

A Grower's Guide

Beebalm/Monarda

Monarda spp.

Several *Monarda* species are native to North America. They are in the mint family and have a square stem and pleasant fragrance. Historically, all have been used medicinally, but only *M. fistulosa* is currently found in the retail herb trade. This *Monarda* is native to much of North America, from the Great Plains east. It is 2 to 3 feet tall, with pink or lavender flowers. *M. didyma* can have reddish flowers, and many cultivated varieties of this species are found in garden catalogs. It is native to wetter areas of eastern North America. *M. punctata* is a biennial or short-lived perennial found on drier soils in eastern North America. It has yellowish, purple-dotted flowers in tiered whorls. *M. bradburiana*, common name “white horsemint,” has white or rose flowers with prominent purple dots and is found on rocky wooded hills in the Great Plains and Midwestern states. Only two of these species, *M. fistulosa* and *M. didyma*, were compared in K-State field trials.



Common names: Bergamot, horsemint, Oswego tea

Family: *Lamiaceae/Labiatae* (mint family)

Life cycle: Herbaceous perennial (Zone 4)

Native: North America

Height: 2 to 4 feet

Sun: Prefers full sun, but will tolerate partial shade.

Soil: *M. fistulosa* likes dry, well-drained soil. *M. punctata* prefers loose, sandy, dry soil, while *M. didyma* prefers rich soil and fair moisture. Field trials included *M. fistulosa* and *M. didyma*, but not *M. punctata*, although it is also grown as a medicinal herb.

Water: *M. fistulosa* appears to handle drought well, but *M. didyma* does not.

Flowers: Red, lavender, pinkish-lavender, yellow, or pink- and purple-spotted flowers bloom early to late summer in most

regions depending on species and biotype.

Propagation: Can grow from seeds, cuttings or root divisions. *Monarda* seed does not require any cold treatment, but germination will improve with several weeks of cold stratification. Cover seeds two times their thickness. Germinates in two to three weeks at a rate of 60 to 70 percent.

Pests: Significant pest pressure was not identified in the field, but *M. didyma* declined rapidly under field conditions. Some of this may have been due to disease, but also because this species is not well adapted to the hot, dry conditions of this part of the Great Plains.

Disease: Powdery mildew is common in late summer.

Harvesting: Harvest aerial parts at any time during the growing season. Can be harvested two to three times per year.

Parts used: Aboveground aerial parts, fresh or dried.

Used as: A culinary substitute for Greek oregano. Leaves smell similar to *Citrus bergamia*, which gives Earl Grey tea its distinctive taste.

Medicinal benefits: The Herbal PDR lists *M. punctata* and *M. didyma*, but not *M. fistulosa*, which is the *Monarda* species most used by the Native Americans and probably the best one to grow in the Great Plains. *M. punctata* contains volatile oils and has carminative, stimulant and emmenagogic effects. Folk uses are for digestive disorders, flatulence and to regulate menstruation. *M. didyma* also contains volatile oils, flavonoids and anthocyanins, and is used for the same things as *M. punctata*. It is also used for premenstrual syndrome. The essential oil may also be used to treat chronic bronchitis. The Lakotas drank a tea from the flower clusters of *M. fistulosa* as a remedy for fevers and colds. Tea leaves were also used for whooping cough and were considered good for people who had fainted. Boiled leaves, wrapped in a soft

cloth and placed on sore eyes overnight, were used to relieve pain.

Market potential: Low to moderate, but increasing. Retail price for *M. fistulosa* tops ranges from \$9.79 to \$23.61 per pound (lb) dry weight.

Summary of field trial data: Two species were tested in field trials. “Wild” bergamot, *M. fistulosa*, did well at both test sites. Over three years the number of plants increased as clumps spread. Weight per plant also increased. Insect and disease ratings were low, and vigor ratings, especially after the first year, were above average – 4.2 and 4.5 for the second and third years respectively.

This crop appears to be well adapted to the Great Plains. The yield estimate of 3,000 lbs/A dry weight may be a little high because it assumes cutting off the plant at ground level, and a marketable crop may be limited to more leaves and fewer stems. However, this is a crop that appears to have potential, as long as a market is obtained. *M. fistulosa* was only listed by two companies. Bergamot does not seem to be a widely used herb.

On the other hand, *M. didyma*, which is native to eastern North America and often cultivated in flower gardens, did not appear to be well adapted to field conditions. Vigor ratings were 2.5 and 1.3 in

years one and two, and the plants had died by the end of year three. This species was only tested at the Wichita site, which has sandy soil and some irrigation. Another problem with *M. didyma* is that although local herbalists recommend it over *M. fistulosa* for certain uses, no market price was listed in retail sources.

M. bradburiana and *M. punctata* were not tested in K-State field trials and would probably be considered wildflowers, so seed would need to be obtained from the wild or wildflower catalogs. These two species were not found in retail herb price lists.

K-State Field Trial Data 2000-2002 *Monarda fistulosa*

				Average	Comments
Age of plants in years	1	2	3		
Number of test sites¹	3	2	2		Tested in Wichita and Olathe for three years, and tested in Colby for one year.
Survival rate (%)	77.7	66.5	89.0	77.7	Clumps were spreading by year three, so individual plants were probably overcounted in survival estimates.
Vigor rating²	3.1	4.2	4.5	3.9	Above-average ratings in years two and three.
Height (cm)	41.7	102.5	110.5	84.9	
Dry weight herb (g/plant)	36.4	56.2	70.3	—	Yield per plant continues to go up. Plant numbers also go up as clumps increase in size.
Dry weight root (g/plant)	10.9	22.8	37.9	—	
Maturity rating³	2.3	5.0	5.3	4.2	Plants were past full flower when harvested in the fall. Optimal biomass and quality in June or July.
Insect damage rating⁴	0.3	1.2	0.4	0.6	
Disease rating⁵	0.1	2.2	0.4	0.9	
Estimated planting density (number of plants/A)	21,780	21,780	21,780	—	1- by 2-ft. plant spacing assumed.
Plant density⁶	16,923	14,484	19,384	—	
kg/A dry weight (g/plant x plant number) – tops	616	814	1,363	—	
Estimated marketable yield (dry weight lbs/A) – tops	1,357	1,793	3,002	—	
Yield x ½ of low price¹	\$6,649	\$8,786	\$14,710	—	
Yield x ½ of high price¹	\$16,026	\$21,175	\$35,454	—	

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.

K-State Field Trial Data 2000-2002 *Monarda didyma* (var. Panorama Red Shades)

				Average	Comments
Age of plants in years	1	2	3		
Number of test sites¹	1	1	1		Only planted in Wichita, in same experiment with <i>M. fistulosa</i> for three years.
Survival rate (%)	53.0	13.0	6.0	24.0	Stand declined each year.
Vigor rating²	2.5	1.3	—	1.9	Rated below average.
Height (cm)	20.0	48.0	—	34.0	
Dry weight herb (g/plant)	1.9	3.4	—	—	Very small plants.
Dry weight root (g/plant)	1.9	34.6	—	—	
Maturity rating³	1.2	5.0	6.0	4.1	The few plants that were left in year three had already senesced, so insects or disease were not rated that year.
Insect damage rating⁴	0.5	1.4	—	1.0	
Disease rating⁵	0.4	1.3	—	0.9	

Note: Due to low yield and lack of markets, no field-scale yield or gross return (\$) was calculated for this herb.

¹ See "How Data Were Collected" below.

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)

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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