



COMMERCIAL LEGUME INOCULANT PRODUCTION AND MARKETING

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Summary

NifTAL has a new initiative to promote private sector investment in legume inoculant production and marketing. The main target beneficiary, however, is not commercial producers but the farmer end-user who will ultimately benefit from high quality and readily available inoculants appropriate to his farming needs. Assistance to the private sector is the means to the end: to renew farmer confidence in BNF technology by delivering a quality product. NifTAL's program encompasses three main components. The first is assistance to private entrepreneurs and established companies, some already engaged in agricultural input manufacturing or distribution, in the establishment of inoculant production facilities, market systems, product development, and internal quality control. The second component is to encourage government and/or university research facilities to transform from limited and sometimes subsidized inoculant producers to a role more appropriate to their technical capabilities including external quality control, certification, applied research activities as it relates to commercial farming; and to avail themselves as a technical resource to both the commercial and public sectors. The third component is extension and market development, including both public and private sector field extensionists with a heavy emphasis on training and promotion.

A. The Basic Problem is Technology Transfer

BNF technology has been introduced and promoted in developing countries for a number of years through leading universities, international donor agencies, international research centers including NifTAL, and the NGO/PVO agencies with varying degrees of success. The "institutional home" of BNF operations in these countries is predominately found in the academic research community, usually within university research facilities affiliated to soil science departments; or with government managed research stations typically under the oversight of ministries or departments of agriculture. These are appropriate locations for biotechnologies to take a foothold in a country, and where research and higher levels of academic training, appropriate to country specific needs, can take place. The transfer of BNF technology to this institutional level, in terms of acceptance, creation of academic "cadres", and localized research, can be considered successful.

But the transfer of the technology to the farm level has been less successful. Why has there not been a sustained increase in farmer adoption of the technology? One of NifTAL's main interest is to promote the transfer of BNF technology to the farmer end-user; the public sector has been effective up to a point, can the private sector do better?

B. Program Rational

1. NifTAL's rationale in promoting the privatization of the inoculant industry in developing countries lies in the premise that the principle and ultimate beneficiary of commercially produced and quality tested inoculant is the *farmer end-user*. The means to ensure a reliable, viable and affordable legume inoculant product, and maintain farmer confidence in its use, is through a sustained and profitable commercial operation.
2. This rationale is compatible with the goal of the NifTAL Center which is to increase farm income specifically and family income generally by improving farm output yield, and/or decreasing production input costs by substituting high-cost nitrogen fertilizer through the commercial introduction of BNF technology and other inter-related farm management technologies for nitrogen fixing crop systems.

3. BNF technology is appropriate for farmers of both genders across the economic spectrum: subsistence, low income, moderate income, progressive and plantation. The program is exclusive to producers of nitrogen-fixing crops and trees only by nature of the technology.
4. Why private sector? The key term is "sustained operations". This implies that private sector businesses are better equipped, staffed, managed and financed than Government research centers, stations and labs which, despite highly skilled and accredited personnel, often operate under less than optimum conditions for sustainable operations (external [government] budgets, low civil service salaries, limited facilities, and directorship operating under bureaucratic, political or financial priorities).
5. BNF technology is a renewable natural resource with no adverse environmental effects. Proven economic advantages, as a substitute for high cost nitrogen fertilizers, is secondary to the known harmful affects that nitrogen fertilizer causes to the environment. This environmental advantage is also a marketing plus to the private sector concerned with government regulations, licensing, and public opinion.

C. Program Issues

1. There are few, if any, privately owned legume inoculant production facilities in most developing countries; where they do exist their main customer is often the government extension service. No competitive marketing is required and the producer, in many cases, has a monopolistic operation.
2. This is not necessarily a negative situation provided that industry standards are maintained and that the government still requires certification (especially if they are the main customer). It must be recognized that the inoculant market is not overly dynamic, especially in the early developmental stages, competition may not exist because the interest is not there and/or the profit potential is low. The key point here is that completion be allowed and that the door remains open for entry into the market.
3. Some countries are producing inoculant of variable quality and quantities through their university research labs or government agricultural research centers. Private companies interested in entering the inoculant production industry lack technical knowledge of applications and equipment, or are discouraged by low demand volumes caused by farmer's low confidence or lack of familiarity with the product.

