



# BioOptions

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Newsletter of the Center for Alternative Plant and Animal Products Volume 1, Number 6 Fall 1990

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## Last Issue of "BioOptions"

Actually, this will be your last issue of "BioOptions" unless you renew your subscription. This first volume has had six issues because we sent the first two issues out free to a wide audience and didn't want to shortchange our subscribers. From now on, there will be four issues per volume and the subscriptions will be on a calendar year basis.

Please fill out the form at the back of the newsletter and mail it in with your payment. We would especially appreciate any comments on how we could improve the newsletter and what topics you would like to see addressed.

In the future we will include information on sustainable agriculture in the News Briefs, Publications and Calendar of Events sections, although the emphasis will remain on alternative agricultural opportunities. We hope you agree that "BioOptions" offers a unique forum in this area.

We look forward to receiving your subscription renewal and comments about "BioOptions". The next issue will appear in January so get those renewals in soon to make sure you don't miss a single issue.

## Overview of Farming Deer

R. M. Jordan

University of Minnesota, St. Paul

Few livestock enterprises have risen as rapidly and appear to have so much potential as deer farming. Deer farming *per se* is less than 20 years old but is already responsible for a score of new industries and is generating over \$100 million in income for New Zealand, England, and countries on the European continent.

In 1970, Sir Kenneth Blaxter (Director of the Rowett Research Institute at Aberdeen, Scotland) convinced the Ministry of Agriculture and Fisheries of Scotland to provide funds to explore the possibilities of farming deer on the hills of Scotland to augment the sheep industry, which was having financial difficulties.

At about the same time (1968), red deer in New Zealand had become so numerous they were restricting sheep production. After years of indiscriminate shooting of New Zealand deer, with little positive effect on the size of deer herds, producers began to trap them with nets dropped from helicopters. In 1968, they captured enough deer to ship 3,200 tons of deer meat to Germany. That success gave birth to the second development, the farming of deer.

Why depend on wild deer? Can they be confined within 6- to 7-foot fences and meat and velvet

harvested at lower costs than catching wild deer? That this idea had virtue is attested to by the fact that, in 1989, one out of eight New Zealand farms raise deer, that they are expanding at a rate of 30% per year, and that they expect to have 900,000 deer under fence by 1990.

Income from New Zealand deer comes from three sources:

a) breeding stock (about \$400-\$600/hind in New Zealand, but quarantine and transportation costs result in \$2,500/hind landed in Canada)

b) meat obtained from 16-month old stags that sells for about \$2.00/lb live weight. Germany remains their big market; however, 17% of their production, or 400 tons, and 24% of deer meat value in dollars are exported to the U.S.

c) velvet horn, cut after about 50 to 55 days of growth, is shipped to the Orient. Prices for velvet are very variable, though in 1989 a good set of red deer horns was bringing \$500-\$700 (U.S. dollars).

While estates in England, Scotland and Europe have confined deer for several hundred years and have practiced some semblance of genetic improvement, numbers of deer and number of farms raising deer did not (*See Deer page 2*)



(Deer from page 1) increase markedly until the early 1980's. The United Kingdom has about 400 deer farms, with their main source of income from the sale of breeding stock reputed to be faster growing, with superior horns and gentler dispositions than deer caught in Scotland or in New Zealand. However, U.K. deer breeders import superior breeding stock from Denmark, Germany, Hungary, and Czechoslovakia. Deer from these countries are reputed to be 20 to 30% larger than red deer in southern England.

The deer farming industry in the U.S. is like a newly sprouted seed. The North American Deer Association has about 150 members, and herd size varies from less than 10 head to more than 2,000 head; but, in total, probably less than 15,000 deer are being farmed in the U.S.

