



Farming a Few Acres of Herbs:

An Herb Grower's Handbook



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Art Credits

Bee Balm

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A. Brown. 1913. Illustrated flora of the northern states
and Canada. Vol. 3: 132.\

Blue Vervain

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Borage

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Feverfew

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Evening Primrose

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Chinese Milkvetch

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Joe Pye Weed

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Marsh Mallow

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Milk Thistle

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Mullein

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Narrow-leaved Coneflower

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Oregano

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Pluerisy Root

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Purple Coneflower

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Red Clover

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Round-headed Lespedeza

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Sheep Sorrel

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Skullcap

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St. John's Wort

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Stinging Nettle

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Valerian

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Yarrow

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Self Heal

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A. Brown. 1913. Illustrated flora of the northern states
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Why grow herbs?

There are many reasons to grow herbs. You may want to keep a few plants around the yard for personal culinary or medicinal use. Or you may have heard about high prices for some herb products and see them as a potentially valuable cash crop for the farm.

Medicinal herbs in Kansas

Kansas agricultural producers are exploring the production and marketing of medicinal herbs. They may be exploring alternative crops because of low prices of traditional commodity crops. This interest is shared by many across the country as well as around the world including Canada, Australia and South Africa. Countries with low labor costs such as China, India, Thailand, South Korea, Brazil, Mexico, Egypt, Indonesia, Kenya and the Philippines also grow a variety of medicinal herbs. European and Mediterranean countries also grow herbs, but are net importers.

Medicinal plants have been used throughout history. There are 35,000 different plant species used for medicinal purposes. In the United States, consumer interest in medicinal herbs is increasing. Herbs are sold as capsules, tablets, extracts and teas, and included as ingredients in foods. Surveys show that consumers are beginning to understand and accept dietary supplements, including herbs. Natural foods markets carry the largest selection, with hundreds of products including whole herbs, tinctures, extracts and standardized products.

Markets for herbs

The global retail market for medicinal herbs is \$14 billion per year. Demand for medicinal herbs in the United States has a retail value of more than \$4 billion per year. Retail sales in the United States increased steadily from 1994 until 1998, then leveled off, remaining steady for the past three years. Compared to 1999, sales in 2000 increased slightly in natural food and health food stores but decreased in food stores, drug stores and mass market retailers.

While demand has stabilized, the medicinal herb supply has increased. Markets are overstocked with raw materials with low demand. A significant market risk is associated with growing medicinal herbs because of limited markets. Current demand can be met quickly by overproduction. For example, the price for Echinacea roots has been as low as \$2.50 per pound of dried root in the last three years, compared with more than \$20 per pound in 1998. The current market price is \$6 to \$8 per pound.

Potential for herb production

Several factors make it difficult to determine the potential for profitable herb production:

- An uncertain market size.
- Low-cost producers who dominate world production.
- Difficulty assessing market information.
- Lack of quality control procedures.
- Little available agronomic information for herbs.
- Mixed acceptance by the medical community.

Kansas has an ideal climate for growing herbs, and many medicinal herbs are native species. Kansas State University's Department of Horticulture, Forestry and Recreation Resources is conducting research trials to see how various herbs perform in Kansas. This research may provide insight about competitive advantages for Kansas producers in raising superior herbs over producers in other states and throughout the world. Details from K-State research trials are published in Appendix A. Recent price ranges for several herbs are found in Appendix B.

Do medicinal herbs offer potential as an alternative crop in Kansas? For individuals willing to invest significant time, effort and capital, the answer is a cautious, "maybe." Herbs are certainly not get-rich-quick crops. The long-term answer for some may involve becoming a low-cost, efficient producer. For others, it will mean selling smaller amounts of high-quality product at the best possible price. For others, it may mean developing a value-added product, like an herb tea blend or line of herb tinctures.

A word of caution for those wanting to make a quick profit: At times there are good prices for some herbs, but prices fluctuate from year to year and season to season, and high prices don't usually stay high for long. Generally, contracts are needed to get those high prices, and these are secured after establishing a track record as a grower and building relationships with one or more buyers. Herbs are a high-value crop, but also require high inputs including seed, land, fertility and pest control. Some herbs also require a lot of hand labor, and harvesting and postharvest handling labor and quality control procedures can be expensive. Also, the trend in herb production is for organic certification, and there are costs to this service, including membership dues, inspectors' fees, and the learning curve and three-year transition period required before certification is granted.

In spite of these cautions, herbs have the potential to be an additional cash crop for Kansas

farmers. Because these are high-value crops, a farm can range from ½ acre to more than 1,000 acres in size. These crops are relatively new to Kansas, and beginning farmers are encouraged to try these crops, as are farmers with experience in other crops.

The term “herb” simply means “a plant,” so describing the production and marketing requirements of this diverse family requires explanation. In fact, the production and harvesting requirements for herbs are probably even more diverse than for fruits and vegetables. For example, growing and harvesting a watermelon is much different than growing and harvesting a carrot.

How to use this handbook

The following sections go into detail, emphasizing the economic and agronomic, or specific growing requirements for herbs. Marketing strategies are separated into local direct marketing and growing for a marketing chain or network. Cultural practices include information on how the plant is harvested because harvesting equipment limits what is grown on an individual farm more than planting or weeding equipment. Root crops are probably the most labor intensive because they may require several seasons to reach a marketable size. Digging, washing and drying

equipment or space are required. Plants harvested for their aboveground biomass (tops) may be harvested by hand or mechanized, but drying equipment or space is necessary. Some of these plants may be harvested once, and others are perennials and can be harvested multiple times, similar to alfalfa or grass hay. Some herb crops can be grown for their flowers or seeds. Flowers might be too labor intensive to grow in the United States because they are grown in other countries where labor is less expensive. It is unlikely that a U.S. grower could compete at current market prices. Growers may want to consider seed crops, however, because harvests can be mechanized. Some seed crops are from annuals, which must be replanted, but others are from perennials, which offer the possibility of multiple harvests.

As much as possible, Kansas data and experience have been used to illustrate local production potential. More than 30 different herbs are being tested in experimental plots in four Kansas locations. These data are found in Appendix A. Data from the 2000 through 2002 growing seasons are included in this handbook. Future editions will add 2003 and 2004 data and cover more species. Also, grower experiences from Kansas and the Great Plains will supplement the field-trial experimental data.

Table 1. Common Culinary Herbs

Common Name	Latin Name	Part Used	Comments
Annuals			
Basil (many sub-types)	<i>Ocimum basilicum</i>	Leaf	Sell fresh in large quantities for pesto. Avoid refrigeration to reduce discoloration of leaves.
Coriander	<i>Coriandrum sativum</i>	Leaf and seed	Called cilantro when used green.
Dill	<i>Anethum graveolens</i>	Leaf and seed	Many uses besides pickles.
Garlic	<i>Allium sativum</i>	Bulb	Plant cloves in fall for June/July harvest (winter annual).
Perennials			
Chives	<i>Allium schoenoprasum</i>	Leaf and flower	Primarily used for garnish, but also adds flavor. Purple flower.
Garlic chives	<i>Allium tuberosum</i>	Leaf	Flat-leaved cousin of chives from Japan. White flower. Great in salads and stir-fry.
Lemongrass	<i>Cymbopogon citratus</i>	Inner core of leaf whorl	Tender perennial, must be brought inside for the winter in pots.
Marjoram	<i>Origanum vulgare (sometimes listed as Marjorana hortensis)</i>	Leaf/flower	Similar to oregano in flavor, though not as strong.
Mint	<i>Mentha spp.</i>	Leaf	Many varieties, adds flavor to many dishes, not just for tea.
Oregano	<i>Origanum vulgare hirtum</i>	Leaf	Greek oregano is used for pizza. Another species, <i>Lippia graveolens</i> (also known as Mexican oregano), is sold in the United States as oregano.
Parsley	<i>Petroselinum crispum</i>	Leaf (root is medicinal)	This plant has medicinal and culinary uses. Flat-leaved (Italian) type is best for cooking. Curly leaf used more for garnish.
Rosemary	<i>Rosmarinus officinalis</i>	Leaf	Tender perennial. Bring inside for the winter in a pot or as cuttings.
Sage	<i>Salvia officinalis</i>	Leaf	Medicinal and culinary uses.
Tarragon	<i>Artemisia dracunculoides sativa</i>	Leaf	French tarragon is recommended for its flavor. Russian tarragon may be easier to grow, but lacks flavor.
Thyme	<i>Thymus vulgaris</i>	Leaf	Medicinal and culinary uses. Small leaves will strip off the stem easily when dried.

Because wholesale price data is nearly impossible to find, Appendix B summarizes retail prices for about 300 species that will grow in Kansas. These are organized into tables by plant type (tree, shrub, etc.). The highest and lowest retail prices were multiplied by 0.5 to estimate possible wholesale prices and gross profit to growers. Calculations for each of the 30 species are included in Appendix A.

Herbs for local markets (Direct marketing)

A variety of herbs can be grown and sold at farmers' markets or to local shops and stores. These include culinary herbs, herbs for teas, salves and other medicinal uses, and herbs or plants used for decoration or floral design. This publication focuses mostly on medicinal herbs because this is an active area of inquiry at K-State, and horticulture specialists receive many requests for information on this topic. Herbs for other uses will be covered briefly in this section. Popular magazines and books also cover this topic.

Culinary herbs

Herbs for cooking can be harvested and sold fresh in bunches or packets, or dried. Dried herbs must compete with the international market where labor is cheap, while fresh herbs usually are not oversupplied and underpriced. Table 1 lists some culinary herbs that grow well in Kansas. Recipes provided at the point of sale might encourage those who don't have experience with herbs.

Herbs for tea

Herbs for tea are easy to grow, harvest and sell to a local market. An herb tea may be a pleasant beverage, possess medicinal properties or both. When growing medicinal plants, make sure to grow the correct species and avoid plants with potentially toxic side effects. The species listed in Table 2 are widely used and considered safe. Some individuals may have sensitivities or allergies and should be careful when trying new products. For more information on herb tea, see K-State Research and Extension publication MF-2579, *Growing Herbs for Home Use*.

Table 2. Herbs Commonly Used in Herb Tea

Common Name	Latin Name	Part Used	Comments
Annuals			
Chamomile – German	<i>Matricaria chamomilla</i>	Flower	Best one for tea.
Chamomile – Roman	<i>Chamaemelum nobile</i>	Flower	More often used as an oil.
Stevia	<i>Stevia rebaudiana</i>	Leaf	Is 300 times sweeter than sugar. Only need a small amount. Can be used as fresh or dried leaf, though an extract is sold commercially.
Perennials			
Alfalfa leaf	<i>Medicago sativa</i>	Leaf	Mild flavor, often overlooked, healthful plant.
Bergamot	<i>Monarda fistulosa</i>	Leaf/flower	Strong but pleasant flavor. Great butterfly plant.
Catnip	<i>Rhannus purshiana</i>	Leaf	Not just for cats! Great for tea.
Comfrey	<i>Symphytum officinale</i>	Leaf	Recent warnings of liver damage with prolonged use. Might not want to sell this one commercially.
Dandelion	<i>Taraxacum officinale</i>	Leaf/root	Can be slightly bitter in tea, but has many health-promoting properties. Best in a blend with other herbs.
Hibiscus flowers	<i>Hibiscus sabdariffa</i>	Flower	Adds color and tartness to tea.
Lemon balm	<i>Melissa officinalis</i>	Leaf	Medicinal herb with a nice flavor.
Lemon verbena	<i>Aloysia triphylla</i>	Leaf	Bring inside during the winter. Tender perennial.
Lemongrass	<i>Cymbopogon citratus</i>	Leaf	Tender perennial. Bring inside.
Licorice root	<i>Glycyrrhiza glabra</i> , <i>Glycyrrhiza uralensis</i> (Chinese), <i>Glycyrrhiza lepidota</i> (N. Am.)	Root	These will spread. Adds sweet flavor to tea. Not recommended for people with high blood pressure.
Mint (several types)	<i>Mentha piperita</i> (peppermint) <i>Mentha spicata</i> (spearmint)	Leaf	These will spread. A classic tea plant. Available in flavors, including chocolate.
Raspberry leaf	<i>Rubus idaeus</i>	Leaf	Included in many women's teas. Worth investigating.
Red clover flowers	<i>Trifolium pratense</i>	Flower	Popular in women's teas. Has some estrogenic properties.
Rosehips	<i>Rosa canina</i>	Fruit	Contains vitamin C. May need to boil slightly to extract flavor.
Stinging nettle	<i>Urtica dioica</i>	Leaf	Mineral rich and flavorful tea, sometimes recommended as a spring tonic.
Yarrow	<i>Achillea millefolium</i>	Leaf	Surprisingly nice tea. Do not make it too strong.

Herbs for salves and creams

A third group of herbs can be grown for use in salves, creams or other topical uses (Table 3). Infused oils, salves and creams are not difficult to make. It is possible to learn how to make them from a class or from books. See page 22 for more information. Some herbs in this category can be used internally and some cannot, so be familiar with each plant and its uses.

Herbs for fragrance and decor

Another group of herbs is used for fragrance, dried flower arrangements, potpourri or other decorative uses (Table 4). Some of these are harvested on a commercial scale for their essential oils. This is only economically feasible where a processing plant exists or there are enough growers to support processing. This market is already somewhat saturated, so this will probably not be a competitive area for new, large-scale growers. These may be profitable for small-scale growers who sell locally. These herbs may not be safe for internal use, but a few, such as mint, have internal uses.

Promoting and marketing herbs

Herbs sold directly to consumers can be promoted in a variety of ways. Herbs are categorized as dietary supplements by the FDA, which are regulated separately from food and drugs. There are some special rules that apply. First, health claims cannot be made about the herbs. As with food items, all herbs should be clean, well labeled and sold unprocessed, unless you have a certified commercial kitchen and/or have sought the advice of the local or state health department.

Labels for herbs may include the name as well as culinary and folk uses. Keep reference books handy so customers can read more about the herbs. These resources also keep the herb seller from assuming the role of an unlicensed health care provider.

Providing recipes or suggestions of herb tea blends is nice for people trying culinary herbs for the first time. Other marketing ideas include writing articles about herbs for newspapers or newsletters or inviting a speaker to the local garden club or farmers' market association to talk about herbs. When selling herbs, the more educated the consumer the better. Education will help growers know how to safely use herbs, and how important it is to find a high-quality, fresh, local source.

Herbs for commercial markets

Deciding which herbs to grow for the commercial market may be much tougher than for the local direct market. For a local market, a grower can try a few things, see what customers like and educate consumers. In the commercial market, the grower is several steps away from the consumer and must be aware not only of what consumers and manufacturers want, but what buyers for the manufacturers want as well. There is a lot of international competition in the commercial market. An herb that must be hand harvested or is time consuming to grow may be more competitive coming from another country. Herbs that grow in tropical climates will not be considered here, except for those that may be grown successfully in unheated greenhouses, or tender tropical perennials that could be grown as annuals. For

Table 3. Herbs for homemade salves and creams

Common Name	Latin Name	Part Used	Comments
Annuals			
Calendula	<i>Calendula officinalis</i>	Flower	High resin varieties available. Pick when flower is at its prime.
Chickweed	<i>Stellaria media</i>	Leaf	Harvest when young and tender.
Perennials			
Aloe	<i>Aloe barbadensis</i>	Leaf	Mucilaginous gel in the fresh leaf used in hand creams and other products. Grow indoors as a houseplant or set out during the summer for rapid growth.
Arnica	<i>Arnica montana</i>	Flower	Maybe difficult in Kansas. In high demand from herbalists.
Burdock	<i>Arctium lappa</i>	Root/leaf	Easy to grow. Wild type also found in Kansas.
Comfrey	<i>Symphytum officinale</i>	Leaf/root	Easy to grow. Propagate by root divisions
Mint	<i>Mentha spp.</i>	Leaf	Easy to grow. Will spread. Essential oil ¹ or infused oil ² of mint more likely in skin products than whole leaf.
Plantain	<i>Plantago lanceolata, P. major</i>	Leaf	This common sidewalk weed often used for skin ailments.
St. John's wort	<i>Hypericum perforatum</i>	Flower	Often found in skin creams and oils, as well as for internal use.

