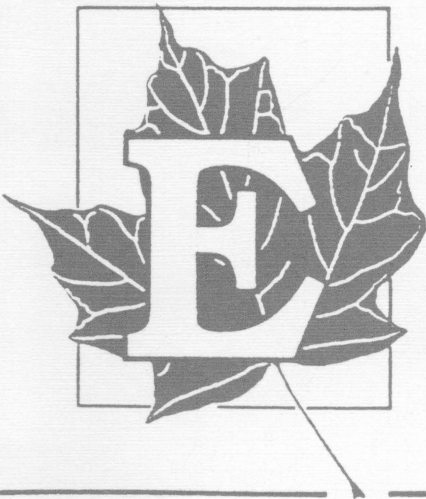


*Innovative*



*Rural*



*Enterprises*

Second Edition  
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The  
Farm Income  
Enhancement Program

Kelso L. Wessel



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## FOREWORD

The Ohio State University, The Ohio Cooperative Extension Service and The Department of Agricultural Economics and Rural Sociology have had an interest in alternatives to traditional agriculture for many years. During the 1980s, a program called Innovative Rural Enterprises was initiated. When farm incomes were falling because of the high costs of production and low prices for traditional farm products, this program encouraged farmers to consider products which would fit into niche markets. At least in the early stages, niche markets tend to be exotic products which fulfill the almost whimsical demand of a small group of consumers. For this reason these products may command very high prices. However, these markets can quickly change or become over-supplied. Sometimes niche markets develop into full-scale markets; soybeans are one example of this.

Because of the novelty and uniqueness of alternative enterprises, few hard research-based facts exist concerning their production and marketing. When adapting an enterprise based upon the experiences of someone else, one should never "bet the farm" the first time around. Begin on a small scale, then expand as you gain experience and find an ample market for the product.

*Innovative Rural Enterprises* has been quite successful, and is in its second edition. The bulletin is intended as a sourcebook for ideas, accumulating several thousand publications on approximately 100 topics. A brief summary is given about the different publications and/or articles under each topic. Also, a list of the articles and their page lengths is given for each alternative enterprise. If you are interested in ordering any of the publications, please use the order form located on the first or last page of this publication. Copies of the articles presented in the *Innovative Rural Enterprises* bulletin are available on a cost-recovery basis. The copying charge is \$.20 per printed side of a page.

A copy of any of the listed articles can be obtained either through any Ohio county extension office or from Innovative Rural Enterprises, The Department of Agricultural Economics and Rural Sociology, 2120 Fyffe Road, Columbus, Ohio 43210, Telephone (614) 292-6413 or 6924, FAX (614) 292-4749.

Thanks are extended to:

The Missouri Alternatives Center, University of Missouri, for so graciously providing us with a copy of their files on alternative agriculture. Their files have formed the basis for our collection of publications and articles.

Thomas L. Sporleder, Ph.D., Endowed Chair holder, Farm Income Enhancement Program, for his enthusiastic support of this effort. His enthusiastic support of this publication kept us going when the task seemed formidable.

Rebecca S. Boerger, B.S., pursuing a Master's degree in agricultural economics. Her summaries of hundreds of articles were the basis for this bulletin.

Debra S. Britton, M.S., and Susan E. Essman, B.A., Program Assistants, income enhancement, innovative rural enterprises, and direct marketing programs, who updated the original databank and prepared the second and third manuscripts, respectively.

Norman L. Moll, Greg A. LaBarge and Daniel L. Frobose with the Ohio Cooperative Extension Service in Lucas, Fulton/Henry and Wood/Sandusky Counties, respectively, were instrumental and supportive in the success of this project from the beginning. Other county extension agents in Ohio have also expressed the need for additional information on alternative agriculture in their counties. It is hoped that this publication will partially fulfill that need.

Kelso L. Wessel, Ph.D., Extension Economist, (specializing in direct marketing and alternative agriculture), Department of Agricultural Economics and Rural Sociology, The Ohio State University.

## ANIMALS

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### ALPACAS

In-depth information concerning camelids (including alpacas) including classification, economic feasibility, nutritional requirements, anatomy, management practices, and production. Experimental verification of alfalfa as a better nutritional source of pasture vs. natural pasture feeding in the Puno region of Peru is discussed, as well as its future impact on offspring (greater live weights and better maternal milk production). Considerations (size and dentition) and descriptions (body strength, fiber, production amounts) of various breeds of camelid are outlined. Tables describe grassland flora of the native pastures and pasture palatability, and note protein and mineral content.

- a. Animal Breeding and Production of American Camelids . . . . . 78 pgs
- b. Alpaca Appeal: Alpacas 101 . . . . . 2 pgs
- c. For Further Information, Selected Books, Magazines, and Sources for Alpacas . . . . 2 pgs

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### ANTELOPE (Blackbuck)

Ranching large exotic animals, such as antelope, requires large acreage. Animals, depending upon how exotic, can cost \$200 to \$10,000 per head. A discussion of fencing requirements, trapping, feeding requirements, hunting and other aspects is included.

- a. Hunting Preserves for Sport or Profit . . . . .7 pgs
- b. The Indian Blackbuck Antelope: A Texas View . . . . . 29 pgs
- c. More Information, Periodicals and Exotic Animal Sales . . . . See 'Exotic Livestock'

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### BAITFISH

The Andersons, minnow farmers in Lonoke County, Arkansas, express pros and cons of minnow farming and their diversified operation. Information is included on weather, water quality, fertilization procedures, types of minnows raised, harvesting and planting times, and some basic costs of operation. An

in-depth discussion of species of minnows, stocking rates, propagation, rearing, supplemental feeding, and harvesting is included. Further discussion includes the white (or common) sucker's production, egg collection, artificial hatching, stocking, fertilizing, harvesting, wintering, holding facilities, transportation (methods, equipment, and chemical), and minnow care.

- a. Fish Farming Handbook--Methods . . . . . 21 pgs
- b. Minnow Farming in Arkansas . . . . . 3 pgs
- c. More Information--Publications, Packets and Dealers . . . . . 2 pgs

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### BEEES AND HONEY

The articles presented outline general considerations for starting a honeybee hive operation. Information is included on using swarms as starter colonies and marketability of products. A beginning apiarist should start with only two hives, with proper equipment and preparation. Keeping a colony strong is essential for production. A colony operates best when placed close to sources of nectar and pollen. Plants that honeybees depend on include legumes, ornamental and fruit trees, and a variety of plants. It takes about a year to establish a hive, depending on the food resources available to the bees. General instructions for beginners in the extraction of honey and reuse of wax are provided. Step-by-step monthly instructions for apiary management are provided, with hive diagrams and lists of things to check.

Sources for suppliers are mentioned--start-up costs of a working community may exceed \$100. At an average price of \$1.25 per pound of honey, an average hive of 55 pounds is worth \$70-100. Modest returns can be obtained through a small farm of 10 to 25 hives after the costs for equipment, hive management and honey extraction. Management considerations such as disease, wax moths, food reserves, queen maintenance, and swarm prevention are discussed in general.

- a. A Very Short Introduction to Beekeeping Economics . . . . . 4 pgs

b. Beekeeping: A Small-Scale Agriculture Alternative . . . . .	2 pgs
c. Beekeeping Basics . . . . .	4 pgs
d. Beekeeping Tips for Beginners . . . . .	4 pgs
e. Honeybee Diseases . . . . .	12 pgs
f. Honey Bees: A Hive of Honey, Money, and Enjoyment . . . . .	2 pgs
g. Honeybee Update . . . . .	1 pg
h. Killer Bees: Origin of the Name and Other Humbugs . . . . .	3 pgs
i. Marketing Honey: The Work Doesn't End With Production . . . . .	1 pg
j. Ohio's Beekeeping Almanac . . . . .	27 pgs
k. Seasonal Apiary Management for Missouri . . . . .	3 pgs
l. What a Sweet Job It Is . . . . .	2 pgs
m. Selling Honey Through Wine . . . . .	1 pg
n. List of References and Sources of Beekeeping Supplies . . . . .	1 pg

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**BISON (American Buffalo)**

This alternative operation can yield handsome profits if properly marketed through specialty stores. Buffalo are raised like beef cattle, but they can subsist on poorer quality pasture. General health considerations, as well as reproduction, are discussed. "Exotics are the future domestics," quotes Dave Whittlesey of Colorado, who comments on the future of raising and marketing bison; others claim the demand exceeds supply. Bison are easier to handle than cattle, but special care in herding and fencing is required due to the buffalo's unpredictable nature. A general discussion of the various producers is included, also outlining meat and by-product distribution.

Depending on the cut of meat, the average price per pound ranges from \$2.50 to \$25.00. Articles in this section also present a detailed discussion on determining a promotion and advertising plan, selling live animals, and marketing bison meat (and by-products) through the traditional and gourmet markets.

a. Home on the Range: Raising Buffalo . . .	3 pgs
b. An Introduction to the Buffalo Industry . .	4 pgs
c. Bison Breeders Meet in Missouri . . . . .	2 pgs
d. Bison Breeder's Handbook . . . . .	9 pgs
e. Beefalo Gaining Popularity in KY and Southern IN . . . . .	1 pg
f. List of Associations, Magazines, Books . . .	3 pgs

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**CAMELS**

Camels, whose main home is North Africa, adapt to very arid and hyperarid areas and are very efficient users of their food which consists of grasses, leaves and twigs of shrubs and trees. A discussion of the various vegetation, including toxic plants, in the humada and rocky plain, regs, wadis, daya, and dune areas of the Sahara area is presented. The camel grazes and browses 8-12 hours a day and is known to be very conservative with grassy areas. The amount of water consumed by the camel depends upon its age, the work it does, the humidity, the environmental temperature and the quality, quantity, and water content of its food.

a. The Camel: Its Evolution, Ecology, Behavior, and Relationship to Man . . . .	55 pgs
b. The Camelid, An All-Purpose Animal . . .	12 pgs
c. Sources for Camels and More Information . . . . .	2 pgs

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**CAPONS**

Capons, castrated roosters, have advantages over roosters because they do not develop undesirable characteristics such as a large comb and wattle, crowing, and aggressiveness. The meat is fine-textured and juicy, which makes it a favorite of many gourmet chefs. Caponizing a rooster is a relatively simple operation. Proper marketing of capons is essential and includes personal contacts, road side signs, and door to door sales.

a. Caponizing: Modern Management and Profitable Marketing . . . . .	14 pgs
b. Capon Production . . . . .	7 pgs
c. List of Extension Publications on Capons .	1 pg

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**CATTLE**

*Beef*

At the farm level, the cow-calf industry is dominated by small producers. A general discussion of the feeder cattle industry and its marketing through auctions, direct marketing, or order buyers is presented. Minimal government intervention has occurred in the beef industry in comparison to other

commodities. Markets are primarily located in the Plains States. Considerations of capital investment, pasture improvement, sunk capital investments, and machinery costs are presented for small operators.

Management tools include: carefully planning the calving season, maximizing weight sold per cow maintained, maintaining an abundant supply of forage, wintering, compiling a marketing plan, and being flexible. Innovative aspects include marketing boxed beef, branded beef, and other enterprises which lend credibility to the beef industry and provide a specialty product to customers. A marketing strategy for small operators is discussed, including types of cattle to use, health, economics, grades, direct sales, and handling before sales.

- a. Options for Kentucky Farmers: Beef . . . 7 pgs
- b. Developing a Management System for a Small Beef Farm . . . . . 6 pgs
- c. Retailing Specialty Beef . . . . . 5 pgs
- d. Making Your Mark in Branded Beef . . . . 3 pgs
- e. Contract Feeding of Cattle . . . . . 2 pgs
- f. A Comparison of the Requirements for Beef and Dairy Farming for Part-Time Farmers (table) . . . . . 1 pg
- g. Backgrounding Calves . . . . . 1 pg
- h. Background Cattle . . . . . 2 pgs
- i. Selling, Buying, and Managing Feeder Cattle . . . . . 18 pgs
- j. Custom Feeding Offers More Profit, More Risk . . . . . 3 pgs
- k. Veal Farm Operates in Limited Space . . . 1 pg
- l. Where's the Bull? . . . . . 1 pg
- m. A Meaty Proposition: Company Steers Toward Leaner Beef . . . . . 2 pgs
- n. Miniature Cow is Better, Mexican Rancher Says . . . . . 1 pg
- o. Singing the 'Blues' About Beef . . . . . 2 pgs
- p. Low-Input Beef . . . . . 2 pgs
- q. Contract Cattle Feeding . . . . . 2 pgs
- r. Starting A Beef Cow Herd . . . . . 1 pg
- s. New Beef Breed Yields Lean, Tender Meat 1 pg
- t. More Information, Books, Agencies/ Specialists . . . . . 5 pgs

*Galloway*

General advantages of the Galloway purebred or crossbred beef cow include reduced feeding costs, reduced veterinary bills, greater animal weight gains, calving ease, and longevity. The cattle can be raised

on pasture until six weeks before slaughter, and can be crossbred with other breeds to bring out the best traits of each breed.

- a. Why Galloway? . . . . . 3 pgs
- b. Galloway Cattle . . . . . 4 pgs
- c. Belted Galloway...The White Galloway . . 2 pgs
- d. 1989 AMBC Breeders Directory & Galloway Breeders Directory . . . . . 6 pgs
- e. Belted Beauties . . . . . 3 pgs

*Oxen*

A detailed discussion of the breeds of cattle best suited for oxen, nutrition, construction of the yoke, hitches, training, logging, shoeing, weight determination, general animal husbandry, and minor medical problems.

- a. The Oxen Handbook . . . . . 49 pgs
- b. Making an Oxen Yoke . . . . . 7 pgs
- c. Animal Traction . . . . . 68 pgs
- d. More Information . . . . . 1 pg

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**CHICKENS**

Chickens are classified by their ability to produce meat, eggs, or a combination of both. Egg production crosses include the Leghorn x New Hampshire and Leghorn x Australorpe, while the meat production types include Plymouth x Cornish crosses. Brooding practices and nutrition recommendations are provided, along with marketing statistics for future consumption trends.

Because the poultry industry is highly concentrated, the most successful part-time producer operates under contract with a slaughtering and marketing firm. Various production and management practices are discussed. Getting started requires proper housing and equipment, as well as adequate knowledge of disease control.

- a. Poultry Cooperative (ADAPT3) . . . . . 4 pgs
- b. Fundamentals of Poultry Production . . . . 4 pgs
- c. Research for Small Farms . . . . . 3 pgs
- d. Getting Started in Farming on a Small Scale . . . . . 4 pgs
- e. The Home Flock . . . . . 12 pgs
- f. Managing Your Small Flock . . . . . 10 pgs
- g. Homestead Chicken Production . . . . . 10 pgs

h.	Brooding and Rearing Chicks for the Family Flock . . . . .	2 pgs
i.	Small Poultry Building (12' X 20') . . . . .	4 pgs
j.	Portable Poultry House . . . . .	4 pgs
k.	Guelph's Alternative Housing System for Hens . . . . .	3 pgs
l.	Putting the Humane in Husbandry . . . . .	2 pgs
m.	Contract Chickens . . . . .	2 pgs
n.	Poultry Production and Marketing Contracts . . . . .	2 pgs
o.	Compost and Chickens . . . . .	2 pgs
p.	Raising Range-Fed Chickens . . . . .	2 pgs
q.	Pasturing Poultry Pays . . . . .	3 pgs
r.	Roger Went Grazing . . . . .	2 pgs
s.	Poultry and Eggs . . . . .	4 pgs
t.	The "Eggmobile" . . . . .	2 pgs
u.	Poultry Puts Eggs on Table and Provides Meat Supply . . . . .	6 pgs
v.	Classic Breeds . . . . .	4 pgs
w.	American Classics . . . . .	1 pg
x.	Raising Chickens . . . . .	25 pgs
y.	Infectious Diseases . . . . .	11 pgs
z.	Sustainable Poultry Production Info Package (ATTRA) . . . . .	9 pgs
aa.	This Rocky's Chicken . . . . .	1 pg
bb.	Gourmet Chickens . . . . .	1 pg
cc.	More Information and Selected Education Resource Materials for Small Farm Operators . . . . .	13 pgs

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## CHINCHILLAS

Chinchillas, native to the Andes Mountains in South America, are raised for their fur, as breeding stock, and for research in the medical and biological fields. The most common of this nocturnal species is the *Lanigera*, which can weigh 18-35 ounces at maturity.

Housing must be well ventilated, dry, free from drafts, and isolated from other animals. Chinchillas mate most often in the winter and spring months, and polygamous breeding is recommended. Females deliver from one to six kits per litter, and up to three litters per year. Fresh pellets, clean alfalfa or timothy hay, and clean water are sufficient for feeding; however, they must be properly balanced. Chinchillas use Fullers earth, very fine sand, or pulverized clay in their dust baths, which keep pelt and skin healthy. Diseases and disorders, as well as harvesting techniques, are discussed.

Prime pelt production occurs from December through March. Pelts can be sold through pooled or cooperative marketing. Pelts that are large and dark bring as much as \$70 each, but most pelts average about \$33. Top breeding males may bring up to \$500 (usually ranging from \$100 to \$350), and females range from \$100 to \$150. The cost of raising an animal to pelting age is about \$12 to \$15.

a.	Chinchilla Raising . . . . .	4 pgs
b.	Raising Chinchillas (Canada Dept of Ag)	11 pgs
c.	Raising Chinchillas (Missouri Farm Magazine) . . . . .	2 pgs
d.	FFA Winner Finds Profit in Chinchillas . .	2 pgs
e.	Ranching with a Soft Touch . . . . .	1 pg
f.	Llamas, Alpacas, Chinchillas Threatened . .	1 pg

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## CHUKAR PARTRIDGES

If you like tender white meat, then the chukar partridge may be for you. The partridge is slightly larger than a quail, and can be recognized by its grayish head, back, and breast. Its white face, and a throat outlined in brown, are also distinctive. The food of the chukar consists of grain and seeds, roots, green shoots, and leaves, as well as a variety of insects and larvae. Ideal for people with limited space, the chukar partridge does best when raised on wire. Chukar eggs are not noticeably different in taste from chicken eggs, and can be sold for consumption or to other breeders. The birds can be sold to hunting resorts or gourmet restaurants. Various ideas on pen building, mating habits, and general care are presented.

a.	Raising Chukar Partridge for Fun and Profit . . . . .	2 pgs
b.	Raising Game Birds in Captivity: The Chukar Partridge . . . . .	5 pgs
c.	Game Bird Propagation--Wildlife Harvest System . . . . .	10 pgs
d.	Raising Game Birds . . . . .	5 pgs
e.	Sources of Chukar Partridges . . . . .	1 pg

*\*See also 'Game Birds'*

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## CRAYFISH (soft-shelled)

Crayfish, or crawfish, are freshwater crustaceans native to most temperate waters in the United States. They are used as fish bait and are gaining popularity

in the gourmet food market, where large soft-shelled crayfish command a high price. Raising crayfish requires an understanding of the molt cycle; it is important to be able to identify and control the molt stages. The articles presented include information on the molt cycle, species selection, production, and reproduction.

- a. Crayfish . . . . . 2 pgs
- b. Crawfish in Backyard Pools . . . . . 2 pgs
- c. Cropping Fish and Crawfish in the Same Pond . . . . . 3 pgs
- d. Crawfish Culture in the Missouri Small Farm Setting; The Economics of Crawfish; Beef Cattle-Crawfish Rotation in a Watershed Pond . . . . . 7 pgs
- e. Soft-shelled Crawfish for Small Farmers . . . . . 5 pgs
- f. Soft-shelled Crawfish . . . . . 2 pgs
- g. LSU Develops Separator for Soft Crawfish Production; Which Species to Culture--A Check List . . . . . 7 pgs
- h. Softshell Farms Projecting 100,000 Pounds This Season . . . . . 1 pg
- i. Soft-shell Crawfish Producers Look at Rapid Change Technology . . . . . 2 pgs
- j. Louisiana Association Grades Crawfish . . 1 pg
- k. Experts See Potential for Missouri Crayfish Business . . . . . 2 pgs
- l. Sources for More Information . . . . . 2 pgs

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**CRICKETS**

Crickets are easy to raise, easy to sell, and can be entertaining to producers. They are susceptible to attack by other insects and growing bacteria, and they need to be maintained in an environment between 70 and 90 degrees--a chick brooder type operation. Crickets should be raised on clean, dust-free bedding (such as sand) in garbage cans, lard cans, metal drums, metal-lined boxes, or similar containers. Cricket food consists of a good quality laying mash, chick starter, or turkey mash. Adult crickets should be removed as soon as the young are hatched, to prevent cannibalism. A general discussion of packaging for shipping is presented.

- a. Crickets (Profitable Earthworm Farming) . . . . . 4 pgs
- b. Crickets (USDA) . . . . . 2 pgs
- c. More Information . . . . . 1 pg

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**DEER (red & fallow)**

Venison from fallow deer, a favorite of gourmet diners in Europe, contains less fat, cholesterol, and calories than either beef or pork. Retailing for as much as \$10 a pound, it can be a money maker for even the small farmer. An area enclosed by an eight-foot fence, containing adequate water such as a pond, with trees for shelter, is essential for raising deer. Corn and hay are sufficient sources of food, and six or seven deer can be fed on the amount required for one dairy cow. Factors in deer farming include fawn crop percentage, carcass weight, and sale price. One source indicates an investment of \$34,000 is required for 50 adult does and 2 bucks in a 15-acre pasture. Articles in this section also describe easy ways to handle deer, and the general health considerations of fallow deer. Venison for consumption in the United States is primarily supplied by New Zealand producers; this venison consists of both red and fallow deer meat.

- a. Fallow Deer Farming: Rural Diversification on Iowa Cattle Farm . . . . 2 pgs
- b. Raising Deer for Venison . . . . . 3 pgs
- c. Profit Potential of Red and Fallow Deer . 6 pgs
- d. Domesticated Deer Offer a Promising Market . . . . . 2 pgs
- e. Bambi And The Baron . . . . . 2 pgs
- f. Deer Handling and Equipment . . . . . 4 pgs
- g. Health Management . . . . . 5 pgs
- h. The Economic Potential of Farming Deer . . . . . 5 pgs
- i. Deer . . . . . 11 pgs
- j. Farm-Raised Deer Have Good Potential . 2 pgs
- k. Venison: From Field to Table . . . . . 15 pgs
- l. Raising Deer for Venison Creates New Market in Oklahoma . . . . . 1 pg
- m. Seven Times Better Than Beef . . . . . 1 pg
- n. Sources for More Information . . . . . 2 pgs

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**DOGS**

Specialty show breeders aren't the only ones making a profit from companion animals; man's best friend can also help enhance farm income. Everything from general information to kennel design is included. For more detailed information, contact the American Kennel Club.