The two main deer species being farmed are the fallow (Dama dama) and red deer (Cervus elaphus). The fallow are small (100-lb does), somewhat flighty deer that produce a fine-textured meat. The red deer are about twice as large as the fallow and more "docile" (though still quite unpredictable on occasion) than the fallow. Seemingly, more effort has been made to genetically improve their disposition, early breeding, antler size, and growth rate than has been true of fallow deer. However, recent imports of fallow stags have been made to not only improve productivity but also to broaden the genetic base and reduce inbreeding.

Current prices of breeding stock just about dictate which species will be most prevalent in the U.S. during the next 20 years. Prices for fallow deer have escalated during the past 5 years from \$150 to \$800-\$1,000/does. The number of red

deer in the U.S. is likely less than 2,000, and the few that are offered for sale bring \$1,500 to \$2,500/hind.

Based upon these prices for females, it's obvious that deer farming is a "high capital" venture. To recoup a portion of these costs, it will be necessary to sell breeding stock at comparable prices. Since their rate of reproduction is slow, prospects for selling breeding females at relatively high prices during the next 20 years appear good. Considerable importing of red deer breeding stock from England and New Zealand may take place, but not to the extent that prices are reduced significantly.

Our current consumption of 400 tons of carcass venison amounts to only .0033 lb per capita, or the meat from about 14,500 fallow carcasses weighing 55 lbs each or from 6,150 red deer carcasses weighing about 130 lbs each. If we assume that 80% of the farmed venison in the U.S. will be produced by fallow deer and 20% by red deer in the next 20 years, 11,640 fallow and 1,230 red deer carcasses would be required.

Our current consumption of .0033 lb per capital could easily be increased 10 times to .033 lb per capita, requiring the production of farmed venison from about 145,000 fallow deer or about 61,530 red deer. If the typical Midwest deer farm produced 50 carcasses/year, it would require 2,900 farms producing fallow deer or 1,230 farms producing red deer. Quite obviously New Zealand is not going to abandon the lucrative U.S. market and will likely retain well over a 50% share of it.

Deer producers count on consumption increasing 10 to 50 times. At those levels, farming of deer will have great potential to augment income from existing agricultural enterprises and produce

a product that requires no government subsidies.

In order to increase consumption, a reliable, year-round supply will be necessary. This type of supply, coupled with aggressive and innovative merchandising, holds promise for a profitable new industry for American farmers.

## BioOptions

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

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## Sesame

Sesame (*Sesamum indicum* L.) is one of the oldest cultivated plants in the world. It was a highly prized oil crop of Babylon and Assyria at least 4,000 years ago. Today, India and China are the world's largest producers of sesame, followed by Burma, Sudan, Mexico, Nigeria, Venezuela, Turkey, Uganda and Ethiopia. World production in 1985 was 2.53 million tons on 16.3 million acres.

Sesame was introduced to the United States in the 1930's. Domestic production has been limited because of the lack of cultivars that can be harvested mechanically. In 1987, sesame acreage in this country was less than 2,500 acres, about half of it in Texas. The U.S. imports about 40,000 tons of seed and 2,200 tons of sesame oil annually, primarily from South America.

Sesame seeds (approximately 50% oil and 25% protein) are used in baking, candy making, and other food industries. Oil from the seed is used in cooking and salad oils and margarine, and contains about 47% oleic and 39% linoleic acid. Sesame oil and foods fried in sesame oil have a long shelf life because the oil contains an antioxidant called sesamol. The oil can be used in the manufacture of soaps, paints, perfumes, pharmaceuticals and insecticides. Sesame meal, left after the oil is pressed from the seed, is an excellent high-protein (34-50%) feed for poultry and livestock.

Commercial varieties of sesame require 90 to 120 frost-free days. Daytime temperatures of 77-80°F are optimal. Sesame should not be planted before the soil reaches a temperature of about 70°F.

Sesame is very drought-tolerant, due in part to an extensive root system. However, it requires adequate moisture for germination and early growth, and a minimum rainfall of 20-26 in. per season is necessary for reasonable yields. Sesame is intolerant of water-logging. Rainfall late in the season prolongs growth and increases shattering losses.

