



# BioOptions

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Newsletter of the Center for Alternative Plant and Animal Products

Volume 1, Number 1 Summer 1989

## Welcome to BioOptions

This is the first issue of the newsletter of the Center for Alternative Plant and Animal Products (formerly the Center for Alternative Crops and Products). The Center was created to aid in the development of alternative crop and livestock products. It provides a University of Minnesota focus for 1) generating, receiving and evaluating new product ideas, 2) facilitating interdisciplinary research and development efforts, and 3) disseminating information to the public on alternative plant and animal products.

"BioOptions" is designed to facilitate interaction among people interested in alternative enterprises, including producers, researchers, extension agents or those in the agri-business sector. The newsletter was also developed as a response to the many requests for information on our activities and publications.

"BioOptions" is still in the process of development and we welcome any suggestions for improvements to the newsletter. We expect to expand its length to include contributed articles. We also encourage you to send items for the "Calendar of Events", "Publications" and "News Briefs" sections.

In order to cover printing and mailing costs, we will be charging a subscription of \$5 per year. We are sending out the first two issues free. See the insert for further subscription information.

## Lupine Research in Minnesota

Lupines are a grain legume that offers potential as an on-farm protein source and a human food. Dr. Daniel Putnam is coordinating a research team of nine scientists from four University of Minnesota departments. They are trying to determine the production and utilization constraints of lupine in

the upper Midwest. This interdisciplinary approach is especially needed in new crops. Many of the problems overlap more than one area and examining all major constraints at once will reduce the amount of time required to establish production guidelines.

Sweet white lupines have been proposed as an alternative protein source for dairy farms, especially in areas (*See Lupines page 2*)

## Alternative Enterprises - A Spiked Pit or the End of the Rainbow?

Luther Waters, Jr., Director

It's neither. Like all business decisions, shifting to new enterprises or systems will only be as successful as the quality of the planning done before the decision is made. However, society provides plenty of discouragement and barriers.

1. Those who take chances are often ridiculed by peers - not an easy thing to accept.
2. Financial institutions are reluctant to fund enterprises they don't understand.
3. Federal government farm policy, price supports and insurance programs encourage growers not to take risks.
4. Information is harder to find the more unusual the enterprise.
5. New enterprises are likely to be more capital, labor and management intensive and have smaller markets.

There are many other barriers but you get the point - it takes a lot of nerve to step out of the comfort of a traditional system and try new things. But if you are willing to try, how do you arrive at a decision? Let me offer one possible series of steps for developing a more comfortable informed decision.

1. Decide what you really like to do - if you are unhappy, you are destined to failure, one way or another.
2. Inventory your resources (tangible and intangible) - land, equipment, buildings, location, education, experience, etc.
3. Develop a list of enterprise possibilities based on your resources and interests.
4. Study possible markets for the identified possibilities.  
(*See Rainbow, insert*)



*Lupines from page 1* where soybeans are poorly adapted. Lupines are high in protein and can be fed directly to livestock since they contain no trypsin inhibitors. Preliminary research by Dr. Don Otterby, from the Department of Animal Science, indicated that lupines could be fed to dairy cattle and calves at quite high levels. In fact, when lupine replaced soybean meal in calf starter diets, there was no decrease in production. He will continue these rate replacement studies to develop more specific feeding recommendations.

Wide variations in lupine yields indicate both a high yield potential and problems with current production methods. Reported yields in Minnesota have ranged from 0 to 60 bu. per acre. By the end of the project, researchers hope to be able to recommend production methods that will result in uniformly higher yields. Among the factors being studied are row-spacing, density, inoculation, nitrogen fertilization, varieties, date of seeding, irrigation, and the effects of weed, disease and insect pressure.

The first year of the project was hampered by drought in 1988, except for the irrigation study. A 600% yield increase was obtained with the addition of 11.5 inches of irrigation water. On-farm demonstration plots had low yields due to drought, weed competition and poor stand establishment.

