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Alternative Crop Development in Oklahoma

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Because of the economic vulnerability associated with growing only one or two commodities, farmers in all areas of the country are seeking alternative or new crops to enable them to diversify and thereby reduce this vulnerability.

A successful new crop venture often results in considerable new economic activity, and the whole economy of an area benefits. As an example, the huge cattle feeding industry in the Great Plains resulted from the development and introduction of short sorghum varieties. Sometimes, however, serious economic consequences occur as a result of the development of a new enterprise. For instance, margarine and cooking oils made from soybeans affected the dairy and pork industries by replacing a large part of the market for lard and butter. On the other hand, abundant supplies of soybean meal as a protein source was a key in the development of the poultry industry. Such adjustments are typical in the economic development process.

The new crop development process is complex and each of a number of factors must be favorable for success. The farmer is only one element in a network that includes seed producers, agricultural researchers, transportation firms, wholesalers, processors, retailers, and regulators. Failure of the new crop will occur if even one factor is unfavorable. The network for the new crop does not develop overnight. Cooperation among the elements must be effective, and commercialization must not be premature. Consequently, just as in the development of a new product in industry, a great deal of risk is associated with new crop development and any single venture has only a small probability of succeeding.

Markets

Market development is the most important factor in the success of a new crop venture. New crop ventures that have been successful have been able to meet a need in the market place. A new crop for feed or food might simply displace or render surplus a like amount of an established crop or have difficulty competing with it for the market. Production and markets must be kept in balance. The production must be absorbed at prices that result in a profit to the producer. The users must be assured of a consistent and abundant supply year after year, which cannot be accomplished until the crop is well established. Growers must realize that markets for most specialty crops are quickly saturated. Since the demand is very inelastic, it is essential that new crops be developed in accordance with demand. If not, they will be plagued with the same glut as that which affects the major established crops today. The challenge is to discover crops that can adapt to the climate and for which a demand exists or can be created. A reliable and consistent supply of the commodity must be developed and yet the market must not be saturated after the supply develops. This means that the market and production must develop together. Exports cannot be relied on to absorb surpluses.

Identifying Opportunities

A new crop should fill a new market or provide for a market currently served through imports. Many possibilities exist and need to be evaluated. The United States imports $15-20 billion in agricultural products annually. Table 1 lists several agricultural imports that make up a large part of the crop commodity imports. These can serve as a guide to potential new crops for which domestic markets might be found. About 70 percent of these are competitive with domestic products and the other 30 percent are complementary and do not compete with our production.

The data in Table 1 suggest several new crop possibilities that need to be considered. A part of the large newsprint market currently supplied by imports might be filled through the fiber crop kenaf. Kenaf has been identified as a possible new crop for Oklahoma. It has been demonstrated that kenaf can be grown in Oklahoma and that it produces high quality fiber. The market potential is large and could absorb a large volume of production. However, the markets would

Table 1. Selected U.S. Agricultural Imports for 1983

Product	Quantity (Metric Tons)	Value ($ Million)
Newsprint	7,000,000	3,500
Coffee	1,021,644	2,771
Vegetables and Preparations	1,779,729	1,165
Sugar	2,644,389	1,025
Tobacco	239,175	744
Bananas	2,545,995	665
Fruits and Preparations	954,692	558
Nuts and Preparations	137,132	250
Coconut Oil	449,389	223
Essential Oils	10,643	97
Palm Oil	149,110	61
Olive Oil	33,113	47
Castor Oil	33,676	48
Flower Bulbs		29
Broomcorn	8,510	14
Mungbeans	2,055	1
Guar Beans	178	1

have to be developed, which would include constructing pulping mills to handle the crop. In addition, technology would have to be developed so that the fiber could be produced competitively with that of pulp wood.

As shown in Table 1, large quantities of fruits and vegetables and their preparations are imported. Many of these can be grown in Oklahoma if the technology could be developed so they could be produced competitively with the current production areas and the market systems already developed. Several publications from the Department of Agricultural Economics at Oklahoma State University analyze and report the feasibility of fruit and vegetable industry in Oklahoma.

Plants are the source of many waxes, oils and complex compounds which either cannot be produced synthetically or cannot be produced on the scale required as easily and economically as they can be derived from plants. These oils and waxes have many industrial and specialty uses. Because of their special properties, coconut and palm oils have many uses, particularly in the large soap and cosmetics industries. Large quantities of these oils are imported each year. No cultivated plants that can be grown in Oklahoma possess these special properties. However, the wild plant cuphae produces seed oils with similar properties. With proper research these plants might be domesticated and grown in Oklahoma. There might also be opportunity with certain other plants not yet domesticated to produce chemically complex raw materials that are now produced by a series of costly chemical steps. These materials include fabricating lubricants, surfactants, plastics, cosmetics, thickeners, and adhesives. The cost of research necessary to develop these small industries would be great, and the sizes of the potential industries might not justify the expense.

The Development Process

Generally, developing a new crop for an area will consist of introducing and adapting an old crop from another part of the world. Determining which crops have potential and then collecting the germplasm and conducting proper agronomic evaluations are the first steps in the process. Pilot scale operations should be conducted on those that show promise before commercialization is undertaken. Finally, after the pilot tests prove successful, steps can logically be initiated to develop the plant into a commercial crop. As the process progresses, care must be taken to keep the various phases coordinated. Markets and production must be kept in balance so processors are assured of an ample supply and the producer has a profitable market for his crop. Failure of either of these can result in the collapse of a whole process which might otherwise have led to a viable new industry.

Sometimes domesticated plants are not available to provide for identified opportunities such as the production of special oils and waxes for industrial purposes. In these cases, efforts turn to finding and domesticating wild plants that produce the needed products. Very few such attempts to domesticate wild species have been successful. For instance, in 1957 the USDA initiated a large exploratory program to screen and identify plants that might be developed into crops to serve as new sources of industrial oils, fibers, gums, natural rubber, carbohydrates, proteins, amino acids, and other constituents. Over 8000 species were screened, with over 75 new fatty acids and 40 raw chemicals discovered by the research. From this extensive work, kenaf is the only plant that has even approached commercialization.

After a new plant is found that can potentially fill a need, improvements are usually possible and necessary. For example, when safflower was introduced into Nebraska, yields were only 600 pounds per acre and oil content was only 20-25 percent. Through research, new varieties were developed that often produce 2000 pounds per acre and have oil contents of 30-36 percent.

Summary

New crops can result in profits for the farmer and economic growth for a geographical area. Markets are of greatest importance, and production and market development must be carefully coordinated. Generally a new crop will be an old one from another part of the world. The new crop should satisfy a new need or fill a market currently supplied by imports and must be sold at a price that results in a profit to a farmer. Otherwise it will simply compete with an established crop and render it surplus.

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