factors that enable us to make high-volume retail sales at market.

While we are reducing our sales to the grocery stores, we will still sell a certain amount to at least one store for years to come. Certain crops, such as lettuce, that we custom grow just for them, we will continue to do because of the profitability and the relative ease of volume production. Alex still does all of the deliveries himself because of the importance of the contact with the produce buyers. It is very difficult to get feedback from grocery store sales, impossible if you never see and talk to the people who buy and handle your product.

In conclusion, we have learned that all markets are different and the most important thing to do is to learn what the market wants and then service it relentlessly. Listen to what your customers are telling you and what they want, then grow it for them. They will reluctantly, at best, buy what you think they want! Try and sell as close to the end-user as you can. The prices will be higher and the feedback that guides your business will be greater. In our case we sell as much at farmers' market as we can and only grow foods that don't have to be cooked (two income families don't have time to cook). If they can't eat it in a salad or on their ice cream or cereal we don't grow it!

The Ups and Downs of Direct-Marketing Beef

Peggy and Richard Sechrist, Fredericksburg, Texas

Direct-marketing beef is both challenging and rewarding. For most producers, marketing is a new skill and requires time and practice to master. Richard and I have been "practicing" for five years and feel that there are some basic guidelines we can share regarding direct marketing. But each and every situation will be different, and producers must develop a marketing plan that fits their situation.

Our presentation will discuss how we have applied the following guidelines.

Direct-Marketing Guidelines

I. Make sure marketing is consistent with your goals, personally and professionally.

A) It is very time consuming (and rewarding)

B) Requires a long time to develop

II. Select and define your market

A) Identify your market niche. You have to know who you are trying to get to buy your product, how to reach them, and figure out a compelling reason for them to change their buying habits.

B) Differentiate your product

C) Study your market. Research information and trends relating to your target audience such as buying habits, priority concerns, future trends, etc.

III. Get your product ready for market

A) Labeling, packaging, promotional material such as brochures, advertising

IV. Develop a marketing plan

A) How are you going to reach your target market?

Options: retail
wholesale

Distribution

B) Marketing tools:

- Resources such as marketing book
- Brochures
- Advertising
- Farmer Markets
- Special events booths

IV. Flexibility & Adaptation

Be prepared to change your marketing strategies or things like your product packaging to better fit the market need.

You have to know who you are trying to get to buy your product, how to reach them, and figure out a compelling reason for them to change their buying habits.

Relationship Marketing

Joel Salatin, Polyface Farm, Shenandoah Valley, Virginia

It's easier to find
100 people who
will spend \$1,000
with you than
\$1,000 people
who will
spend \$100.

1. Diversifying your Pitch.

- A. Education– Consumers need to be told how your product differs from the competition. As clean-food producers, we need to explain the difference between edible products and inedible, extruded, amalgamated, irradiated, genetically-modified, adulterated pseudo-food.
- B. Examples– Giving out samples of your product always works. This is usually the best advertisement investment you can make. People are always predisposed to like something given more than something bought, because the best things in life are free.
- C. Evangelism– Turn your patrons into evangelists by rewarding their efforts with free merchandise. A few gung-ho patrons (we call them cheerleaders) will bring you high quality customers faster than any scattergun approach.

2. Diversifying your Patrons– It's easier to find 100 people who will spend \$1,000 with you than 1,000 people who will spend \$100. The hard part is getting the patron. Once you have the patron, diversify your product line so that you can capture more of the patron's money per visit. This marketing bounce-back is far more efficient than trying to add new customers for a mono-product line.

- A. Individuals– Our 400 families are the backbone of our business. We send out an annual newsletter (epistle) and order blank to keep us from being in the speculative farming business. This way everything is pre-ordered, taking the risk out of the production end.

3. Diversifying your Product

- A. Farmers' Markets– Extending your efforts into multiple venues garners additional exposure and allows you to touch people who may not be ready to come out to the farm. In persuasion, you are always trying to move people in degrees, not lump sums. If you are a "one," and you're talking to a "ten" your goal is to move that person to a nine, not a three or two. Non-farm venues like food fairs, farmers' markets, buying clubs, and health food stores offer opportunities to touch people not ready yet to actually trek out to your farm.
- B. Restaurants– The taste and texture of clean food makes it highly marketable to discriminating chefs. Given the choice, patrons will often choose food produced in a humane or non-chemical way. We supply about 30 restaurants and use a subcontractor to make the weekly delivery. A variable delivery fee is added based on poundage, which serves as the subcontractor's commission. This keeps us from compromising on FOB Polyface prices, encourages the restaurant to buy more in order to get the delivery percentage down, and insures aggressive and high-quality delivery because the whole shebang carries no wages.