- a. Basic Guide to Kennel Management . . . . 2 pgs
- b. Excerpts from "Dogs: General Information" from the American Kennel Club . . . . . 8 pgs
- c. How Much Is That Doggie in the Window? . . . . . 2 pgs
- d. Pet Stock Production . . . . . 2 pgs
- e. List of Sources for More Information . . . 2 pgs

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**DONKEYS (including Sicilian Miniature)**

Donkeys come in many sizes and can be trained as pack animals, used on camping trips, and showed off in races and shows, among other activities. The donkey can also be a very enjoyable pet--far easier to care for than a horse, and requiring less room. Prices range from \$75 to \$1500, but donkeys can usually be bought at auctions for less than \$200. The Gennet's gestation period is around 12 to 13 months. General information about purchasing, breeds, housing, care and feeding, and common problems is also presented. Finally, there is an in-depth discussion of the Sicilian miniature donkey.

- a. All About Donkeys . . . . . 2 pgs
- b. Care and Feeding of Your Donkey  
--from *The Definitive Donkey: A Textbook on the Modern Ass* . . . . . 35 pgs
- c. Looking After a Donkey . . . . . 53 pgs
- d. Miniature Donkey Handbook . . . . . 28 pgs
- e. 33 Inches From Tip to Tip . . . . . 2 pgs
- f. More Information . . . . . 2 pgs

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**DUCKS**

From down to dinner, these versatile birds are the perfect all-purpose addition to your farm. Articles included cover selection, breeding, hatching, and care; the economic potential of duck down and feathers, meat, and even manure are also presented.

- a. Brooding and Rearing Ducklings and Goslings . . . . . 2 pgs
- b. The Complete Homestead Duck Guide . . 4 pgs
- c. Modern Waterfowl Management  
--Preparing Ducks for Market/  
Slaughtering and Marketing Ducks . . . . 10 pgs
- d. Raising Ducks for Egg Production . . . . . 1 pg

- e. Why Ducks? (from *Raising the Home Duck Flock*) . . . . . 9 pgs
- f. Ducks: References and Resources . . . . . 2 pgs

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**ELK**

Elk breeders relate that elk eat one third less than cattle and bring profitable returns; calves sell for \$1,000-\$2,000 per head. Elk producers sell the animals to hobbyists, zoos, and preserves, and have also developed a market for elk velvet and meat. In Montana, antlers may sell for up to \$50 a pound with a big bull yielding up to 30 pounds of antler. Health costs include worming twice a year. A large pasture enclosed by a 7½-foot high fence can serve as an environment for elk. A practical outline for handling exotic animals is also included in this section.

- a. Johnson Elk Farm . . . . . 5 pgs
  - b. Elk Ranching: Not So Crazy After All . . 1 pg
  - c. Deer, Elk, Moose--Restraint and Handling . . . . . 4 pgs
  - d. Where the Deer and the Buffalo Pay . . . 2 pgs
  - e. Get Your Elk in the Ozarks of Missouri . 1 pg
  - f. Sales, Directories, Magazines . . . . . 3 pgs
- \*See also 'Exotic Livestock'*

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**EMUS and RHEAS (Ratites)**

Emus and Rheas are members of the ratite family of flightless birds, which also includes the ostrich. Ratites are socially oriented birds. Raising ratites is an expensive venture, because it requires a large initial investment for the birds (a hatched pair ranges from \$1,400 to \$4,200), incubators, transportation, brooders, fencing, and housing facilities. The market for the hides, meat, and feathers has not yet fully developed. Breeding stock remains an alternative market; however, one source says the expansion of ostrich chicks alone will eventually drive the price down.

A breeding enclosure for a pair of ratites is a minimum of ¼ acre with fencing at 5'6" in height. Considerations for fencing designs and buildings are discussed. The male rhea plays an important part in hatching chicks and keeping the young from danger until they are able to fend for themselves. Handling is done in as calm and quiet a manner as possible



with a gentle hand. A pellet ration of 20% protein with a supplemental feed is necessary for proper growth of the ratite.

- a. Emus (ADAPT3) . . . . . 3 pgs
  - b. Emu Farming . . . . . 4 pgs
  - c. Ratites on the Family Homestead;  
Rheas--A Smaller Breed of Ratite;  
The Rhea, The South American  
'Ostrich' (four parts) . . . . . 16 pgs
  - d. Emu Hauling and Handling . . . . . 3 pgs
  - e. Emu Farming--EmuWorld, Inc., Brenham,  
Texas; Backyard Emus--A Double  
Market . . . . . 5 pgs
  - f. Emus--Nature's Way . . . . . 2 pgs
  - g. Antibiotic Studies in Ratites . . . . . 1 pg
  - h. Raising Ratites in Colder Climates . . . . . 1 pg
  - i. The Anatomy of the Ratites . . . . . 2 pgs
  - j. A Guide to Hatching and Raising Emu . . . . . 27 pgs
  - k. The Ratite Business: Where Is It Headed? . . . . . 3 pgs
  - l. Emu And Rhea Nutrition . . . . . 4 pgs
  - m. Extract From The Emu Farmer's  
Handbook . . . . . 5 pgs
  - n. Starting Over Knowing What I  
Know Today In Rhea Ranching . . . . . 5 pgs
  - o. Basic Facility Design . . . . . 5 pgs
  - p. Emu Farming In America . . . . . 1 pg
  - q. Cassowary . . . . . 2 pgs
  - r. More Information . . . . . 3 pgs
- \*See also 'Exotic Livestock'*

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## EXOTIC CATS

Exotic cats include the Bengal, Bobcat, Caracal, Oicat and Serval. The Bengal, a friendly, loving, domestic cat, is a hybrid of domesticated tabbies and the native Asian Leopard. The Bobcat (*Lynx rufus*), a medium size cat, is a usually solitary animal whose diet consists of rabbits, hare, mice, rats, squirrels, chipmunks and porcupines. The Caracal, the largest of the small wild cats, is nocturnal in the wild but tends to be a one person, or one family, cat when domesticated. Available in 12 different colors, the Oicat is very gentle and intelligent, giving it the ability to be trained. Serval cats are very sociable with people and are most noted for their ability to leap.

- a. The Bengal Cat . . . . . 1 pg
- b. Bobcats . . . . . 2 pgs

- c. Canadian Lynx Farmer Pioneers New  
Ground . . . . . 1 pg
  - d. Meet the Caracal . . . . . 1 pg
  - e. Oicat: The Look of the Wild . . . . . 1 pg
  - f. Sugar and Spice--That's What Little  
Servals Are Made Of . . . . . 1 pg
  - g. Sources of More Information. . . . . 1 pg
- \*See also 'Exotic Livestock'*

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## EXOTIC LIVESTOCK

From antelope to zebu, exotic livestock have captured America's imagination...and its pocketbook. These animals have high market value as luxury pets, as well as bringing good returns for their hides and other attributes. Specific species mentioned include the ostrich, water buffalo, llama, emu, potbellied pig, aoudad, Rex rabbit, fallow deer, buffalo, elk, and many others. Articles in this section also cover everything from start-up costs to breaking your exotic animal into show business.

- a. Exotic Livestock: A Small-Scale  
Agriculture Alternative . . . . . 2 pgs
- b. An Exotic Way With Livestock . . . . . 3 pgs
- c. Exotic Livestock: Potentially Profitable,  
Certainly Risky . . . . . 4 pgs
- d. Big Buck\$ From Bizarre Breeds . . . . . 3 pgs
- e. Raising Exotic Animals is Spies' Specialty . . . . . 2 pgs
- f. Wild Boars: A Livestock Alternative . . . . . 2 pgs
- g. Things To Consider Before Buying Exotics . . . . . 1 pg
- h. General Advice On Keeping Exotics . . . . . 1 pg
- i. Current Prices for Exotics . . . . . 1 pg
- j. More Information . . . . . 6 pgs

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## FISH

### *Fish Farming*

Technical considerations such as temperature, oxygen, size of fish and sources of water are part of fish farming. Financial resources include long term investment in equipment, dams and other structures as well as operating capital for items such as feed and labor (labor being the most critical). Day-to-day managerial problems include algae and theft of fish. Fish can be grown on natural foods or with a protein feed. Busiest seasons for fisheries are May and June.

- a. Fish Farming: What You Should Know . . . . . 7 pgs

b.	The Role of Fish Farming	3 pgs
c.	Aquaculture (ADAPT3)	2 pgs
d.	Aquaculture: A Small-Scale Agriculture Alternative	2 pgs
e.	Incorporating Fish Farming into an Existing Farm Program	9 pgs
f.	Fish and Wildlife Management--Aquaculture and Fishing	22 pgs
g.	Commercial Fish Farming (Kentucky)	4 pgs
h.	High-Yield Aquaculture Using Low-Cost Feed and Waste Recycling Methods	4 pgs
i.	Ohio Catching on to Fishy Business: Aquaculture Surfaces as Growth Industry	4 pgs
j.	Farmland Under Water	2 pgs
k.	Fish Farming in Iowa Barns	1 pg
l.	Fish Farming on the Fast Track	3 pgs
m.	What are White Amur	2 pgs
n.	Going for Net Profits: Fish Farm Feeds on Rising Demand; Where'll We Find the Fish?	2 pgs
o.	America Catches on To Aquaculture	2 pgs
p.	Aquaculture: Interest Increasing; Fish Farming a Growing Bluegrass Ag Business	1 pg
q.	Demand for Farm-Raised Fish Continues to Climb	1 pg
r.	'Net' More Profit From Your Farm Pond	1 pg
s.	Julian Allen, Mississippi Farmer: Raising the Humble Catfish to a 20th Century Delicacy	3 pgs
t.	Sales Tales of a Master Fish Marketer	1 pg
u.	References and Resources	2 pgs

### *Catfish & Catfish Fingerlings*

The guide to raising channel catfish for fishing or table use includes how many to stock, what to feed them, and the kind of pond needed. Fingerlings cost \$20 per hundred and cost an additional \$50 to raise 100 pounds (or about 83 cents/pound). Articles in this section also deal with cage culture, which reduces the and trouble associated with feed and care, but presents disadvantages like disease and increased nutritional requirements. A discussion of cage culture and the raceway system is presented. Well water, with a pH of 6.5 to 8.5, a temperature of 75° to 80° and dissolved oxygen concentration of 5 ppm or higher, is ideal for growth. Review of egg handling, stocking ponds, feeding, harvesting, and other management considerations is given. Costs include the construction of facilities, water, fish, and feed. Five "whats" of a marketing plan include: available resources, money, markets, management time, and size of operation. A

general description of customer relations and a typical catfish budget are presented.

a.	Raising Catfish for Food & Fun	8 pgs
b.	Catfish Farming	16 pgs
c.	Marketing: The Importance of Planning; The Customer is King; Catfish Budgets; Lists of Resources (Missouri Farm)	6 pgs
d.	Catfish Fingerling Production: Exploiting a Niche	1 pg
e.	Producing Channel Catfish Fingerlings	18 pgs
f.	Caged Catfish	1 pg
g.	Ohio Family Converts From Feathers to Fins	1 pg
h.	References and Resources	1 pg
i.	Processor List	.1 pg

### **FROGS**

The frog is legally a game animal, and is subject to laws and regulations governing game animals. Frog legs are a delicacy among gourmet diners, with prices ranging from \$5-6.00 per pound. Current demand is strong, with a market of eight or nine million pounds annually. A pond is sufficient for non-intensive production, but requires different management skills from intensive production. The intensive production of frogs can produce research-quality bullfrogs in 3 to 5 months and edible-size frogs in 5 to 8 months. A very complicated form of aquaculture, the culture system includes a breeding area, a tadpole hatchery, a tadpole grow-out facility, and many other capital intensive (land and labor) aspects. Problems are abundant. Production requires a lot of space as well as terrestrial invertebrates (such as fly pupae) for food. The newly hatched tadpoles and growing frogs can be fed nonliving media; however, growing frogs must be trained to eat it (if not done properly, cannibalism results). In comparison, the ratio of selling price to the cost of feed is \$1.66 for chickens and \$5.67 for frogs.

a.	Bullfrog Culture Still High Risk Venture	6 pgs
b.	Raising Bullfrogs on Non-Living Food	6 pgs
c.	Frogs for Fun and Profit	2 pgs
d.	Bullfrogs	2 pgs
e.	Frog Farmer Hopes to Fill Huge Demand	1 pg
f.	References	1 pg

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## GAME BIRDS

There are many advantages and disadvantages of raising game birds as an agricultural alternative. Advantages: the demand for quality game birds is increasing, most of the work is done during the summer months, any available feed can be used, and expanded C.R.P. set-aside acres can be used for hunting. Disadvantages: the public perceives the use of pen-raised game birds to be unsportsmanlike, animal rights groups may protest your business, and the business itself requires a high level of management. Checking the state laws for game birds in captivity is imperative.

General economics for 1,000 birds include start-up costs of \$3,900, with yearly costs of \$3,600. A good profit can be realized by selling 840 mature birds at \$6 each.

Four species discussed are the Pharaoh Quail, the Bobwhite Quail, the Chukar Partridge, and the Ringneck Pheasant. Various methods of brooding, sexing, and marketing, plus a general discussion of the four species, are presented.

- a. Game Enterprises . . . . . 3 pgs
  - b. Beginning a Commercial Game Bird Farm;  
Which Commercial Species Should I Raise;  
Marketing Commercial Game Bird  
Products . . . . . 22 pgs
  - c. Birds Abound on This Farm . . . . . 3 pgs
  - d. Farm Aflight . . . . . 2 pgs
  - e. More Information . . . . . 5 pgs
- \*See also 'Chukar Partridges', 'Pheasants', 'Quail', and 'Hunting Preserves'*

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## GEESE (Domestic)

Geese are primarily raised for meat and egg production, or as show birds or farm pets. Various breeds include Toulouse, Emden, African, Chinese, Canada, Pilgrim, Buff, Sebastopol, and Egyptian. Management strategies discussed include egg production, incubation, brooding, rearing, nutrition, and grading. Geese can also be used as weeders without harming crops such as strawberries, sugar beets, corn, cotton and ornamental plants.

- a. Raising Geese . . . . . 15 pgs

- b. Brooding and Rearing Ducklings  
and Goslings . . . . . 2 pgs
- c. Growers 'Goose-Up' Their Market . . . . . 1 pg
- d. Weeder Geese at Work . . . . . 1 pg
- e. Weeder Geese and Organic Farming . . . . . 3 pgs
- f. Using Geese as Weeders (from *Ducks & Geese in Your Backyard*) . . . . . 5 pgs
- g. Geese as Weeders . . . . . 5 pgs
- h. Weeder Geese Boost Berry Profits  
\$222/Acre . . . . . 3 pgs
- i. References and Resources . . . . . 3 pgs

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## GOATS

### *Angora and Cashmere*

The production of Angora and Cashmere goats requires an adequate knowledge of facilities and management procedures, grazing crops for summer and winter, and predator control. It's also helpful to get information about mohair and its care and marketing. It is important to be associated with someone who is familiar with production problems, so that you have an expert contact when you meet the same difficulties.

Angora goats are sheared twice a year for their mohair (which has a government-supported guaranteed price), providing cash flow twice a year. Angoras can subsist on low quality land, and are handled similar to cow-calf operations. A 400-head operation can have first year costs of about \$37,000 but can bring in about \$50,000 of income. Angoras are relatively easy to keep; they have a calm and quiet temperament if managed properly. Angora nutrition depends upon a 14% protein feed, trace mineral salt, and fresh water. A year-long monthly schedule is provided, describing the activities required. The kids need special care if born during the winter months.

Cashmere goats produce a coat of heavy, coarse outer hair plus a fine undercover or down that is usually referred to as cashmere. The start up costs are very high for these animals--as much as \$16,000 for a flock of three does and one buck imported from Australia. Cashmere down ranges from \$25 to \$75 per pound depending upon the color, fiber and quality. A review of what the industry is all about, marketing and a general budget is presented. Breeding plans, visual

assessments, reproduction, maintenance and production requirements are discussed.

- a. Making the Switch to Angora Goats . . . . 2 pgs
- b. Mohair: An Introduction to Angora Goats; Angora Goats: Nutrition and Management; Angora Goats Replace Herbicides in Warm-Season Grass Pastures . . . . . 5 pgs
- c. Angora Goat Selection and Production . . 5 pgs
- d. Angora Goats: Caring and Productivity . 9 pgs
- e. Economics of Angora Goat Production . . 4 pgs
- f. Cashmere Goats (ADAPT3) . . . . . 2 pgs
- g. Cashmere Goats . . . . . 2 pgs
- h. Cashmere Goats Come to the U.S. . . . . 2 pgs
- i. Cashing in on Cashmere...Raising Cashmere in the USA . . . . . 4 pgs
- j. Cashmere Goat Handbook . . . . . 7 pgs
- k. The Basics: Understanding the Cashmere Industry . . . . . 12 pgs
- l. Raising Angora and Other Tales of Innovative Rural Enterprise . . . . . 4 pgs
- m. Goating...Living Method for Clearing Brush . . . . . 2 pgs
- n. A New Look At Goats. . . . . .1 pgs
- o. Angora Goats in the Midwest. . . . . 6 pgs
- p. Angora Goats: A Hair-Raising Experience. . . . . 2 pgs
- q. More Information. . . . . 5 pgs

*Dairy*

The biggest cost of marketing goat milk is pasteurization. Goat milk is used to make goat cheeses such as blue, caerphilly, camembert, cheddar, chevre, and feta. The milk is valued at \$2.90 per gallon, and the meat at \$1.50 per pound. A dairy goat budget and a discussion of various breeds are provided. Milk production ranges from 12 to 14 pounds per day down to the day the doe dries off. Tips on feeding dairy goats, kids, and yearlings, as well as various environmental concerns and diseases, are presented.

- a. Goats: A Small-Scale Agriculture Alternative . . . . . 2 pgs
- b. Small Animal Enterprises for Small Farms . . . . . 3 pgs
- c. Goat Industry in Missouri . . . . . 3 pgs
- d. All About Goats; Economics of Dairy Goats . . . . . 7 pgs
- e. Feeding and Housing Dairy Goats . . . . . 2 pgs

- f. The Small Farmer As Entrepreneur . . . . 6 pgs
- g. Buying Goats . . . . . 2 pgs
- h. How to Evaluate Your Goats . . . . . 2 pgs
- i. Breeding, Pregnancy and Care of Doe at Kidding . . . . . 2 pgs
- j. Tips on Kid Care . . . . . 2 pgs
- k. Goat Care . . . . . 2 pgs
- l. More Information. . . . . 3 pgs

*Pygmy*

The Pygmy goat is described as being hardy, alert and animated, good-natured, gregarious and responsive. They are used in children's zoos, 4-H and FFA projects, and are good milkers (with 65% more calcium, 20% more phosphorus, 20% less sodium, 75% more potassium and 35% more iron than the Alpine and Saanen milk). Like other goats, they forage on brush and weeds; does may have two litters per year. A general description of the Pygmy goat, its care and feeding, and its dairy characteristics is presented.

Although similar to the Pygmy only in stature, the Nigerian Dwarf matures at 7 to 12 months. They cost \$200 to \$500 for a single animal.

- a. The Pygmy . . . . . 3 pgs
- b. What is a Pygmy (from *The Pygmy Goat in America*) . . . . . 14 pgs
- c. Nigerian Dwarf Goats: Size Isn't Everything . . . . . 1 pg
- d. List of Registries, Magazines, Books, Associations . . . . . 4 pgs

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**GOAT CHEESE (Chevre) AND MEAT (Chevon)**

Cheese is made from milk in which the protein is coagulated and concentrated. It was the first food to be manufactured that is still consumed by man. Four basic steps include preparing the cheese milk, coagulating of the protein, freeing coagulated protein (curd) from whey, and collecting the curd into a defined mass. The cheese is then aged under controlled conditions to produce the desired flavor and consistency. Variations include cottage or bakers cheese, queso blanco, romano, provolone, cheddar, brick, blue, and domiati cheese. Various marketing techniques of goat and goat milk products are discussed at length.

Uniform standards and identification of retail cuts exist for most other meat producers, but not for the chevon. An assortment of pictures display the cuts of meat possible; charts explain characteristics of young bucks, wethers, and aged does. Sausage is also an option, with an initial investment of less than \$100. Maintenance of the mature chevon costs about \$50 per year, and is perfect for people with outside jobs. Tips on stock selection and replacement, herd health, and kid raising is provided.

- a. Goat Cheese ..... 7 pgs
- b. Making Cheese at Home ..... 9 pgs
- c. Recipes ..... 5 pgs
- d. Chevon: Meat Cuts ..... 3 pgs
- e. Chevon: Processing Goat Meat...Chevon Sausage ..... 3 pgs
- f. Chevon Production: A Profitable Alternative.....10 pgs
- g. More Information ..... 2 pgs

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**GRAZING (Controlled/Intensive)**

More and more American livestock farmers are adopting the forage management practices of countries like New Zealand, based on the idea that healthy animals depend on healthy rangeland. Articles in this section describe various methods for minimizing physical animal impact (grazing, manure, and hoof impact) on pasture land.

The simplest approach is to move the herd from one enclosed area to another, shifting as the forage becomes trampled. Grazing periods, types of barriers, and watering strategies are also discussed.

- a. Controlled Grazing ..... 3 pgs
- b. Ten Principles of Controlled Grazing ... 1 pg
- c. Intensive Grazing Makes Land and Cattle Work ..... 2 pgs
- d. Pasture Replenishers ..... 2 pgs
- e. How About This For A Stocking Rate? .. 1 pg

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**HAIR SHEEP**

Hair sheep, which have hair instead of wool, provide a profitable alternative to conventional mutton sheep. Their meat is lean and naturally lower in cholesterol than that of wool sheep, and the animals are also more resistant to high temperatures. The first hair

sheep were brought to the US from West Africa, and they are still most popular in the Caribbean and the southern states.

- a. *Hair Sheep of Western Africa and the Americas: A Genetic Resource for the Tropics*
  - (1) Hair Sheep: A General Description . 21 pgs
  - (2) Productivity of Hair Sheep and Opportunities for Improvement ..... 36 pgs
- b. Information From Hair Sheep International ..... 6 pgs
- c. Katahdin ..... 2 pgs
- d. Raising Sheep The Easy Way: Hair Sheep 1 pg
- e. More Information ..... 5 pgs

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**HORSES**

*Draft*

Working with horses as draft animals is not for everyone. Horses can cost \$1,000 each, harnesses \$100 each, and collars \$50 each. Draft horses are useful for hauling wood and manure, building and mending fence, cultivating, and pleasure activities like hayrides and sleigh rides. Before deciding to depend on work horses, one should obtain as much practical information as possible about their versatility, hardiness, disposition, stamina, and strength. A general description of the Clydesdale, Percheron, Shire, Suffolk, and Belgian is presented.

