

Marketing and Market Development - Priority #1

The term “marketing” means different things to different people, nonetheless there was broad agreement among participants in the long-term planning process that marketing should be a key component of any plan. The goal of marketing is product image - the creation of a trusted brand name that commands respect and a premium in the marketplace.

Marketing is also delivering products that meet consumer needs. Feedlots want a pot load of like-sized cattle. Supermarkets and vegetable wholesalers want boxes of washed and chilled USDA #1 produce. Restaurants want the prime cut of meat.

Marketing is exploring all possible niches when developing a new product, using existing infrastructure to test new products, and finding value-added uses for secondary products. The farmer who sells their tenderloin to the country club needs a market for hamburger.

The Commonwealth has a valuable asset in its rural landscape. The best way to take advantage of this asset is to preserve it as a working model of itself - as a self-sustaining rural economy. History is a guide. We should aim high. Kentucky's rural economy should have a wholesome image. We should align ourselves with healthy lifestyle trends. Clean and Green - A Human Scale - Authenticity - Food Purity - Craftsmanship should be our watchwords. A coordinated effort is required to build the market infrastructure needed to support this image with products. The creation of county, regional and state markets is an important first step in this direction.

The Kentucky Department of Agriculture has begun a state branding campaign and a “Buy Kentucky” program. Those campaigns should be coordinated with the private sector and other state offices. The creation of a quality assurance program for Kentucky agricultural products, with a state seal of approval guaranteeing that products were as advertised, would add value to Kentucky's brand and qualify our products for industries with strict product- tracking requirements.

Our rural countryside is a fast-appreciating asset as suburbs and strip malls claim chunks of farmland.

We can preserve this asset with profitable working farms. In the knowledge-driven economy of the twenty-first century, the knowledge worker may not be tied to a geographical location. If Kentucky is an attractive place, we will have a leg up in recruiting these knowledge industries.

Efforts to Develop Markets Have Taken Several Forms

In response to demand from producers at the county level, the ADB approved a series of state model programs aimed at allowing individual farmers to compete for diversification grants and addressing the need to upgrade production quality. The need to create a market for this production was clear at local, county and state meetings.

The Purchase Area Aquaculture Cooperative (PAAC) in Farmington is an effort in that direction. Graves County is on the peninsula formed by the Ohio, the Tennessee and the Mississippi Rivers. There is ample water to grow catfish in the Purchase.

PAAC was awarded an ADB grant to build a processing plant and to add freezing capacity in order to compete in the national market for frozen fish. The co-op has developed a profitable market for fresh fish, but price competition from long-established suppliers in Mississippi and from Vietnamese imports has forced the frozen fish business to operate at a loss. This illustrates the difficulty of competing in the global market.

BEPA is a small Christian County produce wholesaler operated by a young farmer who was squeezed out of tobacco when he could not find quota to lease. He went into the sweet corn business and was selling it successfully on the Internet, but he was unwilling to take the price offered for his remainders at the Fairfield Cooperative Market. In response, BEPA secured a fresh market with some local independent grocers, opened a vegetable stand on Ft. Campbell Boulevard in Hopkinsville and began competing for produce on the Fairfield Market with the brokers from Nashville and Louisville. BEPA was given a Christian County matching grant for another

refrigerated truck and a forklift to expand to meet new contracts.



Danny Townsend, a sorghum maker with 40 years' experience, leads the Appalachian Sweet Sorghum Marketing Cooperative, Inc., of Jeffersonville, Kentucky. The co-op received an ADB grant for planting, harvest and labeling equipment to meet expanded demand and bar code requirements from Kroger.

Other efforts to create and strengthen farmer market groups have included vegetable and nursery cooperatives. The Kentucky Center for Cooperative Development was funded to help new cooperatives. Tying these fledgling cooperatives to a central database would allow marketing efforts to be more closely monitored.

Projects under review include farm market showcases in Louisville, a marketing center and business incubator in Northern Kentucky, a farm center in Bath County, an agricultural complement to the new crafts showcase at Berea, and other regional marketing centers. The wine industry has proposals for supporting new grape production.

New Initiatives

The possibility of encouraging state-funded institutions such as school systems, state parks, prisons and other state agencies to give preference to Kentucky products should be explored by the General Assembly in conjunction with the development of quality suppliers for these markets. Providing access to such publicly funded markets can also serve to prepare producers to enter other commercial markets.