¹ Essential oil has been extracted through the use of heat and pressure, usually involving a steam distillation process. These oils are highly concentrated and used in very small quantities, like a few drops. These are usually not made at home, but could if one had a distillation unit. When sold commercially, these bring a very high price, or are sometimes diluted and sold at a lower price.

² Infused oil can easily be made at home, using a process of soaking the fresh or dried herb in olive or other vegetable oil. See reference section for books that describe the process in detail.

example, stevia, originally from Paraguay, does well as an annual in Kansas. (For more information, see the fact sheet, *Stevia*, MF-2630, in Appendix A.)

More than 30 herbs have been screened for production potential in Kansas field test plots. Results for herbs screened for two years or more are found in Appendix A, which is a compilation of fact sheets for each species. As more species are evaluated, new fact sheets will be written. Table 5 summarizes K-State's experiences and recommendations with herbs in Kansas. It includes 30 species in the fact sheets, plus information on species that were observed in gardens.

These recommendations should be interpreted for a specific growing site, considering whether the field is exposed or protected, irrigated or non-irrigated, etc. Table 5 is organized by plant part/harvest method because harvest may limit more growers than any other factor. Though some herbs have markets for more than one plant part (for example, leaves and roots), they are listed in the table under the most common use. Information on equipment and business planning are in the next section of this handbook. Site-specific data from each year are found on the K-State Research and Extension horticulture Web site: www.oznet.ksu.edu/ks/herbs.

Equipment and capitalization

Growing the crop

Equipment for planting and cultivating an herb crop will be similar to equipment for grain and vegetable crops. Harvesting may be different

and will be discussed later. If herbs are the first enterprise on a farm, this equipment will need to be purchased, rented or borrowed, but if adding herbs to an existing farm, many of these items will already be available or in use. When calculating budgets, make sure to include depreciation, repairs and other equipment costs for a fair accounting.

If the crop can be direct seeded, standard planting equipment may work. For example, medium-sized seeds such as milk thistle and Echinacea can be planted with a wheat drill or planter. Smaller-seeded species such as red clover could be seeded using the forage seeder box on a standard planter. Some very small seeded species, such as chamomile or St. John's wort, will need to be seeded in the greenhouse and put into the field as transplants, or seeded by hand and then thinned. Field crop farmers might need to purchase equipment and facilities to grow transplants and place them in the ground. Transplants for some species can be purchased or contracted from another local grower who already has the facilities. On a small scale, purchasing a transplanter does not make sense, but on a large scale, a transplanter can save on labor costs.

With each purchase, evaluate the capital investment, the opportunity cost of that money, the interest if the money is borrowed, the expected life of the equipment and the cost of the labor that the equipment will displace. This calculation should be performed for everything from a tractor to a root digger. Tables 6 through 8 (page

continued on page 10

Table 4. Herbs for fragrance, oils and decoration

Common Name	Latin Name	Part Used	Comments
Perennials			
Bergamot	<i>Monarda fistulosa</i>	Flower/leaf	Flowers and leaves may be dried.
Bittersweet	<i>Solanum dulcamara</i>	Vine/berries	Can be harvested from the wild in Kansas. Used for decoration but has medicinal properties.
Lavender	<i>Lavandula angustifolia</i>	Flower/leaf	Dried flowers and stems are used.
Mints	<i>Mentha spp.</i>	Leaf	Many types available.
Orris Root	<i>Iris germanica var. florentina</i>	Root	The dried root of this variety is fragrant.
Patchouli	<i>Pogostemon patchouli</i>	Leaf	Tender perennial. Fragrant plant.
Pine cones	<i>Pinus spp.</i>	Cone	Many types may be collected and added to potpourri mixtures.
Rattlesnake master	<i>Eryngium yuccafolium</i>	Whole plant	Unusual native plant found only in virgin prairie.
Roses	<i>Rosa spp., Rosa canina (rosehips)</i> <i>Rosa centifolia, Rosa gallica</i>	Flower petals and buds	Many types, old-fashioned musk type have the most aromatic petals. Rosehips, petals or whole flowers may be dried and preserved.
Rosemary	<i>Rosmarinus officinalis</i>	Leaf/flower	Decorative and useful culinary and medicinal herb.
Scented geraniums	<i>Pelargonium spp.</i>	Leaf	Many types available.
Sumac	<i>Rhus glabra</i>	Berries	Sumac berries may be used in tea or decoration. Woody plant, wild in Great Plains.
White sage	<i>Salvia apiana</i>	Leaf and stem	Used for incense or potpourri, not cooking.
Yarrow	<i>Achillea millefolium</i>	Leaf and flower	Flowers dry nicely for arrangements

Table 5. Herbs for the Commercial Market - Organized by Harvest Method for Primary Crop

Common Name	Latin Name	Life Cycle	Sun	Harvest	KSU trials ¹	Recommendations ²	Comments ³
Pollen/Stamens							
Saffron	<i>Crocus sativus</i>	Perennial	Partial shade	Pollen/stamens – by hand	No	G	Very expensive and tedious to harvest. Imported from Spain.
Flowers/petals							
Borage	<i>Borago officinalis</i>	Annual	Sun	Flowers (also stems and leaves). Harvest during flowering period	Yes MF-2608	G/L	For borage oil, the fatty oil of the seeds, though other parts also used medicinally. Flowers added to salads. Good for gardens. Limitations are flowers hard to harvest and limited market for other parts of the plant.
Calendula	<i>Calendula officinalis</i>	Annual	Sun	Flowers	Yes MF-2610	G/F	Grows well here. Time necessary to harvest flowers is a limitation.
Chamomile – German	<i>Matricaria chamomilla</i>	Annual	Sun	Flower rake	Yes (no fact sheet yet)	G/L	Easy to grow and tedious to harvest. Don't confuse with Roman chamomile, <i>Chamaemelum nobile</i> , which is primarily grown for its oil and not for tea.
Elderberry	<i>Sambucus nigra</i>	Woody perennial	Sun, partial shade	By hand (flowers and/or fruit)	Yes (no fact sheet yet)	F/G	Market for elderberry now at a winery in Mulvane, Kan. Native plant, well adapted.
Red clover	<i>Trifolium pratense</i>	Perennial	Sun	Blossoms	Yes MF-2625	F/G/L	Easy to grow but time consuming to harvest. Better to grow a large field of it or rotate with other crops as a cover crop. If only growing a few plants, rabbits may be a problem.
St. John's Wort	<i>Hypericum perforatum</i>	Perennial	Sun	Flowers and/or top 6 inches in full flower, could clip tops	Yes MF-2629	G/F	Well adapted, best yields might be during second year. Need to replant periodically. Gets shrubby. Pretty in garden. Could partially mechanize the harvest. Big market for this crop, especially if high quality.
Fruit							
Elderberry	<i>Sambucus nigra</i>	Woody perennial	Sun, partial shade	By hand (flowers and/or fruit)	Yes (no fact sheet)	F/G	Market for elderberry now at a winery in Mulvane, Kan. Native plant, well adapted.
Hawthorn	<i>Crataegus laevigata</i> , also <i>C. monogyna</i>	Woody perennial	Sun	Fruit (also flower and leaf)	Observation	G/F	Cardiac stimulant and antioxidant. Now imported from Poland, Chile, Bulgaria and France. Well adapted to Kansas landscape.
Seeds							
Evening primrose	<i>Oenothera biennis</i>	Biennial	Sun	Small seeds	Yes MF-2611	N	Medicinal part is the fatty oil extracted from the ripe seeds and fresh plant gathered at the beginning of the flowering season. Did not do well in our trials and seed shatters easily.
Milk thistle	<i>Silybum marianum</i>	Normally a winter annual	Sun	Can use combine	Yes MF-2618	N (if from transplants)	Can plant with wheat drill. Plant very early – February/March – to get a crop in Kansas. Tentative recommendation until direct seeding trials have been conducted.
Leaf							
Alfalfa	<i>Medicago sativa</i>	Perennial	Sun	Leaf and seed, could mechanize both	No	F	Common forage crop in Kansas. Well adapted to local climate. Marketing the crop and working out quality control details are limitations.

¹Fact sheet number if available.

²Recommendation code: G = good for gardens; N = not adapted to Kansas; F = could be a good field crop; L = limitations (labor-intensive, insect or disease, etc.)

³Comments are generally about growing conditions or marketing potential. Occasionally mention medicinal uses to give one a sense of whether this plant has market potential in the future.

Table 5. Herbs for the Commercial Market - Organized by Harvest Method for Primary Crop (continued)

Common Name	Latin Name	Life Cycle	Sun	Harvest	KSU trials ¹	Recommendations ²	Comments ³
Bee balm	<i>Monarda fistulosa</i>	Perennial	Sun	Leaf/flower	Yes MF-2605	G/F	<i>M. fistulosa</i> did well in field trials, but <i>M. didyma</i> did not.
Blue vervain	<i>Verbena hastata</i>	Perennial	Sun	Leaf/whole herb	Yes MF-2606	G/F	Nice plant, though had heavy insect damage in some years.
Boneset	<i>Eupatorium perfoliatum</i>	Perennial	Sun	Leaf/above ground portion	Yes MF-2607	G/F	Nice white flowers, does well under field conditions, even when dry.
Feverfew	<i>Tanacetum parthenium</i>	Perennial	Sun	Flowering tops/leaves	Yes MF-2614	G/F	Grow this plant like an annual rather than a perennial. Poor winter survival.
Ginkgo	<i>Ginkgo biloba</i>	Woody perennial	Sun	Leaves	No	G/F	Limitations are market and harvest method. Adapted landscape tree common in Kansas.
Heal all	<i>Prunella vulgaris</i>	Perennial	Sun	Leaves	Yes MF-2636	G/F	Attractive plant. Did OK in field trials, but may be difficult to harvest. Low growing.
Heartsease/wild violet/wild pansy/Johnny-jump-up	<i>Viola tricolor</i>	Annual to perennial	Sun or shade	Fresh aerial parts, 2 to 3 harvests per year possible	No	G	Approved by Commission E for inflammation of the skin, used both internally and externally. Often a weed in flower beds.
Lemon balm	<i>Melissa officinalis</i>	Perennial	Sun, partial shade	Collect leaves before flowering and/or branching	Yes	G/F	Great in tea. Seems to be expanding market. Winter hardy in a moderately protected area.
Lemon verbena	<i>Aloysia triphylla</i>	Tender perennial, somewhat woody shrub	Sun, partial shade	Lateral branches harvested in the fall	Observation	G	Propagated by runners or cuttings. Used to flavor teas. Probably not hardy in Kansas. Bring inside each winter.
Mullein	<i>Verbascum thapsus</i>	Biennial	Sun (needs good drainage)	Leaves for tea, flowers for infused oil	Yes MF-2619	G/F	Attractive, adapted plant for garden or field. Harvest leaves first year and flowers in second.
Oregano	<i>Origanum vulgare</i>	Perennial	Sun	Leaves	Yes MF-2621	G/F	Adapted to Kansas.
Round-headed Lespedeza	<i>Lespedeza capitata</i>	Perennial	Sun	Whole herb tops	Yes MF-2626	G/F	Native to Kansas. Looks good in the field. Small market now.
Sheep sorrel	<i>Rumex acetosella</i>	Perennial	Sun	Whole herb top and/or leaves	Yes MF-2627	G/F	Great as a salad and tea herb. Picking such a low growing herb may be a limitation. Spreads a lot.
Skullcap	<i>Scutellaria lateriflora</i>	Perennial	Sun	Harvest aerial part of 3- to 4-year-old plants in June	Yes MF-2628	G/F	Did great in field trials. Attractive plant. Market for tops now, roots in future.
Stevia	<i>Stevia rebaudiana</i>	Tender perennial	Sun	Aerial portions.	Yes MF-2630	G/F	Did great in field trials. A tropical plant from Paraguay, so grow like an annual.

¹Fact sheet number if available.²Recommendation code: G = good for gardens; N = not adapted to Kansas; F = could be a good field crop; L = limitations (labor-intensive, insect or disease, etc.)³Comments are generally about growing conditions or marketing potential. Occasionally mention medicinal uses to give one a sense of whether this plant has market potential in the future.

Table 5. Herbs for the Commercial Market - Organized by Harvest Method for Primary Crop (continued)

Common Name	Latin Name	Life Cycle	Sun	Harvest	KSU trials ¹	Recommendations ²	Comments ³
Stinging nettle	<i>Urtica dioica</i>	Perennial	Partial shade	Leaves (also a market for roots)	Yes MF-2631	F	A bit “stingy” for the garden but grows well, even in full sun.
White sage	<i>Salvia apiana</i>	Tender perennial. Grow as an annual.	Sun	Whole tops	Yes MF-2633	G/F	Attractive in the garden. Used for ceremony, not cooking or other herbal preparations. Not winter hardy.
Yarrow	<i>Achillea millefolium</i>	Perennial	Sun	Flowering tops	Yes MF-2634	G/F	Attractive in the garden. Did well in the field.
Root							
Black cohosh	<i>Actaea racemosa</i>	Perennial	Shade	By hand – root	No	G	Difficult to germinate seeds and grow in Kansas, but is an endangered species in the wild. Expanding market.
Blue cohosh	<i>Caulophyllum thalictroides</i>	Perennial	Shade	By hand – root	No	G	Difficult to germinate seeds and grow in Kansas, but is an endangered species in the wild. Expanding market.
Burdock	<i>Arctium lappa</i>	Biennial	Sun	Root is most marketable, fresh or dried, but leaves and seeds also used	Yes MF-2609	G/F	Does well in Kansas. Harvesting is the major limitation.
Chinese milkvetch	<i>Astragalus membranaceus</i>	Perennial	Sun	By hand, or use root digger to loosen soil first	Yes MF-2612	G/F	Used for its anti-viral and immune-stimulating properties in many formulations. Potential for high demand. Grows well in Kansas, but difficult to dig this root. Poor survival in soils that are not well drained. Attractive plant.
Dandelion	<i>Taraxacum officinale</i>	Perennial	Sun	Roots and tops marketed	Yes MF-2613	G/F	Best yields under cultivated conditions, though could harvest small plants at home as “wild greens.”
Echinacea (Narrow-leaf coneflower)	<i>Echinacea angustifolia</i>	Perennial	Sun	Hand or machine dig root	Yes MF-2620	F	Direct seeding is more successful than transplanting. Poor survival.
Echinacea (Pale purple coneflower)	<i>Echinacea angustifolia var. pallida</i>	Perennial	Sun	Hand or machine dig root	Yes MF-2620	G/F	Easier to grow than <i>E. angustifolia</i> . Larger tap root. Unclear market.
Echinacea (Purple coneflower)	<i>Echinacea pupurea</i>	Perennial	Sun	Hand or machine dig root	Yes MF-2624	G/F	Easiest <i>Echinacea</i> to grow. Limited as commercial crop by aster yellows disease. Flowers can be sold to floral shops.
Garlic	<i>Allium sativum</i>	Winter annual	Sun	Hand or machine	No	G/F	Common vegetable crop in Kansas. Many varieties well adapted.
Ginseng	<i>Panax quinquefolius</i>	Perennial	50% shade	By hand	Yes – observation	N	Poor survival. Have tried for several years under simulated woodland conditions. Too hot and dry here.
Goldenseal	<i>Hydrastis canadensis</i>	Perennial	50% shade	By hand	Yes – observation	G	Better survival than ginseng. May be worth growing on a small scale. Probably not a good field crop for Kansas.

¹Fact sheet number if available.

²Recommendation code: G = good for gardens; N = not adapted to Kansas; F = could be a good field crop; L = limitations (labor-intensive, insect or disease, etc.)

³Comments are generally about growing conditions or marketing potential. Occasionally mention medicinal uses to give one a sense of whether this plant has market potential in the future.