- a. Horses on Today's Farm ..... 3 pgs
- b. Work Horse Handbook ..... 11 pgs
- c. Homestead Horses ..... 8 pgs
- d. Specialty Exporting (Modern-Day Horse Trader) ..... 1 pg
- e. The American Cream ..... 2 pgs
- f. Draft Horse Owners Return to Simpler Times ..... 1 pg
- g. Rocky Mountain Horse's Future Safe ..... 2 pgs
- h. Additional Sources ..... 2 pgs

*Miniature*

Miniature horses stand no higher than 34 inches at the withers. The two body types that are found in miniature horses are an Arabian look or a heavier-boned Quarter Horse look. A decent quality brood

mare may cost \$1,500 to \$5,000 and will generally produce a colt worth \$2,500 or more. A Mini takes about six months to train to drive. They cost from \$120 to \$150 annually to keep, including feed, worming and preventative shots. Feed may include a combination of legume hay and oat hay with supplementary feeding of grain or pellets for the working animal.

- a. The World of Miniature Horses . . . . . 2 pgs
- b. The Appeal of Minihorses . . . . . 2 pgs
- c. They Like Their Mini-Mules . . . . . 2 pgs
- d. Introducing the Dartmoor . . . . . 1 pg
- e. A Growing Trend in the Horse Industry . . 1 pg
- f. It's a Small, Small World . . . . . 2 pgs
- g. The Miniature Horse . . . . . 2 pgs
- h. Affectionate Little Horses Capture  
Big Following . . . . . 1 pg
- i. Little Horses Make A Big Hit . . . . . 2 pgs
- j. More Information . . . . . 4 pgs

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## LLAMAS

The llama industry got its start in the early 1970's and has progressed rapidly since then. A female llama worth \$800 in 1975 can be sold for \$10,000 today. Llamas can be used as pack animals; they also can be raised for their wool. Wool sells for \$2/ounce or \$25 to \$30 a pound. Llamas are very sensitive and intelligent animals who do better without any fuss. They can subsist in subzero weather. One source indicates that an initial cost of \$10,000 can yield a net annual income of \$28,000. Their diet consists of good pasture supplemented with grain and free choice mineral and salt blocks. Breeding season starts in April and continues through the end of December to avoid winter babies; gestation occurs in 11 to 12 months. Marketing llamas is location specific and can be accomplished through newspapers, TV, associations, and shows. Llamas can live for twenty or thirty years and are very social, although territorial in nature.

- a. Breeding Llamas: The Love and  
Dollars Farm Crop . . . . . 3 pgs
- b. Leapin' Llamas! . . . . . 5 pgs
- c. Llama Facts . . . . . 2 pgs
- d. Living with Llamas . . . . . 6 pgs
- e. Are You Considering a Petting Zoo?  
Don't Overlook Llamas . . . . . 2 pgs
- f. Llama Owners of Ohio . . . . . 5 pgs

- g. Why Llamas? . . . . . 2 pgs
- h. Lots of Interest in Llamas . . . . . 1 pg
- i. More Information . . . . . 4 pgs

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## MINK

Native to North America, mink are raised on about 1100 mink farms in the US. The furs on these farms are worth well in excess of \$100 million. There are sixteen basic natural colors ranging from black to white, with brown, blue gray and pink shades. Top quality skins are taken from the animal when the fur is "prime"--a decision based on color, lustre, texture, density, depth of fur, and length of guard hairs. Mink pelts can be sold through a marketing association or at auction. Furs are categorized as perishable, fair wearing, good wearing or durable.

Gestation averages 51 days; litters average four kits. Priming of the fur is controlled by the amount of daylight the animals receive. Expert breeders keep one male for every five females. Mink are unfriendly and unsociable animals that spray a musky smell from scent glands when threatened or excited. Mink eat meat, meat by-products, fish and cereal; the largest cost of raising mink is their feed. Fur farming is risky--cyclical in nature and greatly influenced by the fashion world.

- a. A Glance at the Fur Industry . . . . . 7 pgs
- b. Mink: The Gem of Agriculture . . . . . 6 pgs
- c. Mink Require Savvy to Raise: Market  
is a Roller Coaster . . . . . 3 pgs
- d. More Information . . . . . 2 pgs

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## OSTRICHES

Raising ostriches as an alternative enterprise may be profitable for those with limited acreage and limited funds. They are hardy animals and can withstand extreme heat and cold. Ostriches do well on grass and alfalfa in summer with a hay supplement. Most health problems occur in the first few months after hatching. If they survive the first few months, it is possible for them to live for 70 years. Eggs range from 6 to 8 inches long and weigh up to 3 pounds. The price for a fertilized egg can be as much as \$1,000 and for a pair of three-year-old adults as much as \$20,000. Ostrich feathers, as well as the meat and

skin, are income sources. An adult male bird of the species *Struthio camelus* (the African Ostrich) can weigh over 350 pounds and stand eight to nine feet high. Although there is no right way to raise ostriches, several methods are presented.

*General*

- a. Checklist for Purchasing Birds . . . . . 3 pgs
- b. What Are the Kinds of Ostriches and Which One Is Best? . . . . . 2 pgs
- c. Ostrich Primer . . . . . 4 pgs
- d. Ostrich Production . . . . . 6 pgs
- e. Ostrich Nutrition: Gastrointestinal Tract Anatomy And Its Effect on Nutrient Digestion . . . . . 11 pgs
- f. Ranch Preventive Medicine and Treatment . . . . . 1 pg
- g. Picking and the Cause . . . . . 1 pg
- h. Restraint and Handling of Wild Animals . 4 pgs
- i. Save That Ostrich Skin! . . . . . 1 pg
- j. Ostriches In Ohio . . . . . 2 pgs
- k. An Introduction To Ostrich Farming In Missouri . . . . . 5 pgs
- l. Blue Streak Ostrich Ranch . . . . . 3 pgs
- m. Quick Bibliographic Series (Jan '79-May '89). . . . . 9 pgs
- n. Breeders, Books, Associations . . . . . 5 pgs

*Breeding, hatching, and chick rearing*

- a. Getting Started as a Breeder . . . . . 3 pgs
- b. Importance of Sanitation for Breeding Birds . . . . . 2 pgs
- c. Washing and Sanitizing Hatching Eggs . 3 pgs
- d. The Hatching Process: A Step-By-Step Accounting . . . . . 5 pgs
- e. Automatic Humidity--Your Friend . . . . 3 pgs
- f. High Humidity: A Major Cause of Chick Mortality/Variety--The Spice Of Life . . . . . 3 pgs
- g. 10 Tips for Raising Ostrich Chicks . . . . 1 pg

*Production economics and the industry*

- a. Ostriches (ADAPT3) . . . . . 2 pgs
- b. Ostriches as an Industry (ADAPT2) . . . . 1 pg
- c. Thinking About Getting Into The Ostrich Business, Are You? . . . . . 7 pgs
- d. Ostrich Farming Economics . . . . . 1 pg
- e. The Ostrich Industry--What's In Store? . . 1 pg

- f. Big Birds Boast Big Bucks . . . . . 2 pgs
- g. Missouri Agripreneurs Invest in the Ostrich Industry . . . . . 2 pgs
- h. USDA Announces Rules For Importing Ostriches and Other Non-flying Birds . . . 1 pg
- i. Today's American Ostrich Farmer . . . . . 1 pg

*\*See also 'Exotic Livestock'*

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**PEAFOWL**

Varieties of peafowl include the Blue India, White, Black Shouldered, Java Green, Black Wing Japanese, Cameo, and the Indo-Chinese Green. The peafowl prefers lots of room, but can be restricted to the ground by pinioning a wing. Though a hardy bird, it requires some shelter in the winter. A brief description of stock selection, natural living habits, various housing facilities, feeding, and other management ideas is presented.

- a. Stromberg Peafowl Bulletin: Peafowl Breeding and Management . . . . . 8 pgs
- b. Peafowl Species; Selecting Peafowl Stock (*Wacky World of Peafowl*) . . . . . 5 pgs
- c. Management of Peafowl (*Peafowl of the World*). . . . . 12 pgs
- d. More Information . . . . . 1 pg

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**PHEASANTS**

Pheasant, the most popular of game bird species, can be produced by starting with chicks and working up to breeding fowl. A small or large pen system or an artificial brooding house can be used; plot designs are provided. Non-confinement and confinement range system plans are also included. A starting mash in a small kernel form is preferred until chicks are six weeks of age, when green foods are added. Pheasants can be raised as game birds for hunting or for retail sale. Pheasant can be marketed several ways: brine-cured, cold-smoked, cooked, frozen, or raw.

- a. Pheasant Propagation (from *Raising Game Birds*) . . . . . 14 pgs
- b. Pheasant Propagation (from *Quail and Pheasant Propagation*) . . . . . 6 pgs
- c. Feast on Flavorful Gourmet Meats . . . . 2 pgs
- d. Gamebird Enterprises . . . . . See 'Gamebirds'

- e. Quick Bibliography Series (Jan '79-May '89) . . . . . 10 pgs
- f. Pheasants Forever . . . . . 1 pg
- g. More Information . . . . . 1 pg

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### PIGEONS AND SQUABS

Squabs are potential sources of income which require good management and a good market. Squabs weigh from 12 to 24 ounces and can be marketed at 25 to 30 days of age. Squabs sell for \$2.50 to \$3.00 per live bird. Breeds include the King, Carneau, Swiss Mondaine, French Mondain, and the Homer. A general description of the selection of breeds, methods of breeding, feeding, housing, and equipment is included.

- a. Squab Raising (USDA Bulletin # 684) . 14 pgs
- b. Squabs Pay (from *The National Standard Squab Book*) . . . . . 6 pgs
- c. Taking Wing . . . . . 1 pg
- d. Californians Put Pigeons on US Tables . . 1 pg

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### POTBELLIED PIGS (Miniature)

A potbellied pig operator in Indiana relates how she recovered a \$10,000 investment, plus expenses, in just 6 months. Potbellied pigs can be bred at 4 to 5 months of age, gestate in 114 days, and have 6 to 10 young per litter--bringing as much as \$5,000 per litter. The Chinese potbellies mature at 80 pounds, stand only 16 to 18 inches high, and can be trained. These pigs are prone to be overweight; therefore, they need a carefully controlled diet.

- a. Happiness is Having a Potbellied Pig . . . . 3 pgs
- b. Pigtales: About Chinese Potbellied Pigs . . 3 pgs
- c. Vietnamese Potbellied Pigs: Office Pigs? Celebrity Pigs? House Pet Pigs? . . 1 pg
- d. Vietnamese Pot-Bellied Pigs . . . . . 4 pgs
- e. News from Potbellied Pig Registry Service & Organization . . . . . 2 pgs
- f. Ads for Breeders and a List of Exotic Animal Sales & Publications . . . . . 5 pgs
- g. Mini-Farmers Produce Mini-Pigs, Mega-Bucks . . . . . 1 pg
- h. Vietnamese Potbellied Pigs: Mini Pigs Mature at About 80 Pounds . . . . . 1 pg

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### QUAIL

Quail are very shy creatures which mate for life and adapt to domestic life, but cannot be domesticated. Fertilized eggs cost about \$9 for sixty, and must be hatched at a constant temperature of 70°F and 60% humidity. Quail eat 5 to 8 oz. of food per day when mature. A general description of breeder selection, land requirements, equipment, and other management practices is presented.

- a. Quail for Profit . . . . . 3 pgs
  - b. Quail (from *Raising Game Birds* . . . . . 9 pgs
  - c. Quick Bibliography Series (Raising Quail) . . . . . 10 pgs
- \*See also 'Game Birds'*

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### RABBITS

Rabbits are primarily used for their meat and pelts, and for laboratory experimentation. Meat can be sold for \$.85 to \$3 per pound, depending upon the market. Rabbit meat contains the highest protein of all meats, and is also lowest in cholesterol, fat, and calories. Dried pelts can be sold for \$.50 and tanned pelts for \$3 to \$4. Laboratory rabbits require strict specifications for experimentation. Breeding stock yields the greatest return, but is the most difficult to sell.

Various marketing ideas for rabbits are presented, along with pricing options and necessary equipment. Experts agree that slow growth is the best approach to commercial rabbit raising. Various economic aspects for the fryer enterprise, as well as breeding stock, are presented along with a recommended program of production. An in-depth discussion on nutrition, mating, fly control, disease, and sanitation is presented. The Brown County Rabbit Co-op in Brown County, Ohio, relates the growing demand for rabbit meat despite a lagging availability of supply. Rabbitries are considered an 18-month industry which requires a lot of hard work and management skill.

- a. Commercial Rabbit Production . . . . . 11 pgs
- b. Starting a Commercial Rabbit Enterprise . . . . . 1 pgs
- c. Economics of Commercial Meat Rabbit Production . . . . . 2 pgs



- d. Selling Rabbits the Modern Way . . . . . 17 pgs
- e. Making a Buck with Rabbits . . . . . 2 pgs
- f. More Information . . . . . 5 pgs

*Angora Rabbits*

This popular animal is valuable not only for its meat and silky wool, but also for its potential as pet stock. Angora rabbits are the source of true angora wool, while angora goats produce mohair. Gentle, adaptable, and compact, these animals have excellent money-making potential.

- a. How to Buy an Angora Rabbit (from *The Northern California Angora Guild Angora Handbook*) . . . . . 5 pgs
- b. Excerpts from *Completely Angora* (includes "Why Angora?", "Can I Make Money With Angora Rabbits?", "How to Buy an Angora Rabbit", and "Breeds of Angora Rabbits") . . . . . 12 pgs
- c. Care of Your Angora Bunny . . . . . 1 pg
- d. Sources of More Information . . . . . 4 pgs

increase to 37 million by the year 2000, up from 1.5 million in 1990. About 71% of the shrimp consumed in the US are imported. Although shrimp farms have been around a long time, only in the past decade has a profit in shrimp farming been recognized. Difficulties in shrimp farming include obtaining support from financial organizations, and obtaining federal and state permits. A complete discussion of shrimp biology, life cycle, environmental requirements, wastes, pH, nutritional requirements, cultural techniques, nursery, grow out systems, disease, parasites, and predators is presented.

- a. Pioneer Mississippi Shrimp Farm Closing in on Successful Operation . . . . . 3 pgs
- b. Our Appetite for Shrimp Swims Deep . . . 2 pgs
- c. Freshwater Prawns . . . . . 3 pgs
- d. Prawns (from *The Third Report to the Fish Farmers*) . . . . . 6 pgs
- e. Freshwater Prawns (from *Crustacean and Mollusk Aquaculture in the United States*) . . . . . 21 pgs
- f. More Information . . . . . 1 pg

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**RATTLESNAKES**

Snakes are normally enclosed in a vivarium that is easy to clean, escape-proof and simple in design. Temperature and food requirements vary by species. A brief summation of handling, sexing, and reproduction is presented. Diseases may affect the skin, gastro-intestinal tract, respiratory, nervous, excretory, and reproductive systems of snakes. Wintering requirements for snakes are also discussed briefly.

- a. Snakes (from *The Manual of Exotic Pets*) 8 pgs
- b. Housing and General Care . . . . . 7 pgs
- c. The Amphibians and Reptiles of Missouri: Selected Species . . . . . 11 pgs
- d. More Information . . . . . 1 pg

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**SHRIMP**

If you are looking for a challenge, you might want to try shrimp production. An acre of shrimp is valued at \$2,000 to \$4,000. Estimates indicate production will

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**SNAILS**

The founder of The Snail Club of America, R. Tucker, relates how he has turned an ordinary pest into a very lucrative business; he spent less than \$200 in four years by raising the snails in an Oasis which houses 15,000 snails. A snail farm in California, Infant Riant, processes 300,000 snails a month at \$.75 per pound delivered (about 125 snails). After processing, wholesale prices are about \$3.50 per can, and retail prices \$5.25 to \$7 a can. France, the largest consumer of snails, imports *Helix aspera*, which are raised in California. A description of how to raise snails from mating to harvest, temperature regulation, building requirements, disease, and feeding is presented.

- a. From Escargot to Snails . . . . . 1 pg
- b. Taming the Wild Escargot . . . . . 7 pgs
- c. Raising Snails . . . . . 14 pgs
- d. Escargot: From Your Garden to Your Table . . . . . 1 pg

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## SWANS

A general discussion of nine species of swans, as well as a calendar of events for management of swans, is provided. Other miscellaneous topics are presented, such as transportation, handling, and aggressive behavior. Swans seek their own food; they will rid your pond of algae and pondweeds. They will produce young for at least 20 years. A good water supply, fencing, grazing area and supplemental feeding during the winter months are basically all that is necessary to raise swans.

- a. Swan Breeding and Management . . . . . 9 pgs
- b. Waterfowl: a Guide to Maintenance and Propagation . . . . . 20 pgs
- c. More Information . . . . . 1 pg

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## TROUT

Trout can be cultured in all 50 states and are primarily coldwater fish. They require a high level of dissolved oxygen in the water, usually maintained by a flowing water method. Trout are fed high protein diets; they will feed on other fish and invertebrates. They are extremely sensitive to diseases and environmental alterations. Trout husbandry and marketing practices including hatcheries, fingerling production, market size producers, pay lake operators, and live haulers, processors, wholesalers, and distributors are discussed. A detailed description of culturing methods is presented.

- a. Woman Nets First Profits from Trout-Farming . . . . . 1 pg
- b. 34 Years of Chasing Rainbows; Different Ranching . . . . . 2 pgs
- c. Trout . . . . . 4 pgs
- d. Cage Culture of Rainbow Trout . . . . . 2 pgs
- e. Methods: Trout and Salmon (from *Fish Farming Handbook*) . . . . . 13 pgs
- f. More Information . . . . . 1 pg

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## TURKEYS

Six major breeds represent the turkey population; these popular birds dress out between 20 and 25 pounds per bird. Turkeys can be sold as day-old

poults, started poults (6-8 weeks old), or home-grown birds. Eating considerably more feed than chickens, turkeys respond overwhelmingly when given proper feeding rations. An in-depth discussion is presented on raising poults, feed mixes, equipment, and building requirements.

- a. A Suburban Turkey Farm . . . . . 3 pgs
- b. Homestead Turkey Production . . . . . 5 pgs
- c. Raising Your Own Turkeys . . . . . 11 pgs
- d. More Information . . . . . 1 pg

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## WORMS

Earthworms can be grown in enterprises of various sizes, from a simple operation in a garage or basement with as little as \$20 invested, to a large wholesale, retail, or mail-order business. Two types of domesticated earthworms include the manure worm and the red worm, both of which eat any type of organic matter. Income may range from \$.25 to \$7 per square foot of area on a monthly basis. Earthworms can be marketed as sport fishing bait, breeding stock, for soil enrichment, conversion of organic waste to fertilizer, pet food and food for fish hatcheries, zoos, and tropical fish, as well as for laboratory experiments. Worms can be grown in rabbit manure, the backyard, old garbage cans, or wooden boxes. An earthworm bed can be very simple or very elaborate.

- a. Earthworms for Ecology and Profit . . . . 22 pgs
- b. Raising Fishworms with Rabbits . . . . . 14 pgs
- c. Build an Earthworm Bed . . . . . 1 pg
- d. Worm Farmer Finds Niche Near Lake Erie . . . . . 1 pg
- e. Earthworms in Agriculture (Quick Bibliography Series) . . . . . 17 pgs
- f. Nightcrawlers (Adapt 3) . . . . . 1 pg
- g. List of Books & References . . . . . 5 pgs
- h. More Information . . . . . 2 pgs

## PLANTS

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### ALTERNATIVE CROPS

Beginning with an overview of crops ranging from buckwheat to crambe, this section includes articles on feed, cover, and cash crops for the U.S. and international markets. Each article examines the potential headaches and profits of a different alternative crop, from planting and maintenance to harvest and marketing.

Corn, wheat, and soybeans, the 'big three' of traditional field crops, face a new challenge--a host of new alternatives. Some of the alternative crops covered in this section, like oats, barley, and spelt, have long been familiar as secondary crops. The current oat bran craze has contributed greatly to the reemergence of oats as a food crop. Spelt, an Old World grain brought to America by Swiss settlers, also has much to offer. Its unusual growing season (plant in September, harvest in July) makes it a good niche crop, while its lack of gluten makes it safe for people with wheat allergies. Spelt's popularity in the European market has begun to spread to the U.S.; harvested grain was already bringing \$0.10/lb in 1989, compared with \$0.06/lb for wheat.

Alternative animal feed crops are also covered: the cup-plant, a perennials silage crop from Ukraine, features crude protein levels of 24% (for second cuttings). First-year yields average 5 tons of dry matter per acre, while experts expect yields of up to 10 tons per acre from more mature stands. Lupins, second only to soybeans in terms of seed protein content, do not require processing before being used as feed. These frost-tolerant, drought-resistant legumes offer yields of 1,000-3,800 lbs/acre. Seed cost and weed control present a drawback for potential growers.

- a. Alternative Field Crops: An Overview ..... 8 pgs
- b. Buckwheat ..... 2 pgs
- c. Oats Increase In Popularity ..... 2 pgs

- d. Oats: New Luster For An Old Crop ..... 1 pg
  - e. Dinkel, Dinkel, Little Star (Spelt) ..... 2 pgs
  - f. Barley ..... 2 pgs
  - g. Hairy Vetch ..... 2 pgs
  - h. Vetch Holds The Crown As Cover Crop ..... 1 pg
  - i. Pros And Cons of Seeding Rye Or Legume Cover Crops ..... 1 pg
  - j. Yields Like Corn, Feeds Like Alfalfa ..... 1 pg
  - k. Sweet White Lupin: Livestock Feed--Cash Crop ..... 2 pgs
  - l. Home-Grown Protein: Protein-Rich Lupins ..... 1 pg
  - m. Small Fababean ..... 2 pgs
  - n. See What's New In Michigan ..... 3 pgs
  - o. Take A Close Look At Newer Small Grain Varieties ..... 1 pg
  - p. Looking For Greener Grass ..... 4 pgs
  - q. Wild Rice As A Cash Crop ..... 2 pgs
  - r. Proso ..... See 'Birdseed'
  - s. Specialty Crops: Are They Right For You? ..... 3 pgs
  - t. New And Old Crops Offer Alternative Opportunities ..... 3 pgs
  - u. Winterberry Offers Income Boost For Small Growers ..... 1 pg
- \*See also 'Amaranth', 'Canola', 'Crambe', 'Industrial Crops', 'Popcorn', and 'Sunflowers'.*

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### AMARANTH

Amaranth is a protein-rich edible crop which is sensitive to hot and dry spells or heavy rains. It grows best in the western Corn Belt and the Great Plains area. Articles relate how various producers got started growing amaranth, the pros and cons, its uses, and its profitability in the organic health food market. Amaranth can gross as much as \$600 to \$700 per acre. Mike Irwin, an amaranth grower from Wisconsin, summarizes the whole story of amaranth production

into one sentence: "During the first half of the summer, treat amaranth like a vegetable crop and the last half of the summer treat it like a grain crop." Amaranth's merits include its nutritional value, its short mid-summer growing season, and its use as a canned or fresh vegetable product.