The creation of a market in hunting rights would require liability legislation and a registry and inspection system. This could provide significant income to state farmers while reducing the state's excess deer population and should be explored in coordination with state Fish and Wildlife authorities.

Building Kentucky's Agriculture Based Businesses

Agriculture-based business, agri-business, is crucial to the development of sustainable agriculture in the state. Kentucky-owned companies such as F.B. Purnell Sausage Co., Kerns Kitchen, Torbitt and Castleman, Buckner, Gethsemani Farms, Moonlite Barbecue Inn, Southern Belle Dairy, Dippindots, Inc., Ellis Popcorn, Hudson Brothers, Griffin Pie and Laura's Lean Beef in food processing; wood products companies like McCammish Manufacturing Co. and the Freeman Corp.; and processors like Owensboro Grain Edible Oils, Inc. and Weisenberger Mills add the most value to agriculture products.

We should look first to existing agri-business in the state. These businesses should be surveyed to ascertain possible areas for expansion and ways to increase the use of Kentucky products.

Existing incentive programs are based on job creation, job retention and expansion. These incentives should be modified to give increased weight to the use of Kentucky agricultural products by existing and new businesses.

In addition to helping established businesses, the state should be actively involved in recruiting and

developing new agriculture-based businesses, provided these businesses meet environmental requirements, provide innovative profit-sharing plans for farmers and fair labor conditions for employees.



Marketing Requirements and Feasibility Studies

A number of feasibility studies have already been undertaken. Some states have programs Kentucky could emulate; others have made mistakes we would do well not to repeat. Rather than recreate these studies for each new wave of agricultural development projects, an online catalogue of these resources should be created and maintained. Where there are gaps in this knowledge or questions unique to specific projects, the Governor's Office of Agricultural Policy has resources to commission studies.

Directions

Value-added markets demand a reliable supply and a predictable quality. The Kentucky agricultural community's record in meeting these demands varies from one commodity to another. The Thoroughbred horse industry more than meets this test as the standard against which the world market is measured. Efforts to market commercial vegetables have had mixed results.

Kentucky feeder calves are gaining a reputation in response to 20 years of herd improvement initiatives. New marketing methods allow cattlemen to capture the added value of providing uniform load lots to the buyer. The state is positioned to be a dominant player in the feeder cattle market.

A study of the feasibility of locating a feedlot industry in Kentucky (1996 Senechal, Jorgenson, Hale & Company, Inc.) suggested that the minimum economically feasible lot size was approximately 30,000 head. Our muddy winters and relatively high cost of feed put us at a competitive disadvantage, according to the study.

Likewise, the ability of the state to support a large-scale beef slaughter facility or cow kill plant has yet to be demonstrated. Because Kentucky has the largest cow herd in the east, the existing market for cull cows is strong.

The recent experience of North Carolina suggests that the effluent problems associated with large-scale confinement feeding operations can overwhelm a state's ecosystem. The drainage patterns of the underlying strata should be mapped before approving slaughterhouse locations, especially in karst regions. The employment problems associated with large-scale animal processors should be considered before recruiting such plants.

The poultry industry is concentrated in South Central and Western Kentucky. Poultry contributes more than \$300,000,000 in gross income to Kentucky agriculture. Expansion should be based on farmer profitability and weighed against company labor and environmental records.

The demand from individual livestock producers for small-scale processing is increasing as markets open for farm-raised beef, chickens, hogs, sheep and goats. Expanding existing facilities to meet this demand seems to hold the most promise in the short- to medium-term.

Financing the Future: Improving Access to Capital

Access to capital was identified as crucial to the support of agricultural entrepreneurship. Typically, farm production credit is readily available, while capital for value-added enterprises has been subject to high interest rates and strict covenants, making it unavailable to any but sophisticated borrowers. One of the goals of the Agricultural Development Board is to work with lending institutions and farmers to increase the access to capital by strengthening existing programs and developing new ones.

There exists within the lending community a number of sources of funds for various agricultural projects, both production and processing. There appears to be adequate capital throughout all areas of the Commonwealth. Preparing the prospective borrower to access these funding sources may be all that is required to answer the need for traditional agricultural capital.

New agricultural ventures have more limited options because of the unfamiliarity with new ventures by the lending community. Sources of equity capital exist, but are difficult to access in Kentucky even for non-agricultural projects.