4. Most countries do not have well defined industry standards for legume inoculant nor appropriate quality control test procedures either for their own research facilities or for private producers. Generally, farmers applying untested and uncertified inoculant of poor quality invariably stop using inoculant after witnessing little or no response. It is difficult to convince these farmers to recommence inoculation despite new enforcement of standards and certification and the attraction of a low cost input.
5. Many farmers in developing countries don't have access to effective extension services. Even where services are available, knowledge of and confidence in BNF technology within government and private extension services need to be greatly expanded and improved. A recurrent problem in many countries is the lack of effective linkages between the research facilities and government departments of agriculture extension service. Without effective interaction between the commercial producer, the research entity and the extension service, there is little chance that farmers will employ BNF concepts in their farm plans.
6. American inoculant producers are technically advanced in their high volume production and marketing systems but are entrenched in specific areas of operations. There are targets of opportunities for trade and investments in the Pacific Rim region, eastern Europe and the Commonwealth of Independent States. With few exceptions US companies do not consider developing countries as potential markets for export or other ventures.

D. Program Design

1. Private enterprise development, despite its proven merits, cannot be achieved in isolation. The process of developing a commercial legume inoculant production enterprise requires a coordinated effort between technical experts, business and finance specialists, and private and governmental groups specializing in extension of technology to the farm. In many developing countries today, such a profile of interested public and private parties exists. Effective organization of these parties can result in profitable production of a necessary agricultural input product line that increases yield and quality of legume output while significantly decreasing input costs.

Private Sector Role - Production/Marketing

Inoculant Manufacture
Market/Distribution
Market Development/Promotion
Internal Quality Control
Product Development
Culture Strain Development (Optional)
Germplasm Maintenance (Optional)
Economic and technological linkage with
American private sector companies

Public Sector Role - Certification/Research

Rhizobia Strain Development
Germplasm Maintenance
Culture Strain Development
External Quality Control
Industry Standards
Certification
Applied Research
Technical Research/Consulting
Training (of extension)
Regional Networking

Public Sector Role - Extension/Training

Extension Training
Field Tests
Field Statistics
Soil Sampling

2. A sustained and viable inoculant production operation must be designed with three main components:
 - a) privately owned and commercially operated production and marketing operations;
 - b) effective and enforced industry standards and mandatory quality control testing for certification;
 - c) a comprehensive farmer extension program, implemented through commercial agribusiness sales/extension systems and government extension services.

E. Objectives

1. To assist private sector companies or individual entrepreneurs to establish or to expand into commercially viable operations for the production and distribution of rhizobial inoculant;
2. To work with government/university research centers to establish inoculant industry standards, and develop facilities and procedures for quality control testing and certification to ensure the reliability of inoculant reaching the farmer.
3. To assist research facilities in planning research programs aimed at identifying and addressing constraints to BNF application in country-specific situations and at assessing results of inoculant use at farm level;
4. To increase inoculant usage by farmers through improved farm extension services by providing technical training to a cadre of top extension leaders. The use of a cost effective "training of trainers" concept for a multiplier or "trickle down" effect will result in the training of several thousand farmers in each country.

F. NifTAL Services

- * Consulting on facility design, equipment specifications and procurement, and production techniques.
- * Applied research for more effective products, packaging, production and delivery systems.
- * Consulting on business concepts, project proposals, financial analysis and market development.
- * Country-wide assessment of soil resources, research requirements, manpower and infrastructure needs, private sector potential and market entry constraints.
- * Training in rhizobiology, inoculant production and quality control, field extension and facility management.
- * Material and informational support through provision of "mother cultures", instructional manuals, reference materials, scientific publications, news bulletins and "write-in" information service.
- * Computer software programs for financial analysis of production operations (FAIME), quantitative and financial evaluation of on-farm response to inoculation (RESPONSE), quality control testing (MPNES) and germplasm collection data (ACCLAIM).
- * Programs for industry development involving national and international laboratories and research centers, private and public sector cooperation on extension service training, and local government and international development community support and financing.

G. A Final Word of Caution: What is the Private Sector?

Some caution is advised when jumping into "privatization" efforts in developing countries. The historical strengths of free market enterprise and private ownership are more or less proven but there exists an assumption that all private sectors in all countries are governed by the same values and operate under the same financial and political environments. NifTAL will proceed with caution under the assumption that each country is unique, assessing the political makeup, financial infrastructure, government regulation and economic growth policies, the real "freedom" of the market, and the constraints of private ownership.

In the extreme, there will be tendencies toward strong inter-political, inter-governmental ownership, restrictive monopolistic marketing policies, and inhibitive or prejudicial constraints on financial availability. On the upside there are emerging free-market economies, inviting open and external investment, with effective economic policies aimed at growth and stability.

The purpose of this section is not meant to generalize or label developing countries' economic programs. The operative words here are "caution" and "effective assessment". Privatization as a development initiative will not work everywhere. It is part of NifTAL's strategy to identify and work with countries that portray a positive investment picture, where NifTAL's efforts towards commercialization of BNF have a higher chance of success.