Table 5. Herbs for the Commercial Market - Organized by Harvest Method for Primary Crop (continued)

Common Name	Latin Name	Life Cycle	Sun	Harvest	KSU trials ¹	Recommendations ²	Comments ³
Joe Pye weed	<i>Eupatorium purpureum</i>	Perennial	Sun	By hand or root digger	Yes MF-2615	G/F	Attractive, and tall garden plant. Did well in field trials, even when dry, though it prefers wet locations.
Licorice	<i>Glycyrrhiza uralensis</i> and <i>G. glabra</i>	Perennial	Sun	By hand or root digger to loosen first	Yes MF-2616	G/F	Both did well in field trials, but be prepared for some plants to spread via rhizomes. Roots spread, making it difficult to harvest.
Marsh mallow	<i>Althea officinalis</i>	Perennial	Sun, partial shade	Roots, also leaves harvested.	Yes MF-2617	G/F	Attractive relative of hollyhock. Did well in the field. Few pests.
Pleurisy root (Butterfly milkweed)	<i>Asclepias tuberosa</i>	Perennial	Sun	Root (leaves are toxic)	Yes MF-2623	G/F	Great for gardens. Adapted to the field, but time consuming to dig.
Valerian	<i>Valeriana officinalis</i>	Perennial	Sun, partial shade	Hand or machine dig roots	Yes MF-2632	G	Survives in a garden setting, but poor survival in field trials. Root diseases or other problems limit this as a crop.

¹Fact sheet number if available.

²Recommendation code: G = good for gardens; N = not adapted to Kansas; F = could be a good field crop; L = limitations (labor-intensive, insect or disease, etc.)

³Comments are generally about growing conditions or marketing potential. Occasionally mention medicinal uses to give one a sense of whether this plant has market potential in the future.

continued on page 10

14) should help you look at your own operation, decide what scale might be appropriate, and calculate costs associated with equipment and land.

In general, equipment for growing herbs is not that different from other crops, so details are not included in this section. For more information, see K-State Research and Extension publication MF-1115, *Farming a Few Acres of Vegetables*, and other grain and vegetable publications.

Harvesting herbs

Some herbs are harvested much like vegetables. This is especially true of leaf crops that are harvested by hand like lettuce. Root crops can be hand dug or machine harvested with a potato or other root digger. Cleaning herb crops also may be similar to vegetable crops because customers want clean, dust- and soil-free produce.

Though some herb crops can be sold fresh, most are sold dry and priced based on dry weight. This changes how things are done at harvest and in the packing shed or processing area. Many herbs, especially root crops, are perennial rather than annual crops like carrots and potatoes. This means that roots may be longer, more twisted and harder to harvest than carrots or tubers like potatoes. Mechanical diggers may need to be modified to handle these situations.

Reference literature contains few details about herb harvesting equipment. Herb growers need to choose harvesting, digging and washing strategies best for them. Harvesting instructions in books and growers' manuals might say, "Dig with fork or root harvester." What type? How deep? The most useful information is often found on herb farm Web sites. One such site showed using a chisel plow to loosen *Echinacea* roots and using rotating barrel carrot washers to wash herb roots. The site suggested using metal screens mounted on wooden frames with a pressure washer/hose to speed root-washing for those who don't want to invest in a barrel.

Experience in digging roots in the field plots shows that some degree of mechanization may be useful. For example, loosening roots with a tractor-pulled chisel plow saves back muscles and knees, and allows deeper digging than if done by hand. However, a lot of hand work probably remains for sorting, washing and loading roots into the dryer. Other equipment recommended for handling roots includes a U-shaped bar to undercut roots or an L-shaped bar. These are sometimes used in the production of things like strawberry transplants, but probably won't go as deep as a chisel plow shank. The U-shaped bar was tested on field plots near Wichita, on a sandy soil with moderate moisture in the fall. The bar

did a nice job of cutting and lifting the roots, but the braces on the bar prevented it from going deep enough to completely uproot things like burdock. It did a nice job on the mallow roots, and even helped extract some of the licorice, which is a shallow, runner-type root. The bar was originally designed for sweet potato digging, and was fabricated locally. Also keep in mind that some roots are more fibrous, and these may be easier to dig, but harder to wash. *Echinacea pallida*, for example has a nice, carrot shaped tap-root, while *Echinacea pupurea* has a fibrous root system. Stinging nettle also has a shallow fibrous root system that is easy to dig, but hard to clean.

Leaf crops would be easier to mechanize because of the many types, styles and sizes of mowing equipment available. But keeping the leaf matter clean and loaded into a dryer without contaminants limits the kind of mechanization that can be used. Because most leaf crops cannot be dried in the sun, producers cannot treat a feverfew crop as they would an alfalfa hay crop by mowing, sun-drying and turning in the field before baling. Small-scale mowers with adjustable height to miss the lower, less-than-perfect leaves, might be best, and a way to catch the foliage or collect it for placement in drying rooms or frames. Leaf crops have higher moisture content than roots and should be moved out of the sun and into a shady area as quickly as possible, preferably straight into the drying area. Some herb leaves and stems bruise easily and need to be handled with special care to maintain quality. In some crops, leaves and stems can be harvested together at ground level; in others stems, will need to be separated either in the field or later on.

Flower crops probably provide the biggest challenge. Small-scale growers making herb products for themselves or for local sale often simply hand harvest individual blossoms, and pick each patch of calendula, red clover or chamomile several times a week during peak flowering seasons. Some even harvest St. John's wort as individual blossoms, though the commercially harvested product includes the top 6 inches or so of the plant as a clipped, rather than plucked product. Hand-picking blossoms probably does not pay a living wage, so start with some small plots and do these calculations before signing a large contract for a flower crop. Tim Blakely (see book listed in references on page 22) estimates that a fast picker can pick about 1 pound of dried red clover flowers per hour if the field is healthy, but an average picker will only pick ½ to ¾ of a pound. If the price per pound is only \$5 to \$10 this is hardly a living wage when planting time, land, shipping cost, etc. are included.

There are mechanical flower harvesters available for purchase, but only the largest growers may be able to afford them. It may be possible in the future for a group or co-op to purchase equipment like this, making it more cost effective to mechanize. An in-between option is the use of “flower rakes.” Some catalogs sell a chamomile harvester, which is a small scoop held in one hand, with long, pointed metal rods welded at about the right spacing (about one stem-width) to catch small blossoms, and “pluck” them as the scoop is lifted. Stem material is also gathered with this tool, which is not desirable, but it speeds up the picking process some. It is unclear whether flower crops will be commercially viable in the United States when consumers can purchase less expensive products grown abroad.

Drying herbs

Herb growing is very different from vegetable farming when it comes to handling and storage. Some vegetable growers that have diversified into cut flowers, especially everlastings or dried flowers, may be familiar with drying methods and may already have a place on the farm for storing dried herb products.

A few companies may give contracts for fresh herb delivery, and if so, you can skip this step. However, be careful to follow shipping guidelines and timing. It may be necessary to cool the crop before or during shipping so it arrives in good shape. Some essential oils are extracted from fresh plant material, so if you find a market for oils or a local extraction facility, fresh shipping/hauling may work for you.

Most herbalists buy dried product, mainly for practical reasons related to storage and shelf life. In a few herbs, compounds become more or less active when dried. A rule of thumb is that the shelf life of a properly dried and stored whole (not ground) herb is about one year. Grinding an herb reduces its shelf life because it increases the surface area, which is subject to oxidation, and leads to more volatilization of various compounds. Thus, herbs should be ground as close to the time of use as possible.

Drying herbs on farm requires that you follow a few general rules or guidelines. The herb industry is cooperating with government to draft “Good Manufacturing Process” guidelines, which for the most part, are just common sense. For example, wash your hands before handling an herb for human consumption, don’t sneeze on it, don’t allow rodents to nest in it, etc.

The drying room will vary for different farms. Extremely small quantities can be dried in a tabletop food dryer, but it will take a long time if you plan to do several pounds rather than ounces

of material. Some have modified greenhouses as drying areas, but these should be shaded, as light will fade the plant material and reduce its value. A large shed or barn with beams for hanging tied herbs could work as a drying area, as long as it is relatively rodent proof, and you don’t mind tying lots of little bundles together.

K-State’s drying ovens consist of large cabinets, which can be constructed of plywood, with a fan and heat generating unit at the bottom, and a vent at the top. A thermostat controls the heat, and the fan runs continuously. Homemade shelves made of 2-by 2-in. lumber and rigid screen are spaced at about every foot, for a total of eight to 10 shelves per cabinet. Herbs are either laid on the screen in loose layers, or small quantities are placed in brown paper bags, and dried in the bag in the oven. Other models for drying areas, especially if they are primarily used in the summer, might be to section off a corner of a garage or shed from dust and animals, install a large fan to draw air, and possibly a dehumidifier. The Kansas weather will provide the heat. Homemade shelves can be attached to walls or suspended from the ceiling. Some herb reference guides give specific drying time recommendations, but only use these as general guidelines. Drying time will depend a lot on the condition of the plant when it is brought in from the field and drying conditions, such as relative humidity, and other factors.

Processing and packing

Processing and packing is another step that will take place on the farm, and it is recommended that you ask your buyer for specific information on these details. General guidelines include keeping the product away from light, dust, rodents and insects. Most herbs are stored at room temperature, but cool and dry is a good general practice. Generally packing in paper or other breathable material is better than plastic. Anything that isn’t completely dry will encourage bacteria and fungi growth, which would not only decrease the quality but may produce harmful substances. The amount of herb you have will determine how, or to whom you sell your product. Some buyers want ounces, some pounds, some tons. Burlap has been used in the past for herbs, but is not recommended at this time, as the fibers may contaminate the herb.

Marketing

A marketing plan is essential when considering growing herbs. Marketing herbs is unlike conventional crops with established markets and easy access to market information. Markets exist for herbs, but the market is likely to be a small or niche market. Like most niche markets, finding

Tips for Drying Herbs

Do

- Move herbs as quickly as possible from the field to the drying room.
- Either air dry, or use forced air to dry herbs as quickly as possible.
- Avoid temperatures above 120° F. Most recommend temperatures between 80 and 105°F, with some air circulation.
- Prepare a special insect- and rodent-free area to dry and/or store herbs.
- Clean herbs as much as possible before moving into the drying area.
- Slice roots (when appropriate) to speed drying.

Don't

- Allow herbs to heat up in the field in piles after harvesting and before drying.
- Allow UV light or other light to fade the herb.
- Sell dirty or inferior product.
- Store in plastic bags.
- Store before the herb is completely dry. This may take three days or more for some leafy crops, or three weeks for roots. Check by calculating the percentage of moisture content by oven drying (or microwaving). The percent moisture should be 11 to 15 percent for leaves and 10 to 12 percent for seeds. It can be calculated as fresh weight – dry weight = water. $\text{Water} \div \text{fresh weight} = \text{moisture content}$. Also, leaves should crumble easily, and roots should be hard and/or snap.
- Overdry herb seed or it will lose viability.

accurate wholesale prices is difficult. Prices for retail items are available, especially those that have been processed. Retail prices are often substantially higher than the wholesale price offered to the grower.

The driving force in the industry is the relatively few large corporations that control manufacturing, distribution and marketing of herbal products. Herb marketing involves many channels. Some growers do their own processing and market their own brands in health food stores. Some growers have a satisfactory outlet through an individual herb distributor. Often herb marketing is achieved by using brokers. Many growers sell to small dealers or brokers who sell to larger dealers or pharmaceutical manufacturers who form capsules, extract or tincture that is marketed in grocery and drugstore chains.

Growers must show an ability to produce before they can reach established markets. Buyers want assurances the grower can provide a product for several years. Neither local nor large dealers will enter into a contract with an inexperienced grower until they know what the grower can produce. A grower might raise a trial plot to supply the dealer with a product sample and build a reputation for quality and reliability. Thus a long-term commitment is required to grow herbs. Some dealers and manufacturers have minimum amounts that they will buy and will offer contracts to selected established growers.

Knowing what herbs to grow can be a problem. Trends change constantly and growers need to keep informed of current market demand. Yet,

there are few sources of information on the herb market. Two ways to keep up on market trends are reading trade magazines (see page 22) or calling potential buyers. Another way is to join trade associations or cooperatives.

To address some of these marketing concerns, the Great Plains Herb Growers Association was organized in 2001. This not-for-profit association was formed with the following objectives:

- to foster communication among herb growers, herb buyers, retailers, herbalists, health practitioners and other interested parties;
- to cultivate, foster and promote interest and participation in the growing and use of herbs;
- to further the knowledge and safe use of herbs and herbal products;
- to educate farmers and others about organic cultivation practices for medicinal plants best suited for the Great Plains by region;
- and to provide collective resources to aid in the production, processing and marketing of organically grown, high-quality herbs.

Contact information for the Great Plains Herb Growers Association and other marketing resources is listed in the reference section of this handbook.

Economic factors

The profitability of any enterprise depends on successful marketing and knowing costs of production. But production costs for growing herbs are hard to obtain and are rarely published.

Herb producers should carefully assess enterprise budgets for specific herbs to monitor whether the enterprise is profitable.

Factors to consider include farm location, size, machinery, labor use, marketing requirements and growth habits of specific herbs. The general growing habits of herbs fit into three categories: annuals, quick perennials and long-term perennials.

Herbs classified as annuals are planted and harvested in one year. Crops such as wheat, corn, tomatoes and melons have a similar growing habit. Short-term perennials are planted one year and completely harvested at one time in the second or third year after they have reached maturity. Not many agronomic crops besides herbs fit into this growing habit category. The last growing-habit classification, long-term perennials, are harvested over a number of years and are not destroyed by harvesting. Woody and non-woody plants are in this category. Non-herb crops that fit into this category include alfalfa, asparagus, berries and apples.

A fast-growing herb may return a quicker profit, but the herb may be sold at a lower price because it is easy for others to grow, too. A longer growing perennial herb may be slower to return a profit, and two or more years of costs may be incurred before the herb is harvested. Some crops sell at a higher value per pound, allowing a producer to make as much or more per acre on a slow-growing, but higher-value crop.

Enterprise budget calculations

Farm or production size is an important consideration in determining the amount of mechanization necessary to raise and harvest an herb crop successfully. Table 6 (page 14) illustrates the types of equipment relative to the scale of production. One key to profitability is to make sure the fixed-cost investment is scale-appropriate. Tables 7 and 8 (pages 14 and 15) will help calculate fixed costs for the herb portion of a business. Use the figures in Table 10 (page 16) to calculate profitability for various herbs that can be grown in Kansas.

Table 7 shows fixed-cost budget calculations. These are up-front investments with expenses that will be incurred whether a particular crop is planted or not. The standard way to account for land costs is to use either the interest on the value of the land, if purchased, or the rental cost, if rented. In this example, the land was purchased, and a per-acre-per-year cost was determined (\$80). When this number is used in an actual herb enterprise budget, take this figure times the number of (or fraction of) an acre that is used for that herb.

Building and equipment costs are assigned values based on the interest if the money was borrowed (and theoretically, the opportunity cost of the money if it wasn't borrowed), and the depreciation. Depreciation is the total cost of the building or piece of equipment divided by the number of anticipated useful years of the item. There are some standard values used for tax purposes, but for these budgets, use your best realistic estimate.

The percentage of time or space required for the herb business on your farm compared to other enterprises is also taken into account (column 2). The number of hours per year used for herbs (column 7) is used to come up with a per-hour estimate cost for the item. This value is used in Table 10. After completing Table 10, or after a field season where usage hours have been tracked, if you find that the total hours estimated in column 7 is wrong, readjust and recalculate column 8.

Now complete Table 8, using expenses and fixed inputs from your own farm. Include land, facilities and equipment that are part of the farm now, and also items that you intend to purchase if you go into the herb business.

Table 9 can be used to estimate the gross income per acre. Table 9 also illustrates how gross income will change if the price for an herb drops from \$10 per pound to only \$6 per pound, for example, or how income would change in a drought year if the marketable yield was only 600 pounds per acre, rather than the estimated 1,000 pounds. Considering these scenarios is important when estimating risk. Some of these scenarios could also be explored using Table 10 as a template.

Make additional copies of Table 10 to work out production and marketing costs for several herbs and yield and price scenarios. Making a business plan for the whole farm would also be a good idea. More ideas on whole-farm planning can be found in K-State Research and Extension publication MF-2403 *Whole-Farm Planning for Economic and Environmental Sustainability*.