We are in an age of niche marketing. Everyone is looking for something unique; designer duds are in. Most farmers break out in a rash at the thought of doing something different. And yet it is difference that drives marketing distinctiveness. Nothing is as hard

to sell as the same old same old. Product differentiation is key. And nothing is more uniquely recognizable than superior quality.

The wholesale-commodity-based agribusiness system spurns differentiation and applauds mediocrity. But if you will devote yourself to excellence, the market will always make room at the top. The problem is that

most of us will not passionately address the personal character qualities and abilities that will produce a significantly superior product. This requires a major paradigm shift-- probably even getting rid of the TV.

The opportunities are there; the battleground is between the ears. Go for it.

Exploring Value-Added Agriculture

La Rhea Pepper, Texas Organic Cotton Marketing Cooperative, O'Donnell, Texas

Founded in 1993, the Texas Organic Cotton Marketing Cooperative (TOCMC) is comprised of a group of producers whose farmland is certified by the Texas Department of Agriculture. In 1999, membership was also expanded to include cotton producers from other areas, certified by appropriate groups. The program has grown from 400 bales and a handful of farmers, to over 30 farm families and 5,000 bales from the 1999 harvest.

Our farmers consider themselves stewards of the land. As conscientious stewards they want to see the land able to support the next generations of farmers. Many farming practices used today reduce the potential for passing healthy, productive land to our children. Misuse of pesticides and herbicides has done great harm to our environment. That, coupled with the current, and on-going agricultural crisis that we are facing in rural areas, motivated the farmers involved in TOCMC to not only farm using alternative methods-- sustainable methods-- but to also market their product using alternative methods.

TOCMC is bringing the farm gate closer to the market gate by investing in value-added agricultural products. By adding value to farm products, the production chain is shortened, allowing the farmer to share in benefits of the

manufacturing process, create a sustainable market, and most importantly, bring a quality product into the marketplace giving many consumers the option to purchase chemical-free products.

Cotton Plus-- The First Step in Value-Added

When Terry and I first became "certified organic" (1992), a number of people began calling-- wanting organic cotton. Unfortunately, they didn't want a 500 pound bale. They wanted fabric!! At that time, only the "big boys"-- Esprit, O'Wear and Ecosport -- could afford to meet the mill minimums to launch their own organic programs. There was a void in servicing the small and medium-size manufacturers. I still remember the way I felt when my husband and I took our cotton to the mill and ordered 4,000 yards of denim. SCARED!!! What were we going to do with that much denim, and where were we going to put it! Before the fabric arrived, it was all sold, as well as another batch, and we added chambray and canvas. Filling those first orders was a riot, using a ping-pong table to cut and measure fabric, and having a mountain of fabric that the boys used as their playground! Cotton Plus now offers 140 different fabrics,

Value-added is
not for the
faint of heart!

TOCMC is bringing the farm gate closer to the market gate by investing in value-added agricultural products.

used over 750 bales last year and employs 3 full-time people and services over 400 manufacturers.

Organic Essentials– A Giant Leap into Value-Added

Organic Essentials began conceptually in 1994 due to the feedback from consumers seeking alternatives to feminine and personal care products and the need to develop additional markets for the fiber. While we were not having any problem selling and marketing the higher-quality grades of fiber, we were experiencing over ten percent of the fiber falling outside of spinning specifications. In the conventional cotton market, you have a mature market that buys and sells every type of cotton for a variety of applications. The difference in a high leaf or a low micronaire or a short staple may only be a couple of points on the conventional market– in the organic market, it is the difference of being sold for application in an organic program, or being dumped on the conventional market. With all of the bales going into a pool and the equity of the value of the bales evenly divided per pound to each producer, receiving conventional prices for the low-quality bales lowered the progress payments across the entire membership. We began to research programs and areas where we could consistently place this cotton into an organic program. You should have been in the meeting when I told our board that we needed to start making feminine hygiene products!!!! Like I said, this wasn't a small step into value-added agriculture, it was a giant leap!!!