- a. Amaranth: Ancient Crop Makes a Comeback . . . . . 5 pgs
- b. The World is Discovering Amaranth . . . . 4 pgs
- c. A Mid-Summer Crop for Fresh Greens or Canning: Vegetable Amaranth . . . . . 1 pg
- d. Amaranth: Modern Prospects for an Ancient Crop . . . . . 4 pgs
- e. Amaranth: New Future for an Old Crop? 2 pgs
- f. Amaranth . . . . . 1 pg
- g. Amaranth: A Potential Crop for Nebraska . . . . . 2 pgs
- h. More Information--Articles, Buyers, Seed Sources and Researchers . . . . . 2 pgs

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**APPLES**

America's favorite fruit needs no introduction! Articles in this section deal with new varieties, techniques, and packaging. For more general information, see 'Tree Fruits.'

- a. Ashton Orchards--Successfully Marketing the Antique and the Modern Apple . . . . . 3 pgs
- b. Antique Apples: \$1.83 Each . . . . . 2 pgs
- c. English Extensively Test Apples Before Harvest . . . . . 1 pg
- d. Making Inroads With Galas and Fujis . . . 2 pgs
- e. Apple Harvest in the Brushy Mountains . 3 pgs
- f. The Rest of the Story (Alar report) . . . . 1 pg
- g. New Retail-Size Package Keeps Apples Fresh and Crisp for More Than Six Months . . . . . 2 pgs
- h. Switch to Fresh . . . . . 2 pgs
- i. Cash In On Uncommon Varieties . . . . . 2 pgs

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**ASPARAGUS**

Asparagus is a dioecious perennial vegetable that takes three to five years to come into full production. Once established, it can be maintained for 15 to 20 years and yields an average of 3,000 pounds per acre. Market analysis and planning before planting is

essential. Asparagus is sold through wholesale and retail groceries, chain stores, commission houses, re-sell (re-pack), processors, jobbers, farmers' markets, pick-your-own operations, and exporters. Asparagus requires well-drained, sandy soil and sunny sites. It must be properly cared for to insure future growth. 'Martha Washington,' a favorite asparagus cultivar, can be grown from seed.

Problems include weeds and pests, such as spotted and common asparagus beetles, aphids, cutworms, and grasshoppers. In the Midwest, asparagus is harvested from April until mid-June. Advertising includes local radio stations, newspapers, word of mouth and mail order. In-depth discussions of the industry, soils, fertilization, planting, growing, cultivation, care, duration, harvesting, packing, diseases, insects, forcing, cost of production, and returns are available.

- a. Back to the Basics--Getting Started in Asparagus Production . . . . . 14 pgs
- b. Asparagus: The Perennial Vegetable . . . . 2 pgs
- c. King of the Garden . . . . . 5 pgs
- d. Asparagus (Prod. Veg. Crops) . . . . . 15 pgs
- e. Direct Marketing Asparagus . . . . . 2 pgs
- f. Costs of Asparagus Production in Western Michigan . . . . . 4 pgs
- g. Growing Home Garden Asparagus . . . . 2 pgs
- h. Is Your Asparagus Worth Its Salt? . . . . 1 pg
- i. Asparagus? It's Easy! . . . . . 5 pgs
- j. Commercial Vegetable Production: Asparagus . . . . . 8 pgs
- k. Asparagus . . . . . 2 pgs
- l. Asparagus (USDA #829) . . . . . 18 pgs
- m. Opportunities Abound in Fresh-Market Asparagus . . . . . 1 pg
- n. Asparagus 'Spears' Seasonal Harvest . . . . 2 pgs
- o. Hoosiers Develop Asparagus Niche . . . . . 1 pg
- p. Asparagus Experiences . . . . . 2 pgs
- q. The Asparagus Challenge . . . . . 3 pgs
- r. More Information--Extension Specialists Listed . . . . . 1 pg

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**BAMBOO**

Articles summarize techniques for growing bamboo, and outline its use in food preparation and as a house plant. The articles discuss bamboo growth (life cycle), starting and caring (soil types, planing, and care), control, and harvesting. Five strains of bamboo seem

hardest for a Massachusetts grower: *Phyllostachys angusta*, *P. bissetti*, *P. congesta*, *P. flexuosa* and *p. nuda* (an included table lists some hardy bamboos which are commercially available). A short discussion on landscaping and practical uses is presented. Bamboo sources and resources are also included.

A historical perspective of the bamboo plant is designed to give the reader a concept of: 1) what to look for in studying a bamboo plant, 2) what is known about bamboo propagation, 3) distinguishing characteristics, 4) known technical properties, and 5) an analytical review of available research on the bamboo plant. (Included is an appendix listing nurseries in the United States which offer bamboo.)

- a. Bamboo ..... 2 pgs
- b. Hardy Bamboos: Versatile Plants for Northern Gardens ..... 5 pgs
- c. The Bamboos: A Fresh Perspective .... 7 pgs

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**BEANS**

*Dry*

Edible beans include pinto, navy, dark red kidney, great northern, pink, small red, black turtle, cranberry, adzuki, and Swedish brown classes--all harvested as mature dry beans. Various dry bean markets, competitors of the US dry bean market, and potential markets are discussed in general. Production is influenced by the market and by the availability of buying stations or processing facilities. A discussion of production requirements, planting dates, row spacing, fertility, weed control, water use, disease prevention and control, insect problems, harvesting, drying, storage, and alternate uses of beans is included.

A summarization of weed and insect pests, plant diseases, and management strategies in the western and eastern United States is given. Benefits include nitrogen fixation, grassy weed control, and use as a rotation crop for breaking disease cycles. Relatively high humidity and rainfall are not conducive to production, unless the beans are intended as an alternative protein crop for animal feeding.

Appearance and quality of seeds are important for marketability. A description of the major cultivars is

given. Production considerations such as land requirements, fertilization, rhizobium inoculation, seeding, weed problems and insect problems are included. Profitability of dried beans may be greater than that of soybeans and corn according to Harry Minor and Lou Meinke, professors at the University of Missouri-Columbia. Excerpts include the economic importance of beans, adaptation, botanical description, bean types, crop rotation, fertilization, production practices, diseases and insects.

- a. The following articles are from Grain Legumes as Alternative Crops, a symposium sponsored by The Center for Alternative Crops and Products, University of Minnesota:
  - 1.) Market Classes, World Demand, and Competitive Consideration of Field Beans ..... 5 pgs
  - 2.) Production Practices and Constraints to Expansion of Field Beans in the Region ..... 6 pgs
  - 3.) Pest Problems of Field Beans in the United States ..... 7 pgs
  - 4.) Production, Insect and Weed Considerations with Dry Peas, Lentils, Chickpeas, and Faba Beans .... 15 pgs
  - 5.) Disease Problems on Dry Beans, Lentils, Chickpeas, and Faba Beans .... 18 pgs
- b. The Production of Field Crops ..... 1 pg
- c. 'New' Crops in the New Year ..... 2 pgs
- d. Profit in Uncommon Beans ..... 1 pg
- e. Principles of Field Crop Production .... 16 pgs
- f. Protein Beans Grow a Main Dish ..... 4 pgs
- g. Raise High The Broad Bean. .... 3 pgs

*Sprouts*

Bean sprout production is not confined to larger operations; with proper marketing, they can be profitable for small growers. Marketing research methods, packaging, equipment, facilities, and general scheduling information for the smaller operation are presented. Sunsprout Systems, Inc., of Fairfield, Iowa, is developing a standardized package for people looking for a part-time business they can start for under \$2,500 in a basement or spare room.

Various seed sprouting options are available for the home gardener, such as the Chinese mung bean, alfalfa, fenugreek, buckwheat, lentils, cabbage, kale, cauliflower, radish, oats, rye, rice, and wheat. Sprouted seeds are those which have been germinated

and allowed to grow for a few days, until the sprouts are between 6-12 mm ( $\frac{1}{4}$ - $\frac{1}{2}$  in.) long. A discussion of containers, temperature, rinsing methods, and the sprouting base is incorporated. A general list of seed suppliers is included.

Use, appearance, planting (timing, procedure, and general culturing), harvesting (options and date), and cultivar information for adzuki beans, faba beans, and mung beans are outlined. Description of growing methods, as well as culinary and other uses, are presented.

- a. So You Want to be a Sprout Farmer . . . . 4 pgs
- b. Grow Your Own Chinese Vegetables  
(Sources Included) . . . . . 11 pgs
- c. Raise Your Own Sprouts . . . . . 4 pgs

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### BIRDSEED

An outline of costs, packaging options, marketing, and distribution strategies in Illinois, Michigan, Missouri and Iowa are provided. A general outline of proso millet—including description, planting, weed and pest control, harvesting, storage, marketing, and use—is presented. Proso millet is planted and matures in 60 to 75 days during the warm season, while canary seed is planted during the same period as wheat and barley. Soil attributes which are most influential include water holding capacity, internal drainage, seedbed condition, and soil fertility. Nitrogen, phosphate, and potash suggestions are presented, along with application methods.

- a. Bagging and Selling Bird Seed . . . . . 3 pgs
- b. Proso Millet in North Dakota . . . . . 3 pgs
- c. Fertilizing Millet and Canary Seed . . . . . 2 pgs
- d. Proso . . . . . 2 pgs
- e. Double-Crop Sunflower Demo Planting . . 2 pgs

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### BLACKBERRIES/BRAMBLES

The blackberry is a bramble which must be researched thoroughly for production and marketing success. Soils with a pH of 5.5 to 6.5, with good internal water drainage and plenty of organic matter, produce best results. Blackberries are planted in the spring; fertilization should occur about six weeks after the plants begin to grow. Points to consider are: starting small, buying certified plants, watering an

average of 1 to 2 inches of water per week, pruning properly, and marketing.

- a. Brambles as an Alternative Enterprise . . . 2 pgs
  - b. Growing Blackberries in Missouri . . . . . 10 pgs
  - c. Taming the Blackberry . . . . . 5 pgs
  - d. Brambles: Find Market First . . . . . 2 pgs
  - e. Bramble Disease Management . . . . . 2 pgs
  - f. Nursery List, List of Publications and  
Other Resources . . . . . 3 pgs
- \*See also 'Raspberries' and 'Small Fruits'*

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### BLUEBERRIES

Are you looking for a lucrative cash crop? If so, blueberries may be just the crop for you. A half-acre of established U-Pick blueberries can gross more than \$3,000. To plant a half-acre of blueberries, you will need about 550 plants and can expect to spend around \$1,200. You might also want to consider planting sod strips between the rows of blueberries for U-Pick customers.

Blueberries require acid soils with a pH of 4.5 to 5.2. The plants should be mulched with sawdust, wood chips, pine needles, bark or any similar material. Irrigation may be needed for adequate moisture during July and August. The amount and type of fertilization depends upon soil pH and soil nutrients.

Harvesting and pruning techniques, as well as weed and disease control, are discussed. A listing for northern highbush, ornamental cultivars, southern highbush and Rabbiteye cultivars sold by Hartmann's Plantation, Inc. is included. The list describes hardiness zones, yield, growth, quality, harvesting, and marketing of various cultivars in Northern and Southern Regions.

- a. Blueberry Marketing Challenge . . . . . 1 pg
- b. Sing A Song of Blueberries . . . . . 6 pgs
- c. Growing Blueberries in Missouri . . . . . 16 pgs
- d. Blueberry Industry Economic Prospects  
in Future Years . . . . . 9 pgs
- e. No Singing the Blues with These Berries . 2 pgs
- f. Expand Markets for Southeastern Berries 2 pgs
- g. Highbush vs. Rabbiteye Blueberry: A  
Comparison of Fruit Quality . . . . . 1 pg
- h. Blueberries Burst Forth . . . . . 2 pgs
- i. Improve Blueberry Set With  
Gibberellic Acid . . . . . 1 pg

- j. Northern & Southern Blueberry Growers Guide (Hartmann's Plantation, Inc. catalog) . . . . . 24 pgs
  - k. References (Books, Magazines, and Government Publications) and Resources (Nurseries & Related Packets Available from Missouri) . . . . . 2 pgs
  - l. Selected Educational Resources For Small Farmers: Berries . . . . . 5 pgs
- \*See also 'Small Fruits'*

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**BROCCOLI**

Although broccoli is probably not the favorite vegetable of American children, its high vitamin and mineral content has made it the veggie of choice for many health-conscious adults. Imported from Italy in the 1800s, this member of the cabbage family offers high levels of calcium, iron, vitamins A and C, and fiber. California currently controls about 88% of the domestic broccoli market, but the plant's hardiness makes it a candidate for cooler climates as well. Midwestern and Eastern growers report success with this popular vegetable. Broccoli demands soils rich in nitrogen and boron, with a pH near 6.5, and may produce two crops per season with proper management.

- a. The Delights of Broccoli . . . . . 4 pgs
  - b. Broccoli: Eastward Ho! . . . . . 3 pgs
  - c. Broccoli, Cabbage, and Cauliflower . . . . 10 pgs
  - d. Broccoli Production Tips . . . . . 1 pg
- \*See also 'Vegetables' and 'Specialty Produce'*

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**BROOMCORN**

Broomcorn differs from other members of the sorghum family in that it produces beads of long branches which form a brush. These long branches of brush are used for making brooms. There are two groups of broomcorn, the dwarf and standard (which grows from four to fifteen feet in height). Broomcorn does best when the weather is dry and clear during maturing and harvesting. Broomcorn should be planted in areas which are most suited for corn, but where the ground has warmed by May 1. Equipment needed for harvesting includes a thresher, baler, and drying sheds.

Methods of harvesting, curing, and marketing are discussed. Large kitchen brooms sell for around \$12, "cobweb" round brooms run about \$6, fireplace brooms sell for \$8, and whisk brooms sell for \$4 to \$6. An in-depth discussion of the skill and art of broom making is presented.

- a. Broomcorn (Small Farm Journal) . . . . . 1 pg
- b. Broomcorn (Small-Scale Grain Raising) . 4 pgs
- c. Marketing Broomcorn (1922) . . . . . 34 pgs
- d. Broomcorn Growing & Handling (1930) 19 pgs
- e. Broomcorn Production in Oklahoma . . . . 2 pgs
- f. Diversified Farming Pays for Horse Farmer . . . . . 2 pgs
- g. Brooms and Brushes (Foxfire 3) . . . . . 15 pgs
- h. More Information--Magazines, Publications and Companies That Use Broomcorn . . . . . 2 pgs

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**CANOLA**

"Canola" is actually an improved version of an old crop--rapeseed. The new plants produce seeds low in erucic acid and glucosinolates, making them suitable for human consumption. This alternative field crop has another feature which is adding to its popularity in today's health-conscious marketplace; canola oil has the lowest level of saturated fat and the highest level of unsaturated fat of any edible vegetable oil. With a growing season (and cash returns) similar to winter wheat's, canola also harvests early enough to double-crop with soybeans. Yield averages between 35-45 bushels per acre, with returns of around \$5.00 per bushel. Its major drawback is an unsteady market; as with any fairly new crop, canola is taking some time to settle into the established market.

Articles in this section detail the pros and cons of canola, as well as its growing season, fertilizer requirements, planting procedure, harvesting, and marketing possibilities. Fact sheets from Ameri-Can, a canola seed marketing company, provide more information.

- a. How Canola Shells Out . . . . . 2 pgs
- b. Canola . . . . . 3 pgs
- c. Farmers Report Varied Canola Yields . . . 2 pgs
- d. New Winter Crop Flowers For Farmers . 1 pg
- e. Canola: A Fall-Seeded Crop That Can Put Money In Your Pocket . . . . . 2 pgs

f.	Canola Primer: Could This Be The Alternative? . . . . .	2 pgs
g.	Get Winter Canola Up And Off To A Fast Start . . . . .	1 pg
h.	Making Progress With Canola . . . . .	2 pgs
i.	The Year For Canola . . . . .	4 pgs
j.	Tips For Canola Success . . . . .	2 pgs
k.	Canola: Can This Crop Fit Into Your Farm Operation? . . . . .	2 pgs
l.	Ohio Farmers Check Out Canola At Field Day . . . . .	2 pgs
m.	Agronomists Say Canola Shows Promise As Crop In Kentucky . . . . .	2 pgs
n.	Canola Offers Option For Wheat . . . . .	2 pgs
o.	New Canola Venture Launches Domestic Production . . . . .	2 pgs
p.	Ameri-Can Facts/Ameri-Can Shapes US Canola History . . . . .	7 pgs
q.	Canola Fact Sheets . . . . .	8 pgs
r.	Canola: A Profitable Winter Crop . . . . .	6 pgs
s.	A Narrative History Of Canola . . . . .	3 pgs

*\*See also 'Alternative Field Crops' and 'Industrial Crops'*

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## CHRISTMAS TREES

Christmas tree production is labor intensive during planting and summer maintenance, when each tree must be sheared. It usually takes 6-8 years before Christmas trees are ready for market. Costs range from \$100 to \$1000 per acre for seedlings or transplants. A general discussion of relative costs over an eight year period is presented. Perfect shaping, as well as a wider variety of trees, have changed the Christmas tree industry. Shaping tools may include a pocket knife, shearing knife, machete, or grass sickle.

Marketing options include wholesale, retail, choose-and-cut, and stumpage sale. The market can be lucrative because Christmas tree shoppers pay as much as \$15 wholesale and \$20-\$30 retail.

Some family operations provide visits from Santa Claus, coffee, hot chocolate, and other refreshments to customers searching for the perfect tree; many also sell by-products, such as wreaths and cones. In some areas, artificial trees are crowding out 'real' trees and account for 47% of the market--these entertainment sidelines may help recapture a greater share of holiday sales.

a.	High-Return Evergreens . . . . .	3 pgs
b.	Growing and Marketing Christmas Trees . . . . .	4 pgs
c.	Shaping Pine Christmas Trees for Quality . . . . .	2 pgs
d.	People Pay to Cut at Christmas Forest . . . . .	3 pgs
e.	Christmas Trees: Choose & Cut Fits Grain Farm . . . . .	3 pgs
f.	Alternative Ag Enterprises: Christmas Trees . . . . .	2 pgs
g.	Artificial Trees Cut Away at 'Real' Christmas Tree Market . . . . .	2 pgs
h.	Good Management Yields Quality Christmas Trees . . . . .	2 pgs
i.	The Christmas Tree Crisis; Sell Them Better They Do; The Trees Can't Sell Themselves; He Chose Choose-and-Cut . . . . .	7 pgs
j.	Pine Christmas Tree Budget For Missouri . . . . .	2 pgs
k.	Missouri Christmas Tree Industry . . . . .	2 pgs
l.	Christmas Tree Management . . . . .	12 pgs
m.	1987 Ohio Buyers' Directory (Ohio Christmas Tree Association) . . . . .	25 pgs
n.	Your Future In Christmas Trees Is In Your Hands . . . . .	4 pgs
o.	Software for Christmas Tree Growers . . . . .	1 pg
p.	Improved Virginia Pine Christmas Trees Through Genetics & Cultural Practices . . . . .	3 pgs
q.	Shaking Up The Christmas Tree Business . . . . .	1 pg
r.	Marketing Pennsylvania-Grown Christmas Trees . . . . .	7 pgs
s.	A Southern View: Trees and People . . . . .	2 pgs
t.	Christmas Trees Play A Major Role In Nova Scotia . . . . .	1 pg
u.	People Pay To Cut At Christmas Forest . . . . .	3 pgs
v.	Spruced-Up Marketing Efforts Boost Christmas Tree Industry/ Merchandising Christmas Trees In A "Winter Wonderland" . . . . .	8 pgs
w.	More Information, Books and Associations . . . . .	2 pgs

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## CORN, SWEET

This American favorite needs no introduction; its proven popularity has turned sweet corn into money in the bank for many produce growers. Good yields average 1,000 ears per acre, and returns are usually around \$0.10 per ear for top quality corn. You can expect to pay around \$500-\$750/acre in production costs, depending on factors like labor, acreage to be



planted, etc. Storage can present a problem, as sweet corn begins to lose its sweetness immediately after being picked; speedy cooling is the only solution. Articles in this section present a detailed look at the benefits and disadvantages of sweet corn production, and discuss everything from soils and fertilization to exciting new varieties.

- a. Fresh Market Sweet Corn . . . . . 4 pgs
  - b. Commercial Vegetable Production:  
Sweet Corn . . . . . 7 pgs
  - c. New Sweeter Corns Offer  
Marketing Opportunities . . . . . 4 pgs
  - d. Tips On Selecting Sweet Corn . . . . . 1 pg
  - e. Selected Fruit and Vegetable Planning  
Budgets: Sweet Corn . . . . . 3 pgs
  - f. The New Sweet Corns . . . . . 1 pg
- \*See also 'Specialty Produce' and 'Vegetables'*

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## CRAMBE

Crambe, a member of the mustard family, is an oilseed crop. It is used as a raw material by industries for manufacturing polyethylene waxes and nylons. Crambe can be grown in the Eastern Corn Belt and in the Southern Delta on loam and sandy loam-type soils. Estimated crambe production costs are about \$147 per acre. Harvested crambe is valued at \$.79 per pound. Besides crambe, other industrial crops include Meadowfoam and Winter Rapeseed.

- a. Industrial Feedstocks and Products  
from High Erucic Acid Oil: Crambe  
and Industrial Rapeseed . . . . . 29 pgs
- \*See also 'Alternative Field Crops' and 'Industrial Crops'*

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## FLAX

Flax grows best in cooler climates on soils that are not too heavy; it is adaptable to tough sod or newly broken soil. A grain drill is the usual method of sowing the seed, and a grain binder is used for harvesting. Flax should not be grown on the same field more than once in five years to prevent flax disease build-up. Flax is primarily used in the manufacture of linseed oil, paints, varnishes, linen cloth, and other industrial uses. Methods of planting, crop rotation, and spinning are discussed.

- a. Flax . . . . . 7 pgs
- b. Handspinning Flax . . . . . 8 pgs
- c. The Production of Field Crops--A  
Textbook of Agronomy . . . . . 7 pgs
- d. Principles of Field Crop Production . . . 16 pgs
- e. Sources of Fibers . . . . . 1 pg

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## FLOWERS

### *Cut*

Foliage plants vary in shape, size and color. When shipping interstate, producers should be careful of state and federal plant quarantine laws. A minimum of two acres can be profitable, with peak sales around Mothers Day, Valentines Day, and Christmas. Variable costs average 40 to 50 percent of gross receipts. Greenhouses cost anywhere from \$10 to \$40 per square foot. Pests are the largest problem facing a greenhouse manager. Trends in the floral industry show an ever-increasing market for the importing of cut flowers (better quality, selection and price). General descriptions of planting, fertilization, stem cutting, and preservation are provided.

- a. Foliage Plants: A Small-Scale  
Agriculture Alternative . . . . . 2 pgs
- b. Profits from Roses . . . . . 4 pgs
- c. Make Money with Mums; Statice: Easy  
and Profitable; Dollars for Daffodils;  
Cut Flowers for Income . . . . . 8 pgs
- d. Texas Study Examines Growth of  
Marketing Cut Flowers . . . . . 4 pgs
- e. Pack Trials Reveal Breeding and  
Marketing Trends. . . . . 3 pgs
- f. Put Bloom On Your Bottom Line . . . . . 4 pgs
- g. Sources for More Information . . . . . 2 pgs

### *Dried*

The dried flower market includes everlastings like artemisia, statice, ammobium, lavender, larkspur, and thyme, just to name a few. Cut the flowers with stems as long as possible and bunch them together with a rubber band or binder clip--this is also the simplest method of packaging.