Sesame is adaptable to many soil types, but it thrives best on well-drained, fertile soils of medium texture and neutral pH. It has a very low salt tolerance. Sesame, which has an extensively branched feeder root system, appears to improve soil structure. Fertility requirements for sesame are similar to millet.

Sesame can be seeded with a row crop planter equipped with vegetable planter boxes. Populations of 250,000 to 300,000 plants/acre in 18 to 30 in. rows have given the highest yields.

Because of their slow early growth, sesame plants are poor competitors against weeds. Select fields with low weed densities. Cultivate sesame fields early and as close to the rows as possible. Shallow cultivation is recommended because the fine, fibrous sesame roots grow close to the surface and are easily damaged. No herbicides are currently registered in Wisconsin or Minnesota for use on sesame. Growers should check on herbicide clearance for sesame in their areas.

Sesame is ready for harvesting 90 to 150 days after planting. Upon ripening, sesame capsules split, releasing the seed (hence the phrase, "open sesame"). Because of this shattering characteristic, sesame has been grown primarily on small plots that are harvested by hand.

The discovery of a non-shattering mutant by Langham in 1943 began the work towards development of a high yielding, shatter-resistant variety that can be mechanically harvested. Currently available non-shattering varieties have reduced yields and lower seed quality compared to non-shattering types. Sesame yields in test plots average 1,000 to 1,500 lb/acre, though yields of 2,300 lb/acre have been obtained in California under irrigation. Commercial yields are usually lower.

Currently sesame is being imported at a price of 43 cents/lb. This relatively high price reflects a world-wide shortage. Though the market for sesame seed is strong, domestic production awaits the development of high-yielding non-shattering varieties. As with many alternative crops, it is advisable to establish a market before planting.

### Information Sources:

Keys to Profitable Sesame Production. 1979. Bulletin No. L-1786. Texas Agricultural Extension Service. Texas A&M University System. College Station, Texas.

Sesame Production. 1986. Bulletin no. 100. Colorado State University Cooperative Extension.

Ashri, A. 1989. Sesame. Pages 375-387 in *Oil Crops of the World*. G. Robbelen, R.K. Downey, and A. Ashri (eds.): McGraw-Hill Publishing Company, New York.

*This article was excerpted from "Sesame" by E.S. Oplinger et al., in the Alternative Field Crops Manual published by the Univ. of Wisconsin and the University of Minnesota.*



## Publications

**Economic and Medicinal Plant Research, Volumes 3 and 4** represent a collection of significant scientific papers from around the world relating to plants of pharmaceutical importance. The volumes are edited by H. Wagner, Institut für Pharmazeutische Biologie der Universität München, München, Germany; Hiroshi Kikino, Pharmaceutical Institute, Tohoku University, Sendai, Japan; and Norman Farnsworth, College of Pharmacy, University of Illinois at Chicago. Volumes 3 and 4 are available for \$28 and \$32 U.S. from Harcourt, Brace, Jovanovich, Ltd., 24-28 Oval Road, London NW1 7DX, United Kingdom.

**Edible plant videos** are now available from CRC Press. "Trees, Shrubs, Nuts and Berries", "Cooking with Edible Flowers and Culinary Herbs" and "Edible Wild Plants" have been developed by Jim Meuninck, Professor of Ethnobotany and Medicinal Herbs, Indiana University; Jim Duke, Botanist, USDA; and Sinclair Philip, Sooke Harbour House, Vancouver Island, British Columbia. Each of the three videos is 60 minutes long and costs \$49.95 (\$59.00 outside the U.S.). For further information contact CRC Press Inc., 2000 Corporate Blvd, N.W., Boca Raton, Florida 33431.