Organic Essentials is owned not only by TOCMC and members of TOCMC, but because the minimums are so high and this program is capital-intensive, additional shares have been sold to other individuals interested in promoting rural economies and organic cotton products. This is already a success for the farmers involved, because this cotton has an "organic" home. With additional time and

greater volumes, it shows the potential to be a good investment for others as well.

Strategic Alliances

Our third venture into value-added agriculture began in February of 1999. We have found over the years that each market or product has its own specific needs– resources, knowledge, talent, and passion. This is the case with Sunshine Au Naturaul Mill. The primary market focus for the program is bed and bath products towels, sheets, robes, and other related items. From a farmer's perspective, a towel uses two pounds of medium-grade cotton. From a marketing standpoint, it has to be soft and absorbent. You have to tell the story, have the quality, and be able to give point-of-purchase support into the retail market. We have been fortunate in the development of a strategic alliance with Bryant Rayngay who has the expertise and knowledge for this market sector. TOCMC and Cotton Plus are both primary shareholders in Sunshine as well as suppliers of fiber and fabric.

Belly up to the Bar

Since the beginning of the organic cotton businesses (1992) in O'Donnell, Texas Cotton Plus, TOCMC and Organic Essentials– the economy has benefitted \$10.8 million over the price of conventional cotton, over \$6 million in fiber sales, \$2 million in fabric sales, \$1 million in non-woven goods and \$500,000 in payroll. This return has come with a price. TOCMC operates on retains, for every pound of cotton that is sold on the organic market, a pre-determined cents per pound is paid to cover marketing expenses. In addition to that, additional capital has had to be invested in each of the value-added programs in order to develop and launch the program. In addition to the cash that has been invested, there has been ten times that amount invested in blood, sweat and tears. Value-added is not for the faint of heart!

Value-Added = Cash

You may have the most wonderful crop in the world, but if you don't have the cash to turn it into a product all you have is a 500-pound bale that no one wants to buy. Organic Essentials' inventory is a double-edged sword. Fabric minimums at 4,000 are nothing. To meet a minimum in non-wovens, we're talking 50,000 per item. To launch the cotton ball project required \$40,000 cash plus the cotton. The second verse to this song is that you may have the most wonderful product in the whole world, but if you don't market and sell that product – you're still nowhere. You have to put together the entire package.

Value-Added is a Choice

Any one of the steps leading to value-added agriculture may seem insurmountable, if you have to do it alone. Regardless of the crop or agricultural products you are involved in, you have a choice to make. Either be content with the way things are or become involved in your farm, your product, and find a way to become involved in marketing and selling your product. I'm convinced that one of the critical keys to sustainable agriculture is a economically-sustainable and viable market – even if we have to build it ourselves.

Alternatives to Industrial Vertical Integration in Oklahoma Agriculture

John E. Ikerd, Extension professor, University of Missouri, Columbia

People in rural Oklahoma as in much of rural America– are searching for new alternatives for economic development. Unfortunately, economic development and economic growth have become interchangeable concepts in the minds of many. Economic development has come to mean more jobs and more money with little concern for who gets the jobs and who gets the money. More jobs and more money may be fairly accurate measures of economic growth, but they do not necessarily measure how effectively a community is developing its economic resources.

Economic growth means that an economy is getting bigger – it does not necessarily mean that the economy is getting better. An economy is something created by people to meet the needs of people. Thus, an economy should work for people – not the other way around.

Economic development should mean that an economy is getting better at meeting the needs of the people it is meant to serve– which may or may not result from its getting bigger. In reality, many rural agricultural areas quite simply have become places where people from outside the community invest in activities that society will not allow them to carry out elsewhere. The local economy grows, but the needs of the community remain unmet.

A Development Alternative for Rural Communities

People in rural agricultural communities should not be criticized for looking to industrial agricultural enterprises, such as confinement animal feeding operations (CAFOs), as a solution to their problems. The industrialization of agriculture– a process that has been taking place in various forms for

Farmer-owned, value-added enterprises put the maximum number of dollars back into a local agricultural economy.

For the state as a whole, a realistic LOVA strategy... could add more than \$1 billion to the state's agricultural economy and create more than 8,000 new jobs in rural areas.

many decades— has continually confronted farmers with the choice of either getting bigger or getting out. Some must get out in order for others to get bigger. As farms have become larger and more specialized, fewer farm operators and farm workers were needed, and the larger farms reached farther and farther beyond the local community to buy their inputs and sell their products. Fewer farm families coupled with fewer local sales and purchases spelled decline and decay for many agriculturally-dependent rural communities.

