K-STATE Research and Extension: MF-2613

A Grower's Guide

Dandelion

Taraxacum officinale

Dandelion is a relatively recent addition to the medicinal repertoire, and wasn't mentioned in Chinese herbals until the 7th century or in Europe until 1486. The name dandelion was apparently invented by a 15th-century surgeon, who compared the shape of the leaves to a lion's tooth, or *dens leonis*. Dandelion is considered weed in most yards and gardens, but they are nutritious, rich in minerals and vitamins, and have medicinal qualities. The Colorado cities of Aspen and Carbondale have declared it illegal to spray herbicides to eradicate dandelions. They suggest that people eat the plants instead.

Family: *Asteraceae*

Life cycle: Herbaceous perennial (Zone 3)

Native: Europe and Asia, but it is now one of the few plants that can truly claim pan-global dissemination.

Height: 8 to 24 inches

Sun: Full sun to partial shade

Soil: Any soil. Responds to fertility.

Water: Low to moderate. Will respond to increased water and lack of competition from other plants.

Flowers: Bright yellow flowers bloom continuously throughout the season, but primarily in the early spring and fall. Flowers attract bees. Likes cool temperatures.

Propagation: Easy to grow from seed. No treatment needed, but stratification of one week will raise the germination rate to 90 percent. Sow directly in the field or start seed indoors and then transplant in mid- to late spring. Seed needs light to germinate. Do not cover. Space 10 to 12 inches apart. Reseeding will be vigorous. Seed maintains viability for one year or less.

Pests: No major insect or disease pests observed in the field, but human intervention is always a possibility. Numerous herbicides have been developed to take dandelions out of lawns, and even helpful neighbors may think you have a weed growing in your garden and kill it.

Harvesting: Harvest leaves any time and roots in the fall or early spring. One source recommends leaf harvest in the spring of the second year and roots in the fall of the second year. Dig with a needle nose spade or other mechanical digging device. In the home garden, harvest leaves by hand at any time for fresh salads or tea. Some people develop skin sensitivity to the white, milky sap. One of the folk uses of dandelion sap was as a treatment for warts.

Parts used: Whole plant fresh or dried. Leaves and roots also used separately. Dandelion wine is made from the fresh blossoms, with the green calyx removed. The medicinal herb market focus is on the leaf and root of the plant, and there does not appear to be any medical literature about the flowers or wine.

Used as: Infusion, decoction, elixir, extract, infused oil, honey, tincture, medicinal food

Medicinal benefits: Whole body tonic. Benefits the liver, urinary tract and skin. Approved for use in Europe for indigestion, urinary tract infections, liver and gallbladder complaints, and loss of appetite. Folk uses include for disturbance in bile flow, inflammatory conditions of the urinary tract, gout, rheumatic disorders, eczema and other skin disorders. The high potassium, vitamin A and vitamin C content of the leaves makes this a valuable food.

Market potential: High. Prices range from $4.10 to $21.60 for leaf, and $4.10 to $30.85 for root, per pound (lb) dry weight. However, local markets can also be tapped, and greens have sold for $5/lb fresh weight in eastern Kansas, and the greens came from California.

Summary of field trial data: Though up to 3,000 lbs/A dry weight have been reported, our values were far below that, at 400 to 600 lbs/A of leaves, and around 700 lbs/A of roots. A yield of 3,000 lbs/A should be possible because at a planting density of 29,000 plants/A, plants would only need to weigh 47 g. This species was tested at five sites for one year, and is in its second year of testing at two sites. There was a lot of site-to-site variability in the plant, mainly due to access to moisture; for example drip-irrigated plants at Colby yielded 35 g per plant in year one as compared to 5 g per plant at Olathe, a dryland site. We also observed rabbit feeding at some locations, and were not able to quantify losses due to rabbits. Our fairly low survival rate is probably not accurate, as many times our enthusiastic volunteer help did not realize that the dandelion was a crop in this experiment, and not a weed.

It may seem odd to purposely plant dandelions when they are in the lawn already. Dandelions that are properly spaced, weeded, watered and fertilized can get as big as a dinner plate. This cuts down on harvesting costs, which are a big input in the medicinal herb business. It would take about 100 or more dandelions from a typical lawn to weigh as much as one of the dandelions from our best field plots. These plants will produce seed, but it is only viable for one year. Harvest the blossoms before seeding and make dandelion wine. Share with the neighbors to ease concerns about a dandelion crop in the neighborhood.

K-State Field Trial Data 2000-2002 *Taraxacum officinale*					
				Average	**Comments**
Age of plants in years	1	2	3		
Number of test sites[1]	5	2	0		
Survival rate (%)	65.0	38.5	—	51.8	
Vigor rating[2]	3.7	3.6	—	3.7	
Height (cm)	22.2	20.5	—	21.4	
Dry weight herb (g/plant)	15.1	18.7	—	—	Range of 5 to 35 g/plant in year 1, and 9 to 28 g/plant in year 2.
Dry weight root (g/plant)	17.9	31.5	—	—	Range of 11 to 23g/plant in year 1, and 16 to 46 g/plant in year 2.
Maturity rating[3]	1.8	1.0	—	1.4	
Insect damage rating[4]	0.3	1.5	—	0.9	
Disease rating[5]	0.6	0.3	—	0.4	
Estimated planting density (number of plants/A)	29,040	29,040	—	—	Assume 1- by 1.5-ft. spacing.
Plant density[6]	18,876	11,180	—	—	
kg/acre dry weight (g/plant x plant number) – tops	285	209	—	—	
Estimated marketable yield (dry weight lbs/A) – tops	628	461	—	—	
Yield x ½ of low price[1] - tops	$1,287	$945	—	—	
Yield x ½ of high price[1] - tops	$6,782	$4,979	—	—	
kg/acre dry weight (g/plant x plant number) – roots	338	352	—	—	
Estimated marketable yield (dry weight lbs/A) – roots	744	776	—	—	
Yield x ½ of low price[1] - roots	$1,525	$1,591	—	—	
Yield x ½ of high price[1] - roots	$11,480	$11,974	—	—	

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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