**Free publications** are available from the Kirkwood Community College Rural Development Center: "Tomorrow's Harvest", a newsletter published 3 times per year, "Bottom-up - A Local Approach to Rural Development" and "12 Answers to Successful New Micro Enterprise Financing". Contact Rural Development Center, Kirkwood Community College, Box 2068, Cedar Rapids, IA 52406.

**Kiwifruit, snails, and ginseng** are the topics of three books available through agAccess. "Kiwifruit Science and Management", edited by I. Warrington and G. Weston, is a comprehensive handbook that covers virtually every aspect of the crop including history, production, and marketing. It is 576 pages long and costs \$95. "Snail Production Techniques" by R.V. Johnson, is not a highly detailed production manual but it does represent the single best source of information on escargot (97 pages, \$35). "Ginseng: A Concise Handbook" by James A. Duke, provides comprehensive information on the history, pharmacology, cultivation, and uses of the crop (273 pages, \$39.95). For further information contact: agAccess, P.O. Box 2008, Davis, CA 95617, (916) 756-7177.

**Fruit Gardener** is a publication of the California Rare Fruit Growers, Inc. This full color magazine is published bi-monthly. Articles in the June issue included: The date in orchard and garden, A visit to the Mariani orchards, Three ways to prune a fig tree, And now, jostaberry, and Blended cidermaking for the purists. Annual memberships are \$12 in the U.S. and \$20 foreign. Make checks out to CRFG and send to California Rare Fruit Growers, Inc., The Fullerton Arboretum, California State University, Fullerton, CA 92634.

**Advances in New Crops** is the proceedings of the First National Symposium on New Crops: Research, Development, Economics which was held in Indianapolis, Indiana in October, 1988. The objectives of the symposium were to determine the status and future of new crops research and development; to explore the potential of new crops and to

identify new uses for existing and underexploited crops; and to develop strategies for establishing partnerships among state, federal and industrial organizations. The 570 page volume is available from Timber Press Inc. for \$65 plus \$3 postage and handling (\$5 for foreign air mail delivery). Their address is Timber Press, Inc., 9999 S.W. Wilshire, Portland, OR 97225.

**International Produce Cookbook and Guide** was written by Marlene Brown, a consultant for Frieda's Finest/Produce Specialties Inc. Brown was a home economist for Pillsbury Co. and food editor for "Better Homes and Gardens". The 160 page book provides recipes, phonetic pronunciations, origin of the crop, and nutritional information for about 75 commodities. It is available from HP Books, a division of Price Stern Sloan, for \$12.95.

**National Sustainable Agriculture Conference Proceedings** are now available from the University of Nebraska. The program included over 75 presentations by farmers, researchers, extension agents, and representatives of agribusiness, non-profit organizations, and environmental groups. The conference attracted 320 attendees. Make checks for \$10 payable to Univ. of Nebraska and send to: 1990 SANR Conference Proceedings, Attn: J. Collins, Dept. of Agronomy, University of Nebraska, Lincoln, NE 68583-0910.

**Exotic Farmer** is the name of a monthly magazine devoted to diversified farming. The October issue focused on Vietnamese potbellied pigs. There are plenty of advertisements by exotic animal breeders. The magazine costs \$20 for (See *Publications*, page 5)



(*Publications from page 4*) twelve issues, \$35 outside the U.S. Contact Exotic Farmer, P.O. Box 732, Gainesville, MO 65655; (417) 679-3777.

**Dairy Goat Journal** has been in existence since 1916 and has a circulation of over 7,000. It includes information on breeding, nutrition, management, milking, products, and show results. Subscription rates for twelve issues (1 year) are \$20, and \$30 for outside the U.S. Contact Dairy Goat Journal, 6041 Monona Drive, Monona, WI 53716.