It takes people, as well as dollars, to make a viable community. Many rural communities now are desperate and thus are vulnerable to any promise of new jobs and new investments. Further exploitation of people who are already exploited, further degradation of natural resources that are already degraded, and even disruption of a community that has already lost its purpose, may seem reasonable costs to pay for bring new jobs and new money into a community. "Just saying NO" is not a logical response for these communities. They need a viable alternative to industrialization— an alternative that will increase local jobs and income by means that enhance and develop local resources rather than degrade and exploit them for short-term gain.

Locally-owned, value-added enterprises (LOVAs) offer such an alternative. Value-added enterprises include any activity that adds value to basic raw commodities such as cattle, wheat, hogs, and cotton by transforming them into more valuable products such as beef, flour, bacon, and cloth. Thus, adding value to agricultural commodities that are already produced in a community may increase local income and create new jobs without changing the basic nature of local resource use. In so doing, the value of local resources also is enhanced through better access to viable local markets.

If the scale of value-added enterprises is matched with the scale of local production,

new jobs are more likely to go to local people. Larger processing and manufacturing operations may employ more local people in total, but they also tend to bring in a larger proportion of their total work force from outside the community. While additional workers may contribute to the economic growth of a community, they do not necessarily contribute to the development, or betterment, of the local economy. When the scale of new enterprises is linked to the local resource base, prospects for unintended negative consequences are less likely to result.

The development potential of value-added enterprises is enhanced when local investments are used to create jobs for local people by providing local markets for local production. In such cases, the emphasis is on developing the resources of a community natural, economic, and human rather than providing opportunities for outside investors to exploit local resources to create jobs for people from outside. In addition, if more rural communities more fully developed their own resources, there would be fewer opportunities for outsiders to exploit local resources for short term gain and less need for someone elsewhere to create jobs for those without jobs in the local community. In other words, community self-development through locally-owned value-adding -- is more stable and sustainable over time. It gives local people a purpose to live, work, and raise their families in a particular community or place.

In agricultural communities, the development potential of value-added enterprises can be further enhanced when local farmers invest in enterprises that add value to their commodities. If value-added enterprises are not farmer-owned, even if locally-owned, some of the raw commodities will quite likely be purchased from within the community, but some will not. A 1996 USDA study indicated that 42 percent of value-added enterprises located in non-metropolitan areas purchased

less than 25 percent of their raw materials locally (within an hour drive), but that 35 percent of such enterprises reported purchasing more than 75 percent of their raw materials locally. The greater the local purchases, the greater the local economic impact. Farmer-owned, value-added enterprises put the maximum number of dollars back into a local agricultural economy.

LOVA Possibilities for Rural, Agricultural Oklahoma

A study of the potential for LOVAs in Oklahoma's agricultural counties was carried out as part of a larger study of the ecological, economic, and social impacts of confinement animal feeding operations in Oklahoma.

Within the context of this study, Texas County is characterized as a county that began with a logical movement toward long-run economic development that somehow has been captured and redirected toward short-run, economic growth. The course for Texas County seems to have been set. But, what about Oklahoma's other agricultural counties? Should they follow Texas County's strategy of economic growth or choose a strategy for economic development locally-owned, value-added agriculture? The study was designed to provide some insights into the answer to this question.

Potential increases in local purchases and new jobs were estimated based on an assumption that new value-added ventures might be undertaken that are capable of utilizing raw materials equivalent to 50 percent of 1992 production of livestock and crops for Oklahoma's agriculturally dependent counties (excluding Texas County). Two alternative scenarios were developed for local purchases. The cooperative scenario assumed that local producers own the value-added enterprises, and thus, all of local raw materials cattle, hogs, wheat, corn, etc. are purchased within the county. Local purchases of the remainder of input materials and supplies

were assumed to be at the same percentage as for the second scenario. The second corporate scenario assumed that percentages of local purchases were the same as the averages for existing non-metro-based value-added operations reported in the USDA study cited.