The date of seeding and vernalization studies showed the importance of establishing a planting date recommendation based on temperature. Yields decreased with very early and very late planting dates and with vernalization.

Yields were increased by inoculation and inoculated plants had higher seed protein contents. There were no differences in yield between the two Rhizobium strains tested. Additions of nitrogen

fertilizer did not increase yields in inoculated plots.

Two row spacings (6" and 30") and four densities (65, 130, 195, and 260 thousand seeds per acre) were tested. Yields were greatest in the six inch rows at the highest density. Disease and insect problems were not severe, perhaps due to the dry weather. On the other hand weed problems were very serious. Currently Dual and Prowl are the only herbicides labeled for lupines. Evaluation of pre-plant incorporated, pre-emergence, and post-emergence herbicides was conducted at the Staples Irrigation Center. Imazethapyr (Pursuit) gave excellent control of broadleaf weeds, but crop injury was quite severe. Sethoxydim (POAST) gave excellent control of yellow foxtail with no crop injury.

Seedcorn maggot is a pest of dry edible beans. A study was done to examine the importance and control of this pest in lupines. Seed treatments (both fungicides and insecticides) were used. Seedcorn maggot did not significantly affect stand or reduce yield even in the untreated controls.

Disease organisms observed on lupines in 1988 included Pythium, Rhizoctonia, Alternaria, Fusarium, and Phytophthora. A seed treatment study with seven fungicides failed to show improved stands over the control.

Educational efforts on lupines that were conducted in 1988 include publication of a fact sheet, on-farm demonstration plots, field days and tours.

The lupine studies for 1989 have been planted. This year's studies will build upon the results from 1988. On farm trials will be repeated and if yields are satisfactory, an on-farm feeding trial will be conducted. An 18 inch row spacing will be evaluated in addition to the 6 and 30 inch rows. The vernalization and date of seeding

trials will be repeated this year. The inoculation/nitrogen and irrigation trials will continue in 1989 and 1990. Crop tolerance of post-emergence applications of imazethapyr will be evaluated using two application rates, two additives and two application dates. In the area of entomology, control methods for foliar pests of lupines will be evaluated.

## BioOptions

is the quarterly newsletter of the Center for Alternative Plant and Animal Products. The Center was created to aid in the development of new and alternative crop and livestock enterprises.

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Subscription rates: U.S.  
and Canada \$5 per year,  
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year. Send subscription  
inquiries and  
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## Animal Alternatives

Brian Larson, Asst. Extension Specialist

Animal Species offer many alternatives for agriculture. Since biblical times, livestock has been a measure of honorable wealth. Domesticated and semi-domesticated species still offer fiber, hides, food products, labor and entertainment to an ever growing population of humans.

In an attempt to better inform producers and consumers of potential alternatives, the Animal Science Department, Minnesota Extension Service and the Center for Alternative Plant and Animal Products offers a growing list of fact sheets highlighting alternative animal species. These fact sheets are devoted to production and economic aspects of each species with references enabling readers to pursue the topic in more depth.

Current fact sheet subjects include marketing alternative animal products, small farm-flock sheep,

dairy beef, dairy goats, dairy sheep, angora goats, rabbits, llamas and alpacas, farm-to-consumer meat marketing, game birds, farm flock poultry, American buffalo, domesticated deer, fish farming, family farm pigs, and bee production. These fact sheets are available in Minnesota county extension offices and at the Distribution Center at the University of Minnesota's St. Paul Campus.

Regional and national seminars will be offered which address various current alternative animal topics, such as the North American Dairy Sheep Symposium that was held this July. Regional extension information meetings have been held across Minnesota highlighting topics of local interest.

Alternative animal enterprises will continue to grow in importance, underscoring the need for research and education in this area.