**Proceedings of the Third International Symposium on Peat/Peatland: Characteristics and Uses** is now available. This 622 page book contains 60 scientific papers covering peatland ecology and utilization, peat structure and composition, peat chemistry and analysis, industrial products from peat, plant/peat relationships, and biological properties of peat. Symposium participants and speakers represented fourteen countries. Copies of the proceedings are available at a cost of \$60. Make check payable to "Center for Environmental Studies" and send it to them at Bemidji State University, 1500 Birchmont Dr. N.E, Bemidji, MN 56601-2699. Copies of the 1983 symposium are available from the same organization at a discounted price of \$25.

**Choices for the Heartland: Alternative Directions in Biotechnology and Implications for Family Farming, Rural Communities, and the Environment** is the title of a 113 page report by the Center for Rural Affairs. The report is geared to researchers, policy makers, and the rural population of the North Central Region. To order your copy, send \$10 (Nebraska residents add .50

tax) to: Center for Rural Affairs, P.O. Box 405, Walthill, NE 68067.

**Quick bibliographies** on many subjects have been prepared by the Alternative Farming Systems Information Center of the National Agricultural Library. Items of special interest to "BioOptions" readers include: Alternative Crops (QB 90-25), Amaranths for Food or Feed (QB 90-29), and Raising Quail, Partridge, Pheasant, Bobwhites, and Ostriches (QB 89-95). They have also produced a special reference brief on Raising Snails (SRB 88-04). They are available free of charge. Indicate the title and number of the publication you want and send a self-addressed, gummed label to: Alternative Farming Systems Information Center, National Agricultural Library, Room 304, 10301 Baltimore Blvd., Beltsville, MD 20705.

**Proceedings of the 1990 Illinois Asparagus School** are now available for \$5, including postage. The 64 page publication includes valuable information for anyone who is interested in growing asparagus. Make the check payable to Rock Island County Extension Service and mail to Asparagus Proceedings, Rock Island County Extension Service, 1188 John Deere Road, East Moline, IL 61244.

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*(News Briefs from page 6)*

**Asian Pears** offer unexcelled taste, marrying the sweetness of their European cousins with the crunch of an apple, according to an article in the May/June, 1990 issue of "Harrowsmith Country Life". They were introduced to North America by Chinese laborers in the nineteenth century. In 1975, fewer than 500 acres were planted to Asian pears in the United States; recent estimates show that has

grown to more than 4,500 acres. They are mostly grown in California, Oregon and Washington, although they can be grown wherever European pears will grow. A mature tree yields 100-200 pounds of fruit, with select pears selling for up to \$3.00 each.

**Toro, Toro, Toro** Semen from four Wagyu bulls that were secretly brought to the United States from Japan 14 years ago is worth \$250 per vial, ten times the price of normal bull semen. According to an article in the September 28 issue of the "Wall Street Journal", those bulls probably represent the only Wagyu cattle ever to leave Japan. The Japanese regard the breed as a national treasure and have a special love for Wagyu meat, also called Kobe beef. In Japan, they pay up to \$180.00 a pound for it. Since the relaxation of import quotas on beef from America, there is heightened interest in the breed by American ranchers.

**Feverfew**, a member of the chrysanthemum family, has potential in the treatment of migraine headaches and other ailments. According to "The Herb Market Report", (vol. 6, #8) feverfew has been thought to relieve headaches and swelling since the Middle Ages. Since 1978, reports have appeared in medical journals detailing feverfew's effect on prostaglandin production, platelet aggregation inhibition, serotonin inhibition, and more specifically, migraine prevention. The compounds responsible have not been identified. Further research is needed. Feverfew is one of the fastest growing botanical products in the U.S. and net returns can exceed \$6,000 per acre. The correct address for "The Herb Market Report" is 1305 Vista Drive, Grant's Pass, OR 97527.



## News Briefs

**Agricultural Development and Diversification** is a new program of the Wisconsin Department of Agriculture's Trade and Consumer Protection Division. "Shiitake News" (August, 1990) reported that grants totaling \$29,079 were awarded to the Shiitake Growers Association of Wisconsin for a market development project. The project will develop cooperative marketing mechanisms, establish grading standards, provide technical assistance to those establishing indoor production facilities, develop shiitake recipes and products, and publicize shiitake.