Table 6. Mechanization appropriate for farm size and operation intensity

	Range of Mechanization			
	None	Low	Medium	High
Tillage	Hand/shovel	Small rototiller	Large rototiller	Tractor mounted plow, spader, rotovator
Weeding	By hand, combined with mulch, flame, etc.	Some plastic or fabric row cover, walk behind wheel hoe	Walk behind rototiller/cultivator	Tractor mounted cultivation equipment, flame
Planting	Hand seed, hand transplant	Push seeder, use wheel hoe to make furrow	Rototiller to make furrow, attach seeder	Tractor mounted seeder and transplanter
Leaf harvest	By hand	Hand with large loppers	Electric hedge trimmer	Sickle bar mower
Root harvest	Shovel, fork	Shovel or fork with more labor, or borrow equipment	Furrow with tractor or tiller, hand separate	Root digger (carrot or potato)
Root washing	By hand, hose, bucket	Mounted screens, pressure washer	Rent or borrow barrel washer	Barrel root washer
Flower harvesting	By hand	Hand rake (chamomile example)	Modified hedge trimmer	Commercial flower harvester
Drying	Air dry, small batches	Air dry, large batches	Small forced air heater/dryer	Large forced air heater/dryer
Approximate size of operation (in acres):	0.01 – 0.5	0.5 – 2.0	2.0 – 5.0	5.0+
Equipment price range (per item):	\$0 – 20	\$20 – \$100	\$100 – \$2,000	\$2,000 – \$25,000

(Note: these are not absolute categories – needs will vary, and one farm may use items from more than one column. Also, in the intermediate levels, it may make sense to rent or borrow equipment listed in the “high” category rather than to purchase it.)

Table 7. Example of fixed-cost budget calculations for adding an herb business to an existing farm

	1	2	3	4	5	6	7	8
Item	Cost of item	Share or amount used	Total cost	Useful life (years)	Depreciation \$/year	Interest \$/yr (8% of total cost)	Number of hours per year used	Cost (\$)³
Land								
Cropland	\$1,000/A	2 acres	\$2,000	na¹	na	\$160	na	\$80/A/yr
Improvements and facilities								
Storage buildings	\$5,000	10%	\$500	10	\$50	\$40	na	\$90/yr
Equipment²								
Tractor	\$12,000	50%	\$6,000	20	\$300	\$480	120	\$6.50/hr
Rotovator	\$3,000	100%	\$3,000	15	\$200	\$240	50	\$8.80/hr
Cultivator	\$500	100%	\$500	15	\$33	\$30	70	\$0.90/hr
Farm truck	\$25,000	2%	\$500	5	\$100	\$40	25	\$5.60/hr
Storage containers	\$100	100%	\$100	5	\$20	\$8	na	\$28/yr
Drying frames	\$200	100%	\$200	5	\$40	\$16	na	\$56/yr
Hand tools	\$200	90%	\$180	10	\$18	\$14	50	\$0.65/hr
Total fixed costs			\$12,980		\$761	\$1,028		

¹Not applicable.

²Note: gas, oil, and repairs are not included in equipment costs. A formula or percentage may be used to estimate future costs, or farm records can be used to record actual costs. These could be added to Table 10 as variable costs.

³Use the numbers in this column to complete Table 10.

Table 8. Worksheet for calculating fixed costs

	1	2	3	4	5	6	7	8
Item	Cost of item	Share or amount used	Total cost	Useful life (years)	Depreciation \$/year	Interest \$/yr (8% of total cost)	Number of hours per year used	Cost
Land								
Cropland								
Woodland								
Other land								
Improvements and facilities								
Storage buildings								
Dryers								
Other								
Equipment¹								
Primary tillage								
Cultivation								
Harvest								
Total fixed costs			\$		\$	\$		

¹This table should include existing equipment, new equipment purchases, and used/rebuilt equipment.

Table 9. Gross income (\$/Acre) calculated from estimated yield and price information

	Price per pound (\$)										
	1	2	4	6	8	10	15	20	30	40	50
Yield (lb/A)											
50	50	100	200	300	400	500	750	1,000	1,500	2,000	2,500
100	100	200	400	600	800	1,000	1,500	2,000	3,000	4,000	5,000
200	200	400	800	1,200	1,600	2,000	3,000	4,000	6,000	8,000	10,000
400	400	800	1,600	2,400	3,200	4,000	6,000	8,000	12,000	16,000	
600	600	1,200	2,400	3,600	4,800	6,000	9,000	12,000	18,000		
800	800	1,600	3,200	4,800	6,400	8,000	12,000	16,000	24,000		
1,000	1,000	2,000	4,000	6,000	8,000	10,000	15,000	20,000	30,000		
1,500	1,500	3,000	6,000	9,000	12,000	15,000	22,500	30,000			
2,000	2,000	4,000	8,000	12,000	16,000	20,000					
3,000	3,000	6,000	12,000	18,000	24,000	30,000					
4,000	4,000	8,000	16,000	24,000							

How to use Table 10

- 1) Use a separate column for each herb crop, if growing a one-year annual crop. Use multiple columns for multi-year crops, especially if yield is obtained more than one year. Complete each column for the amount of herb on your farm. Convert to dollars per acre or dollars per square foot later, to compare among crops.
- 2) Supplies, such as seed, fertilizer and compost can be recorded as money actually spent in each year for each crop.
- 3) Equipment costs can be estimated by taking the number of hours of equipment use times your farm cost in dollars per hour calculated in Table 8. Land and building costs will be added at the end under fixed costs.
- 4) When calculating labor costs, separate into self-labor and hired labor. The hired labor is part of the variable cost of producing the crop, while the self-labor column will be calculated at the end of the worksheet, as the residual once all the variable and fixed costs are paid. The number of hours you put in will be divided by the total net income, to figure out your return to management/labor.
- 5) At the end of the table, compare your hourly wage raising herbs to the opportunity cost of your labor at another job for which you are qualified. Also, compare to a living wage in central Kansas, which is about \$10 per hour.

Table 10. Worksheet for calculating profit/loss for several herb crops

Note: Dill has been used as an example in column 1 of this table.

	Herb 1 (or Year 1)	Herb 2 (or Year 2)	Herb 3 (or Year 3)	Herb 4 (or Year 4)
10.A Background information				
Common name	Dill			
Latin name	<i>Anethum graveolens</i>			
Seed source	ABC Garden Seeds			
Plot dimensions	10- by 10-ft.			
Square footage	100			
% acre (ft ² /43,560)	.002			
Date planted	5-1-04			
Date harvested	7-5-04			
Number of years	less than 1			
10.B Yield and gross income				
Flower or seed				
Total harvested (lb fresh/dry weight)	—			
Marketable yield (lb fresh/dry weight)	—			
Leaf or herb tops				
Total harvested (lb fresh/dry weight)	100 lbs fresh weight			
Marketable yield (lb fresh/dry weight)	90 lbs fresh weight			
Root or bark				
Total harvested (lb fresh/dry weight)	—			
Marketable yield (lb fresh/dry weight)	—			
Return (list each part of crop on separate line)				
Price per lb (fresh/dry weight)	\$2/lb fresh weight			
Total sold	80 lbs			
Total gross income	\$160			
10.C Variable costs (Use per hour or per acre figures from Table 8 and your farm records)				
1. Soil preparation				
Soil test	\$3			
Plow	—			
Chisel	—			
Disk	—			
Rototill	0.5 hr = \$4.40			
Lime	—			
Soil amendments (fertilizer, compost, manure)	compost ~ \$5			
Hired labor (hrs x rate = \$)	—			
Self labor (enter hours)	½ hr			
Total soil preparation costs	\$12.40			

Table 10. Worksheet for calculating profit/loss for several herb crops (continued)

	Herb 1 (or Year 1)	Herb 2 (or Year 2)	Herb 3 (or Year 3)	Herb 4 (or Year 4)
Table 10.C continued				
2. Seeding and transplanting				
Seeds	\$1			
Transplants (or cost to produce)	—			
Planting equipment cost	—			
Hired labor (hrs x rate = \$)	—			
Self labor (enter hours)	½ hr			
Total seeding and transplanting costs	\$1			
3. Production costs				
Mulches/row cover	—			
Cultivation equipment	—			
Other equipment used	—			
Other – water	2,000 gal = \$2			
Herbicide (if used)	—			
Insecticide (if used)	—			
Fungicide (if used)	—			
Irrigation	—			
Fuel and oil	—			
Misc. equip. repairs	—			
Hired labor (hrs x rate = \$)	—			
Self labor (enter hours)	weeding – 2 hrs			
Total production costs	\$2			
4. Harvesting costs				
Mowing/clipping	—			
Digging	—			
Root washing	—			
Seed harvest	—			
Sorting	—			
Drying	—			
Equipment	hand shears			
Bags/containers	\$2			
Grinding	—			
Hired labor (hrs x rate = \$)	—			
Self labor (enter hours)	2 hrs			
Total harvesting costs	\$2			

Table 10. Worksheet for calculating profit/loss for several herb crops (continued)

	Herb 1 (or Year 1)	Herb 2 (or Year 2)	Herb 3 (or Year 3)	Herb 4 (or Year 4)
5. Management and marketing costs				
Shipping/hauling	Drive to Manhattan – \$4			
Brokerage fee				
Accounting				
Other				
Hired labor (hrs x rate = \$)				
Self labor (enter hours)	1.5 hrs			
Total marketing costs	\$4			
Total variable costs – cash	\$21.40			
Hired labor (hrs x rate = \$)	0			
Self labor (enter hours)	6.5 hrs			
10.D Fixed costs¹				
Interest on land and buildings	$\$80/A \times .002 = \0.16			
Taxes on land and buildings	N/A			
Cash rent	—			
Depreciation on machinery	already included			
Interest on machinery ¹	already included			
Depreciation on irrigation equipment ¹	—			
Interest on irrigation equipment	—			
Insurance	—			
Organic Certification	—			
Operating loan/interest	—			
Other fixed costs - memberships, etc.	GPHG $\frac{1}{5} \times \$25 = \5			
Total fixed costs	\$5			
Total fixed plus variable costs	\$26.40			
10.E Returns				
Returns over variable costs	$\$160 - 21.40 = 138.60$			
Returns over total (fixed plus variable) costs	$\$160 - 26.40 = 133.60$			
Average returns per year over variable costs (for multi-year crops)	—			
Average return per year over total costs (fixed plus variable) (for multi-year crops)	—			
Total hours of self labor	6.5 hrs			
\$/hr for self divided by returns over variable costs	\$21.32			
\$/hr for self divided by returns over total costs	\$20.55			
Opportunity costs (what you would have been paid for those hours at another job)	$6.5 \text{ hrs} \times \$20 = \130			

¹Divide fixed costs into amount appropriate for each crop. For example, land cost can be apportioned to the crop actually growing on the land. Insurance, organic certification and other costs might be divided by the total number of crops grown, or also apportioned according to space or size of each crop enterprise. Include all fixed costs not already allocated to individual variable cost sections.

Conclusions

The next section of this handbook contains information on growing herbs. Table 11 lists the herbs described in Appendix A and some additional herbs that were grown in K-State observation plots. Details on seed germination requirements and our experience with the seed are listed. More growing information, as well as background information and economic projections, are found in Appendix A. Retail prices are listed in Appendix B. These provide rough estimates of the relative value of the herbs at the

time the price research was conducted. It should be noted, however, that many times there was a bigger difference in the prices of a particular herb between companies, than for different herbs within a single company. For fact sheet estimates of possible wholesale value, the lowest and highest prices were divided by two.

Good luck in your new venture, and check out www.oznet.ksu.edu/ksherbs for updates to this publication. Herb resources and organizations are listed on page 22.

Table 11. Germination requirements of herbs grown in KSU trials.

Herb		Literature Recommendations			K-State Trials		
Latin Name	Common Name	Seed Treatment	Germination	Germ. %	Germination	Transplant Time	Comments
<i>Achillea millefolium</i>	Yarrow	Light	10-12 days	70%	6 days	8-12 weeks	Small seed
<i>Althea officinalis</i>	Marsh mallow	Stratify 7 days	3-5 weeks	70%	11 days	8 weeks	Spreads quickly
<i>Arctium lappa</i>	Burdock	No treatment	1-2 weeks	80-90%	7 days	4-8 weeks	Direct seed biennial
<i>Artemisia vulgaris</i>	Mugwort	Stratify 2 weeks	2-4 weeks	70%	n/a	10-12 weeks	Small seed
<i>Asclepias tuberosa</i>	Butterfly weed	Stratify several weeks	2-3 weeks	40%	8 days	12-16 weeks	Grows slowly
<i>Astragalus membranaceus</i>	Milk vetch	Stratify 3 weeks, Scarify and soak	4 weeks	50%	2 days (overnight soak)	12 weeks	Soak overnight
<i>Borago officinalis</i>	Borage	No treatment	7-14 days	75%	10 days	6 weeks	Direct seed
<i>Calendula officinalis</i>	Calendula	No treatment	7-10 days	80%	4 days	8 weeks	Direct seed
<i>Cnicus benedictus</i>	Blessed thistle	No treatment	7-15 days	60%	5 days	4-8 weeks	Direct seed
<i>Echinacea angustifolia</i>	Narrow-leaf coneflower	Stratify 90 days, light	10-20 days	50%	15 days	12 weeks	Direct seed in fall
<i>Echinacea pallida</i>	Pale purple coneflower	Stratify 60 days, light	10-20 days	50%	4 days	8-12 weeks	Direct seed in fall
<i>Echinacea purpurea</i>	Purple coneflower	No treatment	10-20 days	70%	9 days	8-12 weeks	Direct seed
<i>Eupatorium perfoliatum</i>	Boneset	Stratify 7 days, light	2-3 weeks	80-90%	13 days	8-12 weeks	Small seed
<i>Eupatorium purpureum</i>	Joe Pye weed	Stratify 7 days, light	3-4 weeks	n/a	12 days	8-12 weeks	Likes moisture
<i>Glycyrrhiza glabra</i>	Licorice	Soak and scarify	7-14 days	70-80%	7 days	12-16 weeks	Soak overnight
<i>Glycyrrhiza uralensis</i>	Licorice	Soak and scarify	7-14 days	70-80%	7 days	12-16 weeks	Soak overnight
<i>Hypericum perforatum</i>	St. John's wort	Light	3-4 weeks	70%	3 weeks	12 weeks	Small seed
<i>Hyssopus officinalis</i>	Hyssop	No treatment	10-20 days	70%	6 days	10-12 weeks	Small seed
<i>Inula helenium</i>	Elcampane	No treatment	3-4 weeks	50%	6 days	8-12 weeks	Direct seed
<i>Leonurus cardiaca</i>	Mother wort	Stratify several weeks	2 weeks	75%	15 days	10-12 weeks	Small seed
<i>Lespedeza capitata</i>	Round-headed lespedeza	Stratify for 2 months. Remove hulls or scarify seed.	n/a	n/a	n/a	n/a	n/a
<i>Levisticum officinale</i>	Lovage	Stratify 1-2 weeks	2 weeks	5%	12 days	8-12 weeks	Poor germination
<i>Marrubium vulgare</i>	Horehound	No treatment	2-3 weeks	70%	9 days	8-12 weeks	Small seed
<i>Matricaria recutita</i>	Chamomile	No treatment	7-14 days	70%	n/a	8-10 weeks	Quick crop
<i>Monarda fistulosa</i>	Monarda	Stratify 3 months	2-3 weeks	60-70%	8 days	8-weeks	Spreads quickly
<i>Nepeta cataria</i>	Catnip	Stratify 2-3 weeks	2-3 weeks	50%	n/a	2-3 months	Spreads quickly
<i>Oenothera biennis</i>	Evening primrose	Stratify several weeks	2 weeks	80%	8 days	8-10 weeks	Biennial
<i>Origanum vulgare</i>	Oregano	Stratify 1 week	7-14 days	70%	n/a	8 weeks	Spreads quickly

Table 11. Germination requirements of herbs grown in KSU trials. (continued)

Herb		Literature Recommendations			K-State Trials		
Latin Name	Common Name	Seed Treatment	Germination	Germ. %	Germination	Transplant Time	Comments
<i>Passiflora incarnata</i>	Passion flower	Stratify 1 week	3 weeks	40%	n/a	8-10 weeks	Difficult to germinate
<i>Prunella vulgaris</i>	Self heal	Stratify 1 month	3 weeks	70%	12 days	8 weeks	Spreads quickly
<i>Rumex acetosella</i>	Sheep sorrel	No treatment	7-10 days	70%	7 days	8 weeks	Spreads quickly
<i>Ruta graveolens</i>	Garden rue	Stratify 1 week	7-10 days	50%	14 days	8-10 weeks	Handle with gloves
<i>Salvia apiana</i>	White sage	Stratify 1 week	2-3 weeks, 80°	40%	9 days	10-12 weeks	Annual in Kansas
<i>Scutellaria lateriflora</i>	Skullcap	Stratify 1 week	2-4 weeks	75%	13 days	10-12 weeks	Spreads quickly
<i>Silybum marianum</i>	Milk thistle	No treatment	10-14 days	90%	10 days	4 weeks	Direct seed
<i>Spilanthes oleracea</i>	Toothache	High temperature	10 days	100%	4 days	4-8 weeks	Spreads quickly
<i>Stevia rebaudiana</i>	Stevia	No treatment, bottom heat	2-3 weeks	30%	4 days	8-10 weeks	Difficult to germinate
<i>Tanacetum parthenium</i>	Feverfew	Stratify 1 week, Light	10-14 days	70%	7 days	8 weeks	Will reseed readily
<i>Taraxacum officinale</i>	Dandelion	Stratify 1 week, light	10-14 days	90%	7 days	8 weeks	Deer love this herb
<i>Trifolium pratense</i>	Red clover	Stratify 7 days	7-14 days	75%	9 days	4-8 weeks	Deer love this herb
<i>Urtica dioica</i>	Stinging nettle	Stratify 1 week, light	10-15 days	50%	4 days	8-12 weeks	Handle with gloves
<i>Valeriana officinalis</i>	Valerian	No treatment	2-3 weeks	70%	14 days	8-12 weeks	Root rot problems
<i>Verbascum thapsus</i>	Mullein	Plant on surface	10-20 days	80%	14 days	8-12 weeks	Needs a lot of space
<i>Verbena hastata</i>	Blue vervain	Stratify 2 weeks	2-3 weeks	75%	10 days	4-8 weeks	High seed production
<i>Withania somnifera</i>	Ashwagandha	No treatment	7-14 days	70%	13 days	12 weeks	Needs a lot of space

Includes plants listed on fact sheets and also new plants that will be covered in future fact sheets.