The same levels of value-added activities for livestock and crops are assumed for both scenarios. The estimated numbers of jobs created, the same for each scenario, were based on the average relationship between dollars of local purchases and jobs created reported in the USDA non-metro value-added survey. However, the farmer-owned cooperative scenario utilizes a larger proportion of total local production because it gets all of its raw materials -- cattle, hogs, wheat, corn, etc. locally, whereas the corporate scenario purchases some raw materials from outside the county.

This analysis is only meant to give some general indications of the potential of LOVAs as rural economic development strategy in these counties. For example, the numbers of potential jobs resulting from a LOVA development strategy range from 250 in Cotton County to 1779 in Cimarron Co. The average across all 13 counties was 636 new jobs per county. The total number of jobs created for the 13 counties was more than 8,264. The average potential increase in local purchases ranged from \$26.5 million for the corporate strategy in Cotton County to \$258 million for the cooperative strategy in Cimarron County. The average was \$93.6 million for the cooperative strategy and \$67.1 million for the corporately-owned strategy.

The farmer-owned cooperative strategy resulted in a potential \$1.2 billion increase in local purchases for the 13 counties in total compared with a \$873 million increase in local purchases for the corporately owned LOVA strategy. These results give some general indication of the range of results that might accrue over time from successful strategies

An economy should work for people, not the other way around.

consistent with those represented by the scenarios outlined in this analysis.

Conclusion

There is little doubt, opportunities for increasing employment or local purchases by these magnitudes would create considerable interest if they were offered by outside investors. The possibility of attracting a new industry that will employ over 600 people probably would be given number-one priority by any rural economic developer. Millions of dollars in public funds might be spent to lure such an industry to a rural county. Landing a business that promises even 250 new jobs would be viewed as a major prize for many rural communities. However, this type of potential quite likely exists in all of Oklahoma's agricultural counties as it does for most agricultural counties across the nation.

For the state as a whole, a realistic LOVA strategy, as outlined in this analysis, could add more than \$1 billion to the state's agricultural economy and could create more than 8,000 new jobs in rural areas. This level of economic achievement would likely surpass that of the largest agri-industry ever brought into Oklahoma, which probably is the Seaboard CAFO operation in Texas County. However, one marked difference is that scattering numerous locally-owned, value-added enterprises across the state does not create the negative environmental and social impacts of concentrating all activity in one location. In many cases, negative environmental and social impacts are not a consequence of the total amount of waste or of the total number of people involved, but instead are a result of concentrating too much waste or too many people in one place. *The poison is in the dose.*

Can Oklahoma achieve its rural economic development objectives more effectively through LOVAs than through industrial recruiting? The answer depends upon Oklahomans. If rural Oklahomans want

someone else to create jobs for them by bringing in investments from outside, a LOVA strategy won't work. CAFOs, or some similar strategy for exploiting rural resources for short run growth, may be the only options. On the other hand, if Oklahomans are willing to accept the responsibility for creating jobs for themselves, by investing their own time, energy, and money in their communities, then LOVAs certainly would seem to be worthy of serious consideration as a rural economic development strategy. The choice is between growth from outside investment or development from within. Growth is far easier and quicker to achieve than development. So, Oklahomans will have to decide whether they want faster economic growth or instead are willing to work a bit harder and longer for economic development for economic betterment of their rural communities.

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Presenters

KEYNOTE SPEAKERS

John E. Ikerd, Ph.D is an Extension professor at the University of Missouri, Columbia, and co-coordinator of sustainable agriculture extension programs in Missouri. Raised on a small dairy farm in southwest Missouri, Ikerd is an agricultural economist who has published widely and extensively on topics such as sustainable/alternative agricultural systems, community development, and changes in agriculture including the effects of large-scale swine production. Dr. Ikerd is currently project leader for a three-state four-year program funded by the W.K. Kellogg Foundation titled “Sustaining Rural Community Development Through Sustainable Agriculture.”

Joel Salatin is a full time farmer on 550 acres in Virginia’s Shenandoah Valley. A third generation alternative farmer, he returned to the farm full time in 1982 and continued refining and adding to his parents’ ideas.

The family’s farm, Polyface, Inc. (The Farm of Many Faces) has been featured in National Geographic and other magazines. The farm services roughly 400 customers with salad bar beef, pastured poultry, eggmobile eggs, pig-aerator pork, forage-based rabbits, pastured turkey and forestry products through “relationship marketing.” He is the author of three books, including *YOU CAN FARM: The Entrepreneur’s Guide to Start and Succeed in a Farming Enterprise* and *Pastured Poultry Profits*.