**Cash prizes offered for best paw paws** was the title of an article in the Sept./Oct. issue of "Missouri Farm". In addition to the money, you may make a contribution towards the genetic improvement of this wild fruit. The purpose of the contest is to obtain fruit that excels in various categories for use as germplasm in the Paw Paw Project breeding program. For more information, send a self-addressed stamped envelope to: The Paw Paw Project, Rt. 1, Box 682, Eureka Springs, AR 72632.

**Development of a car that runs on 85% ethanol** by the South Dakota Corn Growers Association won them the 1990 Environmental Achievement Award from the National Environmental Awards Council. According to emissions tests, running the car on 85% ethanol and 15% gasoline reduced carbon monoxide emissions by 49% and hydrocarbon emissions by 31%. It also reduced carbon dioxide and nitrous oxide emissions.

**Roadside stands issue notes to raise money.** According to an article in the Summer 90 issue of "Rural Enterprise", two farmers

in Berkshire County, Massachusetts sold notes in the winter that would be good for the following summer's produce. The notes were sold for \$9 and could be redeemed for \$10 worth of produce at the farmers' roadside stands. It gave the farmers short term loans for spring planting and built customer use for the roadside stands.

**Alfalfa as a substitute for sphagnum peat moss** was tested at Purdue University and reported in Station Bulletin No. 590. Peat moss is currently used in the horticultural industry as a soil amendment and growing medium. Its price is relatively high due to transportation costs. The potential of using low quality alfalfa as a substitute for sphagnum peat moss in Indiana was examined using cost effectiveness, and characteristics such as water holding capacity, nutrient holding capacity and aeration, as criteria. Consumers found the alfalfa to be acceptable and retail costs would be about 30% below that of peat moss.

**Chinese cousin may make American chestnut important forest tree again** according to the Minnesota Extension Service. In the first part of this century, a blight caused by the fungus *Cryphonectria parasitica* made the American chestnut nearly extinct. It's smaller relative, the Chinese chestnut, is resistant to the blight. Charles Burnham, professor emeritus of agronomy and plant genetics, is attempting to transfer blight resistance to the American chestnut while keeping its physical characteristics by backcrossing and selecting for resistance. Breeding is under way in New York, Tennessee, New Jersey, Connecticut, West Virginia, Virginia, and Kentucky.

**Soybean oil inks** were developed by the American Newspaper Publishers

Assn. in 1985 as a replacement for petroleum-based inks. Currently about one third of U.S. newspapers are printed using soy inks, according to an article in "Science of Food and Agriculture". Advantages include: less rub-off, more vivid colors, biodegradability, pressroom safety since soy ink does not emit volatile hydrocarbons, more papers printed per pound of ink, and quicker press startup. If a total conversion occurs, 1.5 billion pounds of soybeans would be needed to supply the news-ink market.

**Birds for livestock fly control** are being studied by scientists at Kansas State University. According to Don Mock, extension livestock entomologist, "The Moscovy duck and the cattle egret my someday be enlisted as a major natural weapon of defense against the housefly and the horse and deer fly". A Canadian study with dairy calves showed that Moscovy ducks removed 30 times more houseflies than manufactured flytraps, baitcards, flypaper, or flysheets. The ducks also ate spilled feed, eliminating a fly breeding site.

**University of Minnesota researchers develop potential new AIDS drug from pokeweed.** The research was reported in the September 6 issue of the journal "Nature". A chemical derived from the poisonous pokeweed plant, pokeweed anti-viral protein (PAP), was 1000 times more effective than AZT on cells in test tubes. PAP is coupled with antibodies that react with cells containing the AIDS virus, inhibiting production of the virus. The drug is still in the preliminary stages of development.