Kansas State University herbs propagated in greenhouse at a daytime temperature of 70°F, nighttime temperature of 68°F. Seed started in 3-inch cavity cell with a media mix of Jiffy Mix® and compost at a 1-1 ratio. Seedlings transplanted into 4-inch square containers using a media of high porosity mix and compost at a 1-1 ratio. Fish emulsion used for fertilizer. Beneficial insects and soap and water for insect control.

Glossary*

- abortifacient** – A drug or chemical that induces abortion.
- adaptogen** – A preparation that acts to strengthen the body and increase resistance to disease.
- alterative** – Any drug used to favorably alter the course of an ailment and to restore health. To improve the excretion of wastes from the circulatory system.
- annual** – A plant that completes its growth cycle in one year.
- anthelmintic** – An agent or drug that is destructive to worms.
- balm** – Topical, usually includes oil, somewhat viscous.
- bitter** – An alcoholic liquid prepared by maceration or distillation of a bitter herb or herb part that is used to improve appetite or digestion.
- deciduous** – A tree that sheds its leaves at the end of the growing season.
- decoction** – A liquid substance prepared by boiling plant parts in water or some other liquid for a period of time.
- extraction** – The portion of a plant that is removed by solvents and used in drug preparations in solid or liquid form.
- homeopathic** – Substances that are administered in minute amounts with the theory that substances that may cause or mimic a disease in larger amounts can be used to treat or prevent disease if given in small amounts.
- inflorescence** – The spatial arrangement of flowers along the axis. The mode of disposition of flowers or the act of flowering.
- infusion** – The process of steeping or soaking plant matter in liquid to extract its medicinal properties without boiling.
- mucilage** – A viscid substance in a plant consisting of a gum dissolved in the juice of the plant. A soothing application made from plant gums.
- perennial** – A plant that grows for three or more years.
- rhizome** – An underground stem.
- salve** – Topical, made with infused oil, and sometimes thickened with beeswax.
- tincture** – An alcoholic or hydroalcoholic mixture prepared from plant parts.
- tonic** – A medication used to fortify and provide increased vigor.

*From the *Physicians Desk Reference for Herbal Medications*

Disclaimer

Please consult reference texts and a health-care practitioner(s) before taking herb products to treat a medical condition. This handbook is intended to provide herbal information to gardeners, not medical advice.

References

- American Botanical Council. HerbalGram 41, 51, 53. Articles of Incorporation of Great Plains Herb Growers Association.
- “Commercial Medicinal Herb Enterprise” Alberta Agriculture Food and Rural Development. Available online at http://www.agric.gov.ab.ca/agdes/200/263_830-2.html
- “Market Report on Herbs and Spices” Herb Market Report April 2000. Agribusiness in Sustainable Natural African Plant Products.
- “Medicinal Herbs” Agricultural Notes Series No. AG0673.
- “The US Market for Medicinal Herbs” Rural Agricultural Incomes with a Sustainable Environment, March 2001.

For more information

American Botanical Council

Nonprofit educational organization, publishes the quarterly trade magazine *Herbalgram*
PO Box 144345, Austin, TX 78714-4345
Phone: 512-926-4900
Fax: 512-926-2345
www.herbalgram.org

ATTRA, Appropriate Technology Transfer for Rural Areas

Many fact sheets on herbs in general and also specific popular herbs. Many other fact sheets of interest to farmers looking for alternative crops.
PO Box 3657, Fayetteville, AR 72702.
1-800-346-9140.
www.attra.org

Kansas State University

www.oznet.ksu.edu, especially publication MF-2532
Economic Issues with Echinacea
www.kansassustainableag.com for links to other herb Web sites

North Carolina

www.ces.ncsu.edu/depts/hort/hil/
Check out the specialty crop fact sheets for information on culinary and medicinal herbs.

Seed Sources

Horizon Herbs, LLC

Seeds grown by well-known herbalist/writer Richo Cech and his family
PO Box 69, Williams, OR 97544
Phone: 541-846-6704
Fax: 541-846-6233
E-mail: hhcustserv@HorizonHerbs.com
www.horizonherbs.com

Johnny's Seeds

Sells vegetable seed to gardeners and professional growers. Good selection of culinary and medicinal herb seed, including some organically grown seed.
184 Foss Hill Rd, Albion, ME 04901
Phone: 207-437-4301
www.johnnyseeds.com

Prairie Moon Nursery

Large selection of seeds for prairie plantings and restoration, including medicinal plants from the prairie.
Route 3, Box 1633, Winona, MN 55987-9515
Phone: 507-452-1362
Fax: 507-454-5238
E-mail: pmnrsv@luminet.net
www.prairiemoonnursery.com

Richters Herbs

Company founded in 1970 to sell bedding plants and herbs. Good selection and informative catalog and Web site.
Phone: 905-640-6677
Fax: 905-640-6641, Goodwood, Ontario, Canada.
L0C 1A0
www.richters.com

Seedman.com

Jim Johnson, Seedman

Carries large and varied selection of seeds from around the world.

3421 Bream St., Gautier, MS 39553
Phone: 800-336-2064
Fax: 228-497-5488
E-mail: support@seedman.com
www.seedman.com

Associations

Great Plains Herb Growers Association

For those considering commercial-scale herb production. One-year membership, newsletter \$25. Send to Rhonda Janke, Department of Horticulture, Forestry, and Recreation Resources, 2021 Throckmorton, KSU, Manhattan, KS 66506. Make checks payable to GPGH. For more information, visit www.oznet.ksu.edu/ksherbs.

To join a free mailing list for herb workshop updates, contact Christy Dipman, Phone: 785-532-6173; E-mail: cdipman@oznet.ksu.edu

The Herb Growing & Marketing Network

Non-members can learn a lot from visiting this Web site, reading their newsletters. Member benefits include Web site design and hosting, listing your herb business in the Herbal Green Pages Online and discounted rates for product liability insurance. Membership prices start at \$40/year and higher.

PO Box 245, Silver Spring, PA 17575
Phone: (717) 393-3295
Fax: (717) 393-9261
www.herbnet.com and www.herbworld.com
E-mail: HERBWORLD@aol.com

There are many other herb associations, but these will help you get started.

Books – General

The Bootstrap Guide to Medicinal Herbs in the Garden, Field, and Marketplace

Lee Sturdivant and Tim Blakley (1999)
San Juan Naturals, PO Box 642, Friday Harbor, WA 98250-0642
Great guide to herb growing and marketing by two individuals who are actually doing it.

The Complete Book of Herbs – A practical guide to growing and using herbs

Lesley Bremness (1988)
Penguin Books: N.Y.
Lots of information about growing herbs.

Complete Illustrated Guide to the Holistic Herbal

David Hoffmann (1996)
HarperCollins Publishers, London
Nice photographs, good listing of herbs.

The Complete Medicinal Herbal

Penelope Ody (1993)
Dorling Kindersley: N.Y.
Great photos, some history, nice reference tables in second section.

Field Guide to Medicinal Wild Plants

Bradford Angier (1978)
Stackpole Books: Cameron and Kelker Streets, Harrisburg, Pa.

Farming a Few Acres of Herbs: An Herb Grower's Handbook

Flora of the Great Plains

R.L. McGregor, T.M. Barkley, R.E. Brooks, and E.K. Schofield (1986)

University of Kansas Press: Lawrence, Kan.

The Green Pharmacy

James A. Duke (1997)

St. Martin's Paperbacks, St. Martin's Press: New York, N.Y.

This affordable book offers scientific insight and practical herbal remedies for everything from baldness to bad breath. James Duke was a research scientist for the USDA in Beltsville, Md.

The German Commission E Monographs

Translated by Mark Blumenthal, available through American Botanical Council

Recommendations of a scientific council, based on published research, for herbal supplements that may be prescribed by physicians in Germany.

Growing 101 Herbs That Heal

Tammi Hartung (2000)

Storey Books: Schoolhouse Road, Pownal, Vt.

Good section on germination and growing requirements for 100+ herbs.

Handmade Medicines - Simple Recipes for Herbal Health

Christopher Hobbs (1998)

Interweave Press, Inc: Loveland, Colo.

Herbs for First Aid – Simple Home Remedies for Minor Ailments and Injuries

Penelope Ody (1997)

Keats Publishing: Los Angeles

The Honest Herbal – 3rd Edition

Varro E. Tyler (1993)

Haworth Press, Inc: New York

Provides some information about using herbs, some well researched, and some anecdotal. This book is written by a skeptic, but is fairly balanced.

Medicinal Wild Plants of the Prairie, an Ethnobotanical Guide

Kelly Kindscher (1992)

University of Kansas Press: Lawrence, Kan.

Peterson Field Guides: Eastern/Central Medicinal Plants and Herbs - 2nd Edition

Steven Foster and James A. Duke (2000)

Houghton Mifflin Company: Boston

Physicians' Desk Reference for Herbal Medicines – 2nd Edition (2000)

Medical Economics Company: Montvale, N.J.

The most thorough reference for describing herbs, supplements derived from herbs, summarizing herb efficacy, and warning about side effects and drug/herb interactions.

The Village Herbalist

Nancy and Michael Phillips (2000)

Chelsea Green Publisher

See www.herbsandapples.com for more information.

A great book. Discusses the "how" of herbalism at the home and village scale, as well as providing some information about the plants.

Books - for Large-Scale Growers

Herb and Spice Production Manual

Connie Kehler (1999)

Produced by the Saskatchewan Herb and Spice Association, Print It Centre, Regina, Sask. (available through Richters Catalog)

Grower's Crop Monographs

Frontier Organic Research Farm, Norway, IA

Available through Frontier's Web site

www.frontiercoop.com/about/farm.html

Database and reference Web sites

HerbMed® is an interactive, electronic herbal database that provides hyperlinked access to the scientific data underlying the use of herbs for health. It is an impartial, evidence-based resource for professionals, researchers and the general public, provided by the nonprofit Alternative Medicine Foundation, Inc.
www.herbmed.org

Kansas State University provides online publications on herbs, data from field sites, and links to the Great Plains Herb Growers Association calendar and newsletters. Also provides hot-links to herb Web sites of interest.
www.oznet.ksu.edu/ksherbs

Plants for a Future is a registered charity based in Devon, Great Britain. They are compiling a database, which currently consists of approximately 7,000 species of plants. They conduct research and provide information on edible and otherwise useful plants suitable for growing outdoors in a temperate climate. There are now 1,500 species of edible plants growing at "The Field" in Cornwall demonstration gardens since 1989.
www.pfaf.org

Phytochemical and Ethnobotanical databases, compiled by Dr. James Duke. Searchable database includes: plant searches (chemicals and activities in a particular plant, high concentration chemicals, chemicals with one activity, ethnobotanical uses, list chemicals and activities for a plant), chemical searches (plants with a chosen chemical, activities of a chosen chemical, list activities and plants for a chemical), activity searches (plants with a specific activity, search for plants with several activities, chemicals with a specific activity, lethal dose (LD) information for a chemical, search for plants/chemicals with one or more activities, search for plants/chemicals with a superactivity), ethnobotany searches (ethnobotanical uses for a particular plant, plants with a particular ethnobotanical use) and database references and reference citations.
www.ars-grin.gov/duke

Appendix A

The plants described in the following fact sheets were grown in K-State test plots in either Hays, Colby, Wichita or Olathe, Kan. Four replications of each species were generally included at a site, though not all species were screened at each site, or screened each year. The number of replications of location-years is included in the summary table with each fact sheet, and the detailed data can be found at www.oznet.ksu.edu/ksherbs.

All plants were grown from seed in the greenhouse and transplanted in the field in late May or early June. Depending on the location/year, either five or 10 plants per plot were established. All plants at each location were used to determine the percent survival, vigor rating and insect and disease ratings. Three plants per plot were measured for height, and only one plant per plot was harvested for yield each year. Cultivating four plots allowed researchers to estimate yield from four plants at each location/year.

The plants were dried and weighed, and top and root weights are recorded in grams. The grams per plant are converted to kg/A, and also lb/A for purposes of estimated field scale yield. Herbs are usually marketed based on dry weight per pound or kilogram. The population density used to calculate field yields was the optimal population density (determined by the average size of the plants) multiplied by the actual percent survival as measured in the field. There was generally some loss due to transplant shock, and for some species, significant winter loss as well.

Plant spacing recommendations on each sheet are for within a row. The distance between rows will depend on the farming operation and equipment used. The minimum row spacing will be the same as the plant spacing recommendation. For example, if plants need to be 12 inches apart, the rows should be a minimum of 12 inches apart as well. However, if cultivator or root harvesting equipment is on 5-foot centers, plant rows 5 feet apart to facilitate cultivating and harvesting. Adjust estimated plant density per acre on the worksheets, if trying to estimate gross yield and net income.

In addition to yield, some semi-quantitative ratings were done on plants in the field, including vigor rating (1 = very poor, 3 = slightly above average, 5 = very good, well adapted), maturity rating (1 = vegetative, 2 = early bud, 3 = early flower, 4 = full flower, 5 = seed production, 6 = senescence), insect-damage rating (scale of 0 to 5, with 0 = no damage, 5 = severe) and disease rating (scale of 0 to 5, with 0 = no damage, 5 = severe). Height was recorded in centimeters.

The prices listed on each fact sheet are from Appendix B. To calculate a rough gross income potential for each herb, the estimated yield is taken times the lowest and the highest retail price, divided by two. This is a rough estimation of wholesale price. Actual prices should be determined if you enter into a contract, and small on-farm plots can be used to determine yield before investing money in large-scale herb production.

In our field trials, only organic production methods were used. None of the land was certified organic, but compost was used as the fertility source, and weeds were controlled mechanically, by hand or with the use of fabric and straw mulches. Insects and diseases were not controlled to determine if there was significant pest pressure on these species in Kansas. Higher prices are often offered for herbs that are grown organically, and in the future, non-organic herbs may be difficult to sell to a health-conscious consumer. For these, and other reasons, only organic methods were used in test plots and greenhouse. In the greenhouse, standard seed starting peat mix, pots and greenhouse conditions were used. However, compost was added to the transplant soil mix, fish emulsion used for fertility, and biological predators and soap were used for pest control.