The Agricultural Development Board has seen a number of creative ideas. Ideas, however, translate into viable businesses with difficulty. Some of these were sophisticated and required a large capital investment, others showed promise for added value with a minimal investment. The difficulty often lies in the ability of the producer to execute the business plan, if in fact a business plan even exists. To address this need, the Agricultural Development Board has entered into an agreement with the Kentucky Small Business Development Center that is cooperating with extension agents to offer business planning courses.

In order for a farm business to determine its profitability, the farmer needs accurate financial information. In its Model Agricultural Diversification Program, the ADB has agreed to underwrite 50% of the cost of the Farm Business Analysis program offered through the University of Kentucky's

Extension service. Continued support for producer participation in the Farm Business Analysis program should be encouraged and opportunities explored through county programs for making the service available to more producers.

Currently within the state there are a number of micro-lending agencies working with very small businesses, providing assistance in business development, and issuing loans of less than \$35,000. Funds are provided through the Small Business Administration (SBA), and include dollars both for loans and technical assistance. The technical assistance financing is based on the amount of outstanding loans (typically 20% of the portfolio annually), thus allowing for continued assistance after the loan is made.

SBA requires a match of 20% to establish a loan loss reserve in the micro-loan company. Regional micro-lending agencies offer low-cost capital, localized technical assistance, and leveraged federal funds. Agricultural Development Funds should be set aside to encourage the development of agricultural lending programs among these micro-lenders.

Providing Adequate Capital

The Kentucky General Assembly created the Kentucky Agricultural Finance Corporation (KAFC) in 1984 to address the unique financing needs of agriculture. It is currently inactive. This agency should be restructured to provide capital for agricultural diversification and infrastructure projects.

KRS 247.940 - 247.978 set the framework for the Kentucky Agricultural Finance Corporation. According to legislative findings set forth in 247.940 (2), a reason for the establishment of KAFC was the recognition that "...private enterprise and investment have not been able to produce, without assistance, the capital necessary to permit the small family farm operators to continue to compete successfully in agricultural enterprises." Included in the findings was the charge that KAFC would "promote new agricultural ventures."

As established in KRS, KAFC serves principally as a lender, providing either direct loans or loan guaranties. The organization has the ability to raise capital through issuance of revenue bonds, including the issuance of revenue bonds as allowed under KRS 103. Certain requirements in the act are intended to follow those in the Internal Revenue Code to permit the issuance of Agricultural Bonds for first-time farmers. The statute has a fairly broad definition of agriculture that includes diversification and alternative crop production. No specific mention is made of value-added processing. Clearly the value-added approach will allow for increased income to Kentucky producers.

The definition for “first-time farmers” must conform to the requirements of the Internal Revenue Code, in order to maintain the agricultural bond program allowed by that law. Provisions should be made to raise permissible income levels to take into account off-farm employment that enhances farmer income or provides health care and other benefits that otherwise would not be available to the farm family.

While the statute does contemplate assistance to any legally formed entity, the definition prevents assistance to newly formed ventures in that income must be generated in the year before the assistance is provided. Thus any new entity, for example one created for the purpose of value-added processing, would be ineligible for assistance under the current law.

Forms of Financial Assistance

Linked Deposit Loan Program

The KAFC statute is sufficiently broad to allow direct loans, loans through private lenders and loan guaranties provided by KAFC. A similar loan-to-lender program currently exists through the state’s Linked Deposit Investment Program. As set forth in KRS 41.600 - 41.625, funds from the State Treasurer’s unclaimed and abandoned property program are invested in financial institutions (including members of the farm credit system) at interest rates equal to the Prime Rate as published in the *Wall Street Journal* on the first day of each month, less 4% percent

(minimum rate no less than 2%). The bank then makes a loan at the Prime Rate (minimum interest rate of 5%). At the time of this writing, with the Prime Rate at 5.5%, the bank spread is 3.5%, the state receiving 2% for its investment.

Currently funds are available for both small businesses and agri-businesses, with a maximum loan amount of \$100,000 and a maximum maturity of seven years. The program is not a guaranty, but rather an investment in a bank. The credit decision when made by the lender is likely to be tied to risk aversion, since the ultimate responsibility for repayment of the investment to the Commonwealth lies with the financial institution.