(See *News Briefs*, page 5)



(Calendar from page 8) contact Morris Fabian, Rutgers Cooperative Extension, P.O. Box 231, New Brunswick, NJ 08t903. The next conference will be held in St. Paul, Minnesota.

March 21-22, 1991 - Prospects for Lupins in North America St. Paul, Minnesota. Preliminary abstracts for contributed papers and posters will be accepted until December 15th, 1990. Contact Lynn Field, Program Chair, 135 Crops Research, 1903 Hendon Ave., University of Minnesota, St. Paul, MN 55108; (612) 625-9765.

September 23-28, 1991 - First International Amaranth Congress Oaxtepec, Morelos, Mexico. Sponsored by the University of Mexico. For further information contact Programa Universitario de Alimentos, Coordinacion de la Investigacion Cientifica, CD Universitaria 04510, Mexico, D.F., Mexico.

October 6-9, 1991 - Second National Symposium on New Crops: Exploration, Research, Commercialization Indianapolis, Indiana. For further information, contact Jules Janick, Horticulture Building, Purdue University, West Lafayette, IN 47907.

April 12-16, 1992 - Second International Food Legume Research Conference Cairo, Egypt. Contact Dr. A.E. Slinkard, Crop Development Centre, University of Saskatchewan, Saskatoon, Sask. S7N 0W0 Canada; Phone: (306) 966-4978, Fax: (306) 343-1025.

Intensive fish culture seminars are offered periodically by the Rural Development Center at Kirkwood Community College. For dates and tuition, contact them at Box 2068, Cedar Rapids, IA 52406.

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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.



## Calendar of Events

**December 4-5, 1990 - Farming for the Future** Atlantic City, New Jersey. This is a training seminar on organic and sustainable agriculture for Cooperative Extension and other agriculture professionals. Contact Jean Hornyak, Rutgers Coop. Extension of Mercer County, 930 Spruce Street, Trenton, NJ 08648 or call Judy Green, Cornell University (607) 255-9832.

**December 6-8, 1990 - Western States Livestock Health and Nutrition Alternatives** Bozeman, Montana. Contact Alternative Energy Resources Organization, 44 N. Last Chance Gulch, #9, Helena, MT 59601; (406) 443-7272.

**January 8-10, 1991 - Southern Biomass Conference** Baton Rouge, Louisiana. The theme is "Strategies for Biomass Commercialization". Contact Michael Buchart or

Tommie Landry, Louisiana Dept. of Agriculture and Forestry, P.O. Box 3334, Baton Rouge, LA 70821; (504) 922-1280.

**February 11-12, 1991 - Setting Priorities: Research and Demonstration Programs for a More Sustainable Agriculture** Ames, Iowa. Sponsored by the Leopold Center for Sustainable Agriculture, Iowa State University. Poster contributions will be accepted through December 3, 1990. Contact the Leopold Center, 126 Soil Tilth Building, Iowa State University, Ames, IA 50011; Phone (515) 294-3711, Fax (515) 294-9696.

**February 13-15, 1991 - North American Bramble Growers Association Annual Meeting** St. Petersburg, Florida. Contact Don Alder, P.O. Box 9963, Daytona Beach, FL 32120.

**February 15-16, 1991 - National Conference on Organic /Sustainable Agriculture Policies** Washington, D.C. Contact Agriculture Conference, CSPI, 1875 Connecticut Ave. N.W., Suite 300, Washington, DC 20009-5728.

**February 17-21, 1991 - 9th North American Mushroom Conference**, San Antonio, Texas. This meeting is sponsored by the American Mushroom Institute. On February 20 there will be a one-day "Specialty Mushroom Program" with emphasis on Shiitake and Pleurotus. Contact: American Mushroom Institute, 907 E. Baltimore Pike, Kennett Square, PA 19348.

**February 21-24, 1991 - Sixth National Farmers Direct Marketing Conference** Parsippany, New Jersey. For further information (*See Calendar page 7*)

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