W. Joe Lewis, Ph.D. grew up on a Mississippi farm and is currently a research entomologist with the USDA Agricultural

Research Service (ARS) in Tifton, Georgia. He was recently awarded the 1999 Outstanding Senior Scientist of the Year award by the ARS. He is nationally and internationally recognized in research and planning activities to develop bio-friendly and economically sustainable pest management and agricultural production systems. He has also been active in historic preservation and downtown development in Tifton and currently serves as vice-mayor of the city of Tifton. He has worked with Marion Jay to apply ideas about how healthy ecosystems work to other areas, such as schools and communities,

Marion Jay is a field facilitator for Communities in Schools of Georgia, the oldest and largest dropout prevention network in the nation. The focus of her work is engaging citizens in resolving/ finding solutions to the issues that challenge communities, such as school drop-outs, teen pregnancy, teen crime, and getting people with disabilities into the work force. She and Dr. Lewis have worked together for eighteen years developing their ideas about communities as dynamic living systems. They have concluded that for rural communities to prosper, all elements in the community must be supported: social, economic, infrastructure, arts and culture.

WORKSHOP LEADERS

Max Carter has been called “the father of conservation tillage in south Georgia.” He began farming in 1955 and farmed conventionally for the first twenty years, then switched to farming no-till (no-plow) for the

last 23 years. He raises cotton, peanuts, corn and soybeans. Through his leadership, his county has converted some 40,000 acres to winter cover crops, strip-till and no-till summer crops.

Walt Davis grew up on a Texas ranch and now runs a cattle operation near Bennington, Oklahoma. In 1962 he began managing his ranch using the “best” practices of soil fertilization, weed control, animal health and animal nutrition supplementation. This approach resulted in tremendous production but very poor profitability. He shifted his operation towards a lower input, more sustainable program in 1974 and began reeducating himself in grassland ecology. He is now a grazing management consultant.

John R. Dunkin has had farms and ranches near Wagoner and Hominy, Oklahoma. He received the region four “Steward” award from the National Cattlemen’s Beef Association in 1997. His belief that cattlemen are environmentalists every day has led him to reclaim highly erodible land, improve the forage base, reduce erosion (from 15 tons per year to 2 tons), implement reduced-till farming and increase wildlife and fish habitat on his properties.

Steve Groff and his family farm 175 acres of vegetables and crops on hilly land in Lancaster County, Pennsylvania. He has pioneered the “Permanent Cover Cropping System” which includes no tillage, cover crops, and effective crop rotations as a way to increase profits, save soil, and reduce pesticides. The farm won Pennsylvania’s 1998 Clean Water Farm Award and is one of nine “harmony demonstration” farms nationwide promoting technologically advanced and environmentally friendly farming practices.

Alex Hitt and his wife Betsy have been farming since 1982 in North Carolina. They

make their entire living on less than five acres of vegetables, cut flowers, and berries, growing almost 200 varieties. They market their produce through farmers’ markets, grocery stores and restaurants. Alex also serves on the board of the Chapel Hill- Carrboro Farmers’ Markets (two markets, 100 members) and is active in the USDA’s southern region SARE program.

Rodney Holcomb is an assistant professor and agribusiness economist with Oklahoma State University’s Food and Agricultural Products Research and Technology Center. His primary focus area is the economics of processing and marketing value-added agricultural products. He also serves as a state resource on market trends for various food products, and is an expert on the legalities and liabilities of operating food businesses.

Dan Nagengast grew up on a wheat farm in Nebraska. A former Peace Corps volunteer in Africa, he became director of the Kansas Rural Center in 1991. In 1994 he organized a cooperative of eight organic vegetable, herb, fruit, meat and poultry growers which direct markets to a C.S.A. of 350 families in Lawrence and Kansas City. He also works on projects which develop urban agriculture and markets, such as channeling farm production into a college and a meals-for-the-elderly program.

La Rhea Pepper with her husband Terry operates an organic cotton farm in West Texas. She has spent the last few years developing markets for, as well as developing specific value-added products made from, organically-grown cotton. She is a founding member of the Texas Organic Cotton Marketing Cooperative. She is the president of Cotton Plus which sells raw fiber to mills, and also spins and weaves the fiber into various fabrics. She is also a shareholder in Organic Essentials which manufactures personal and feminine care products from organic cotton.