One of the simplest ways to preserve everlastings is by air drying. Air drying requires cool, dry summer air or a dry, well-ventilated, dark room which is free of

dust and not less than 50°F (10°C). The quicker the flower is dried, the better it retains its color and shape. Everlastings should be suspended for two to three weeks to insure complete drying. Several other methods of drying are discussed: drying in containers with or without water, pressing, desiccants, silica gel, and the microwave. Flowers that mold due to moisture can be shredded and sold in potpourri.

Marketing outlets include farmers' markets, craft fairs, horticultural shows, wholesales, and home retail. Suggestions for advertising and sources of seed and plants are presented. Average cost per acre in Ohio is \$9,750, with income ranging from \$10,000 to \$32,000 per acre depending upon the flowers used.

- a. Marketing Dried Flowers (ADAPT3) . . . 2 pgs
- b. Fit to be Dried...Making a Wreath . . . . 6 pgs
- c. Flowers That Last Forever . . . . . 16 pgs
- d. Flower Drying With a Microwave . . . . . 6 pgs
- e. Cut and Dried . . . . . 1 pg
- f. Remembrance Of Gardens Past . . . . . 5 pgs
- g. The Complete Book of Everlastings  
(excerpt) . . . . . 4 pgs
- h. The Commercial Field Production of  
Cut and Dried Flowers . . . . . 8 pgs
- i. Dried Flowers (Summary of Second  
National Conference on Farm Income  
Enhancement) . . . . . 4 pgs
- j. Fill Your Hours With Flowers . . . . . 4 pgs
- k. Flowerfest's a Showcase for Growers . . . . 5 pgs
- l. Now, Flowers Can Stay Frozen In Time . 1 pg
- m. Sources for More Information . . . . . 1 pg

*Edible*

Edible flowers have become quite popular with the gourmet crowd. Elderberry, apple, and squash blossoms are just a few of the flowers that can be used for culinary purposes. Edible flowers are used dried or fresh, and their essence adds a unique flavor to many dishes. They are also quite attractive when used as a garnish or in salads.

Marketing edible flowers provides many opportunities for small-scale entrepreneurs; however, it is subject to the whims of designers, chefs, and fashion. Once a market is established, it is important to provide consistent, dependable service with high-quality products.

- a. Specialty Flowers: A Small-Scale  
Agriculture Alternative . . . . . 2 pgs
- b. Edible Flowers . . . . . 1 pg
- c. Edible Flowers for Year Round Use . . . . 2 pgs
- d. Culinary Herbs . . . . . 8 pgs
- e. Business Is "Blooming" . . . . . 2 pgs

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**FRUITS**

*Small Fruit*

Commercial fruit production is not often an easy task and is not the alternative agricultural project for everyone. Economic considerations for crops from blueberries to grapes include establishment costs, operating costs, and labor. It may take one to five years for fruit to reach maturity, with only a low to medium return on investment. Location and water availability are critical for success in small fruit production. One must also be able to coordinate and plan at least 15 to 30 months in advance.

Marketing strategies must be effective in order to compensate for product perishability, increasing competition, high costs of production, and changing consumer purchasing trends. Selling on a contract basis to processors requires a thorough knowledge of the commodity. Pricing is very important to direct marketers; each 1¢ move in price per pound, with 10,000 pounds per acre produced, changes profit by \$100. Determining fixed and variable costs in your location will give you an idea of whether it is profitable to produce and how to set your selling price. Knowing what the competition is doing is also very helpful as a gauge for setting your price.

- a. Choosing a Small Fruit Crop for  
Commercial Production . . . . . 2 pgs
- b. Money Making Ideas on Small Fruits . . . 2 pgs
- c. Site Selection and Preparation for Fruit  
Production . . . . . 4 pgs
- d. Cultural Practices for Small Fruit  
Plantings During the  
Establishment Years . . . . . 2 pgs
- e. Financial Management for Small Fruits . 2 pgs
- f. Berries: Meetings Hone Marketing Skills . 1 pg
- g. Fruit Cultivars for Ohio Home Gardens . 8 pgs
- h. Juneberry . . . . . 4 pgs
- i. Fruit In Flux . . . . . 1 pg
- j. Sell No Fruit Before Its Time . . . . . 1 pg

- k. Elderberries: Success On A Small Scale . 2 pgs
  - l. More information and nursery sources . . 4 pgs
- \*See also 'Blackberries/Brambles', 'Blueberries', 'Gooseberries and Currants', 'Grapes,' 'Raspberries', and 'Strawberries'.*

*Tree Fruit*

Some basics for successful tree fruit production include a good site, good deep soil, good planning, supplemental water, skillful management, and good marketing. Characteristics of apples, peaches and nectarines, pears, plums, sweet and sour cherries, and apricots are discussed in general. An overview of blooming times by variety is presented.

Dwarf trees, although more expensive, are easier to trim and bear fruit earlier. Spring planting is suggested to prevent winter injury. Fruit trees require special care during procedures such as fertilization and pruning, especially when trees are young. Climate affects the growth of the trees and the ripening process of the fruit. Protection from frost and proper thinning procedure for fruit trees are discussed.

- a. Tree Fruit Alternatives . . . . . 3 pgs
- b. Growing Apples, Pears and Quinces:  
Pest Control, Air Drainage Important . . . 3 pgs
- c. Peaches, Nectarines, Plums, Apricots,  
Cherries: Climate Puts Limit On What  
You Can Raise . . . . . 3 pgs
- d. The Ten Commandments for Fruit  
Marketing . . . . . 1 pg
- e. Investigate Asian Pears . . . . . 1 pg
- f. Nectarines: Nectar of the Gods Gains  
Popularity . . . . . 4 pgs
- g. Consumer Demand Rising for Tree-  
Ripened Fruit . . . . . 2 pgs
- h. Exporting to the US . . . . . 2 pgs
- i. Tree-Ripe or Tree-Hype? . . . . . 2 pgs
- j. Quality Key for Retail Orchard . . . . . 2 pgs
- k. Sweet Success With Honeybells . . . . . 1 pg
- l. Move Over, Cherry Pie . . . . . 1 pg
- m. Fitness & Fruit . . . . . 1 pg
- n. Fruit Acreage Growth Poses Challenges . 1 pg
- o. New Products For Tart Cherries . . . . . 4 pgs
- p. Perpendicular V For Peaches . . . . . 3 pgs
- q. Compare Costs Of High Density Systems 4 pgs
- r. Focus On Fruit Markets . . . . . 1 pg
- s. References and Resources . . . . . 1 pg

*\*See also 'Apples'*

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**GINSENG**

In the eastern United States, ginseng's nickname--"green gold"--is well-deserved. Ginseng is a valuable root that is sold worldwide; Hong Kong, Japan, Taiwan, Malaysia, Singapore, Indonesia and the Philippines consume 85% of American ginseng. Wild ginseng commands a higher price than field-grown ginseng, but there is some controversy over hunting wild ginseng. Some states require special permission to collect wild ginseng because collectors have seriously threatened the survival of the plant by stripping the forests.

Ginseng does not have to be hunted in forests; it can be grown in an idle woodlot. Ginseng likes a well-drained upland area, and it requires at least 70% shade to develop. With a little capital investment, one-half acre of ginseng can bring in \$30,000 in five or six years. The articles presented include information on various plants, maintenance, and harvesting methods. A list of root buyers, suppliers of machinery, artificial shade, seeds and/or seedling roots, consultants, organizations, and other literature is also provided.

- a. American Ginseng: A Forest Crop . . . . . 6 pgs
  - b. American Ginseng: Green Gold . . . . . 8 pgs
  - c. Farming Ginseng on Your Woodlot . . . . 5 pgs
  - d. Oriental Crops for Ozark Forests . . . . . 2 pgs
- \*See also 'Herbs'*

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**GOLDENSEAL**

The rhizomes of goldenseal, a medicinal herb, are used for the alkaloids they produce--Hydrastinine and Berberine. Goldenseal requires a moist, shady environment for growth. Propagation can be accomplished through rhizome division, stratified seeds, or by planting buds from roots. Goldenseal does not have any disease problems, but it is sensitive to high fertilization. Its general history, cultivation practices, and collection techniques are described in the articles. The wholesale price for goldenseal is \$11.00 per pound, and it retails for \$20.00 per pound.

- a. Golden Seal Cultivation...Golden Seal  
History (from *Ginseng and Other  
Medicinal Plants*) . . . . . 24 pgs

- b. Golden Seal (*Herbal Bounty*) . . . . . 4 pgs
  - c. The Potential of Herbs as a Cash Crop (Selected Tables) . . . . . See 'Herbs'
  - d. Golden Seal (The Rodale Herb Book) . . 4 pgs
- \*See also 'Herbs'*

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### GOOSEBERRIES & CURRANTS

Adapted to cool, moist areas, currants and gooseberries can be grown in partial shade on soils of high organic matter. Bearing fruit in June and July, these brambles live 10 to 15 years. Currants yield three to four quarts per mature bush per season, and gooseberries yield five to ten quarts per mature bush per season. General information on planting, fertilization, harvesting, and pruning is given.

- a. Currants, Gooseberries and Elderberries . 1 pg
- b. Currant and Gooseberry . . . . . 4 pgs
- c. Currant & Gooseberry: Cold Climate Friends (from *Successful Berry Growing*) . 5 pgs
- d. Gooseberries and Currants (from *Training and Planting Small Fruit Crops In Missouri*) . . . . . 3 pgs
- e. Nursery List and More Information . . . . 3 pgs

*\*See also 'Small Fruits'*

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### GOURDS

Gourds grow best in sandy loam soils with compost or rotted manure, sprinkled with cotton seed meal and wood ashes. Basic input cost for one acre of gourds is about \$350. Seeds sell for 35¢ per seed. Wholesale prices average \$3; retail prices range from \$5 to \$40 for the larger gourds.

Innovative ideas for people interested in crafts include burning scenes or inscriptions on the gourds, rattles, and other decorative ideas. General descriptions of cultivars, propagation, pest control, pruning, harvesting, and preservation are included.

- a. Growing Gourds (ADAPT2) . . . . . 1 pg
- b. Great Gobs O' Gourds . . . . . 5 pgs
- c. Gourds: A Fun Plant for Your Garden . . 1 pg
- d. Are You Out of Your Gourd? . . . . . 1 pg
- e. Gourds are Easy . . . . . 1 pg
- f. Gourds: Their Culture and Craft . . . . 13 pgs

- g. Big Sponge Gourds Attract Attention as Alternative Crop . . . . . 1 pg
- h. Seed Suppliers and More Information . . 2 pgs

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### GRAPES

Grapes can be categorized as table or juice grapes; table grapes offer a higher profit per acre. Table grapes yield approximately \$4,000 to \$5,000 per acre with annual maintenance costs of \$800 to \$1,000 per acre. When starting, plant five or six varieties suited to your climate. A sample six-year budget plan is provided.

California grape growers have had great success with drip irrigation. The single curtain cordon, the Geneva double curtain, and knitted systems are a few of the various types of training systems for grape vines that are discussed. An in-depth discussion of vineyard preparation, planting, posts and wires, and winter protection is presented.

- a. Table Grapes . . . . . 2 pgs
  - b. Drip Irrigation Grapes . . . . . 3 pgs
  - c. Training Systems for Missouri Vineyards . 6 pgs
  - d. Grapevine Planting Guide . . . . . 8 pgs
  - e. Succeeding With Viniferas . . . . . 2 pgs
  - f. Wineries Serve a Taste of Romance . . . 3 pgs
  - g. Vacuum Your Grapes . . . . . 2 pgs
  - h. Partners in Wine . . . . . 2 pgs
  - i. The Grape Escape . . . . . 2 pgs
  - j. Grow Table Grapes Successfully . . . . . 3 pgs
  - k. Table Grapes Could Be A Source of Farm Income In KY . . . . . 1 pg
  - l. Grape Winter Injury Tips . . . . . 1 pg
  - m. Contacts, Nursery List, and Others . . . . 3 pgs
- \*See also 'Small Fruits'*

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### HERBS (and herb drying techniques)

Herbs are used in a variety of ways, with culinary, cosmetic, industrial, medicinal, landscaping, decorative and incense or fragrance-emitting properties. The fresh-cut herb business is the best market for the small entrepreneur. Advice is given on getting started and on various marketing ideas such as contacting local grocers, selling at home, and mail order. Currently, 95% of the herbs and spices sold in the U.S. are imported. Herbs retail for \$2.15 to \$20.00 per pound. Starting seeds in flats requires good

sanitation practices. Supplemental lighting may be needed in the winter months.

Drying herbs successfully depends upon temperature control and air flow. Drying can be done by hanging plants in a warm room or using forced air, desiccants, or a microwave. One article thoroughly describes the construction techniques for two herb driers. A list of flowers and herbs dry well with each method is also presented. The lack of current research on herb cultivation, as well as the lack of knowledge about labor requirements, are obstacles for herb growers.

- a. Herbs: A Small-Scale Agriculture  
Alternative . . . . . 2 pgs
- b. Growing Herbs for Market . . . . . 8 pgs
- c. Herbs and Spices Offer Diversity . . . . . 3 pgs
- d. Greenhouse Herbs . . . . . 2 pgs
- e. Herb Business . . . . . 1 pg
- f. Harvesting and Drying Herbs . . . . . 4 pgs
- g. Herb Harvesting . . . . . 2 pgs
- h. Herbs: Big Success Comes in a Small  
Package . . . . . 3 pgs
- i. Herb Farming Makes Good 'Scents' . . . . . 2 pgs
- j. Creeches Offer Unique Herb, Floral  
Experience . . . . . 1 pg
- k. Drying Crude Drugs (USDA) . . . . . 16 pgs
- l. The Potential of Herbs as a Cash Crop--  
Tables, Seed Sources, and Bulk Buyers . . . 6 pgs
- m. Herb Gardening (Jan 85-July 90) Quick  
Bibliography Series . . . . . 11 pgs
- n. Medicine-Tree Farm . . . . . 2 pgs
- o. Economic Outlook For Herbs and  
Spices In The 1990s . . . . . 2 pgs
- p. More information . . . . . 8 pgs
- q. Flowers That Last Forever--  
Growing, Harvesting, and  
Preserving . . . . . See 'Flowers--Dried'
- r. The Complete Book of Everlastings  
(excerpt) . . . . . See 'Flowers--Dried'

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## KIWIFRUIT

The hardy kiwi is a native of Asia, but there is a self-pollinating variety that is now grown in America. It can stand temperatures as low as 25 degrees below zero, and is sweeter than its cousin, the fuzzy kiwi. Although it prefers richer soils, the hardy kiwi will grow in marginal soils; however, it requires adequate moisture and excellent drainage. Grown like a grape vine, the hardy kiwi can be started from seeds within

the fruit. Although a dioecious plant, one can graft the male onto the female plants or include one male plant within 35 feet of every five to ten female plants to provide pollination. A discussion of planting, care, vine training, and other growing tips is provided.

- a. How to Grow Hardy Kiwi . . . . . 4 pgs
- b. You Can Grow Your Own Kiwi . . . . . 3 pgs
- c. Trying Something New . . . . . 1 pg
- d. Search on for Kiwi Cousins . . . . . 1 pg
- e. Kiwifruit in Missouri . . . . . 2 pgs

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## MELONS

Various cultivation techniques, insect control, harvesting, marketing and grading techniques of melons (cantaloupes and watermelons) are presented. Although melons are a labor intensive crop, using plastic row covers and mulch systems to stagger planting dates is helpful. Marketing may include a delivery route, direct marketing, or wholesaling. When wholesaling, one must have a thorough knowledge of packaging, shipping requirements, and insurance needs.

Miniature melons are hybrid triploid varieties of watermelon. They range from 5 to 10 pounds and can be competitively grown by small-scale entrepreneurs for direct retailing. Germination of these seeds requires special care; however, they can be started in pots or pellets of peat in greenhouses, or with some other temperature control method. Hybrids of other vine-producing dessert fruits, such as cantaloupe, are also recommended for disease tolerance and quality.

Botanical names, production, consumption trends, vitamin content, nematode control, and other topics that deal with transportation and marketing are presented. A table of various agriculture enterprises that include market, cost to start, special requirements, risks, and returns. Various costs for establishing, growing and budgeting watermelon and cantaloupe are presented.

- a. Dessert Vines: A Small-Scale Agriculture  
Alternative . . . . . 2 pgs
- b. Producing Vegetable Crops: Muskmelons 16 pgs
- c. Producing Vegetable Crops: Watermelons 13 pgs
- d. Costs of Watermelon Handling from  
Grower to Retailer . . . . . 18 pgs

e.	Systems and Costs for Marketing Cantaloupes . . . . .	30 pgs
f.	Knott's Handbook for Vegetable Growers (Info on melons included) . . . . .	See 'Vegetables'
g.	Selected Fruit and Vegetable Budgets . . .	6 pgs
h.	High Yield Gardening . . . . .	2 pgs
i.	Growing Watermelons in Missouri . . . . .	4 pgs
j.	New Melon Being Tested . . . . .	1 pg
k.	Commercial Muskmelon Production in Illinois . . . . .	4 pgs
l.	Growing For Market: Watermelons . . . . .	13 pgs
m.	Seedless Melon Demand Growing . . . . .	1 pg
n.	A Seedless Revolution . . . . .	1 pg
o.	Pepino Dulce 'Toma': Nature's Versatile Melon . . . . .	1 pg
p.	Seed Sources and Other Sources of Information . . . . .	4 pgs

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## MUSHROOMS

### Button

Button mushrooms are the most common mushrooms in the world. The lesser-known oyster mushroom is gaining in popularity. Button mushrooms are grown on compost that has been supplemented with nitrogen and a conditioning agent. Oyster mushrooms can be grown on cereal grain straw as well as hardwoods. Pasteurization of the growing medium (corn stalks, wheat straw, cotton waste) is necessary to control competitor organisms. Other cultivation methods such as temperature control, aeration, and humidity control are discussed. Mushrooms are harvested before maturity to prevent spore accumulation. Button mushrooms generally sell for \$.90 to \$1.00 per pound, and take two to three months to produce. Oyster mushrooms sell for three to five times more than button mushrooms. Problems encountered in mushroom farming include poor quality spawn, log dryness or overheating, competing wood-rotting fungi, molds, termites, deer, slugs, snails, and insects.

a.	Mushrooms: A Small-Scale Agriculture Alternative . . . . .	2 pgs
b.	Six Steps to Mushroom Farming . . . . .	8 pgs
c.	Raising Oyster Mushrooms (ADAPT2) . . .	2 pgs
d.	Cultivation of Oyster Mushrooms . . . . .	2 pgs
e.	Mushrooms and Other Related Fungi. . . .	12 pgs
f.	References and Sources . . . . .	3 pgs

\*See also 'Truffles'

### Shiitake

Shiitake (pronounced "shee-tah'-kee") mushrooms are grown on hardwood logs. One cord of wood can produce 338 pounds of shiitake mushrooms over a 20-month period. Shiitake have a chewy texture and a full-bodied aromatic flavor. They are very low in calories and fat, but contain abundant amounts of B vitamins and minerals. Shiitake are resistant to bruising and spoilage and have a shelf life of 12 days. In Ohio, fresh shiitake bring \$4 to \$6.50 a pound wholesale. Production costs average about \$500 per cord. The various steps for cultivating shiitake mushrooms are outlined.

a.	Shiitake Mushrooms . . . . .	3 pgs
b.	Shiitake Mushrooms (ADAPT2) . . . . .	2 pgs
c.	Shiitake . . . . .	4 pgs
d.	Growing Shiitake--The Basics . . . . .	2 pgs
e.	Oriental crops for Ozark Forests . . . . .	2 pgs
f.	Questions and Answers About Shiitake Cultivation . . . . .	2 pgs
g.	Persimmon Hill Farm's Instructions for Caring for Your Shiitake Log . . . . .	1 pg
h.	Fungi With a Future . . . . .	2 pgs
i.	A Flavorful Fungi . . . . .	3 pgs
j.	Shiitake Marketing Guide Gives Growers Valuable Tips . . . . .	2 pgs
k.	References and Resources . . . . .	6 pgs

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## NUT TREES

A detailed treatment of various nut trees, from almonds to persian walnuts, is presented. Aspects of cultivation, such as soil, air, drainage, site, varieties, culture, pollination requirements, bearing time, and yield are also presented. The articles include information on harvesting, curing, cracking, and propagation.

a.	Growing Nuts . . . . .	25 pgs
b.	Nut Crops--Trees for Food, Ornament, Shade, and Wood . . . . .	5 pgs
c.	Tough Nuts . . . . .	12 pgs
d.	Chestnuts: Making a Comeback? . . . . .	2 pgs
e.	Growing Chestnuts In The U.S. . . . .	1 pg
f.	Hazelnuts Could Be New Great Lakes Crop . . . . .	2 pgs
g.	More Information and Catalog Sources . .	2 pgs

\*See also 'Pecan Trees' and 'Walnut Trees'

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## ONIONS

These flavorful bulbs rank among America's most popular vegetables; started from seeds or from sets, cooking and sweet onions can be a profitable produce choice. Articles in this section detail the progression from seed to harvest, offer sample production costs, and reveal the secrets of a successful onion grower.

- a. Sweet Onion Success . . . . . 1 pg
- b. Onion Production Costs . . . . . 3 pgs
- c. The Onion King Speaks . . . . . 2 pgs
- d. Sweet Onion Seen As New Tar  
Heel Crop . . . . . 1 pg

*\*See also 'Specialty Produce' and 'Vegetables'*

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## ORIENTAL VEGETABLES

Today's focus on healthier recipes, especially those light on the fats and heavy on the vegetables, has led to a rediscovery of Oriental cuisine. Asian cultures have developed a diet based on the vegetables described in this section: Chinese cabbage, daikon radishes, snow peas, winter melon, bitter melon, and Thai basil, among others. These crops have been in increasing demand due to America's changing lifestyles; this growing market still has plenty of room for new growers.

- a. Capture Gold With Oriental Vegetables . 3 pgs
- b. Getting Into Oriental Vegetables  
(ADAPT 2) . . . . . 2 pgs
- c. Preparing Oriental Foods: A Way to  
Enhance Sales . . . . . 2 pgs

*\*See also 'Water Chestnuts,' 'Specialty Produce,' and 'Vegetables'*

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## PECAN TREES

Pecan trees grow successfully in soils that range from sandy to clay loam, or in alluvial soils with a neutral pH. Rainfall of 35 inches annually and a long growing season are required. Among the many varieties are 'Peruquem', 'Major', and 'Greenriver.' A discussion of establishing the trees, harvesting and storing methods, and a pest control guide are provided. Pecan trees can live to be 200 years old and can yield up to 100-200 pounds per tree in a good year. One

marketing technique is to rent a tree to your clientele and let them pick their own nuts.

