

A Grower's Guide

Boneset

Eupatorium perfoliatum

This herb is called “Boneset” because its leaves were once used to treat “break-bone (or dengue) fever.” Boneset was a common remedy used by Native Americans and early settlers in the 1800s, and was widely used for flu epidemics in North America and Europe. Though little research has been conducted on this plant recently, compounds in the plant have been shown to stimulate the immune system. A European cousin of this plant, *E. cannabinum*, also appears to stimulate the immune system. However, both also contain potentially liver-harming pyrrolizidine alkaloids, so they should be used with caution.



Family: *Composite/Asteraceae*

Life cycle: Herbaceous perennial (Zone 3)

Native: Can be found wild on wet sites from Nova Scotia to Florida and throughout the eastern half of North America.

Height: 2 to 5 feet

Sun: Full sun to partial shade

Soil: Prefers a rich, moist soil

Water: Natural habitat is on wet sites, and plant prefers regular, deep watering. However, Boneset also appears to withstand Kansas heat and drought fairly well.

Flowers: White to pale purple flowers, in flat clusters, July through October

Propagation: Easily propagated from seeds or cuttings. Take cuttings before the plant has flowered. Seeds will germinate without stratification, but will germinate better with stratification. Seeds need light to germinate. Do not cover. Germination

is typically two to three weeks, with 80 to 90 percent germination. Older plants can be divided and replanted in the spring. Plant on 18 to 24 inch centers, with row spacing of 24 to 30 inches, because each plant will form a clump.

Pests: No major pests

Harvesting: Harvest aboveground portion when flowers are starting in early or mid-summer. Dry quickly, or it will decompose. A second, fall harvest may be possible.

Parts used: Aerial parts

Used as: Tea, tincture, homeopathic remedy

Medicinal benefits: The herb acts as an anti-inflammatory, a diaphoretic and a bitter, in addition to stimulating the immune system.

Market potential: Low to medium. This was a once popular herb for colds and flu. Most is gathered from the wild now, but buyers may prefer to buy from a known, organic source. Warnings of liver

toxicity may limit its popularity or widespread use. Current retail prices range from \$10.36 to \$23.15 per pound (lb) dry weight.

Summary of field trial data: This is an attractive plant that held up well under drought and dryland conditions though it prefers rich, moist soil. On a small scale, this plant could be added to a flower bed border. On a larger scale, because the aboveground portion is harvested, this has potential for mechanized harvest. However, demand is projected to be small, so this probably won't be a cash crop.

The vigor rating was fairly high on this species, averaging 3.7 on a 5-point scale, and insect and disease ratings were fairly low, with the exception of the year three insect rating of 4.5. Note also that the maturity rating that year was a 5.9, on a 6-point scale, where 6.0 is a dead, or senesced plant, so insect feeding on nearly dead plants is not surprising. The yield

in year three is also very low because it was harvested after the plant had peaked. If we had harvested in midsummer, yields would have been similar to year two. The harvest in year three was slightly earlier than in year two (Aug. 26 and Sept. 5 for Wichita and Olathe, respectively, in year three; Sept. 14 and Sept. 21 in year two). The plants flowered and/or declined faster in year three, possibly due to the maturity of the plants or the exceptionally hot, dry conditions in the summer of 2002.

K-State Field Trial Data 2000-2002 <i>Eupatorium perfoliatum</i>					
				Average	Comments
Age of plants in years	1	2	3		
Number of test sites¹	3	2	2		Grown in Wichita and Olathe for three years, and Colby for one year.
Survival rate (%)	88.7	77.5	69.5	78.6	
Vigor rating²	3.1	4.8	3.3	3.7	
Height (cm)	37.3	95.5	94.0	75.6	
Dry weight herb (g/plant)	21.0	310.7	30.8	—	The low third-year yield as compared to the second year is because the plants had begun to senesce before harvest (see maturity index of 5.9 vs. 4.9), even though fall harvest was at about the same time, in early to mid-September.
Dry weight root (g/plant)	12.0	230.9	62.5	—	
Maturity rating³	2.3	4.9	5.9	4.4	
Insect damage rating⁴	1.1	1.2	4.5	2.3	The high insect rating in year 3 was also due to the late stage of growth and feeding by opportunistic insects.
Disease rating⁵	0.4	2.2		1.3	
Estimated planting density (number of plants/A)	10,890	10,890	10,890	—	Assume 2- by 2-ft. spacing.
Plant density⁶	9,659	8,440	7,569	—	
kg/A dry weight (g/plant x plant number) – tops	203	2,622	233	—	
Estimated marketable yield (dry weight lbs/A) – tops	447	5,776	513	—	
Yield x ½ of low price¹	\$2,315	\$29,920	\$2,657	—	
Yield x ½ of high price¹	\$5176	\$66,886	\$5,941	—	

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. Because there were four plots, this 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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