The medicinal benefits section of each fact sheet is not intended to be a guide for use, but to help growers understand more about what consumers might want the herb for, and to give a general idea of the usefulness, and potential market for the herb. It may be confusing in some places to find that a single species could have varied uses. This seems somewhat contradictory at first. How can an herb be used for the liver and also for a head cold, for example? But, as clinical trials catch up to folklore, researchers find a lot of cross-reactivity, that is, plants that were used by Native Americans for snakebite also have activity in anti-cancer screening trials, for example.

The following fact sheets cover more than 30 herbs that were tested in Kansas between 2000 and 2002, in the first three years of K-State trials. Additional species and new data for these 30 will be added in later editions and updates.



Herb Fact Sheets

Common Name	Latin Name	Fact Sheet Number
Bee balm	<i>Monarda fistulosa</i>	MF-2605
Blue vervain	<i>Verbena hastata</i>	MF-2606
Boneset	<i>Eupatorium perfoliatum</i>	MF-2607
Borage	<i>Borago officinalis</i>	MF-2608
Burdock	<i>Arctium lappa</i>	MF-2609
Butterfly milkweed	<i>Asclepias tuberosa</i>	MF-2623
Calendula	<i>Calendula officinalis</i>	MF-2610
Chinese milkvetch	<i>Astragalus membranaceus</i>	MF-2612
Coneflower – narrow-leaved	<i>Echinacea pallida</i> <i>Echinacea angustifolia</i>	MF-2620
Coneflower – purple	<i>Echinacea purpurea</i>	MF-2624
Dandelion	<i>Taraxacum officinale</i>	MF-2613
Feverfew	<i>Tanacetum parthenium</i>	MF-2614
Evening primrose	<i>Oenothera biennis</i>	MF-2611
Heal all/Self heal	<i>Prunella vulgaris</i>	MF-2636
Joe Pye weed	<i>Eupatorium purpureum</i>	MF-2615
Licorice	<i>Glycyrrhiza uralensis</i> <i>Glycyrrhiza glabra</i>	MF-2616
Marsh mallow	<i>Althea officinalis</i>	MF-2617
Milk thistle	<i>Silybum marianum</i>	MF-2618
Mullein	<i>Verbascum thapsus</i>	MF-2619
Oregano	<i>Origanum vulgare</i>	MF-2621
Red clover	<i>Trifolium pratense</i>	MF-2625
Round-headed lespedeza	<i>Lespedeza capitata</i>	MF-2626
Sheep sorrel	<i>Rumex acetosella</i>	MF-2627
Skullcap	<i>Scutellaria lateriflora</i>	MF-2628
St. John's wort	<i>Hypericum perforatum</i>	MF-2629
Stevia	<i>Stevia rebaudiana</i>	MF-2630
Stinging nettle	<i>Urtica dioica</i>	MF-2631
Valerian	<i>Valeriana officinalis</i>	MF-2632
White sage	<i>Salvia apiana</i>	MF-2633
Yarrow	<i>Achillea millefolium</i>	MF-2634

Appendix B

Market research is very difficult in the herb business. There are no governmental statistics, and the industry is reluctant to reveal quantities, prices or even exports vs. imports purchased. Many companies require growers to sign a confidentiality agreement when making purchases, and brokers don't like to reveal the price they are getting from the company or the company making the purchase.

So market researchers are left with data on retail, but not wholesale prices. A number of major (and some minor) companies' catalogs and Web sites were gleaned for price information for many of the herbs that may grow in Kansas. Some of these herbs are plants that are already abundant, such as walnut trees. Some are grown in flower gardens, such as lavender and lily of the valley. A few may not be welcome in yards, such as stinging nettle, burdock and dandelion, but they all have value in the medicinal herb market.

This price list can help you determine if it is worth the effort to gather, clean, dry, and market the plant or plant part on the list. A fair assumption is that the price you get will be at least half, or maybe even less, than the retail price (unless you are retailing it yourself). Some of the prices are for whole herbs, but many are for cut and sifted (coarse ground), or powdered. Ironically, in some cases the whole herb is worth more than the processed, which means that equipment purchased for grinding would not pay for itself. Some of these details are not included in the table because it is already nine pages long, with just the bare minimum of price info. You can check these details by going directly to the retailer's Web site.

When there are organic options, the organic price is in bold type. Some companies only offer organic herbs. See Table B1 for this information. Pricing information is out-dated almost as soon as it is compiled. This table was put together using spring 2003 catalogs and Web sites. We recommend using these tables only as a starting point. As you can see, the range for herb prices is large even within a particular species. In many cases, there is a tenfold difference between the highest and lowest price for an herb. The difference is partly explained by quality and source. The lower price probably represents imported herbs, of unknown source and unknown quality. The higher prices are for organically grown, ethically wildcrafted, and probably marketed by a small company with a good reputation among herbalists. If you find yourself thinking about growing a particular herb for the market, go back to these sources, find some current prices and then see if you can find a market. You won't al-

ways be able to lock in a market or prices without sending in some sort of sample, but it will give you a little experience in marketing and a way to get started.

Herb Price Research: Sources of Other Herb Price Info Sites

Agriculture Canada

www.agr.gc.ca/misb/infohort/data/herbs_spices

Herbal Green Pages

www.herbworld.com

www.HerbNet.com

Health Food Stores

People's Grocery, 17th and Yuma, Manhattan, Kan.

Community Mercantile, 9th and Iowa, Lawrence, Kan.

Several in Wichita, see yellow pages in phone book.

Local Broker

David Hall

"Future in Herbs"

Wichita, Kan.

316-775-1613

Kansas Center for Sustainable Agriculture and Alternative Crops

(includes links to many other sites)

www.kansassustainableag.org

Table Index

- B.1. Bulk herb sources
- B.2. Trees
- B.3. Shrubs and vines
- B.4. Woodland herbs
- B.5. Weedy sun-loving perennials
- B.6. Other sun-loving perennials
- B.7. Medicinals also grown as culinary species
- B.8. Flowers sold as medicinals
- B.9. Medicinal animal feed market
- B.10. Alpine herbs
- B.11. Herbs for essential oil and fragrance markets

Table B1. Bulk Herb Sources

Name	Comments	Address	Web site
Ameri-Herb, Inc.	Mentioned as a reasonable source of bulk herbs by another Web site, catalog only, no Web site.	PO Box 1968 Ames, IA 50010-1968 1-800-267-6141	No Web site, but see www.racehorseherbal.com/Suppliers/suppliers for reference
Blessed Herbs	Bulk botanicals, sold as (w) wildcrafted, (org) certified organic, and (h) high-quality herbs whose growing conditions we cannot verify. Purchase from a network of wildcrafters and organic growers, and only sell herbs that are not fumigated, irradiated or treated with synthetic chemicals. More than 600 products on list.	109 Barre Plains Road Oakham, MA 01068 1-800-489-4372 blessedherbs@blessedherbs.com	www.blessedherbs.com
Bouncing Bear Botanicals	Sells about 24 herb products, most not on KSU trial list. Not listed as organic.	PO Box 3895 Olathe, KS 66063-3895 orders@bouncingb.com	www.bouncingbearbotanicals.com
Desert Bloom	Sells about six locally wildcrafted desert herbs.	Desert Bloom Herbs 505 N. Bullard St. Silver City, NM 88061 1-800-583-2976	www.desertbloomherbs.com
Frontier Herb Coop	Products include organic bulk herbs, also many other products in recent years. Can find bulk herbs with common name search, Latin name also available. Source of herb not listed.	Frontier Cooperative Herbs 3021 78 th St. P.O. Box 299 Norway, IA 52318-0299 319-227-7996	www.frontiercoop.com
Herbal Advantage, Inc.	Sells several herbal products in addition to bulk herbs. Appear to make their own tinctures. Also, the farm grows a new variety of stevia, sweeter and less bitter than older varieties.	131 Bobwhite Rd. Rogersville, MO 65742 417-753-4000 800-753-9199	www.herbaladvantage.com
Jean's Greens	Bulk herbs by the ounce or by the pound, maximum order 2 pounds. List of herbs notes if organic or wildcrafted. Source of herb not listed.	119 Sulphur Spring Road Norway, NY 13416 315-845-6500	www.jeansgreens.com
Horizon Herbs	Offers growing guide and catalog of many herb seeds. Also offers many books by founder, Richo Cech. Sells herb extracts, but not bulk herbs. Certified organic by Oregon Tilth.	Horizon Herbs, LLC PO Box 69 Williams, OR 97544 541-846-6704	www.horizonherbs.com
In Harmony Herbs and Spices	250 dried herbs, many certified organic. Prices not listed on Web site.	PO Box 7555 San Diego, CA 92167 619-223-8051	www.inharmonyherbs.com
Mountain Rose Herbs	Bulk herbs, essential oils, other herbal products and equipment to make your own. Bulk herbs are either certified organic or sustainable wildcrafted/grown, no chemicals.	PO Box 50220 Eugene, OR 97405 800-867-3337	www.mountainroseherbs.com
Pacific Botanicals	Oregon Tilth Certified Organic. Carries 175 medicinal herbs and spices in whole, cut, tea bag and powder. Grown on 114-acre certified organic farm and eight contract growers.	4350 Fish Hatchery Rd. Grants Pass, OR 97527 541-479-7777	www.pacificbotanicals.com
Planet Herbs	Herbs, roots, barks, and Native American ceremonial and ritual items. Lists common and Latin names, not necessarily organic.	815 2 nd Ave. Marlinton, WV 24954 1-888-480-4372	No Web site.
Prairie Moon Nursery	Catalog and cultural guide for many herb species, but they specialize in native plants for wetland, prairie, savanna and woodland. Seeds only, no bulk herbs.	Route 3 Box 163 Winona, MN 55987-9515 507-452-1362	www.prairiemoonnursery.com
Richters Herbs	Established company for diverse herb seeds and plants, new species each year. Some bulk herbs, but primary business is seeds. Great Web site with photos, growing tips, etc.	Richters Herbs, 357 Hwy 47, Goodwood Ontario LOC 1AO, CANADA 1-905-640-6677	www.richters.com
San Francisco Herb and Natural Food Company	Bulk herbs offered, listed by common and Latin name, source (country), only a few available as organic.	47444 Kato Rd. Fremont, CA 94538 510-770-1215	www.herbspicetea.com
Snake Root Man	Sells only wildcrafted <i>Echinacea angustifolia</i> roots, cut and sifted.	The Snake Root Man PO Box 242 Bison, KS 67520 elfenquarters@yahoo.com	No Web site.

Table B1. Bulk Herb Sources (continued)

Name	Comments	Address	Web site
Trinity House	Wholesale only supplier, supporting herbal retailers, practitioners and manufacturers. Does not sell to individuals. Web site offers links to companies that carry its products.	P.O. Box 1001 Graton, CA 95444 707-824-2040 888-874-4372	www.trinityherb.com
Wild Weeds	Family-run, mail-order business. Offer organically grown herbs when available. Since 1987.	233 Red Rock Lane Fieldbrook, CA 95519 800-553-9453 (ph/fax)	www.wildweeds.com
Years to Your Health (YTYH)	Catalog includes common name only, priced by the ounce, a few listed as organic. Source not listed.	503 E. 2 nd St. Irving, TX 75060 972-579-7042	www.yearstoyourhealth.com/herbs

Notes for Tables B2 through B11

These are prices from Web sites in dollars per pound dry weight (\$/lb), usually using the per pound price, not the bulk rate, but also not the more expensive per ounce rate.

The prices are for cut and sifted products in most cases (a very coarse grind), and in a few situations, for whole item (especially berries). Powdered products generally run \$1 to \$3 more per pound than cut and sifted. In a few cases, powdered products bring a lower price. For some roots, the whole root (licorice) or sliced root (astragalus) brings a better price than cut and sifted. Check individual catalogs for details. When an organic and a conventional source were listed side by side in the same catalog, both prices are listed divided by a slash. The first price is the organic price (in bold) and the second price

is nonorganic. In all of these cases, organic means certified organic. In some catalogs, it is assumed that all herbs are wildcrafted and/or nonorganic, and in some it is stated that most are organic, and in some, each item is coded. Check individual catalogs for details.

This list is not exhaustive. It was accurate when it was compiled (April 2003), but some prices have changed. Also, not everything makes sense, for example, the prices at People's Grocery, a Manhattan, Kan., health food store, should be linked to Frontier's price, the wholesale supplier for People's Grocery (according to the labels on the bulk jars). However, the price when People's Grocery bought the herb may have been different than the day the prices were checked at the store.

Table B2. Trees with market as medicinal species

Common Name	Species	Herb Part	YTYH	San Francisco	Mtn Rose	Richters	Frontier	Jean's Greens	Wild Weeds	Blessed Herb	People's Grocery
Black walnut	<i>Juglans nigra</i>	Leaf	17.60	—	7.50	—	—	13.00	—	—	—
Black walnut	<i>Juglans nigra</i>	Hull pwd	14.40	3.50	7.00	—	11.00	9.00	12.00	12.10	—
Black walnut	<i>Juglans nigra</i>	Bark	—	4.90	—	—	—	—	—	14.30	—
Butternut	<i>Juglans cinerea</i>	Inner bark	21.60	—	—	—	—	—	—	—	—
Cedar	<i>Thuja occidentalis</i>	Chips Tips	10.40 20.00	2.50	—	— 21.79	7.00 16.75	— 9.00	5.50 —	—	—
Chaste tree	<i>Vitex agnus-castus</i>	Berry	28.80	4.40	11.00	25.42	12.60	17.00	16.00	12.70	—
Cherry – wild	<i>Prunus virginiana/</i> <i>(P. serotina)</i>	Bark	16.80	5.10	9.00	17.25	16.25	12.00	14.00	10.45	13.35
Chestnut	<i>Castanea sativa/</i> <i>dentata</i>	Leaf	6.40	3.25	—	—	15.50	—	—	—	—
Elm – slippery	<i>Ulmus rubra</i>	Inner bark	45.60	12.95	22.00	28.60	39.79/ 30.15	27.00	25.00	15.15	28.05
Fringe tree	<i>Chionanthus virginicus</i>	Bark	—	—	—	—	—	68.00	—	—	—
Ginkgo	<i>Ginkgo biloba</i>	Leaf	21.60	3.50	9.50	46.31	26.85/ 13.95	30.00	30.00	17.60	25.85
Horse chestnut	<i>Aesculus hippocastunum</i>	Nut/seed leaf	— 20.00	9.50	24.00	—	13.45	28.00	—	13.20	—
Linden	<i>Tilia europaea</i>	Leaf and flower	38.40	7.65	16.00	31.78	24.35	25.00	25.00	17.05	—
Oak – white	<i>Quercus alba</i>	Bark	14.40	2.75	9.00	36.32	22.25/ 12.75	10.00	11.00	10.45	—
Persimmon	<i>Diospyros virginiana</i>	Leaf (trad. bark)	—	6.90	—	—	—	—	—	—	—
Pine – white	<i>Pinus strobus</i>	Bark	13.60	3.00	—	19.52	15.90	—	6.00	9.70	—
Poplar	<i>Populus tremuloides</i>	Bark	32.00	—	—	20.43	—	—	—	—	—
Willow – black	<i>Salix nigra</i>	Bark	42.40	—	—	—	—	—	—	10.30	—
Willow – white	<i>Salix alba</i>	Bark	16.80	5.20	13.50	36.32	17.00/ 11.15	10.00	11.00	9.90	15.95

When organic and nonorganic herbs are available, organic prices are shown in bold type.