- a. Pecans . . . . . 4 pgs
- b. Fruit and Nut Varieties for  
Home Plantings . . . . . 1 pg
- c. And Now, the Profitable Pecan . . . . . 1 pg
- d. Picking Up Profits . . . . . 1 pg
- e. Prevailing Issues Common to Georgia-  
Based Pecan Growers, Accumulators,  
and Shellers . . . . . 11 pgs
- f. Northern Pecan Is Some Kind Of Nut . . . 1 pg
- g. The Byrds Tamed The Edible Wild . . . . 1 pg
- h. Pecan Business Is All It's Cracked Up  
To Be . . . . . 1 pg
- i. Pecans From Tree To Table . . . . . 1 pg
- j. More Information . . . . . 1 pg

*\*See also 'Nut Trees'*

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## PEPPERS (Hot and Sweet)

The versatile pepper can add substantial profits to farm income. Although it demands lots of water, near-perfect temperatures, and rich soils, the bell pepper rewards growers with sweet flavor and even sweeter profits. The Ohio Cooperative Extension Service's Piketon Research and Extension Center has prepared a list of 37 varieties of colored peppers. This chart includes information on color progression, disease resistance, time to harvest, and seed sources.

The hardier hot pepper is less choosy, and its market is growing steadily. Jalapenos, and the even hotter habaneros, are in great demand as America discovers these flavorful Mexican favorites.

- a. Hot Ideas For Sweet Peppers . . . . . 2 pgs
- b. Specialty Colored Peppers . . . . . 2 pgs
- c. Pick A Peck of Purple Peppers . . . . . 4 pgs
- d. Two Zesty Alternatives to Bell Peppers . . 3 pgs

*\*See also 'Vegetables' and 'Specialty Produce'*

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## POPCORN

Popcorn is primarily produced in Indiana, Illinois, Ohio, Nebraska, Iowa and Missouri. Popcorn production requires good marketing contacts because the market is very sensitive to changes in production. Seventy percent of the popcorn is eaten at home; the

remaining 30 percent eaten in public places such as theaters, stadiums and schools. A general description of varieties, pesticides, cultural practices, harvesting, storage, marketing, and contracts is presented. Advantages include: popcorn has no effect on corn base acres, is slightly less expensive to grow than other corn, does not require farm storage, spreads risk, allows flexibility in pricing, and bears no tax liability under some contracts. Germination of popcorn seed is slower than dent corn, and it has a less extensive root system. Three markets include processor-contracted acreage, open-market sales, and local sales. Contracts range from \$160 to \$185 per ton of ear corn, and are devised to return a \$30 to \$40 premium per acre over soybeans.

- a. Popcorn (ADAPT2) . . . . . 3 pgs
- b. Popcorn as an Alternative Crop (ADAPT2) . . . . . 3 pgs
- c. Taste Half a Century of Popcorn Know-How; Poppin' Up Good Times on the Prairie . . . . . 2 pgs
- d. Native Inheritance: The Story of Corn in America . . . . . 6 pgs
- e. Popcorn: Production and Marketing . . . . 6 pgs
- f. Popcorn Remains American Favorite Through the Centuries . . . . . 1 pg
- g. How to Put 'Pop' in Popcorn . . . . . 1 pg
- h. Put a Pencil to Diversification . . . . . 1 pg
- i. Corn That Goes "Pop" . . . . . 3 pgs
- j. Popcorn Fun, Facts . . . . . 1 pg
- k. A Feud That's Really Popping . . . . . 1 pg
- l. List of Open-Pollinated Varieties of Popcorn and List of Seed Companies from "Garden Seed Inventory" . . . . . 13 pgs

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## POTATOES

The basic spud goes colorful with several exciting new varieties, with hues ranging from purple to yellow. Other articles in this section explain how plastic row covers warm plants (encouraging higher yields and earlier harvests) and describe how to combat vine wilt.

- a. Specialty Potatoes: A Small-Scale Agriculture Enterprise . . . . . 2 pgs
- b. Can Purple Potatoes Put You In The Green? . . . . . 1 pg
- c. Row Covers Even Increase Potato Yields . . . 2 pgs
- d. Ways to Control Potato Early Dying . . . . 2 pgs

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## POTPOURRI

Potpourri is a mixture of dried flower petals and spices in a dry or moist form. Flower petals should be collected for drying after a rain or in the early morning, when the dew is still on. Ingredients may include herbs, spices, wood chips, or citrus fruit peels. Also discussed are preparations for natural insect repellents, such as rosemary leaves used in sachets, and crystallizing flowers.

- a. Sachets and Potpourris (from *Herbs and Things*) . . . . . 9 pgs
- b. Herbs for Fragrance . . . . . 5 pgs
- c. Potpourris and Sachets (from *The Rodale Herb Book*) . . . . . 9 pgs
- d. Fragrance (from *New Age Herbalist*) . . . . 3 pgs
- e. Lavender Sachets: Potpourri . . . . . 3 pgs
- f. List of Herbs and Spices Commonly Used in Sachets and Potpourris . . . . . 2 pgs
- g. Potpourris, Sachets and Tussie Mussies (from *World of Herbs and Spices*) . . . . . 3 pgs
- h. Perfuming the House (from *The Herb Book*) . . . . . 5 pgs

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## PUMPKINS

Pumpkins come in many shapes and sizes, and are relatively easy to grow. They are subject to the same pests and diseases as cucumbers and squash, and they can be stored up to three months. Pumpkins require well-drained soil with a pH of 5.5 to 7.5. A general description of this cucurbit crop is given, as well as nutrient needs, spacing of plants, and resistant varieties.

According to the Seiple family from Bath, Pennsylvania, the key to choosing a new crop lies in reviewing its labor requirements. During pumpkin season, sales can be increased through a haunted barn which will attract new customers.

- a. Be a Price Maker, Not a Price Taker . . . 4 pgs
- b. Pumpkin . . . . . 3 pgs
- c. Squashes and Pumpkins . . . . . 6 pgs
- d. Cucurbit Crops Have Uniform Needs . . . 9 pgs
- e. 'Punkin' Profits . . . . . 2 pgs
- f. More Than A Scary Face (Recipes) . . . . 2 pgs
- g. The Pumpkin Man . . . . . 2 pgs



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## RASPBERRIES

Raspberries have traditionally required a large amount of hand labor for pruning; new varieties, such as 'Heritage,' reduce this requirement. The soil must be very fertile, with a high level of organic matter and good drainage, for successful growth. One inch of water per week is necessary. Descriptions of soil preparation, plant selection, fertilization, weed control, and other management techniques are presented. Berries are best marketed through a U-Pick operation.

A typical budget and guide for yearly care is presented. Costs to establish a half-acre of red raspberries are estimated at about \$833. Once a plot is established, you can expect yearly expenses of about \$382. Earnings from \$1,000 to more than \$3,000 per acre for 10 years can be obtained with proper marketing. Enterprise budget for PYO raspberries is presented (15 year estimate).

- a. Growing Fall Bearing Red Raspberries as a Small Scale Commercial Enterprise 15 pgs
  - b. A Berry Bonanza . . . . . 4 pgs
  - c. Raspberries Offer Profit Potential . . . . . 2 pgs
  - d. A Taste for Raspberries . . . . . 3 pgs
  - e. There's Always Something Cooking at Rothschilds . . . . . 1 pgs
  - f. Selected Educational Resource Materials for Small Farm Operators . . . . . 8 pgs
  - g. University Extension Publication (Missouri) . . . . . 4 pgs
  - h. Raspberries Blossom Into New Market . . . . . 1 pg
  - i. List of Publications, Nursery List . . . . . 5 pgs
- \*See also 'Small Fruits'*

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## SOYBEANS (Food-grade)

The market for food-grade soybeans is considered a niche market. Three distribution channels for food-grade soybeans include: 1) Regular #2 soybeans purchased by importers, 2) Number 2 soybeans grown in Indiana, Ohio, Michigan and Illinois (shipped from Toledo with Beeson the predominant variety) for export, and 3) Beans that are imported by an end user. Although Japan is the largest market for U.S. food-grade soybeans, many difficulties occur with negotiations, import rules and regulations, distinguishing between producer products, and

shipping conformation. Advantages include profit, efficient use of resources, less competition, new opportunities and no written contracts--only a handshake.

- a. Food-Grade Soybeans (Summary from Second National Conference on Farm Income Enhancement) . . . . . 4 pgs
- b. Specialty Soybeans: Worth Checking . . . 1 pg
- c. Marketing Food-Quality Soybeans in Japan . . . . . 22 pgs

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## STRAWBERRIES

There are two types of strawberries: "junebearing" and "everbearing" (or "day-neutral"). Strawberries require the soil to be well drained with a pH of 5.5 to 6.8 for best growing results. Various growing methods, including the hand training of runners, are presented. A budget estimate indicates the total expenses for one-half acre in the first and second years to be \$1,071 with gross sales at \$2,500. After three years in operation a net of \$3,215 per acre can be recognized. One source indicates a population of 2500 people is necessary to support an acre of strawberries.

- a. The Ultimate High-Value Crop . . . . . 5 pgs
- b. Strawberries as an Alternative Enterprise 2 pgs
- c. The Strawberry Enterprise . . . . . 4 pgs
- d. Three 'P's' to Successful Strawberry Growing . . . . . 4 pgs
- e. Strawberry Cultural Reminders for Success . . . . . 4 pgs
- f. Strawberry Planning Budget . . . . . 6 pgs
- g. A Tradition of Strawberries at Vince Brown Farms . . . . . 2 pgs
- h. Day-Neutral Strawberries Can Extend Season . . . . . 2 pgs
- i. Managing People is an Important Part of Strawberry Business . . . . . 2 pgs
- j. Cover Your Strawberries . . . . . 2 pgs
- k. Building a Better Strawberry . . . . . 2 pgs
- l. Strawberry Production and Marketing Experiences . . . . . 3 pgs
- m. Farmer Adopts New Attitude With His Crop Switch . . . . . 1 pg
- n. Strawberries: A Small-Scale Agriculture Enterprise . . . . . 2 pgs
- o. Alternative Agricultural Enterprises: Strawberries . . . . . 2 pgs

p. Strawberries: The Best Of The Berries . . . 1 pg  
q. Calendar For The Production and Care  
of Matted Row Strawberries . . . . . 1 pg  
r. Wisconsin Strawberry Grower  
Experiments With Living Mulch . . . . . 2 pgs  
s. Strawberries Take A Team Effort . . . . . 2 pgs  
t. Commercial Strawberry Production In  
North Carolina . . . . . 13 pgs  
u. Foliar Fertilization For Strawberries . . . . 1 pg  
v. Small Fruit Nursery List, Publications  
Agencies . . . . . 2 pgs

\*See also 'Small Fruits'

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## SUNFLOWERS

Sunflowers are a versatile crop. They can sustain germination temperatures of 45° to 50°, making them ideal for early planting or double cropping. After the fourth week, sunflowers can compete adequately with weed population but are susceptible to diseases and pollinating insects. Header attachments are necessary at harvest to prevent loss of seed. Sunflowers are grown for the production of oil, and as poultry and livestock feeds. The decrease in sunflower production is attributed to the growth of government programs for spring wheat and barley. Prices in August 1988 averaged \$12.37 per hundredweight.

a. Suggested Sunflower Production  
Practices . . . . . 4 pgs  
b. Sunflower . . . . . 6 pgs  
c. Many Sunflower Growers Turn to  
Other Crops . . . . . 4 pgs  
d. Marketing Sunflowers . . . . . 1 pg  
e. Grow Sunflowers on Contract? . . . . . 2 pgs

\*See also 'Alternative Field Crops'

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## SWEET SORGHUM (for Molasses)

A successful crop of sweet sorghum depends greatly upon the weather. Much of sweet sorghum production relies on old methods and has been virtually untouched by technological developments. New varieties have also been limited due to the closure of the USDA sugar crops field station at Meridian, Mississippi in 1984.

Molasses production is labor intensive, from the harvesting of the cane to processing of the final

product. Molasses wholesales for \$10 to \$15 per gallon, and retails for \$20 to \$25 per gallon. It is disadvantaged due to the competition with sugar and sugar substitutes. For most producers, a net return of \$2,000 per acre can be realized with proper marketing.

Various steps in planting, harvesting, and processing are presented. Processing includes cooking the juice until the desired sugar content and syrup consistency are obtained.

a. Sweet Sorghum (from *Options  
For Kentucky Farmers*) . . . . . 2 pgs  
b. Production and Marketing of  
Sweet Sorghum Syrup . . . . . 2 pgs  
c. Specialty Crop: Sorghum . . . . . 3 pgs  
d. Sweet Sorghum! (from *Mother Earth  
News*) . . . . . 3 pgs  
e. Sorghum (Foxfire 3) . . . . . 14 pgs  
f. Farm Production of Sorgho Sirup . . . . . 22 pgs  
g. Processing Critical to Sorghum Syrup  
Quality . . . . . 2 pgs  
h. Grain Sorghum . . . . . 2 pgs  
i. Sorghum Nostalgia Growing, Bringing in  
Extra Farm Money . . . . . 1 pg  
j. Kerr Center Evaluates Several  
Sweet Sorghum Varieties . . . . . 1 pg  
k. More information and Seed Sources . . . . 1 pg

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## TOBACCO

Although the world has increased its use of burley tobacco, the US burley market has declined to 25% of the world market. The importation of burley tobacco has come close to exports of tobacco by the US, due to higher priced domestic burley and the accumulation of tobacco stocks. Federal price support programs have been involved in the tobacco industry since 1933 under the Agricultural Adjustment Act. Types of tobacco include burley, fire-cured, and dark air-cured.

Returns to land, operator, labor, quota, and management range from \$762.70 to \$2169.74 (based on \$1.30/lb and a yield of 2000 lb/acre). Soil requirements include adequate amounts of moisture to reach its shallow root system and large amounts of readily available nitrogen and potash. Tobacco grows six feet tall with two-inch flowers. Tobacco wastes contain nicotine which is harmful to insects (good and

bad) when applied in a concentrated form. Various methods of growth, curing, and pressing are presented.

- a. Tobacco (from *Options For Kentucky Farmers*) . . . . . 4 pgs
- b. Tobacco (from *Soils and Men: Yearbook of Agriculture*) . . . . . 3 pgs
- c. Tobacco (from *Encyclopedia of Organic Gardening*) . . . . . 3 pgs
- d. Growing Tobacco...Tobacco Curing . . . . . 6 pgs
- e. Tax Free Tobacco . . . . . 3 pgs
- f. Tobacco (*Principles of Field Crop Production*) . . . . . 28 pgs
- g. Tent Tobacco (*Farm Quarterly*) . . . . . 4 pgs
- h. Ohio's Tobacco Industry Faces Changes . . . . . 1 pg
- i. Grow A Better Tobacco Crop . . . . . 1 pg
- j. Tobacco: Can We Grow Enough? . . . . . 2 pgs
- k. More Information . . . . . 4 pgs

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## TOMATOES

The tomato grower faces the difficulty of maintaining adequate sales during peak tomato season. Although a plethora of tomato varieties exist, selecting quality tomatoes is the sales advantage of a marketer. A description of growth and harvesting of tomatoes is provided. Tomatoes can be sold by weight or by measure. A budget for tomatoes over four years of production is presented and shows an income of \$4,500 per acre.

- a. Tomato Varieties from the UMC Horticulture Report . . . . . 2 pgs
- b. Tomatoes: A Tricky but Profitable Commodity (from *Growing For Market*) . . . . . 8 pgs
- c. Selected Fruit and Vegetable Planning Budgets: Tomato . . . . . 4 pgs
- d. You Can Make Money Growing Tomatoes Like These . . . . . 2 pgs
- e. Fresh/Processed: A Marriage of Convenience . . . . . 3 pgs
- f. Marketing Fresh Tomatoes (USDA) . . . . . 27 pgs
- g. For Vitamin A Eat an Orange Tomato . . . . . 1 pg
- h. Tomatoes Easy Gardening in Missouri . . . . . 3 pgs
- i. Tomato Growers Experiment With Drip, Plastic . . . . . 1 pg
- j. More Information . . . . . 3 pgs

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## TRUFFLES

The fungus "melanosporum," in its ripened form, is black in coloration and possesses an extremely odorous smell. This meat-like mushroom is used by gourmet chefs to flavor meat dishes and sauces. Living a symbiotic relationship with a host plant (oak or filbert trees), the truffle lives in well-drained soils with a pH of at least 7.2 and an organic matter of 2 to 8%. A figure from 1979 indicates that truffles can sell for \$400 a pound. Among the articles is an in-depth discussion on starting a truffle farm and hunting truffles with pigs or dogs. Start up costs run between \$2500 to \$6000, with an annual return of \$3000 to \$10,000.

- a. Truffle: The Black Diamond . . . . . 26 pgs
- b. Letter from Francois Picart, Agri-Truffle, Answering Questions . . . . . 8 pgs
- c. More information . . . . . 1 pg

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## VEGETABLES

Raising vegetables requires as little capital as \$150 per acre and can be profitable on as little as an acre of land. A few considerations include time, labor, capital, production knowledge, market, location, and quality produce. Equipment cost can range from \$4,000 to \$10,000, depending upon whether it is used or new equipment. Cultural practices vary by type of vegetable produced.

Marketing can be profitable through roadside stands, direct sales, PYO, farmers markets, local stores, or wholesale produce dealers. Pricing involves knowing what the competition is doing, odd-cent pricing and developing alternative marketing strategies for excess produce. Budget considerations include variable and fixed costs for individual producing regions. Various ideas such as starting from seed, transplanting, mulching with plastic, irrigation, and disease and pest management are presented. A vegetable planning calendar with varieties, planning guides, and planting dates is included.

- a. Farming a Few Acres of Vegetables . . . . . 28 pgs
- b. Specialty Vegetables: A Small-Scale Agriculture Alternative . . . . . 2 pgs
- c. Selecting New Cultivars . . . . . 2 pgs

d.	Determining Commercial Marketing and Production Opportunities for Small Farm Vegetable Growers . . . . .	29 pgs
e.	Vegetable Planting Calendar . . . . .	4 pgs
f.	Marketing Alternatives for Small-Scale Commercial Vegetable Growers . . . . .	3 pgs
g.	What's a Whatley Farm? . . . . .	1 pg
h.	Okra Not Just a Southern Crop . . . . .	1 pg
i.	Going for Greens . . . . .	1 pg
j.	Vegetable Marketing Co-ops Stack the Odds in Their Favor . . . . .	2 pgs
k.	Americans Eating More 'Veggies' Than Ever, Ag Analyst Says . . . . .	1 pg
l.	Floating Row Covers Grow Crops and Profits . . . . .	2 pgs
m.	US Vegetables on the World's Dinner Plate . . . . .	3 pgs
n.	Shifting Gears in Maine . . . . .	3 pgs
o.	1987 Disease Managements Guide for Commercial Vegetable Growers . . . . .	8 pgs
p.	Artichokes, Cranberries, Garlic: Magical, Medicinal and Mythical Crops . . . . .	2 pgs
q.	Vegetables: They're A Big Big Business . . . . .	2 pgs
r.	The Dynamic US Fresh Produce Industry: An Overview . . . . .	22 pgs
s.	Better Veggies Ahead . . . . .	2 pgs
t.	Vegetable Production In Nebraska . . . . .	3 pgs
u.	Bountiful Brittany . . . . .	3 pgs
v.	The Green Rush . . . . .	5 pgs
w.	Intensifying With Vegetables Means Managing Your Time . . . . .	1 pg
x.	Future of The Fresh Market Produce Industry . . . . .	1 pg
y.	Let's Take A Look At Garlic . . . . .	5 pgs
z.	Fertilizer Guide For Commercial Vegetable Growers . . . . .	6 pgs
aa.	Knott's Handbook for Vegetable Growers . . . . .	19 pgs
bb.	More Information . . . . .	6 pgs

*\*See also 'Specialty Produce'*

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## WALNUT TREES

An in-depth discussion of site selection, planting, growth and development, pruning, and harvesting is presented. The Black Walnut does best on deep, well-drained, neutral soils which are moist and fertile. Walnut lumber brings high returns per thousand board feet, as well as profits from the home or commercial nut crop. Techniques for the identification of damage from various causes are also

presented. Marketable trees are large, with dead tops or large dying branches, while unprofitable trees are of low quality, are growing poorly, or have severe stem defects.

a.	Manager's Handbook for Black Walnut . . . . .	27 pgs
b.	Growing Walnut...for Profit and Pleasure . . . . .	8 pgs
c.	How to Diagnose Black Walnut Damage . . . . .	23 pgs
d.	How to 'Train' Black Walnut Seedlings; Tender Loving Care of Black Walnut Increases Profits . . . . .	4 pgs
e.	Missouri Consulting Foresters Association: A Guide To Professional Forestry Assistance . . . . .	2 pgs
f.	Black Walnut Woes: A Tree-Grower Learns From the Roots Up...Walnut: The Cabinetwood Par-Excellence . . . . .	6 pgs
g.	Selling Walnut Timber . . . . .	4 pgs
h.	Investment Alternatives for Black Walnut Plantation Management . . . . .	5 pgs
i.	Black Walnuts Targeted as New Indiana Commodity . . . . .	1 pg
j.	More information . . . . .	1 pg

*\*See also 'Nut Trees'*

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## WATER CHESTNUTS (Chinese)

Water chestnuts are most adaptable to the soils and climates of the southeast, but they can also be grown in a greenhouse. Chinese water chestnuts are grown in 2 to 3 inches of sandy soil in flooded fields or raceways. The corm (edible portion) may yield 8 to 23 tons/acre and is covered with a tough, thick, dark brown skin. Corms used for food average \$.10 each; ornamental and mail-order corms sell for \$4 each. A botanical description, as well as cultivation, fertilization, and harvesting techniques, are presented.

a.	Chinese Water Chestnuts . . . . .	4 pgs
b.	The Chinese Water Chestnut . . . . .	18 pgs
c.	The Chinese Water Garden (from <i>Grow Your Own Chinese Vegetables</i> ) . . . . .	9 pgs

*\*See also 'Oriental Vegetables'*

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## WILDFLOWERS

Wildflower projects for federal highway improvement, started in Texas in 1927, have saved the government millions of dollars in maintenance costs. These herbaceous flowering plants come in many shapes, sizes and colors. They are sensitive to soil conditions and environmental factors, and may be area specific.

Marketing outlets include gardeners, landscapers, colleges, institutions, or retail garden centers and florists. Purchasers should be aware of quarantine laws, and should also be warned that packages of seeds are not always labeled accurately. Collection in natural habitats should be done during the early spring or late fall, when they are in their dormant stages. One mail-order marketing business has a mark-up of 50% to 100% on each plant, with major shipping seasons from mid March until June 1 and September 1 until mid November. The collection and propagation of native plant seeds is also detailed.