The Kentucky Economic Development Cabinet (KEDC) administers the small business program, while the Kentucky Department of Agriculture administers the agri-business portion of the program. In the area of agri-business lending, the program has had modest success. It generally has been a program for higher quality borrowers, given the obligation of the lender to repay the investment.

The value-added lending function now administered by the Kentucky Department of Agriculture should be moved to KAFC and minor changes made to the eligibility requirements. Specifically the definition of “agri-business” includes persons engaged in agricultural endeavors (not defined) but requires at least one-half of annual gross income be derived from farming (gross earnings not to exceed \$1 million per year). Given the nature of family farm income, often with one spouse working off-farm, this 50% of income derived on-farm may be difficult to attain, and should be modified. Discussion also should focus on definition of agriculture endeavor, with a goal of conforming definitions in both the KAFC and the Linked Deposit legislation.

Direct Loans, Loan Purchases and Loan Guaranties

Currently KAFC has a direct loan fund. There was only \$500,000 in this fund at the beginning of 2002. As noted earlier, KAFC currently has authority in its enabling legislation to issue bonds for direct loans,

loan purchases from commercial lenders, and loan guaranties. Agricultural Development Funds could be used to capitalize the loan fund directly and could serve as leverage in obtaining other funds for the loan pool, for example, funds from federal agencies that become available from time to time for agricultural endeavors.

KAFC has the authority to provide below market financing by using tax-exempt financing for first time farmers in accordance with rules set out in the Industrial Revenue Code. KAFC also has the authority to issue bonds outside of the Internal Revenue Code requirements at non-tax-exempt market rates. This kind of debt issuance could be used to establish a larger revolving loan fund immediately, rather than to build up a loan fund with money set aside from Phase 1 dollars. The fund would require an annual set-aside of Agricultural Development Funds as the primary source of repayment for the bond debt service. This would allow the revolving loan fund to build up as repayments if principal and interest were made back to the fund.

Under this arrangement Agricultural Development funds could be used to service debt over the life of the bond issue, but the proceeds of the bond issue would be set aside exclusively for direct lending at rates conceivably below market, established by the KAFC board.

Since the bonds would be repaid with funds exclusive of the repayment from the individual loans, financings could be made available at rates different from the rates charged for the bond issue itself, thus providing additional flexibility to KAFC in structuring financings for farm-based and other agricultural businesses.

KAFC would continue to serve as issuer of financings for "first-time farmers" as set out in the Internal Revenue Code. In this case the agency would be a conduit for the financing and the underlying credit would be the assets being financed. Specifically there would be no liability for repayment by KAFC, and because the bonds could be issued as tax-exempt instruments, the borrowers would obtain below-market financing for sums potentially greater than

could be obtained through the agency's direct loan program.

The funds would be available for all agricultural borrowers, either as direct loans or as purchases of loans from commercial lenders, with the corresponding interest rate savings passed on to the borrower. Whenever possible funds should be used to complement funds from private sources.

The question should be asked whether KAFC should be making direct production loans, when the private sector is better suited for such activity. The private lenders are closer to the borrowers and thus have better ability to oversee the collateral being offered for loans. Indirect lending from KAFC likely is a better approach here, and in this instance a loan-to-lender program would be the more appropriate form of assistance, particularly if it could be tied to the Linked Deposit program. The borrower still would be able to benefit from below-market interest rates, while program administration costs would be reduced.

Some Phase 1 funds should be set aside exclusively for the purpose of loan guaranties. Such a program could function to establish, with participating lenders, a loan loss reserve into which KAFC would contribute some amount (perhaps less than 3% of the total loan), with comparable amounts being contributed by the lender and borrower. The loan loss reserve pool would build up as additional loans were made provided the default rate was kept to a minimum.

KAFC should explore lending part of the percentage of a loan not guaranteed through existing federal guaranty programs. The U.S. Small Business Administration and USDA's Rural Development Administration have programs that will guarantee a certain portion of a private lender's loan. Typically in the event of a default the lender goes to the federal agency and collects the guaranteed portion of the loan. The federal agency then allows for the liquidation of assets to collect the remainder of the loan. If there is a shortfall below the guaranteed portion, the federal agency absorbs the loss. The non-guaranteed portion is the lender's responsibility. A restructured KAFC could enhance the amount of guaranty by

participating in this portion of the loan and agreeing to share equally with the bank in any losses or recoveries that resulted from liquidation.