Jim Robinson is an agroforester with the National Agroforestry Center, a partnership between the USDA, the Natural Resources Conservation Service (NRCS) and the Forest Service. He was co-chairman of the National Conservation Buffer Conference in San Antonio in 1998. He is an expert on riparian ecosystem management and riparian forest buffers, and is active in training. He began his career with the Soil Conservation Service in 1971.

Richard and Peggy Sechrist follow holistic management practices in their ranching operation in Fredericksburg, Texas. They raise certified organic beef and soon-to-be certified organic pastured chickens. They consider themselves both ranchers and marketers. They have been marketing their products both wholesale and direct to consumers for four years and will share their ups and downs and what works.

Russell Stevens is a wildlife and range specialist with the Noble Foundation in Ardmore, Oklahoma. His primary role is to consult with area ranchers on wildlife and range management issues. He has helped several ranchers integrate wildlife management or recreational leasing into their operations. He also oversees the wildlife management program on the Noble Foundation's Coffey Ranch west of Marietta.

OTHER CONFERENCE PRESENTERS *(papers not included in Proceedings)*

Chuck Hassebrook is program director of the Center for Rural Affairs in Walthill, Nebraska. The Center works with rural people who are starting new farms and businesses, experimenting with sustainable farming systems, and/or initiating policy reform. Hassebrook is a native of Platte Center, Nebraska, where his family is engaged in

farming. He serves on the board of the USDA National Commission on Small Farms and on the University of Nebraska Board of Regents. Previously he served as vice-chair of the USDA Agricultural Science and Technology Review Board and as a member of the Iowa State University external advisory committee on bioethics.

Kent Donica and his family run a cow-calf/stocker calf/goat operation on approximately 1000 acres near Ardmore, Oklahoma. He is a 1987 graduate of OSU in animal science. He received a producer grant from the Kerr Center in 1998. His three-year project demonstrates how controlled burning can be used with goats to convert land with heavy brush/timber to grass, and how adequate grass cover can prevent erosion and siltation.

Rick Maloney has served as director of the Market Development Division of the Oklahoma Department of Agriculture (ODA) since 1995. The division manages programs to develop domestic and international markets for Oklahoma agricultural products. He has been instrumental in developing the value-added processing sector for commodities produced within the state. He also directs ODA's Ag in the Classroom, Farmers' Market, Market News and Rural Economic Development programs.

Tom Trantham was a conventional dairy farmer in South Carolina for many years, working 12-16 hours a day, until he found a better way. With the help of the USDA's Sustainable Agriculture Research and Education Program (SARE) he developed his "Twelve Aprils" rotational grazing dairy system and discovered that farming can be fun! He recently served on the National Commission on Small Farms, and has been chair of the southern region SARE program.

The Kerr Center for Sustainable Agriculture

For over forty years, the name Kerr has been associated with progressive ideas in agriculture. The late Senator Robert S. Kerr for whom the Center is named, was a rancher and conservationist. After his death, an endowment from his estate made possible the establishment of a non-profit foundation. From 1965-1985, the agricultural division of the Kerr Foundation provided farmers and ranchers in southeastern Oklahoma with free technical assistance and information, while always emphasizing wise stewardship.

In the mid-80's, foundation trustees recognized that Oklahoma agriculture was in crisis. Financial and environmental problems on the farm needed to be addressed with fresh ideas that emphasized long-term solutions. So in the best Oklahoma pioneering tradition, the organization made a fresh start, reorganizing as the Kerr Center for Sustainable Agriculture.

By adding the word "sustainable" to the organization name, the Center

joined the search that is going on worldwide for farming practices and marketing structures that will preserve our natural resources and environment, improve the quality of life for farmers, and support the social and economic health of rural communities.

The Kerr Center is a non-profit 501(c)(3) organization located on 4,000 acres on highway 271 south of Poteau, Oklahoma. Its mission statement reads: *The Kerr Center offers progressive leadership and educational programs to all those interested in making farming and ranching environmentally friendly, socially equitable, and economically viable over the long term.*

Its programs include: Oklahoma Producer Grants, The Stewardship Farm, Rural Development and Public Policy, Communications/ Education, Vero Beach Research Station, and the Overstreet-Kerr Historical Farm. For more information contact the Center at P.O. Box 588, Poteau, OK 74953; 918-647-9123; www.kerrcenter.com.