- a. Wildflowers: A Small-Scale Agriculture  
Alternative . . . . . 2 pgs
  - b. Native Perennials: Old Plants Find  
A New Purpose . . . . . 2 pgs
  - c. Mail-Order Wildflowers . . . . . 5 pgs
  - d. Growing and Propagating Wild Flowers . 24 pgs
  - e. Wild and Wonderful . . . . . 3 pgs
  - f. More Information . . . . . 2 pgs
- \*See also 'Flowers'*

## GENERAL

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### ALTERNATIVE BEDDINGS/MULCHES

Livestock farmers are finding shredded paper to be a more absorbent alternative to straw bedding; it can be purchased for \$35-\$40 per ton, and farmers who chop it themselves can often pick up free bales of newspaper from recycling centers. Newsprint and other inks aren't harmful to animals bedded on shredded paper, and any ink rub-off is usually removed during normal cleaning. Newspaper or other non-glossy stock is strongly recommended. Articles in this section include testimonials from hog and dairy farmers who swear by paper's absorbency (6 times that of sawdust, 10 times that of straw), low price, and lower toxin levels. Also included are articles on wood-chip bedding and degradable plastic mulches.

- a. Recycled Paper Makes Better Bedding. . . . . 2 pgs
- b. 'Old News' Paper . . . . . 2 pgs
- c. Nutrients Cycle When The Chips Are Down . . . . . 1 pg
- d. Plastics of the '90s Coming On Strong . . . . . 2 pgs

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### BED AND BREAKFAST

Key words to starting up are "cleanliness, comfort and hospitality", and success lies in providing a full, varied breakfast. Rates in family bed and breakfast inns can be 30 to 40% cheaper than motels, with more service provided. According to Janet Mochel, a Bed & Breakfast reservation service of Philadelphia, requirements are simple: take in guests, be nice to them, feed them a good breakfast, and charge reasonable rates. Reasons for interest in B & Bs are increasing motel rates and the European style of travel.

Professionals invest anywhere from \$100,000 to \$650,000 for a large house, and cause concern among "amateur" B & B owners. Zoning regulations may vary, but obtaining the necessary permits is not impossible. Health regulations may include annual inspections, special equipment, limited food license, and lodging rules. Fire codes, building codes, and tax rates are also considerations.

A general business plan, marketing strategy, and advertising plan are discussed. Rate setting is determined by the location, bath, breakfast, and home. Ideal arrangements for the bedroom, breakfast entrees, and bath accessories are discussed. Factors to consider when beginning a B & B include your financial situation (obtaining an accountant and lawyer), insurance, regulation considerations, brochure contents and confirmation letter. Suggestions for successful hosting include: being timely; setting "House Rules"; providing entertainment and meal options, telephone, maid service, and keys; registering guests; settling the bill; advertising; and additional suggestions such as touring and transportation.

- a. Farm Bed & Breakfast (ADAPT3) . . . . . 2 pgs
- b. Starting a Rural B & B (ADAPT3) . . . . . 3 pgs
- c. Bed and Breakfast (ADAPT2) . . . . . 3 pgs
- d. Bed and Breakfast (*Country Journal*) . . . . . 5 pgs
- e. Bed and Breakfast: Hosting Travelers for Extra Income . . . . . 3 pgs
- f. How to Start Your Own B & B . . . . . 10 pgs
- g. Country Hospitality . . . . . 2 pgs
- h. Little House In The Woods Is Retreat For Vacationers . . . . . 4 pgs
- i. Otter Fork Hills/Bed and Breakfast Basics/Wal-Mec Farm . . . . . 4 pgs
- j. Is 'Bed & Breakfast' Your Kind Of Business? . . . . . 2 pgs
- k. More Information--Other Publications and Associations . . . . . 1 pg

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### COMPOST

Composting is defined as "the art and science of mixing various organic materials in a pile, monitoring the resultant biological activity, and controlling conditions so the original raw substances are transformed into a stable humus." It can be time consuming and cost a little extra; however, the results of stabilizing the soil, using excess materials, distributing trace minerals more evenly, and eliminating odors can be very useful. Various techniques for composting are presented, with various sources and application tips. In heavily populated areas, composting is big business for the disposal of yard leaves, lawn clippings, and other plant wastes.

The contributions of nitrogen, phosphoric acid, and potash from compost materials are other positive aspects.

Before using sludge as fertilizer, chemical analysis for metal content is necessary to prevent contamination and the spreading of weed seeds. A detailed description of equipment (also sources for equipment) and application methods is provided. Undersowing (overseeding or companion seeding) green manures is also a viable practice in gardening.

- a. Composting (from *The Soul of Soil*) . . . 12 pgs
- b. \$2.5 Million from 126 Acres. . . . . 4 pgs
- c. To Sludge Or Not To Sludge . . . . . 2 pgs
- d. His Business Is Spreading . . . . . 3 pgs
- e. 'Free Fertilizers' . . . . . 4 pgs
- f. The Complete Book of Composting . . . 60 pgs
- g. Fertilizer from the Garden . . . . . 7 pgs
- h. From Waste To Asset . . . . . 2 pgs
- i. More Information . . . . . 1 pg

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## CRAFTS

The popularity of country crafts is hardly new; farm families have been enhancing their income with handicrafts for centuries. These articles detail the experiences of three families who turned their hobbies into profits, working with baskets, ceramics, and even a catalog of local craft items.

- a. Selling Homemade Goods With  
The Personal Touch . . . . . 4 pgs
- b. How A Farm Home Business Grew . . . . 2 pgs
- c. The Basket Lady . . . . . 2 pgs
- d. A Homespun Business . . . . . 2 pgs
- e. Weaving New Industry . . . . . 1 pg

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## DIRECT MARKETING

Marketing techniques vary by area as well as by diversity of products. Roadside markets, pick-your-own establishments, and farmers' markets are extremely successful approaches to direct marketing; these topics are covered in their own sections. Marketing to restaurants, subscription marketing, and mail order marketing are other alternatives. Direct marketing requires thorough planning and research to be successful. The key to any marketing plan is a

detailed study of the market area, consumer needs, and financial viability. Creativity and ingenuity in dealing with the public at the retail level also requires excellent communications skills.

- a. Farmer-to-Consumer Direct Marketing . . 3 pgs
- b. Marketing Trends Must Be Understood . 1 pg
- c. Direct Market Ideas For More Farm  
Profit . . . . . 2 pgs
- d. Non-Direct Marketing For Fruits and  
Vegetables . . . . . 5 pgs
- e. It's How You Sell It That Counts . . . . 2 pgs
- f. Texas Expands Programs on Rural  
Diversification . . . . . 5 pgs
- g. State Efforts Boost 'Down-Home' Sales . . 2 pgs
- h. Market Planning Is Important . . . . . 1 pg
- i. Direct Marketing: Sources of Help  
For Direct Marketers . . . . . 4 pgs
- j. Direct Marketing in Wisconsin . . . . . 4 pgs
- k. Quality Replaces Quantity As Key  
In Agriculture . . . . . 1 pg
- l. Marketing Sophistication Needed . . . . . 1 pg
- m. Market Now, Plant Later . . . . . 2 pgs
- n. Risk, Liability, and Insurance  
For Direct Marketers . . . . . 4 pgs
- o. Beginning Business Planning  
For Direct Marketers . . . . . 4 pgs
- p. Direct Marketing Alternatives . . . . . 3 pgs
- q. Marketing Cooperatives . . . . . 1 pg
- r. Direct Marketing: An Alternative  
for Ohio Agriculture . . . . . 2 pgs
- s. Diversity and Marketing  
Combined At Sunrise Farms . . . . . 3 pgs
- t. More Information . . . . . 2 pgs

### *Alternative Products*

- a. Essential Tools For The  
Market Gardener . . . . . 4 pgs
- b. Marketing Of Alternative  
Horticulture Products . . . . . 3 pgs
- c. Marketing Pays Big, Even For  
Small Farmers . . . . . 1 pg
- d. Potentials and Pitfalls  
of the New Markets . . . . . 4 pgs
- e. New Markets For Old Crops . . . . . 3 pgs
- f. Creative Marketing Rewards Quality . . . . 2 pgs
- g. Marketing Tips For  
Specialty Crop Success . . . . . 1 pg
- h. Making the Most of a  
Small Acreage . . . . . 2 pgs
- i. Beans, Flowers, and More . . . . . 2 pgs

*Consumers*

- a. Growers Told To Know Their Markets for Profitable Farming . . . . . 1 pg
- b. Meeting The Needs of Direct-Market Consumers . . . . . 3 pgs
- c. The Consumer and Direct Marketing . . 11 pgs
- d. Selling Direct To Consumers . . . . . 10 pgs

*Restaurant/Urban Sales*

- a. Smart Marketers . . . . . 2 pgs
- b. Marketing to Restaurants . . . . . 2 pgs
- c. A Slice of the Pie: Direct Restaurant Sales Offer High Profit Potential . . . . . 3 pgs
- d. Restaurants Are A Hot Market For Some Small Growers . . . . . 4 pgs
- e. Farming Close to "Downtown" . . . . . 4 pgs
- f. Taking Advantage of Urban Expansion . . . . . 2 pgs
- g. Marketers Lure Upscale Parents . . . . . 2 pgs

*Niche Markets*

- a. Finding Success in Specialty Products . . . . . 3 pgs
- b. Try Niche Markets for Growing Success . . . . . 1 pg
- c. Direct Marketing Meat . . . . . 1 pg
- d. Baiting Becomes Big Business . . . . . 2 pgs
- e. How To Make Money at Produce Auctions . . . . . 1 pg
- f. Market by Mail . . . . . 2 pgs
- g. Subscription Marketing . . . . . 2 pgs

*Pricing*

- a. Your Profitable Farming Checklist . . . . . 4 pgs
- b. Pricing Your Product . . . . . 2 pgs
- c. Crop Budgets For Direct Marketers . . . . . 4 pgs
- d. Putting A Price On Your Products . . . . . 3 pgs
- e. Pricing Produce For Profit . . . . . 3 pgs

*Value-Added Products*

- a. Adding Value Adds Profit . . . . . 3 pgs
- b. Food & Fiber Ctr Adds Value to Mississippi's Ag Economy . . . . . 4 pgs
- c. Everybody Wins With Value-Added Farm Products . . . . . 2 pgs
- d. Family Cannery Is Big Business . . . . . 3 pgs

- e. Country Cooked Puts Its Stock In Potato Chips . . . . . 5 pgs
- f. New Cereal Helps Farmers Earn More Profit From Corn . . . . . 4 pgs

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**FARMERS' MARKETS**

Information is included on the general steps for marketing success, from choice of location to pricing. Stages of market development are presented. Some of the problems involved include location, rules, produce quality and grower participation. Organized marketing groups need regular meeting times, a constant physical location, a mixture of produce and craft items, a core management, local appeal, and consumers. Marketing fresh produce may include tasting by customers, prepackaged salads or other creative ventures. Tools for the market gardener and costs involved are also briefly discussed.

Various products such as apples, carrots or sugar beets can also be sold as deer bait. Variety such as crafts and bakeries add to the surroundings of any farmers' market. Successful markets provide parking, traffic control, safe access, rest rooms, and a safe play area for children.

- a. Farmers Markets: Steps to Success & Tips from a Tailgater . . . . . 2 pgs
- b. Should I Grow Fruits and Vegetables?--Farmers' Markets . . . . . 4 pgs
- c. A Farmer Goes to Market . . . . . 3 pgs
- d. Tips for Direct Marketing . . . . . 2 pgs
- e. Factors of a Good Farmers Market . . . . . 3 pgs
- f. Farmers Markets are a Growing Business . . . . . 2 pgs
- g. Urban Farmers Markets Thrive . . . . . 2 pgs
- h. Cadillac Municipal Market Well-Received . . . . . 2 pgs
- i. A Garden Grows In The South Bronx . . . 5 pgs
- j. Shelby, NC Revives Uptown With Farmers' Market . . . . . 4 pgs
- k. More Information . . . . . 1 pg

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**GREENHOUSES**

Building a greenhouse, whether for commercial purposes or home use, can be expensive. Commercial greenhouses cost from \$1 to \$3 per square foot to construct. Guides, tips and plans for building your



own greenhouse, with efficient use of space and regulation of environment, are provided.

Marketing techniques for greenhouse products include folders with information about the business, and color coding for perennials, annuals and roses in the shop. Three areas critical to transplants are good seeds, exact temperatures, and controlled water. Growing uniform transplants ensures uniform plants at maturity. The transplant medium should support the plant, provide water and oxygen, and serve as a reservoir for nutrients. A general discussion of various mediums and soil testing is included.

Future trends in greenhouse growth indicate a slow increase with a shift towards herbs as an alternative crop. Herbs can be classified as culinary, aromatic, ornamental and medicinal, all of which are more profitable to raise in winter greenhouses than vegetables. Problems most noted in greenhouse management are unsanitary cultural practices and the abuse of pesticides.

- a. Pauley's Plants: A Growing Greenhouse Business . . . . . 2 pgs
- b. Mother's Mini-Manual: Greenhouse Gardening . . . . . 12 pgs
- c. Blend Marketing and Production Techniques; Time Your Transplants; Media and Soil Tests Affect Transplant Quality; Charting Trends in Greenhouse Vegetables . . . . . 6 pgs
- d. Greenhouse Herbs . . . . . 2 pgs
- e. Under Cover . . . . . 8 pgs
- f. Greenhouse Wholesaling (ADAPT3) . . . . . 3 pgs
- g. More Information . . . . . 2 pgs

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## HUNTING PRESERVES

Establishing a hunting preserve can be a big financial responsibility, particularly if you begin by purchasing the land. However, renting is always an option--and if you already own a fairly large amount of woodland or marshland, this could be a profitable way to put that unfarmable land to use. Successful game preserves begin with research; you must determine what birds and/or animals will be the most popular, and then decide on a layout for your facility.

Articles in this section stress the responsibilities of the game preserve operator, from supplying game stock to

maintaining the grounds. Game can be anything from pheasants to elk, and usually should be as wild as possible for a challenging hunting experience. Many operators supply everything needed for a hunt, from ammunition to trained retrievers--service keeps hunters coming back. Before opening for business, check with your state Division of Wildlife about becoming licensed; Ohio permits 4 licensed preserves per county.

- a. Taking Profits on the Wing . . . . . 2 pgs
- b. Ohio Hunting Preserves Provide Opportunities For Fun and Profit . . . . . 2 pgs
- c. Developing A Game Bird Preserve (from *Raising Game Birds*) . . . . . 5 pgs
- d. Hunting Reserves For Sport and Profit . . . . . 22 pgs
- e. Supplemental Income From Wildlife On Your Land . . . . . 2 pgs
- f. Your Own Hunting Preserve . . . . . 3 pgs
- g. More Information . . . . . 1 pg

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## HYDROPONICS

Hydroponics can be defined as any of several methods of growing plants without soil. For example, produce can be grown indoors under controlled lighting and continually washed with nutrient-enriched water. Commercial operations require a large investment in capital, labor, and skills. Hydroponics is a risky venture. Plants produce more at a faster rate when grown hydroponically than when field grown. The produce, when packaged correctly, has a shelf life of more than three weeks. There are various plant growth media, as well as a variety of nutrient mix formulas (which are very critical to the growth of the plants).

- a. Hydroponics . . . . . 4 pgs
- b. Hydroponic Spinach, Lettuce Mean No More Grit in Salad . . . . . 1 pg
- c. Hydroponics Come Home . . . . . 4 pgs
- d. Non-circulating Hydroponic Systems: An Affordable Alternative . . . . . 2 pgs
- e. Hydroponics Improves Farmers' Cash Flow . . . . . 1 pg
- f. Hydroponics: A Growing Idea . . . . . 2 pgs
- g. Soilless Culture of Greenhouse Vegetables (excerpt) . . . . . 7 pgs
- h. Rooted In Water . . . . . 3 pgs
- i. More Information . . . . . 2 pgs

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## INDUSTRIAL CROPS

Industrial crops, such as stokes aster, meadowfoam, and wood byproducts, can serve as alternatives for farm production and meet real market needs. Many of these crops are within three to five years of commercial development. The future holds promise for these crops; they will be used in the production of plastics, soaps, oils, rubber, and epoxies.

- a. Growing Regions for Crops . . . . . 1 pg
- b. Development of New Crops: Needs, Procedures, Strategies, and Options . . . . 30 pgs
- c. New Crop Economics--Commercialization: Growing Industrial Materials . . . . . 2 pgs
- d. Meadowfoam: Growing Industrial Materials . . . . . 2 pgs
- e. Wood Byproducts: Growing Industrial Materials . . . . . 2 pgs
- f. Stokes Aster: Growing Industrial Materials . . . . . 2 pgs
- g. Crambe: Growing Industrial Materials . . 2 pgs
- h. Cuphea: Growing Industrial Materials . . 2 pgs
- i. An Example of the Potential for the Industrial Utilization of Whole-Plant Products . . . . . 1 pg
- j. Guayule Program--Past, Present, and Future . . . . . 5 pgs
- k. Jojoba . . . . . 2 pgs
- l. Guayule . . . . . 2 pgs
- m. Lunaria . . . . . 2 pgs
- n. Vernonia . . . . . 2 pgs
- o. Lesquerella . . . . . 2 pgs
- p. Chinese Tallow Tree . . . . . 2 pgs
- q. Winter Rapeseed . . . . . 2 pgs
- r. Tree Crops . . . . . 2 pgs
- s. Kenaf . . . . . 2 pgs
- s. Excerpts from Directory . . . . . 5 pgs

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## INTEGRATED PEST MANAGEMENT (IPM)

Integrated pest management refers to a pest control program which combines insect monitoring and physical removal with the introduction of beneficial insects and microorganisms, as well as the occasional use of pesticides. Articles in this section detail biological control systems for the greenhouse, orchard, and bramble patch, with methods ranging from pheromones to bacterial antagonists.

- a. A Pest-By-Pest IPM Primer . . . . . 2 pgs
- b. Tiny Wasp Eats Pests . . . . . 1 pg
- c. IPM Tips For Southeastern Apple Growers . . . . . 3 pgs
- d. Praying Mantis: Giants In The Orchard . . 1 pg
- e. Bramble Diseases: IPM Works . . . . . 3 pgs
- f. Beneficials Go Mainstream . . . . . 1 pg
- g. Pheromones Find A Niche . . . . . 1 pg
- h. Microbes Make Their Mark . . . . . 1 pg

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## IRRIGATION (drip or trickle)

Drip or trickle irrigation is used to apply small amounts of water directly to the root zone at a controlled pace. Besides requiring less time and effort than spray irrigation, it uses a smaller amount of water, uses low pressure, and reduces weed growth between rows, among other advantages. On the downside, water filtration for the emitters is required, it costs more than a sprinkler system, it is not adaptable for frost protection and it requires a higher level of management. Articles in this section include a guide to the various types of emitters, equipment, and hardware necessary for drip irrigation. Also explained are transpiration stress to the plant and the water levels needed at various stages. Fertigation, the liquid feeding of a plant, is another innovative idea discussed.

- a. Weatherproof Your Farm with Irrigation . 2 pgs
- b. Water by the Drop . . . . . 3 pgs
- c. Drip Demonstration Intrigues Virginia Growers . . . . . 3 pgs
- d. Trickle Irrigation in the Eastern United States . . . . . 14 pgs
- e. The Advantages of Drip Irrigation . . . . .1 pg
- f. Irrigate for Top Fruit, Vegetable Yields . . . . . 1 pg
- g. Drip Irrigation Surges Ahead . . . . . 1 pg
- h. Tips on Irrigating Vegetables (Small Farm Series) . . . . . 16 pgs
- i. Drip Irrigation Calibration . . . . . 1 pg
- j. Underground Drip Makes A Splash . . . . 2 pgs
- k. An Umbrella For Drought . . . . . 2 pgs
- l. Precision Feeding . . . . . 2 pgs
- m. More Information . . . . . 2 pgs

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**LISA (Low-Input Sustainable Agriculture)**

Low-input sustainable agriculture has developed from the belief that there is a misapplication of biological and rural social systems in our co-evolution with nature (agroecology). This belief was strengthened by the promotion of organic techniques, as well as a skepticism of technological fixes. Agroecology is defined as a theoretical framework aimed at understanding agricultural processes in the broadest sense. Various approaches to LISA are discussed with efficiency as a critical element. In the short run, chemicals provide lower input costs than labor--but in the long run, this may not be true.

Dr. William C. Liebhart of the Rodale Research Center has created a conversion project that enables farmers to convert from chemical to organic farming in five years. The change to LISA may be more difficult economically for American farmers if the US experiences a boom in export demand and commodity prices. Various producers of agricultural products who use the LISA system give ideas and other information for starting up and continuing in this program.

- a. An Overview of Sustainable Agriculture...On the Design of a Sustainable Farm ..... 5 pgs
- b. Low-input Farming Faces Profitability Issue ..... 2 pgs
- c. Agroecology: What's It All About? ..... 2 pgs
- d. Where Do I Start? (from *Profitable Farming*) ..... 14 pgs
- e. The Future of Small Farms in a Sustainable Agriculture (from *Rural Development News*) ..... 2 pgs
- f. The Sustainable Agriculture Issue ..... 8 pgs
- g. The Future of Small Farms in a Sustainable Agriculture ..... 14 pgs
- h. Brochure from Center for Sustainable Agriculture Systems, University of Missouri, Columbia ..... 2 pgs
- i. Paper Tiger or Potential Catastrophe ... 2 pgs
- j. He Steers Toward Sustainable Systems ... 2 pgs
- k. Common Ground: The Sustainable Ag Movement Matures ..... 1 pg
- l. Sustaining America Through Sustainable Agriculture ..... 7 pgs

- m. Taking The Lead in Sustainable Agriculture ..... 2 pgs
- n. Profitability Will Sell Sustainable Ag/ A Viable Concept For Agriculture? ..... 5 pgs
- o. Sustainable Agriculture At The Ohio State University ..... 8 pgs
- p. More Information ..... 2 pgs

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**MANAGEMENT**

All operations, big and small, can benefit from a closer look at management practices. From employee relations to financial management, these articles offer ways to make your enterprise run more smoothly.

- a. Finding Good Employees ..... 2 pgs
- b. The Magic Of Motivation ..... 3 pgs
- c. Managing Employees ..... 3 pgs
- d. Managing Your Farm Market In The 90s 3 pgs
- e. Market Management For Profit ..... 4 pgs
- f. Examine Liability Issues ..... 3 pgs
- g. Farm Management Today-- Increasingly Complex ..... 1 pg
- h. Cash In On CASH ..... 2 pgs
- i. Six Steps to Better Problem Solving ..... 3 pgs
- j. Training Helps Farm Market Employees Succeed ..... 3 pgs

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**MAPLE SYRUP**

The maple industry, no longer the exclusive specialty of New England, is bringing in profits for a wide range of American entrepreneurs. In northeastern Ohio, the sugaring season begins in mid-February and lasts well into the spring. Freezing nights, followed by days warming into the 40s, make for perfect sap collection. This enterprise requires maple trees, plenty of buckets and taps, a collection system, and an evaporator to condense the syrup, among other equipment. Articles in this section tell of syrup success stories, explain collection and production techniques, and introduce the maple industry.