### *Rainbow, from page 1*

5. Determine production, handling and marketing requirements for the potential enterprises.
6. Make a decision: Nothing happens until a decision is made but it should be made only after enough information is collected.
7. Develop a comprehensive business plan. A critical step!
8. Start slow! Give yourself time to develop experience and expertise. Failure awaits those who are impatient.
9. READ! Sources of help are often limited but they are available; however, you must learn to help yourself and reading is important.

While this procedure is no guarantee of success, it should provide you with a higher level of comfort in approaching the bank for funding, accepting ridicule and starting a new enterprise.

## Order Form - BioOptions

Please send me a one year subscription to BioOptions. I am enclosing a check or money order for \$5.00 ( \$8.00 outside U.S. and Canada) made out to: University of Minnesota. I will receive my subscription through fall of 1990.

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Your comments about "BioOptions" would be most helpful to us. Please tell us what you like about our newsletter and how we could improve it. We also encourage you to send us information on upcoming events and new publications.



## News Briefs

**Rapid growth in ornamental horticulture industry** Rural Enterprise magazine (Winter 89) reported on a recent USDA survey which showed that the greenhouse and nursery sector has grown at an average annual rate of 9.6% since 1982. In 1987, fresh cut flowers grew 13% and potted flowering plants grew at 18%.

**New Profits From the Old Fishin' Hole** was the title of a recent article in The New Farm (March/April, 89). The article profiles an Iowa farmer who was "netting" a profit of \$8,000 per acre raising catfish. Prospects are bright since fish consumption in the U.S. has increased by 18% per year since 1981.

**Corn Fiber May Help Lower Cholesterol** Progressive Farmer (July, 89) reported that a Georgetown University Researcher, Dr. Jerry Earle, found that corn fiber helped lower blood cholesterol levels by 20% and triglycerides by 31%. Corn fiber is also lower in calories than oat bran.

## Publications

The Center for Alternative Plant and Animal Products sponsors a series of in-depth symposia. The proceedings from our first four symposia (listed below) are available for purchase. Checks should be made payable to University of Minnesota and sent to Extension Special Programs, 405 Coffey Hall, 1420 Eckles Ave., University of Minnesota, St. Paul, MN 55108.

**Grain Legumes as Alternative Crops** The proceedings from this symposium, held July 23-24, 1987, cover the production, utilization and marketing aspects of a variety of grain legumes. The problems and approaches involved in the development of new crops in general was also covered. This 194 page volume is available at a cost of \$20 from Extension Special Programs.

**Soybean Utilization Alternatives** This symposium was held February 16-18, 1988. It was sponsored by the Center in conjunction with the American Soybean Association and several state soybean associations. Topics related to chemical characteristics of soybean components, methods of modifying soybean composition, nutritional value of major soybean components, and recent advances in industrial, human food and animal feed uses for soybeans. This 427 page volume costs \$30.

**Commercial Field Production of Cut and Dried Flowers** The Center and the American Society of Horticultural Science sponsored a symposium on floricultural alternatives December 6-8, 1988. The 207 page proceedings includes information on marketing, economics, production, and handling of fresh cut flowers, dried flowers, and other decorative plants. The proceedings are available at a cost of \$20.

**Shiitake Mushrooms** This national symposium and trade show was held May 3-5, 1989. Topics covered include production and handling of shiitake, economics and marketing, and development of new shiitake products and recipes. The proceedings from this symposium are available from Extension Special Programs at a cost of \$20.

**Triticale, Amaranth and Lupine Publications** The Center is sponsoring a series of fact sheets on a variety of agricultural and forestry alternatives. To date, three of them have been published and are available through the Minnesota Extension Service: Triticale in Minnesota (AG-FO-3337, \$.50), Growing Grain Amaranth as a Specialty Crop (AG-FS-3458, \$.20) and Lupine Production and Utilization (AG-FO-3494, \$.50). The price per copy includes postage. There is a \$1.00 minimum order. Minnesota residents need to add 6% sales tax. Make check payable to

University of Minnesota and send to Distribution Center, 3 Coffey Hall, 1420 Eckles Avenue, University of Minnesota, St. Paul, MN 55108.