Venture Capital and Near Equity Type Programs

A separate pool of Agricultural Development Funds should be set aside to serve as equity or near-equity in agricultural ventures. An example of a near-equity participation might include a loan convertible to ownership based upon the occurrence of certain

events. All equity-type financing should be limited to innovative agricultural diversification, or new agricultural technologies with possibilities for significant return on investment which would not otherwise meet the security requirements for traditional lending. It should include agricultural research and development targeted by the Kentucky Innovation Commission, but based upon board approval could include other ventures as well. Any equity positions taken by a venture capital fund could return to the fund for reinvestment in fund-related activity.

Financial Incentives for Environmental Stewardship

The Commonwealth's long-term plan for agriculture recognizes the state's rural landscape and environmental quality as valuable assets in marketing both Kentucky and its agricultural products. To preserve this asset, we must re-evaluate farm management techniques for long-term sustainability. Certified sustainable programs and incentives must be encouraged. Kentucky should embrace national and international programs by rewarding farmers and state companies who follow approved practices and pressuring those who do not.

Regulations requiring farmers to limit livestock access to waterways and to plant riparian buffer zones are contemplated under the Agriculture Water Quality Act. The Kentucky Soil Erosion and Water Quality Cost Share Program was established by the 1994 General Assembly to assist Kentucky producers in meeting the requirements of this act. During the 2000 session of the General Assembly, \$18 million from the Agricultural Development Fund was appropriated to assist Kentucky's landowners through this program. This funding should be continued.

We have historically underestimated the economic, ecological, social and cultural values of forests. With 92 percent of these assets in private hands, primarily in tracts of less than 40 acres per landowner, fragmentation has made coordinated management difficult. The 1998 Forest Conservation Act was a step toward addressing this need by providing

training for loggers; however, the need for landowner technical assistance has been largely unmet.

The Forest Stewardship Incentive Fund was established by the General Assembly in 1998 to serve as a way to provide financial assistance to landowners for stewardship practices. This program has never been fully funded.



Farmland Preservation Programs

Complementary crops such as mushrooms and ginseng can provide rewards to individual woodlot owners for following sustainable practices. Forestry officials should be trained to recognize the value of complementary crops in woodlots.

The disposal of dead animals is an important element in environmental health. The Kentucky Department of Agriculture has completed a study of the removal of fallen livestock and pets.

Farmland preservation programs such as the purchase or donation of development rights can be a valuable tool for preserving agricultural assets, particularly those near urban areas. Currently the Kentucky Department of Agriculture's Purchase of Agriculture Conservation Easements (PACE) program and Fayette County's Purchase Development Rights (PDR) operate to preserve threatened farmland. These programs require coordination with county planning and zoning boards and combine government planning and market-based incentives. The governor's Smart Growth Initiative is also beginning to address this need.

Farm Family Education and Computer Literacy

Priority should be given to developing a state-wide online library of agricultural development resources and conducting farm business accounting and analysis programs. County Extension offices should be encouraged to expand county-based programs aimed at improving farm family Internet access, and developing farmer-to-farmer training programs. Programs that focus on the needs of farm families in the areas of financial planning, personal development and basic computer literacy should be made more accessible.

Kentucky farm families are in need of better access to GED programs, two-year and four-year degree programs and vocational training. The Workforce Development Cabinet, Kentucky Community and Technical College System (KCTCS), Kentucky Virtual University, Land Grant and Regional Universities, and the division of Secondary Vocational

Education can provide this access through short winter courses and night courses to better match the time available to farmers.

Information technology is an important component of the long-term plan. In order to participate in the proposed state electronic marketing system, farmers will need access to a computer and to be able to enter and receive product information.

The demands of product tracking placed on agriculture by increasingly strict food safety requirements will necessitate a bar code system for produce. Both the five-state beef cattle initiative and the statewide agriculture marketing system will require bar codes on products for sale. Farmers should be assisted to meet the demands of this new technology.

Supporting Local Leadership

Leadership Development

Kentucky's rural communities are in a state of transition. The decline in the economic significance of burley tobacco combined with the risk and uncertainty associated with agriculture in general has placed added strain on the rural economy. Funds

should be available in each extension area of the state to organize community-based leadership programs that emphasize skills related to farm-based business development.