- a. Farmers Collect Maple Sap For Quality Sugar ..... 2 pgs
- b. Ohio's Maple Industry Is Younger ..... 1 pg
- c. Making Maple Syrup Is The Sweet Side Of Life ..... 4 pgs
- d. Maple Syrup (Alternative Ag Enterprises) 2 pgs

- e. Maple Sugaring...An Annual American Tradition ..... 2 pgs
- f. Producers Stick Together To Sweeten Market ..... 1 pg

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**NURSERIES**

General guidelines are presented for planning, production, crop rotation, fertilization, container grown crops, and other aspects to consider in nursery management. An in-depth discussion is provided on pricing for the wholesale market. A demonstration building arrangement and associated fixed and variable costs are outlined. Pricing considerations and a sample budget are included.

- a. Nursery Management: Administration and Culture ..... 37 pgs
- b. Calculating Field Nursery Costs ..... 10 pgs
- c. Consider Overhead When Setting Prices . 3 pgs
- d. More Information ..... 2 pgs

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**ORGANIC FARMING**

Organic matter--such as animal manure, compost, green manure, and fall cover crops--is used to improve the condition of the soil. Increased soil tilth and water-holding capacity, prevention of soil compaction and crusting, and slowed erosion are just a few benefits of organic farming. A general discussion of soil components, pH, disease and insect control, and ways to improve the soil organically is presented.

Organic farming requires good management skills; all aspects of the farm operation must be carefully controlled. To become certified, a producer usually agrees to follow guidelines of a certifying agency, whereby an inspector oversees field operations. Certification may also involve laboratory testing for pesticide residues. Although it has slightly lower yields, organic farming has the advantages of lower input costs, higher quality products, and significantly higher commodity prices.

- a. OEFFA Organic Certification Standards ..... 20 pgs
- b. To Certify or Not to Certify ..... 5 pgs
- c. Industry Organizations Developing Organic Certification in Mid-Atlantic; Growing Organic ..... 3 pgs

- d. Organic Certification (ADAPT3) ..... 2 pgs
- e. It Isn't Organic 'Til They Say It's Organic ..... 2 pgs
- f. Overview of Organic Fruit Production (ATTRA Information Brief) ..... 23 pgs
- g. Organic Gardening Techniques (Horticultural Guide) ..... 6 pgs
- h. Before You Plant ..... 3 pgs
- i. Ozark Organic Growers Ride Wave of the Future ..... 3 pgs
- j. He Sets His Own Grain Prices ..... 3 pgs
- k. Organics Gain Ground ..... 3 pgs
- l. Organic Methods Yield Profits ..... 2 pgs
- m. Organic May Soon Be Easier to Swallow . 2 pgs
- n. Canadian Grower Struggling With Organic System ..... 1 pg
- o. Stone Farmer of the Sonoma; Ecological Marketing Tips; Nine Predators: A Gallery of Beneficial Insects ..... 7 pgs
- p. Organic Grower Farms it "His Way" .... 2 pgs
- q. Soil Organic Matter: Impacts on Crop Production (Quick Bibliography Series) . 46 pgs
- r. Organic Certification: USDA Reference Briefs ..... 12 pgs
- s. Ozark Organic Growers Association Certification Standards ..... 10 pgs
- t. Organic The Only Way To Go For Orchardist ..... 2 pgs
- u. Organic Claims Exaggerated ..... 2 pgs
- v. Striking A Balance ..... 2 pgs
- w. Back To The Future: A Movement To Farm Without Chemicals Makes Surprising Gains ..... 1 pg
- x. USDA Board Begins Organic Rulemaking ..... 3 pgs
- y. More Information ..... 5 pgs

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**PELLETS (Wood densification)**

Densified wood, wood by-products that are cut in uniform sizes to be compressed into a fuelwood product, come in logs, pellets, and briquettes. These products burn three times longer than dry cordwood, and are used as residential firewood and for commercial applications. A general description of equipment used to produce the densified wood, ways to prepare the raw material, and the post densification process is provided.

Equipment capable of producing 2000 lbs of finished product per hour costs approximately \$70,000. For example, a rotating gas fueled dryer costs approximately \$160,000. Hammermills and conveying systems cost about \$20,000, and a metering bin costs \$30,000. Operating costs include 6 to 9 employees, machinery maintenance costs of \$5,000, and the cost of raw material and packaging. Tables outlining capital expenditures, loan data, operating cost items, revenue items, and various financial management applications of the Sims Bark Company, Inc., are provided. Other articles in this section include a review of the industry in Idaho, an identification of market segments, and a description of the pellet stove.

- a. Wood Densification . . . . . 6 pgs
- b. Pelletizing Equipment Manufacturers . . . 1 pg
- c. Known Pellet Stove Dealers . . . . . 3 pgs
- d. Pellet Primer--An Introduction to Heating With Wood Pellets . . . . . 9 pgs
- e. Basic Assumptions, Sims Bark Company, Inc., Pellet Mill Operation . . 32 pgs
- f. Manufacturing and Marketing of Wood Fuel Pellets (includes a list of wood pellet manufacturers, mobile whole tree processors, storage equipment, on-site chippers, bagging and pelletizing equipment, and others) . . . . . 55 pgs
- g. More Information . . . . . 1 pg

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**PICK-YOUR-OWN (U-PICK)**

Direct marketing (including PYO) has advantages for both farmer and consumer; the farmer benefits from higher income and reduced operating costs, and consumers can obtain higher quality products at cheaper prices. Success may be limited by the number of available consumers, inclement weather, time for the farmer, and expenses for the consumer.

PYO is primarily consumer-oriented, requiring the grower to be able to deal with people for many hours a day. Crops best suited for PYO range from highly perishable crops to those with high labor requirements or relatively high value per acre. Location is the key to successful PYO; crop diversity, quality, advertising, and promotion are other important considerations. Various dos and don'ts, as well as advantages and disadvantages of PYO, are presented.

- a. Farmer-to-Consumer Direct Marketing . . 3 pgs

- b. Is Your Farm Suited to Pick-Your Own? . 4 pgs
- c. Should I Grow Fruits and Vegetables?-- Pick-Your-Own Markets . . . . . 4 pgs
- d. Pick Your Own (from *Growing For Market*) 7 pgs
- e. PYO Keeps Demand High . . . . . 1 pg
- f. Pick-Your-Own Marketing of Fruits and Vegetables . . . . . 4 pgs
- g. Let Your Customers Do the Harvesting . 3 pgs
- h. Direct Marketing Consultant Offers Advice on How to Establish Prices . . . . . 1 pg
- i. Indiana Grower Discusses Pick-Your-Own Strawberries . . . . . 1 pg
- j. Decline in PYO Strawberries . . . . . 1 pg
- k. Fun, Profits in U-Pick . . . . . 2 pgs
- l. Target Your Serious PYO Customers/ Add Complementary Crops . . . . . 1 pg
- m. Target The Retired For Pick-Your Own . 1 pg
- n. The Bloom Is Off Pick-Your Own . . . . . 2 pgs
- o. Estimating The Trade Area and Potential Sales For A Pick-Your-Own Strawberry Farm . . . . . 2 pgs
- p. More Information . . . . . 1 pg

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**ROADSIDE MARKETING**

Articles in this section cover every aspect of the extremely versatile and profitable roadside approach to direct marketing. From designing your market to pricing your product, these articles offer the advice of successful operators as well as hints from outside experts.

*General*

- a. Don't Forget Your Cider Card . . . . . 3 pgs
- b. First Impressions: The Good, The Bad, The Ugly . . . . . 4 pgs
- c. KY Farmers Successfully Market Outside Traditional Networks . . . . . 1 pg
- d. Factors In Successful Attraction Marketing Cited . . . . . 2 pgs
- e. Going The Extra Mile Helps Put Farmers In The Green . . . . . 1 pg
- f. A Better Roadside Stand . . . . . 2 pgs
- g. Roadside Market Traffic-Stoppers . . . . . 2 pgs
- h. Market Mania . . . . . 1 pg
- i. Hot Tips For Boosting Roadside Sales . . 2 pgs
- j. Hot Roadside Marketing Tips For Bigger Profits This Year . . . . . 3 pgs

- k. How Tree-Mendus Farm Became A Tourist Attraction . . . . . 3 pgs
- l. California Farmers Apply Fun And Quality In Direct Marketing . . . . . 3 pgs
- m. Apple Barn Benefits From Tourism In Tennessee's Smoky Mts . . . . . 5 pgs
- n. Mapleside Offers Variety In Mini-Mall Setting . . . . . 5 pgs
- o. 7K Farms, One Family's Success Story . . . 1 pg
- p. Heffron Farms Prospers by Fulfilling Customers' Desires . . . . . 3 pgs
- q. Old-Fashioned Quality Flourishes At Danny Boy . . . . . 3 pgs

*Advertising, Logos, and Promotion*

- a. Selling On Nutrition . . . . . 2 pgs
- b. Working With The Media . . . . . 2 pgs
- c. Logo Programs Spur Sales of State-Grown Products . . . . . 2 pgs
- d. Developing Logos For Farm Markets . . . 4 pgs
- e. How To Get The Most Out Of Low-Cost Promotional Campaigns . . . . . 3 pgs
- f. Promoting A Folksy Farm Image . . . . . 2 pgs
- g. Merchandising, Pricing, and Promotional Strategies . . . . . 4 pgs

*Market Design, Layout, and Location*

- a. Product Display: Showing Off Your Produce . . . . . 13 pgs
- b. Product Handling and Storage . . . . . 16 pgs
- c. Designing Your Market . . . . . 2 pgs

*Diversification*

- a. Fish Ponds A Big Draw At California Farm Market . . . . . 2 pgs
- b. Diversity Is Marketing Success . . . . . 2 pgs
- c. Succeed By Diversifying . . . . . 1 pg

*Family Involvement*

- a. Farmer Dan's: His Is No Garden-Variety Market . . . . . 2 pgs
- b. Family Involvement Contributes To Success at Anderson & Girls Orchard . . . . . 2 pgs
- c. Changes, Adaptation Keep Motmans Successful . . . . . 2 pgs

*Festivals & Entertainment*

- a. Prosperous Virginia Farm Capitalizes On Blend Of Entertainment, Agriculture . . 2 pgs
- b. Fall Festivals Draw Customers . . . . . 2 pgs
- c. Celebrate Harvest Time In Mid-America . 4 pgs

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**SMOKEHOUSES**

Smokehouses for personal use may vary from a barrel to a sturdy brick building. Smoke can be produced from any hardwood, corn cobs or sawdust that colors, flavors, and dries salted meats. A description of various smokehouses and curing of meats, as well as Missouri's administrative guidelines for inspecting, processing, packing and selling fish, seafoods, and game animals are presented.

PLEASE NOTE: This information is for home use only. Anyone interested in operating a commercial smokehouse should contact their state health department and comply with their regulations.

- a. Smoking (from *Basic Butchering of Livestock & Game*) . . . . . 4 pgs
- b. How to Build a Smokehouse and Do It Yourself . . . . . 7 pgs
- c. Administrative Guidelines for Inspecting the Processing, Packing and Sale of Fish, Seafood and Game Animals for Missouri . . . . . 10 pgs
- d. More Information . . . . . 1 pg

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**SPECIALTY PRODUCE**

Specialty produce includes arrowroot (Chinese potato), cipolines, daikon, dongua, elephant garlic, fava bean, and fiddlehead greens, among others. Considerations before starting any of these enterprises include growing conditions, standard packing requirements, and shipment. Miniature produce is also in high demand in some retail markets and gourmet restaurants.

A clientele membership club for U-Pick customers is an option for meeting labor shortage demands. A list of various growers' favorite specialty produce is presented. One diversified specialty produce farm

boasts at least \$2,000 an acre return on their farm. Transplanting gives growers a head start on weed population. Various growers give their story on how they started as well as the market consideration of "sell it before you grow it."

a.	Specialty Produce: A Possibility for Diversification . . . . .	3 pgs
b.	Of Daikons & Dinosaurs . . . . .	9 pgs
c.	Exotic Fruits: A Small-Scale Agriculture Enterprise . . . . .	2 pgs
d.	Growing Ethnic Crops . . . . .	4 pgs
e.	Looking for that 'Special' Crop? . . . . .	3 pgs
f.	Small is Beautiful . . . . .	3 pgs
g.	New Crop: Baby Produce . . . . .	3 pgs
h.	How Specialty Products Can Boost Farm Income . . . . .	2 pgs
i.	European Chicory Lessons . . . . .	5 pgs
j.	Specialty Crops for the Northeast . . . . .	1 pg
k.	Specialty Crops: The Long Term View . . . . .	2 pgs
l.	Specialty Farm Crops Offer Marketing Control . . . . .	1 pg
m.	Specialty Agricultural Enterprises-Boom or Boondoggle . . . . .	4 pgs
n.	Specialty Crops Feed Farm Income . . . . .	2 pgs
o.	Stalk Crops . . . . .	4 pgs
p.	\$200,000 From Half An Acre . . . . .	1 pg
q.	Specialty and Non-Traditional Crops . . . . .	6 pgs
r.	Blue-Corn Growers Aren't Singing the Blues . . . . .	2 pgs
s.	Stopping Produce Bruising . . . . .	1 pg
t.	Post-Harvest Handling of Fresh Produce . . . . .	4 pgs
u.	Produce Demand Strong--For Now . . . . .	1 pg
v.	Purple Artichokes Upstaging Green Globes . . . . .	5 pgs
w.	How To Earn Special Crop Premiums . . . . .	1 pg
x.	Earn Early "Sweat Money" From Your Garden/ Mini-Acre Money Makers . . . . .	3 pgs
y.	The Common Man's Caviar: Pickles . . . . .	1 pg
z.	North Carolina Growers Capitalize on Cooling . . . . .	2 pgs
aa.	Gardening For All Seasons . . . . .	14 pgs
bb.	Produce Sidelines That Work . . . . .	2 pgs
cc.	The Brave New World of Specialty Produce . . . . .	2 pgs
dd.	Cactus Captures Specialty Food Market . . . . .	1 pg
ee.	More Information . . . . .	4 pgs

*\*See also Vegetables'*

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## WIND ENERGY

The use of electricity-producing systems requires time and money, and should be viewed with caution. Those interested in energy generation should obtain detailed background information before serious consideration. Such an enterprise also requires careful consideration of the operator's lifestyle, availability of resources and components, load requirements of the proposed system, and cost comparisons. The operator must determine whether the proposed system will violate any federal, state, or local regulations, including zoning, electrical, and building codes. In addition, they should be aware that wind machines may interfere with airports and communication systems.

Before selecting a site for the windmill, area wind speeds should be monitored for 1 to 5 years, depending upon the purpose of the wind machine. An average wind speed of at least 12 miles per hour is recommended. Maintenance may be difficult, as the machine is usually perched atop a 40- to 100-foot tower and requires regular attention. Other articles in this section cover water pumping, the transport and storage of water, and recommendations for site selection. A table of energy requirements for household appliances and farm equipment in common use, as well as a guide to windmill selection and erection, is also provided.

a.	Homemade Electricity . . . . .	14 pgs
b.	Is the Wind a Practical Source of Energy for You? . . . . .	8 pgs
c.	A Water-Pumping Windmill Primer . . . . .	10 pgs
d.	Breakthrough in Wind-Powered Water Pumping . . . . .	2 pgs
e.	Reading list: Solar Energy Research Institute . . . . .	4 pgs
f.	Reading list: National Appropriate Technology Assistance Service . . . . .	4 pgs
g.	Dempster Industries Inc: Typical Windmill Installation, Pumps & Cylinders, Hand & Windmill Pumps . . . . .	12 pgs

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## WINDBREAKS

Windbreaks are beneficial in reducing heating bills (by up to 20-30%), noise, pollution, and dust; they also reduce erosion and aid in moisture conservation.

Well-planned windbreaks should be started in the fall. Various planting plans and shape considerations are discussed, as well as weed control and other management concerns.

- a. Windbreaks for Missourians . . . . . 5 pgs
- b. Managing Established Tree Windbreaks . 2 pgs
- c. Planning Tree Windbreaks in Missouri .. 6 pgs
- d. Farmstead Windbreaks . . . . . 4 pgs
- e. More Information . . . . . 1 pg

- i. Alternative Wood Drying Technologies: Solar Energy and Dehumidification; Drying Lumber in a Vacuum . . . . . 4 pgs
- j. A Barn for Air Drying Lumber: Pennsylvania Dutch Tobacco Sheds Inspire Design . . . . . 2 pgs
- k. Buying and Drying: How to Find and Season Your Own Lumber . . . . . 4 pgs

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## WOOD DRYING (Lumber)

A complete description of wood tissue, coloration, consistency, and other qualities familiar to woodworkers is presented. Techniques for establishing sites and foundations for air-drying your own wood depend upon the ultimate use of the wood. Methods of stacking wood will also vary, depending on the size of the wood and the level of moisture control needed. Humidity can be measured using a dial-type hygrometer, sling psychrometer, or a stationary dual-bulb hygrometer. Relative air humidity should balance with the bound water in wood. An equilibrium moisture content can vary between 0% and 30%; variations of this scope can change the shape of the wood. Close monitoring of temperature and humidity is essential to dry wood properly. Designs for a dehumidifier kiln, solar kiln, vacuum, and barn for wood drying are presented.

- a. Wood: A Look at this Fundamental Material (from *Fine Woodworking*) . . . . . 5 pgs
- b. Air Drying Lumber: Usable Stock Comes from a Carefully Stickered Stack . 2 pgs
- c. As Dries the Air, So Shrinks the Wood: Why Woodworkers Keep a Weather Eye on Relative Humidity . . . 3 pgs
- d. Measuring Relative Humidity . . . . . 1 pg
- e. Calculating Wood Moisture Content . . . . . 1 pg
- f. Shop-Built Moisture Meter: Printed Circuit Guides You Through Electronic Maze . . . . . 3 pgs
- g. A Dehumidifier Kiln: Home-Dried Lumber with No Frills . . . . . 3 pgs
- h. A Solar Kiln for Drying Wood: Dry, Defect-Free Wood and a Place To Store It, Too . . . . . 4 pgs



## ADDITIONAL SOURCES

The following list contains additional sources for information on alternative agriculture.

Agricultural Library Forum  
National Agricultural Library  
Attn: Karl Schneider  
Room 111  
Beltsville, Maryland 20705  
301-344-2113

Appropriate Technology Transfer for Rural Areas  
(ATTRA)  
P.O. Box 3657  
Fayetteville, Arkansas 72702  
800-346-9140

Center for Alternative Plant & Animal Products  
University of Minnesota  
340 Alderman Hall  
St. Paul, Minnesota 55108  
612-625-5747

IDEAS-1990  
Attn: Ms. Linda Balmer  
Ridgetown College of Agricultural Technology  
Ridgetown, Ont.  
Canada NOP 2CO

Marketing & Transportation Research Branch  
TMD/AMS/USDA  
Attn: Julie K. Anton  
Room 2955-S  
P.O. Box 96456  
Washington, D.C. 20090-6456

Missouri Alternatives Center  
628 Clark Hall  
Columbia, Missouri 65211  
314-882-1905

Office of Small Scale Agriculture  
Attn: Howard W. Kerr, Jr.  
USDA-CSRS  
OSSA, Suite 328A Aerospace Building  
Washington, D.C. 20250-2200  
Phone: 202-401-1805  
Fax: 202-401-1804

The Ohio State University  
Department of Agr. Econ. and Rural Sociology  
Attn: Kelso L. Wessel or Susan E. Essman  
2120 Fyffe Road  
Columbus, Ohio 43210  
614-292-6413 or 614-292-6924

Small Farm Enterprise Project  
Attn: Claudia Meyers  
University of California, Davis  
Davis, California 95616  
916-757-8910

Successful Farming  
Attn: Tammy Hagerty  
1716 Locust  
Des Moines, Iowa 50336  
515-284-2853

## USEFUL PUBLICATIONS

The following magazines, newsletters, and resources provide excellent publications for anyone interested in information on alternative agriculture.

### MAGAZINES

*American Small Farm*  
Andy Stevens, Ed.  
455 Columbian Ave.  
Columbus, Ohio 43233  
614-275-1622

*The New Farm Magazine of Regenerative Agriculture*  
222 Main Street  
Emmaus, Pennsylvania 18098  
(215) 967-5171

*Rural Enterprise*  
P.O. Box 878  
Menomonee Falls, Wisconsin 53052-0878  
(414) 255-0100

*Small Farm Today* (formerly Missouri Farm Magazine)  
Ridge Top Ranch  
3903 W. Ridge Trail Rd.  
Clark, Missouri 65243  
(314) 687-3525

*Successful Farming*  
1716 Locust Street  
Des Moines, Iowa 50336-0001  
(515) 284-3000  
FAX (515) 284-3563

### NEWSLETTERS

*Ag Opportunities*  
Missouri Alternatives Center  
University Extension  
628 Clark Hall  
Columbia, Missouri 65211  
(314) 882-1905

### *BioOptions*

Center for Alternative Plant and Animal Products  
305 Alderman Hall  
1970 Folwell Avenue  
University of Minnesota  
St. Paul, Minnesota 55108

### *Small Farm News*

Cooperative Extension  
University of California  
Davis, California 95616  
(916) 757-8910

### *Small-Scale Agriculture Today*

Office for Small-Scale Agriculture  
USDA/CSRS/OSSA  
Suite 328A Aerospace Building  
Washington, DC 20250-2200

### *Tomorrow's Harvest*

Rural Development Center/Bldg. 31  
Kirkwood Community College  
6301 Kirkwood Blvd. SW  
P.O. Box 2068  
Cedar Rapids, Iowa 52406  
(319) 398-5669

### RESOURCES

Northeast Regional Agricultural Engineering  
Service (NRAES)  
152 Riley Robb Hall  
Cooperative Extension  
Ithaca, New York 14853-5701  
(607) 255-7654  
FAX (607) 255-4080

Contact NRAES for information on obtaining these two excellent references:

- 1.) *Farming Alternatives: A Guide to Evaluating the Feasibility of New Farm-Based Enterprises*
- 2.) *Facilities for Roadside Markets*

ORDERING INFORMATION

This publication is available to Ohio residents and non-Ohio residents on a cost-recovery basis by sending \$3.00 per copy. Copies of the articles presented in this publication are available on a cost-recovery basis. Indicate the item topic, title, subtitle (if applicable), and number of pages for each document requested. The copying cost is \$20 per printed side of a page. Orders must be prepaid. Overseas orders add an additional \$5.00 U.S. funds for postage.

Make checks payable to "OSU/IRE". Send requests to: Innovative Rural Enterprises, Department of Agricultural Economics and Rural Sociology, The Ohio State University, 2120 Fyffe Road, Columbus, Ohio 43210, Telephone (614) 292-6413 or 6924, FAX (614) 292-4749.

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