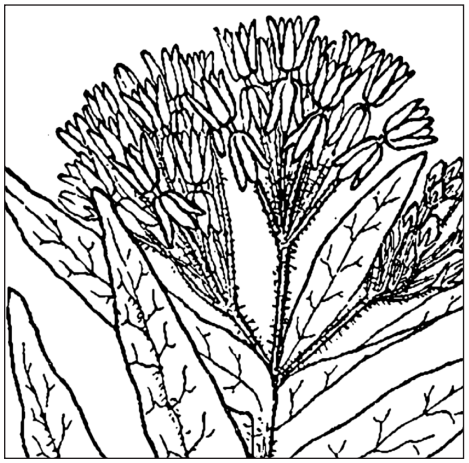
K-STATE Research and Extension: MF-2623

A Grower's Guide

Butterfly Milkweed/Pleurisy Root

Asclepias tuberosa



This is a beautiful plant that stands out on the prairie. It has a bright orange flower and gorgeous fruit pods in the late summer. The common name, pleurisy root, comes from the use of this herb by Native Americans and pioneers to treat lung inflammations, or pleurisy. This milkweed does not have a white, milky sap that is common to other milkweeds.

Family: *Asclepiadaceae*

Life cycle: Herbaceous perennial (Zone 4)

Native: Great Plains; frequently seen in the Flint Hills of Kansas, though the plant is now on the United Plant Savers at-risk list. This plant should not be wild harvested.

Height: 24 inches

Sun: Full sun

Soil: Well-drained soil. Tolerates dry, sandy and rocky soil.

Water: Low to moderate

Flowers: Brightly colored orange flowers bloom in midsummer.

Propagation: Stratify seed for at least one month, then sow indoors. Seedlings appear in two to three weeks with 40 to 50 percent germination. Transplant in mid- to late spring. Sow directly in the field in late winter or early spring. Plant 12 inches apart. Grows in mounding clumps.

Harvesting: Harvest the root in the fall after the plant has gone to seed. Roots may be dug with a garden fork or needle-nose spade.

Parts used: Dried roots. Do not ingest any other part of this plant.

Used as: Tincture, elixir, syrup, some medicinal tea blends

Medicinal benefits: Recommended for respiratory conditions, coughs, as an analgesic and to ease breathing. Also used as a diaphoretic and expectorant.

Market Potential: Low to moderate. Price range $8.50 to $46.40 for retail, bulk dried (cut and sifted) herb.

Summary of field trial data: This plant germinates fairly well in the greenhouse after the seed is stratified. Young plants seem to lack vigor and are easily attacked by common greenhouse pests. Once in the field, the plants seem to need extra attention the first year because they are quite small. By the second year, plants are more vigorous. Insect and disease pressures were not severe, but a large number of aphids weakened small, first-year plants.

This may be a good long-term crop for growers seeking diversification because the roots generally wouldn't be large enough to dig until the second or third year, or later. Prospects for sales are moderate, but the root is found in some commercial cold remedy teas. Ironically, as a native plant to central Kansas and the Great Plains, one would expect good vigor, but this plant rated only slightly above average with an overall average rating of 3.3.

K-State Field Trial Data 2000-2002 *Asclepias tuberosa*					
				Average	Comments
Age of plants in years	1	2	3		
Number of test sites[1]	6	4	4		The six test sites evaluated in year 1 include testing two genotypes at two of our locations.
Survival rate (%)	66.9	47.3	52.0	55.4	We aren't sure how to explain the increase in percent survival from year 2 to year 3, except that some plants apparently re-grew from the roots after being harvested as data plants.
Vigor rating[2]	3.1	3.4	3.5	3.3	
Height (cm)	28.4	49.5	60.5	46.1	
Dry weight herb (g/plant)	6.3	89.1	104.7	—	
Dry weight root (g/plant)	4.3	42.7	61.9	—	
Maturity rating[3]	2.5	5.0	4.0	3.8	Plants were in full flower during harvest in years 2 and 3.
Insect damage rating[4]	0.6	1.0	0.7	0.8	Aphids early, *Tetraopes sp.* or milkweed beetle on year 3 plants, and larvae damage to some roots.
Disease rating[5]	0.2	1.7	1.0	1.0	
Estimated planting density (number of plants/A)	43,560	43,560	43,560	—	Assume 1- by-1 ft. spacing.
Plant density[6]	29,142	20,604	22,651	—	
kg/A dry weight (g/plant x plant number) – roots	125	800	1,402	—	
Estimated marketable yield (dry weight lbs/A) – roots	276	1,938	3,088	—	
Yield x ½ of low price[1]	$1,173	$8,237	$13,125	—	
Yield x ½ of high price[1]	$6,403	$44,962	$71,642	—	

(Note: two biotypes were grown in the field - one adapted to silt or sand soils and one selected by the seed company for sites with more clay. Both types have been averaged in this table, but performed slightly differently at our different sites. For detailed site information, see Appendix C in K-State Research and Extension Publication S-144, *Farming a Few Acres of Herbs: An Herb Growers Handbook*.)

1 See "How Data Were Collected," on page 3.

2 Vigor rating (1=very poor, 3=slightly above average, 5=very good, well adapted)

3 Maturity rating (1=vegetative, 2=early bud, 3=early flower, 4=full flower, 5=seed production, 6=senescence)

4 Insect damage rating (scale of 0 to 5; 0=no damage and 5=severe damage)

5 Disease rating (scale of 0 to 5 with 0=no damage and 5=severe damage)

6 Calculated as starting plant density x survival rate.

How Data Were Collected

The plants described in this fact sheet were grown in K-State test plots in Hays, Colby, Wichita, or Olathe, Kan. Generally, four replications of each species were included at a site. Not all species were screened at each site or each year. The number of locations is noted in the table. Depending on the location and year, either five or 10 plants per plot were established in each of the replications. Details can be found at *www.oznet.ksu.edu/ksherbs*. Plants were grown from seed in the greenhouse and transplanted in the field in May or June.

All plants at each location were used to determine survival percentage, vigor rating, insect damage rating, and disease rating as described above. Three plants per plot were measured for height, and only one plant per plot was harvested to measure yield each year. Cultivating four plots allowed us to estimate yield from four plants at each location per year.

Plants were dried, and top and root weights recorded in grams. Grams per plant were converted to kilograms per acre (kg/A) and pounds per acre (lb/A) to estimate field-scale yield. The population density used to calculate field yields was the optimal population density (determined by the average size of the plants) times the actual percentage 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 fact sheet are for spacing within a row. Distance between rows will depend on the particular farming operation and equipment used. The minimum row spacing will be the same as the plant spacing recommendation. For example, if the recommendation is to set plants 12 inches apart, 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 to estimate gross yield and net income.

Prices were taken from Appendix B of K-State Research and Extension publication S-144 *Farming a Few Acres of Herbs: An Herb Growers Handbook*. To calculate a rough gross income potential for each herb, estimated yield was multiplied by the lowest and the highest retail price, divided by two. This is a rough estimate of wholesale price. Actual prices would be determined based on a contract obtained from a buyer.

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