County Agricultural Council Support

County Agricultural Development Councils have assumed substantial responsibility at the local level for the future of Kentucky agriculture. Limited administrative funds have been a handicap to the councils. A mechanism should be established to allow use of county Phase 1 funds for expenses associated with Council functions including:

1. Field days, training meetings, workshops or other events linked to Agricultural Development Board projects.
2. Regular meetings of the Council (including meal costs for members).
3. Community planning functions sponsored or co-sponsored by the Council.
4. Printing, publicity and information dissemination related to Agricultural Development Board projects and programs.
5. Communications and information technology costs related to the administration of the Council and its functions.

Enhancing the Extension Network

The Kentucky Cooperative Extension Service has been assigned new roles and assumed broad responsibilities under the Commonwealth's agricultural

community economic development. State extension leadership and specialists are assuming responsibility for providing agents with the support required to meet these new challenges.

While the growth and viability of rural communities is ultimately dependent upon the ability and initiative of farm families and rural leaders, the extension system serves as a vital element of the infrastructure required to foster their success. Extension needs appropriate support for this mission in the future.

Enhanced training and continuing education for county personnel are the keys to improved job performance and program delivery. Clear standards for continuing education should be established. Extensions' communications and Internet technology infrastructure should be improved to better support both distance learning for agents and statewide access to educational programs. Kentucky agents hold fewer Master's degrees than their counterparts in other states. Masters' programs should be tailored to the extension agent's role. Public administration, community development, agricultural education, and business administration programs could be tailored for extension agents.

In order to recruit and train the best agents, salaries should be upgraded. Kentucky's extension agent salaries rank 47th in the nation, last among the University of Kentucky's benchmark institutions, and last in the Southern region. Salary issues will need to be addressed through recurring fund sources. If long-term funding is not available, consideration should be given to supporting an achievement and professional development-linked incentive program. This program should reward agents for achieving specific professional development and continuing education standards.

Kentucky's ability to seize opportunities depends directly on the awareness and responsiveness of local leaders to the issues confronting rural communities. Nurturing local leadership, adequately supporting County Agricultural Development Councils, and investing in the enhancement of the Extension Service network will better position rural leaders to create new opportunities in their communities.



development initiatives. The county agents' newly mandated functions include commitments to planning, implementation and evaluation of projects and programs of county agricultural development councils and the Agricultural Development Board. These functions spill over into the broader issues of

Research and Development

Biotechnology, genetic engineering and molecular farming may hold promise for adapting agricultural crops and livestock to new purposes. Plants and animals may be engineered to produce a variety of valuable biological molecules ranging from vaccines to biodegradable plastics. The opportunities and risks presented by this technology should be carefully weighed.

While the commercial progress is exciting, molecular farming is still an emerging industry. As Kentucky seeks to take advantage of opportunities presented by molecular farming, it is imperative that policy makers recognize widespread concerns about the implications of these technologies. Issues raised by farmers, consumers and governments in Mexico, Canada, Brazil and Europe illustrate the international debate about biotechnology. Concern about human health and safety issues has arisen in European and Japanese markets. Food labeling, segregation of traditional and genetically altered crops, and environmental impacts are major issues in a number of countries.

Often purveyors of new technology seek to minimize ecological risks and maximize profit potential. The role of molecular farming in Kentucky should receive further attention, discussion and deliberation in open meetings. The economic and ecological stakes in agriculture require that the potential long and short-term risks and benefits of this technology be fully deliberated. Representatives of industry, farmers, researchers, ecologists, consumer groups, regulatory agencies and other interested parties should be included in such deliberations. One specific topic of public deliberation should be how to assure material benefit for farmers through novel models of intellectual property ownership and commercialization.

Large Scale Biology Corporation (LSB) operates a facility at Owensboro that has genetically engineered the tobacco mosaic virus to produce a vaccine that prevents recurrence of non-Hodgkin's lymphoma, a cancer of the lymph system. LSB is different from other biotech companies that engineer animals and plants into production systems. LSB has rejected permanent genetic modification of plants and animals. Instead, the company inserts genes that make a therapeutic protein into the tobacco mosaic virus. LSB then infects tobacco with the transgenic virus and gets the plant to serve as a temporary factory to produce the desired molecule. (Source: Scientific American, October 2001)



Ways to move the efforts of multidisciplinary research projects like the University of Kentucky's New Crops Opportunities Center, Kentucky State University's small farm research and other university research projects into production agriculture should be explored. Applied research efforts on existing Kentucky farm products should continue to be a high priority.