

AGRICULTURAL BIOTECHNOLOGY:

COMPETITIVENESS THROUGH MULTI-STATE COLLABORATION

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Each of our universities wants to grow and develop its research program. Universities are places where people are the most important resource and the most important product. With these circumstances in mind, several principles undergird research program growth and development.

1. Universities cannot rely solely on direct allocations of state and federal resources for growth; a research institution cannot leave its destiny in others' hands.
2. The principle role of universities is education. This results in a broad, thin layer of expertise across subdisciplines in each degree granting unit (departments) and critical mass for deep research requires a distinct organization.
3. University departments are cultural centers where faculty receive protection, social exchange, professional development, and professional recharge over their careers. Changing departmental structure requires a culture change. Universities desiring a nimble response to change don't have the time for departmental structural change.
4. Faculty and students produce everything. Administrators create opportunities for faculty members to be fulfilled in their work, while guiding university products in cohesive, focused directions to fulfill the institutions' missions. Faculty fulfillment lies in one's ability to see growth and progress, income growth for the family, recognition by peers and the community, and contributions to science and to humankind.
5. Research centers work as a second tier organization to build a critical mass of faculty across teaching units without disturbing departmental cultures. If properly constructed, centers can create opportunities for faculty fulfillment.
 - a. Centers without walls or jurisdictional boundaries and without rigid membership lists let anyone participate while avoiding bureaucracy.
 - b. The shingle effect of creating a center is an effective marketing device.

- c. A substantial seed money fund creates centripetal force for quick organization and quick product and allows for preliminary work to build excellent proposals.
 - d. Faculty steering committees assure feasible agenda setting.
 - e. Centers can reach across departments, colleges, universities, states, and nations in search of talent.
6. Collaboration requires being open to genuine partnership rather than remaining in the “proposal for sale” mode. I take instruction from Farmland Industries, a rapidly growing cooperative company with nearly \$10 billion in annual sales, which never met a competitor it didn’t explore. Farmland evaluates whether competitors and customers are doing some things better or cheaper, and whether there are different customer service assets, in order to form joint ventures or merge whenever it serves the company’s interests. Partnership requires finding genuine win-win solutions and recognizing that other institutions are better at some things while ones own is better at others, and joining forces so both can prosper.
7. I learned the principle of relationship marketing from an executive of Bank IV before it was merged into Bank of America. The bank offered a single officer to each major customer. This officer met with various departments of the customer’s company to determine the customer’s banking needs, then went back to the bank to handle all of the customer’s services for them ... a personal banker for a large company. Universities are large, complex organizations. Agencies and companies find them difficult to use. Center directors can serve the external role of relationship marketers—one person in the university to contact who will have all of the expertise available in a broad area—that’s customer service.

K-State has applied these principles in several core areas, including plant biotechnology, environmental and natural resource management, wheat production and processing, food safety, community health and agricultural value added science. I will illustrate how K-State has built a competitive critical mass in the area of plant biotechnology using these principles of collaboration.

After studying how to coalesce K-State’s biotechnology assets we learned that interests were widely dispersed. There was a strong affinity group in the plant molecular biology area, so the Plant Biotechnology Center was established. Originally 18 scientists were identified, a small enough group that the chair of Plant Pathology agreed to serve as director, with no additional pay. A faculty steering committee was established as the governing and operational board, composed of one biologist, one biochemist, two plant pathologists, and one agronomist with the USDA-ARS (faculty leadership). A

plant transformation specialist, another molecular biologist, two research assistants, and a \$250,000 competitive grant pool were added to the Center (seed money). Anyone at K-State could participate in proposal development (no boundaries). The Center now has attracted scientists from biology, biochemistry, plant pathology, agronomy, entomology, and grain science (across departments and colleges).

The shingle effect appeared immediately. Once the Center was approved by the Regents, the International Rice Research Institute (IRRI) proposed a formal Memorandum of Understanding, though K-State had been working with them for many years. K-State made one IRRI scientist an adjunct professor and IRRI made one K-State scientist an adjunct scientist.

Shortly thereafter, the Plant Biotechnology Center at K-State, the Center for Biotechnology at the University of Nebraska, the Plant Transformation Center at Oklahoma State, and the Nobel Foundation, in Oklahoma, formed the Great Plains Cereals Biotechnology Consortium to add depth, fill gaps, and seek grants together as one entity in a strong, competitive position. Together, 80 faculty among the three institutions have interest in some facet of plant biotechnology.

Already, the Consortium has submitted proposals through the National Science Foundation's EPSCOR program and the Department of Agriculture's National Needs Fellowship mechanisms. It has also developed a relationship with the International Rice Research Institute in the Philippines and entered serious discussions with the International Maize and Wheat Improvement Center (CIMMYT) in Mexico. All of these efforts are directed toward strengthening research programs to understand and manipulate the processes which cause adaptation of wheat, corn, and sorghum to biotic and abiotic stresses, and apply the results in practice. The target is to reduce the \$700 million annual loss of potential grain yield in the three states due to plant stress, and to build genetic resilience to stress in cereal crops, which are fundamental to the world's food supply.

Collaboration requires lots of effort in the development of personal relationships among scientists. However, in states with smaller university scientific infrastructural investments, collaboration may be essential to collect the critical mass of resources to be competitive in national resource acquisition.