Table B3. Shrubs and vines with a market as medicinal species

Common Name	Species	Herb Part	YTYH	San Francisco	Mtn Rose	Richters	Frontier	Jean's Greens	Wild Weeds	Blessed Herb	People's Grocery
Barberry	<i>Berberis vulgaris</i>	Root bark	32.80	4.75	9.00	—	17.70	21.00	21.00	13.20	—
Bayberry	<i>Myrica cerifera</i>	Root bark	48.80	7.80	15.00	34.50	42.65	40.00	—	18.15	—
Bilberry	<i>Vaccinium myrtillus</i>	Fruit	69.60	16.50	32.50	44.49	42.55	—	—	25.40	—
Bilberry	<i>Vaccinium myrtillus</i>	Leaf	21.60	5.85	21.00	—	19.15	20.00	—	16.50	—
Bittersweet	<i>Solanum dulcamara</i>	Leaves and stems	54.40	—	—	—	—	—	—	—	—
Blackberry	<i>Rubus fruticosus</i> <i>(villosus)</i>	Leaf Root	20.00 29.60	4.05	11.00 22.00	— 20.43	— —	16.00 23.00	— —	— 10.45	— —
Black haw	<i>Viburnum prunifolium</i>	Bark	26.40	—	18.25	—	—	20.00	23.00	—	—
Blueberry	<i>Vaccinum spp.</i>	Leaf	28.80	4.90	9.50	—	—	25.00	24.50	—	—
Buckthorn	<i>Rhamnus frangula</i> <i>(cathartica)</i>	Bark	16.00	—	9.00	22.25	12.80	11.00	—	11.30	—
Cascara sagrada	<i>Rhamnus purshiana</i>	Bark	19.20	7.50	9.25	22.25	17.25	17.00	17.00	10.30	—
Cramp bark	<i>Viburnum opulus</i>	Bark	52.80	14.00	21.00	—	45.00	40.00	40.00	18.15	49.69

Table B3. Shrubs and vines with a market as medicinal species (continued)

Common Name	Species	Herb Part	YTYH	San Francisco	Mtn Rose	Richters	Frontier	Jean's Greens	Wild Weeds	Blessed Herb	People's Grocery
Elderberry	<i>Sambucus nigra</i>	Berry	17.60	4.60	10.00	—	21.65/ 12.50	19.00	—	12.65	—
Elderberry	<i>Sambucus nigra</i>	Flower	27.20	9.00	10.00	25.42	20.40	20.00	20.00	15.15	—
Elderberry	<i>Sambucus nigra</i>	Leaf	50.40	—	—	—	—	—	—	—	—
Elderberry	<i>Sambucus nigra</i>	Root	54.40	—	—	—	—	—	—	—	—
Forsythia (Chinese)	<i>Forsythia suspensa</i>	Fruit									
Hawthorn	<i>Crataegus laevigata/monogyna</i>	Leaf and Flower	28.00	—	11.00	—	21.45	24.00	—	17.60/ 15.15	—
Hawthorn	<i>Crataegus laevigata/monogyna</i>	Berry	9.60	5.00/ 3.50	10.50	17.71	12.50	20.00	18.00	13.60/ 11.55	9.15
Honeysuckle	<i>Lonicera japonica</i>	Flower	53.60	—	16.00	—	oil only	24.00	—	—	—
Hops	<i>Humulus lupulus 'Hallertauer'</i>	Flower	27.20	6.00	23.00	25.42	34.90	26.00	26.00/ 16.50	18.15/ 12.70	na
Hydrangea	<i>Hydrangea arborescous</i>	Root	30.40	—	10.00	23.61	18.35	16.00	—	11.40	—
Jasmine	<i>Jasminum officinale</i>	Flower	30.40	7.90	9.00	—	17.60	—	—	18.15	
Juniper	<i>Juniperus communis</i>	Berry	19.20	5.50	10.00	25.42	26.85	17.00	17.00	20.35/ 12.10	14.45
Jujube – Chinese	<i>Ziziphus spinosa/ jujuba</i>	Whole dates/ seeds	21.60 34.40	— 13.25	—	— 363.20	—	9.00	—	12.65	—
Oregon grape	<i>Mahonia aquifolia</i>	Root	26.40	9.50	9.00	19.52	—	24.00	—	14.85	27.95
Passion flower – American	<i>Passiflora incarnata</i>	Herb	26.40	4.25	14.75	20.43	2-30	18.00	17.00	11.55	17.35
Raspberry – red	<i>Rubus idaeus</i>	Leaf	14.40	2.95	10.00	30.42	24.75/ 13.13	18.00	18.00	15.15	21.65
Red root/ Jersey tea	<i>Ceanothus americanus</i>	Root	30.40	—	14.00	—	25.10	21.00	—	14.85	—
Sassafras	<i>Sassafras albidum</i>	Root bark Leaf	56.80	12.75	25.00	34.96	47.00 26.25	36.00	32.00	24.75	47.05
Schisandra	<i>Schisandra chinensis</i>	Berries	34.40	6.00	18.00	23.61	17.80	15.00	18.00	10.90	—
Seabuckthorn	<i>Hippophae rhamnoides</i>	Berries	—	—	—	—	—	—	—	—	—
Sumac – sweet	<i>Rhus aromatica</i>	Root bark	—	—	—	55.39	—	—	—	—	—
Wahoo	<i>Euonymus atropurpurea</i>	Leaves Root bark	150.40	—	—	44.49	—	—	—	— 21.45	—
Witch hazel	<i>Hammamelis virginiana</i>	Bark	20.80	5.90	11.00	20.43	22.50	15.00	20.00	10.45	—
Witch hazel	<i>Hammamelis virginiana</i>	Leaves	32.00	—	13.00	20.88	23.90	16.00	—	12.10	—
Wolfberry – Chinese	<i>Lycium barbarum</i>	Berries	39.20	—	10.00	—	37.50	24.00	24.00	13.75	—

When organic and nonorganic herbs are available, organic prices are shown in bold type.

Table B4. Woodland herbs with a market for medicinal species (Difficult to grow in the Great Plains)

Common Name	Species	Herb Part	YTYH	San Francisco	Mtn Rose	Richters	Frontier	Jean's Greens	Wild Weeds	Blessed Herb	People's Grocery
Black cohosh	<i>Cimicifuga racemosa</i>	Root	28.80	4.70	16.00	19.07	41.63/ 31.63	22.00	22.00	18.15/ 11.55	28.65
Blue cohosh	<i>Caulophyllum thalictroides</i>	Root	21.60	6.50	12.50	19.07	26.25	19.00	18.50	10.45	—
False unicorn	<i>Chamaelirium luteum</i>	Root	225.60	only tincture	94.00	146.19	—	—	96.00	82.50	—
Ginseng – American	<i>Panax quinquefolius</i>	Root	280.00 (dom) ¹ 1896.00 (wld) ¹	53.00	70.00	309.00	360.00/ 180.00	128.00	—	163.00 (wo)¹ 825.00 (wld)¹	93.00
Ginseng – Korean/Asian	<i>Panax ginseng (P. pseudoginseng)</i>	Root	200.00 to 634.00**	16.00 to 34.00	—	—	62.00 to 144.00	—	—	50.00	—
Ginseng – Siberian (Eluthero)	<i>Eleutherococcus senticosus</i>	Root	41.60	3.70	12.00	15.89	18.75	17.00	9.50	18.15/ 16.50	—
Goldenseal	<i>Hydrastis canadensis</i>	Root	186.40	19.10	144.00	280.00	240.00	160.00	144.00	142.69/ 72.60	280.25
Goldenseal	<i>Hydrastis canadensis</i>	Top	105.60	31.00	—	127.12	81.00	56.00	—	35.75	—
Gotu Kola (tropical annual)	<i>Centella asiatica</i>	Herb	20.00	3.50	12.00	72.64	25.10	22.00	24.50	17.55/ 14.85	n/a
Pipsissewa	<i>Chimaphila umbellata</i>	Herb	29.60	—	19.00	27.24	—	34.00	32.00	15.15	—
Spikenard	<i>Aralia racemosa</i>	Root	40.00	12.25	22.25	30.42	31.95	28.00	—	19.25	—
Uva Ursi	<i>Aretostaphylos uva ursi</i>	Leaf	31.20/ 26.40	7.50	11.00	12.72	21.35/ 19.15	16.00	—	17.35/ 14.85	17.95

¹ wo = woodland organic, wld = wildcrafted, dom = domestic
When organic and nonorganic herbs are available, organic prices are shown in bold type.

Table B5. Weedy sun-loving perennials with a potential for medicinal herb market

Common Name	Species	Herb Part	YTYH	San Francisco	Mtn Rose	Richters	Frontier	Jean's Greens	Wild Weeds	Blessed Herb	People's Grocery
Burdock	<i>Arctium lappa</i>	Root	33.60/ 18.40	3.60	9.00	19.07	20.40	14.00	14.50	13.59	20.40
Burdock	<i>Arctium lappa</i>	Leaf	10.05	—	—	—	—	—	—	—	—
Chickweed	<i>Stellaria media</i>	Herb	25.60	4.35	8.00	25.42	14.90	13.00	13.50	12.70	13.95
Chicory	<i>Chicorium intybus</i>	Root	16.00	3.90	7.50	24.06	11.25	6.00	—	12.10	16.05 (roasted)
Cleavers	<i>Galium aparine</i>	Herb	20.00	5.50	9.00	22.25	13.45	17.00	16.50	11.55	—
Clover – sweet	<i>Mellilotis officinalis</i>	Herb	—	—	—	24.06	—	—	—	11.20	—
Clover – red	<i>Trifolium pratense</i>	Flowers Herb	29.60 52.80/ 16.00	5.70	42.00 8.00	15.44	24.70/ 19.55	12.00	14.50	47.03 10.21	16.65
Coltsfoot	<i>Tussilago farfara</i>	Leaf	20.80	4.75	9.00	25.42	20.55/ 16.15	18.00	17.00	14.85/ 12.10	—
Couchgrass	<i>Triticum repens</i>	Rhizome	—	3.90	10.00	—	—	36.00	—	16.50	—
Dandelion	<i>Taraxacum officinale</i>	Leaf Root	21.60 23.20	4.10 4.10	8.00 10.00	— 30.42	20.40 23.45	19.00 20.00	16.00 19.00	15.53 15.53	19.65 30.85
Dock – yellow/ curley	<i>Rumex crispus</i>	Root	16.80	3.20	18.00	20.88	19.80	28.00	13.00	9.90	—
Goldenrod	<i>Solidago virgaurea</i>	Herb	13.60	3.50	11.00	—	—	14.00	—	10.30	—
Horsetail	<i>Equisetum arvense/ hyemale</i>	Herb	16.80	3.25	11.00	22.25	17.20	24.00	16.50	15.40/ 10.75	16.05
Kudzu	<i>Pueraria lobata</i>	Root	33.60	4.90	—	25.42	14.80	17.00	—	12.10	—

Table B5. Weedy sun-loving perennials with a potential for medicinal herb market (continued)

Common Name	Species	Herb Part	YTYH	San Francisco	Mtn Rose	Richters	Frontier	Jean's Greens	Wild Weeds	Blessed Herb	People's Grocery
Lettuce – wild	<i>Lactuca verosa</i>	Herb	29.60	6.95	11.00	38.14	—	20.00	—	13.55	—
Marsh mallow	<i>Althea officinalis</i>	Root	28.00	8.80/5.00	12.00	19.07	27.30	19.00	19.00	13.06	18.45
		Leaf	36.00	3.90	—	—	—	—	—	11.50	—
Mullein	<i>Verbascum thapsis</i>	Leaf	3.50	3.90	15.00	20.43	19.95	19.00	19.50	10.45	9.95
Nettles	<i>Urtica dioica</i>	Leaf	3.25	3.25	10.00	19.52	18.90	14.00	18.00	11.50	15.95
		Root	—	4.50	11.00	—	18.50	—	—	12.54	—
Plantain	<i>Plantago major</i>	Leaf	17.60	5.15	9.00	—	—	16.00	12.00	—	—
Plantain	<i>Plantago lanceolata</i>	Leaf	—	—	—	22.70	19.15	—	—	12.70	—
Pokeweed	<i>Phytolacca americana</i>	Root	21.60	8.50	—	20.43	—	15.00	15.00	9.90	—
Puncture vine	<i>Tribulus terrestris</i>	Weed	—	7.50	—	317.80	—	—	—	—	—
Shepard's purse	<i>Capsella bursa pastoris</i>	Herb	18.40	3.50	8.00	20.43	14.80	13.00	16.00	12.65	—
Sorrell	<i>Rumex acetosa</i>	Herb	31.20	6.30	11.00	15.89	33.00	30.00	30.00	22.47/15.68	—
Yucca	<i>Yucca glauca</i>	Root bark	34.40	8.50	14.25	54.48	35.00/24.90	18.00	—	13.75	—

When organic and nonorganic herbs are available, organic prices are shown in bold type.

Table B6. Other sun-loving perennials with a potential for medicinal herb market

Common Name	Species	Herb Part	YTYH	San Francisco	Mtn Rose	Richters	Frontier	Jean's Greens	Wild Weeds	Blessed Herb	People's Grocery
Alfalfa	<i>Medicago sativa</i>	Leaf	23.20	1.90	6.00	—	13.80	8.00	13.20	8.50	8.85
		Seed	10.40	4.75	—	—	10.50	12.00	—	—	9.19
Angelica	<i>Angelica archangelica</i>	Root	29.60	4.00	16.50	34.96	24.88	21.00	23.50	22.55/15.15	—
Ashwagandha	<i>Withania somnifera</i>	Root	33.60	8.90	25.00	31.33	28.95	44.00	—	16.50	—
Bergamot – wild	<i>Monarda fistulosa</i>	Herb	—	—	—	23.61	—	—	—	9.79	—
Blessed thistle	<i>Cnicus benedictus</i>	Herb	13.60	4.00	9.00	18.61	22.05/12.60	14.00	17.00	11.40	10.85
Boneset	<i>Eupatorium perfoliatum</i>	Herb	19.20	—	10.25	23.15	15.00	14.00	—	10.36	—
Borage	<i>Borago officinalis</i>	Herb	23.20	4.70	7.00	30.42	—	25.00	26.00	17.24	—
Bupleurum	<i>Bupleurum chinense</i>	Root	48.00	9.75	8.00	38.14	—	30.00	—	19.40	—
Burdock	<i>Arctium lappa</i>	Root	33.60/18.40	3.60	9.00	19.07	20.40	14.00	14.50	13.59	20.40
		Leaf	10.05	—	—	—	—	—	—	—	—
Butterfly milkweed	<i>Asclepias tuberosa</i>	Root	46.40	8.50	22.00	25.42	—	25.00	28.00	15.68	—
Calamus (sweetflag)	<i>Acorus calamus</i>	Root	22.40	5.75	12.00	22.25	21.50	17.00	18.50	12.40	—
Calendula	<i>Calendula officinalis</i>	Flower	24.00	4.80	27.00	36.77	18.50	39.00	32.00/8.00	25.89/10.97	23.75
Celandine	<i>Chelidonium majus</i>	Herb	31.20	6.25	15.25	25.42	—	31.00	—	—	—
Chamomile – German	<i>Matricaria recutita</i>	Flowers	21.60	9.90/3.50	12.00	30.42	25.10	12.00	23.00/11.00	16.50	25.25
Chinese milkvetch	<i>Astragalus membranaceus</i>	Root	40.00	7.50	17.00	54.03	38.00/20.80	56.00	52.00	16.50	35.25
Comfrey	<i>Symphytum officinale</i>	Leaf	27.20/1.20	8.90/3.90	10.00	36.32	19.63/12.45	12.00	13.50	12.10	13.85

Table B6. Other sun-loving perennials with a potential for medicinal herb market (continued)