**Rural Enterprise** This quarterly publication is the "business and news magazine for rural direct marketers". It is published in Wisconsin but is national in scope. It looks at new rural-based businesses and ways to increase the profitability of existing operations such as pick-your-own farms. Subscription prices in the U.S. are \$8.95 for 4 issues or \$15.95 for 8 issues. Their address is P.O. Box 878, Menomonee Falls, WI 53051.

**El Guayulero** This is the official publication of the Association for the Advancement of Industrial Crops, formerly the Guayule Rubber Society. The objective of the publication is to foster research and development efforts on new industrial crops and to promote communication among members. Beginning this year, El Guayulero will include a section for peer-reviewed articles. The Association dues are \$25 per year and include a subscription to El Guayulero which is published at least twice a year. For further information, contact Himayat Naqvi, Dept. of Botany and Plant Science, Univ. of California, Riverside, CA 92521.



## Calendar of Events

**September 12-14, 1989 - 1989 Southern Biomass Conference and 1989 Nat'l Meeting of State Biomass Energy Coordinators**  
Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Contact Bill Mashburn, Energy Extension, VPI, Blacksburg, VA 24061 (703) 231-6684.

**September 16, 1989 - Deer Farming Symposium** Sponsored by the University of Minnesota and the Minnesota Family Farm Institute. Earl Brown Center for Continuing Education. Contact Gerald Wagner, Extension Special Programs, 405 Coffey Hall, St. Paul, MN 55108 (612) 625-2722.

**September 24-27, 1989 - Expanding the Future of the Small Farm: What Works!** Columbia, Missouri. Sponsored by Farmer's Home Administration, Univ. of Missouri-Columbia, Lincoln Univ., and Missouri Dept. of Agriculture. Contact Joy Williams or Evelyn Topper, Univ. Extension Conference Office, 344 Hearnes Building, Univ. of Missouri-Columbia, Columbia, MO 65211 (314) 882-8320.

**October 1-5, 1989 - First Annual Meeting of the Association for the Advancement of Industrial Crops** It will be held in Peoria, Illinois. For further information, contact Earle Hamerstrand, USDA/ARS Northern Regional Research Center, Peoria, IL 61604. Telephone: (309) 686-4011.

**October 16-17, 1989 - Unique and Diverse: Educational Programs for Alternative Agriculture in the Northeast** Albany, New York. Sponsored by Cornell Farming Alternatives Project, ES-USDA, and Cooperative Extension. Contact Nancy Grudens Schuck, Farming Alternatives Project, Warren Hall, Cornell Univ., Ithaca, NY 14853-7801 (315) 364-7837.

**November 6-10, 1989 - International Symposium on Mushroom Biotechnology** Nanjing, China. Sponsored by the Int'l Society of Mushroom Science and Jiangsu Science and Technology Exchange Centre with Foreign Countries. For more information, contact Dr. Paul Wuest, Dept. of Plant Pathology, Pennsylvania State Univ., University Park, PA 16802

**November 16-17, 1989 - Food and Agricultural Policy Issues-Alternatives for the 1990's** Washington, DC. Sponsored by NCR 151 Policy Research Committee, and other organizations. Contact Bob Spitze, Chairman, University of Illinois, Dept. of Agricultural Economics, 1301 W. Gregory Dr., Urbana, IL 61801.

**June 19-21, 1990 - Corn Utilization Conference III** St. Louis, Missouri. Sponsored by the National Corn Growers Assn. and Funk Seeds International. Papers, posters and demonstrations on new chemicals from corn and biotechnical applications are being solicited. For more information contact Ann, National Corn Growers Assn., 1000 Executive Parkway, Suite 105, St. Louis, MO 63141-9938 (314) 275-9915.

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