Common Name	Species	Herb Part	YTYH	San Francisco	Mtn Rose	Richters	Frontier	Jean's Greens	Wild Weeds	Blessed Herb	People's Grocery
Comfrey	<i>Symphytum officinale</i>	Root	36.80/ 17.60	8.70/3.95	11.25	36.32	24.75/ 13.35	18.00	18.00	14.05	13.95
Dong Quai	<i>Angelica polymorpha</i>	Root pwd/ slice	31.20	8.75	12.00	34.96	29.05 47.75	17.00 40.00	8.90	18.15 27.50	— 43.05
Echinacea – narrow leaf	<i>Echinacea angustifolia</i>	Leaf Root	— 95.20	— 21.00	— 20.00	— 73.09	32.15 70.00	— 80.00	— 50.00	14.39 38.4	— 99.99
Echinacea – pale purple	<i>Echinacea pallida</i>	Leaf Root	— —	14.00	—	—	—	—	—	22.47	—
Echinacea – Purple coneflower	<i>Echinacea purpurea</i>	Leaf Root	54.40 65.60	— 18.50	— 12.00	17.71 63.56	16.00 40.15	14.00 46.00	— 28.20	— 18.29	— 38.65
Elecampane	<i>Inula helenium</i>	Root	20.00	4.75	10.50	25.42	14.20	22.00	14.60	11.85	—
Evening primrose	<i>Oenothera biennis</i>	Herb Seed	—	7.50 —	—	34.96	—	—	—	—	—
Feverfew	<i>Tanacetum parthenium</i>	Herb w/ Flowers	40.00	6.75	9.00	27.69	22.55	16.00	16.00	14.39	—
Fo-Ti (plant)	<i>Polygonum multiflorum</i>	Root	20.80	4.75	11.00	29.06	16.15	15.00	16.50	14.50	—
Heal-all	<i>Prunella vulgaris</i>	Herb	56.80	—	—	—	—	—	—	20.35	—
Horehound	<i>Marrubium vulgare</i>	Herb	16.80	4.00	13.00	25.42	24.35	18.00	—	14.05	24.35
Hyssop	<i>Hyssopus officinalis</i>	Herb	17.60	3.80	10.00	25.42	23.65	21.00	19.70	12.65	—
Joe Pye weed	<i>Eupatorium purpureum</i>	Root	28.00	9.50	14.00	25.42	21.95	19.00	23.00	10.30	—
Lady's mantle	<i>Alchemilla vulgaris</i>	Herb	24.80	6.25	12.00	34.96	22.05	38.00	—	18.15	—
Lemon balm	<i>Melissa officinalis</i>	Herb	22.40	6.25	13.00	25.42	28.70	22.00	22.00	13.75	19.85
Lemon verbena	<i>Aloysia triphylla</i>	Herb	36.80	8.90	13.00	72.64	28.30	26.00	26.50	—	23.05
Lespedeza – round headed	<i>Lespedeza capitata</i>	Herb	—	—	—	19.52	—	—	—	—	—
Licorice	<i>Glycyrrhiza glabra</i>	Root	14.40 cs 25.60 wh	9.65/3.35	10.00	22.25	16.70	—	20.00/ 9.50	13.06/ 9.79	16.70
Licorice – Chinese	<i>Glycyrrhiza uralensis</i>	Root	28.00 wh 46.40 sl	—	—	—	18.20	20.00	—	—	—
Lobelia	<i>Lobelia inflata</i>	Herb	43.20	5.40	30.00	31.33	24.63	40.00	—	18.15	34.55
Lungwort	<i>Pulmonaria officinalis</i>	Herb	32.00	—	—	30.42	24.65	—	—	—	—
Marsh mallow	<i>Althea officinalis</i>	Root	28.00	8.80/5.00	12.00	19.07	27.30	19.00	19.00	13.06	18.45
Milk thistle	<i>Silybum marianum</i>	Seed	20.00	3.20	12.00	19.07	24.65/ 11.95	22.00	26.50	14.05/ 11.85	24.65
Motherwort	<i>Leonurus cardiaca</i>	Herb	20.00	4.50	17.00	26.79	21.25/ 18.13	22.00	21.00	13.30	19.05
Mugwort	<i>Artemisia vulgaris</i>	Leaf	16.00	4.50	12.50	28.15	24.13/ 14.63	14.00	16.00	12.10	—
Mullein	<i>Verbascum thapsis</i>	Leaf	3.50	3.90	15.00	20.43	19.95	19.00	19.50	10.45	9.95
Nettles	<i>Urtica dioica</i>	Leaf Root	3.25	3.25 4.50	10.00 11.00	19.52 —	18.90 18.50	14.00	18.00	11.50 12.54	15.95
Patchouli	<i>Pogostemon cablin</i>	Leaf	44.80	oil only	18.00	38.14	22.50	—	16.00	18.15	—
Pennyroyal	<i>Menthe pulegium</i>	Herb	16.80	3.60	8.00	22.70	15.63	17.00	17.00	15.15	—
Prairie clover	<i>Petalostemum candidum/</i> <i>purpureus</i>	Roots and flowering tops	—	—	—	—	—	—	—	—	—

Table B6. Other sun-loving perennials with a potential for medicinal herb market (continued)

Common Name	Species	Herb Part	YTYH	San Francisco	Mtn Rose	Richters	Frontier	Jean's Greens	Wild Weeds	Blessed Herb	People's Grocery
Red clover	<i>Trifolium pratense</i>	Flowers Herb	29.60 52.80/ 16.00	5.70	42.00 8.00	15.44	24.70/ 19.55	12.00	14.50	47.03 10.21	16.65
Rue	<i>Ruta graveolens</i>	Herb	67.20	6.67	17.00	29.06	30.45	18	—	14.05	18.15
Skullcap/ scullcap	<i>Scutellaria lateriflora</i>	Herb	64.00/ 33.60	16.00	16.00	33.59	34.25/ 30.00	24.00	25.00	17.24	26.05
Soapwort	<i>Saponaria officinalis</i>	Root	—	10.00	20.00	—	—	—	—	—	—
Spilanthes/ Toothache Plant	<i>Spilanthes oleracea</i>	Herb	—	—	—	39.95	—	39.00	—	27.50	—
St. John's wort	<i>Hypericum perforatum</i>	Tops w/ flowers	20.00	4.50	10.00	24.06	25.70	22.00	—	16.72/ 13.06	25.75
Tansy	<i>Tanacetum vulgare</i>	Herb	21.60	9.00	—	15.89	—	25.00	—	11.55	—
Valerian	<i>Valeriana officinalis</i>	Root	2.95	4.50	9.00	31.33	31.65	26.00	22.00/ 11.50	14.39	30.85
Vervain – blue	<i>Verbena hastata</i>	Herb	—	4.50	14.50	22.25	20.30	17.00	17.00	10.45	—
Wormwood	<i>Artemisia absinthium</i>	Herb	16.80	3.50	17.00	25.42	20.00/ 11.25	18.00	18.50	14.85	17.55
Yarrow – 'Proa'	<i>Achillea millefolium</i>	Flower	20.00	3.40	16.00	20.88	24.65/ 12.90	22.00	18.00	12.02	11.05

When organic and nonorganic herbs are available, organic prices are shown in bold type.

Table B7. Medicinals also grown as culinary species (annuals and perennials)

Common Name	Species	Herb Part	YTYH	San Francisco	Mtn Rose	Richters	Frontier	Jean's Greens	Wild Weeds	Blessed Herb	People's Grocery
Asparagus tuber	<i>Asparagus cochinchinensis</i>	Root	44.00	5.90	—	—	—	—	—	—	—
Basil – sweet	<i>Ocimum basilicum</i>	Leaf	11.20	4.60	8.00	26.79	13.80	16.00	14.00	15.40	7.69
Catnip	<i>Nepeta cataria</i>	Leaf Flower	43.20/ 25.60	5.50	9.00	11.35	20.40/ 18.20	24.00	20.50	13.30	17.55
Chervil	<i>Anthriscus cerefolium</i>	Leaf	32.80	9.75	18.75	—	27.70	—	—	—	25.85
Chives	<i>Allium schoenoprasum</i>	Leaves (rings)	81.60	11.50	40.00	—	79.30	—	—	—	32.05
Cilantro	<i>Coriandrum sativum</i>	Leaf	—	14.40/ 4.20	17.00	41.31	35.00/ 24.05	17.00	—	22.55	26.85
Corn silk	<i>Zea mays</i>	Silk	25.60	4.95	13.00	—	13.25	14.00	—	14.20	12.35
Coriander	<i>Coriandrum sativum</i>	Seed	6.40	4.25/ 1.95	7.00	12.71	10.55/ 4.80	16.00	11.00	14.05	4.85
Dill	<i>Anethum graveolens</i>	Leaf	32.00	4.70	14.00	31.78	26.25/ 18.50	24.00	—	18.15	23.05
Dill	<i>Anethum graveolens</i>	Seed	7.20	3.30	8.00	17.71	12.00/ 6.00	—	—	—	12.85
Fennel	<i>Foeniculum vulgare</i>	Seed	9.60	4.95/ 3.60	6.50	6.36	16.50/ 8.50	12.00	13.00	12.65	11.25
Garlic	<i>Allium sativum</i>	Bulb/root (granules)	10.40	3.40	8.00	—	16.50	15.00	15.50	13.60	—
Ginger – tropical	<i>Zingiber officinale</i>	Root	12.80	3.50	9.75	30.42	18.75/ 8.75	20.00	18.00/ 8.50	15.15	8.35
Horseradish	<i>Armoracia rusticana</i>	Root	34.40	5.90	—	39.04	20.30	—	—	—	—
Lemongrass	<i>Cymbopogon citratus</i>	Leaf	24.00/ 12.00	3.25	8.00	25.42	15.25	12.00	12.50	13.30	13.95
Lovage	<i>Levisticum officinale</i>	Root Leaf	32.80 12.00	6.50	12.00	—	21.05	—	—	—	—
Oat straw	<i>Avena sativa</i>	Straw	12.80	2.50	7.00	20.43	19.50	8.00	9.00	9.10	—
Oregano	<i>Origanum vulgare</i>	Leaf/Herb	16.00	3.85	9.50	25.42	15.00/ 11.00	13.00	14.00	12.70	13.45
Parsley	<i>Petroselinum crispum</i>	Leaf	20.80	6.50/ 4.10	14.00	22.70	26.25/ 18.88	16.00	—	16.35	18.65
Parsley	<i>Petroselinum</i>	Root	24.00	6.50	14.00	—	21.25	15.00	—	14.85	—
Peppermint	<i>Mentha piperita</i>	Leaf	23.20/ 11.20	2.75	10.00	—	13.65/ 8.50	10.00	14.00	10.45	13.95
Rhubarb – common	<i>Rheum officinalis</i>	Root	—	—	—	—	15.40	—	13.00	—	—
Rhubarb – Turkish/Chinese	<i>Rheum palmatum</i>	Root	17.60	4.75	10.00	31.78	20.30	27.00	20.00	18.15/ 17.05	—
Sage – common	<i>Salvia officinalis</i>	Leaf	27.20	4.50	10.00	14.07	21.25/ 14.38	16.00	18.00	12.10	12.05
Spearmint	<i>Mentha spicata</i>	Leaf	10.40	2.50	8.00	19.52	15.80/ 7.80	14.00	15.00	15.15	14.35
Strawberry	<i>Fragaria vesca</i>	Leaf	18.40	3.50	8.00	—	—	15.00	15.00	—	—
Stevia	<i>Stevia rebaudiana</i>	Herb	24.00	6.50	12.00	36.77	19.15	18.00	17.00	17.24	31.75
Tarragon	<i>Artemisia dracunculoides</i>	Leaf	—	—	11.00	55.39	55.00/ 35.40	25.00	—	27.25	33.05
Thyme	<i>Thymus vulgaris</i>	Leaf	8.80	—	13.00	30.42	18.20/ 12.25	26.00	23.00/ 7.00	17.60	18.25

When organic and nonorganic herbs are available, organic prices are shown in bold type.

Table B8. Flowers sold as medicinals

Common Name	Species	Herb Part	YTYH	San Francisco	Mtn Rose	Richters	Frontier	Jean's Greens	Wild Weeds	Blessed Herb	People's Grocery
Blue flag iris	<i>Iris versicolor</i>	Root	54.40	—	44.00	—	—	48.00	—	24.20	—
Blue malva	<i>Malva sylvestris</i>	Flower	24.00	12.90/6.75	15.00	—	—	—	36.00	—	—
Butterfly milkweed	<i>Asclepias tuberosa</i>	Root	46.40	8.50	22.00	25.42	—	25.00	28.00	15.68	—
California poppy	<i>Eschscholzia californica</i>	Herb	—	—	33.00	43.13	—	48.00	—	33.00	—
Calendula	<i>Calendula officinalis</i>	Flower	24.00	4.80	27.00	36.77	18.50	39.00	32.00/8.00	25.89/10.97	23.75
Evening primrose	<i>Oenothera biennis</i>	Herb Seed	—	7.50	—	34.96	—	—	—	—	—
Fumitory	<i>Fumaria officinalis</i>	Herb	24.00	4.80	12.00	—	—	—	—	—	—
Hibiscus	<i>Hibiscus sabdariffa</i>	Flower	20.80	4.75	11.00	—	15.25	21.00	20.00/10.50	15.95	26.25
Hydrangea	<i>Hydrangea arborescens</i>	Root	30.40	—	10.00	23.61	18.35	16.00	—	11.40	—
Jasmine	<i>Jasminum officinale</i>	Flower	30.40	7.90	9.00	—	17.60	—	—	18.15	—
Lavender	<i>Lavandula officinalis (angustifolia)</i>	Flower	32.80	6.95	16.00	44.49	—	20.00	32.00/22.00	22.00/16.35	25.55
Lilly of the valley	<i>Convallaria majalis</i>	Herb	—	—	—	31.33	—	—	—	18.15	—
Orris root	<i>Iris germanica</i>	Root	35.20	6.10	10.00	24.06	21.30	17.00	17.00	—	25.05
Passion flower – American	<i>Passiflora incarnata</i>	Herb	26.40	4.25	14.75	20.43	2-.30	18.00	17.00	11.55	17.35
Peony	<i>Paeonia officinalis</i>	Root	32.80	7.50	—	—	—	—	—	—	—
Rose hips	<i>Rosa canina</i>	Fruit	12.00	2.50	9.00	—	10.55/8.75	14.00	14.00	12.10	6.95
Rose petals	<i>Rosa gallica, R. centifolia</i>	Petals, Buds	—	4.50	9.00-120.00	24.06	11.80	8.00	10.00	18.15	—
Violet	<i>Viola odorata</i>	Leaf	—	—	—	43.13	—	—	—	22.40	—
Violet – blue	<i>Viola tricolor</i>	Leaf	41.60	4.80	22.75	43.13	28.95	27.00	25.00	22.40	—

When organic and nonorganic herbs are available, organic prices are shown in bold type.

Table B9. Medicinal animal feed market

Common Name	Species	Herb Part	San Francisco	Mtn Rose	Richters	Frontier	YTYH	Jean's Greens	Wild Weeds	Blessed Herb	People's Grocery
Fenugreek	<i>Trigonella foenum-graecum</i>	Seed	3.10/1.90	6.00	30.42	11.75/4.30	6.40	15.00	—	11.00	11.05
		Herb	—	—	—	—	—	—	—	—	—
Goat's rue	<i>Galega officinalis</i>	Herb	7.00	—	—	—	32.00	—	—	—	—

When organic and nonorganic herbs are available, organic prices are shown in bold type.

Table B10. Alpine Herbs - probably difficult to grow in Kansas

Common Name	Species	Herb Part	YTYH	San Francisco	Mtn Rose	Richters	Frontier	Jean's Greens	Wild Weeds	Blessed Herb	People's Grocery
Arnica	<i>Arnica montana</i>	Flower	23.20	15.00	112.00	63.56	38.13	2,400.00 ¹	20.00	36.30	—
Eyebright ²	<i>Euphrasia officinalis</i>	Herb	29.60	—	13.00	38.14	29.90/21.45	24.00	19.00	19.80/18.15	24.05
Gentian	<i>Gentiana lutea</i>	Root	29.60	13.50	14.00	17.71	28.50	24.00	—	21.45	—
Osha	<i>Ligusticum porteri</i>	Root	74.40	—	40.00	54.03	—	44.00	44.00	49.50/33.00	—

¹ Arnica flowers at \$50/oz.

² Parasitic annual, attaches to grass roots

When organic and nonorganic herbs are available, organic prices are shown in bold type.

Table B11. Herbs for essential oil and fragrance markets

Common Name	Species	Herb Part	YTYH	San Francisco	Mtn Rose	Richters	Frontier	Jean's Greens	Wild Weeds	Blessed Herb	Peoples Grocery
Calamus (sweetflag)	<i>Acorus calamus</i>	Root	22.40	5.75	12.00	22.25	21.50	17.00	18.50	12.40	—
Chamomile – Roman	<i>Chamaemelum nobile (Anthemis nobilis)</i>	Flowers	—	—	—	95.34	—	—	—	35.20/26.95	—
Clary Sage	<i>Salvia sclarea</i>	—	38.40	—	—	—	—	—	—	—	—
Lavender	<i>Lavandula officinalis (angustifolia)</i>	Flower	32.80	6.95	16.00	44.49	—	20.00	32.00/22.00	22.00/16.35	25.55
Patchouli	<i>Pogostemon cablin</i>	Leaf	44.80	oil only	18.00	38.14	22.50	—	16.00	18.15	—
White sage	<i>Salvia apiana</i>	Herb	32.00	7.85	17.00	—	23.10	20.00	21.00	—	—

When organic and nonorganic herbs are available, organic prices are shown in bold type.

Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

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