

# Basil

## An Herb Society of America Guide



**The Herb Society of America**  
9019 Kirtland Chardon Rd.  
Kirtland, Ohio 44094

©2003 The Herb Society of America

## Table of Contents

---

Introduction .....	3
Contributors & Acknowledgements.....	3
Description .....	6
Chemistry .....	6
Nutrition .....	7
History & Folklore .....	7
Literature & Art .....	9
Cultivation .....	10
- Indoor .....	10
- Outdoor .....	12
Pests & Diseases .....	15
Pruning & Harvesting .....	16
Preserving & Storing .....	18
Uses .....	19
- Culinary .....	19
- Recipes .....	20
- Craft .....	29
- Economic .....	29
- Medicinal & Ethnobotanical .....	29
- Garden .....	30
Species Highlights .....	30
Basil Cultivar Examples .....	32
Literature Citations & References .....	37
HSA Library Resources .....	41

## Introduction

---

### **Mission:**

The Herb Society of America is dedicated to promoting the knowledge, use and delight of herbs through educational programs, research, and sharing the experience of its members with the community.

### **Environmental Statement:**

The Society is committed to protecting our global environment for the health and well-being of humankind and all growing things. We encourage gardeners to practice environmentally sound horticulture.

### **Purpose, Scope and Intended Audience:**

This guide was designed to provide an overview of the uses, cultivation, history, folklore and types of basil. It was written to accommodate a variety of audiences, providing basic information appropriate for beginners to herbs and herb gardening with supplemental information for intermediate level herb enthusiasts. It can be used in conjunction with HSA's *Herb Study Groups Resource Kit* or as a starting point for those interested in pursuing individual research or developing an herbal presentation/program.

**Disclaimer:** Information is provided as an educational service. Mention of commercial products does not indicate an endorsement by The Herb Society of America. The Herb Society of America can not advise, recommend, or prescribe herbs for medicinal use. Please consult a health care provider before pursuing any herbal treatments.

## Contributors & Acknowledgements

---

Text by: Michele Meyers, HSA Director of Education, except where otherwise noted  
© 2003 The Herb Society of America

Horticultural Advisor: Robin Siktberg, HSA Editor/Horticulturist

### **Contributors**

The Herb Society of America would like to thank the following contributors, without whose expertise and input this guide would not have been possible:

#### **James Adams**

Jim Adams has been gardening and growing herbs since childhood. He earned his horticulture degree from Michigan State University. He completed numerous internships at some of the country's premier horticultural institutions before becoming the Assistant Curator of the Fern Valley Native Plant Collection at the U.S. National Arboretum. In 1997, he changed posts and became Curator of the National Herb Garden, also at the arboretum. Jim is a member the Potomac Unit of The Herb Society of America as well as various other horticulture-related organizations. He lives in Washington, D.C.

#### **Gwen Barclay**

Gwen is Director of Food Services at The International Festival Institute at Round Top, Texas. A member of the both the Pioneer Unit and the South Texas Unit of HSA, she is a nationally recognized ex-

pert on herbs and herbal cuisine. Gwen and her mother, Madalene Hill, are co-authors of *Southern Herb Growing*.

**Susan Belsinger**

Susan Belsinger is a culinary educator, food writer and photographer whose articles have been published in *Woman's Day*, *Organic Gardening*, *Victoria Magazine* and *The Herb Companion*. She is the author of *Flowers in the Kitchen*, co-author, with Carolyn Dille, of *The Garlic Cookbook*, *Herbs in the Kitchen*, and *The Greens Book*, and co-author of *Basil: An Herb Lovers Guide* with Thomas DeBaggio. Susan is a member of the Potomac Unit of The Herb Society of America.

**Joan DeLauro**

Joan is HSA's Garden Consultant and is responsible for the design and maintenance of the demonstration garden at HSA Headquarters. She previously served as Urban Gardening Coordinator at Cleveland Botanical Garden and currently runs her own freelance gardening business. She lives in Cleveland, Ohio, and is a member at large of The Herb Society of America.

**Madalene Hill**

Madalene was president of The Herb Society of America from 1986-1988 and has been a member for 46 years. She organized the South Texas Unit and was a charter member of the Pioneer Unit. Madalene was awarded HSA's Helen de Conway Little Medal of Honor in 1978. She is an accomplished plantswoman, and her garden at The International Festival Institute at Round Top, Texas, attracts visitors from all over the world.

**Mark Langan**

Mark has a degree in Ornamental Horticulture from Washington State University and has been working in the horticulture field since he was a teenager. He and his wife, Karen, run Mulberry Creek Herb Farm, an organic herb nursery in Huron, Ohio; lecture, and offer workshops on herbs and gardening. Mark is a member at large of The Herb Society of America.

**Arthur O. Tucker, Ph.D.**

Dr. Tucker is a research professor at Delaware State University specializing in the chemistry and identification of herbs. He is a member of the Rosemary Circle and the Northern New Jersey Unit of HSA and has received HSA's Nancy Putnam Howard Award for Excellence in Horticulture and the Helen de Conway Little Medal of Honor. Art has a B.S. from Kutztown State College and M.S. and doctoral degrees from Rutgers University. He is a nationally recognized expert on flavor, fragrance and medicinal plants and has been published many times in scholarly and popular publications. Dr. Tucker is co-author of *The Big Book of Herbs* with Thomas DeBaggio.

**Tina Marie Wilcox**

Tina Marie Wilcox has been the head gardener and herbalist at the Ozark Folk Center's Heritage Herb Garden in Mountain View, Arkansas, since 1984. She tends the extensive gardens, plans and coordinates annual herbal events and workshops and facilitates the production of the plants sold there. Tina is an HSA member at large.

### ***Acknowledgements***

Concept and content format developed and reviewed by members of the HSA Educational Program Development Subcommittee:

Gretchen Faro, HSA Executive Director  
Arlene Kestner, Ph.D., HSA President 2002-2004  
Linda Lain, HSA Communications Committee Chair 2002-2005  
Michele Meyers, HSA Director of Education  
Carrie Stubbs-Vetrovsky, former HSA Director of Education  
Lois Sutton, Ph.D., HSA Education Committee Chair 2003-2006  
Janet Walker, HSA Botany & Horticulture Chair 2002-2005

Additional editorial assistance was provided by Robin Siktberg, HSA Editor/Horticulturist. Research assistance was provided by Christine Liebson, HSA Librarian/Webmaster and Theodora Drozdowski.

HSA would like to thank Interweave Press for permission to reprint Susan Belsinger's pesto recipe from *Basil: An Herb Lovers Guide* by Thomas DeBaggio and Susan Belsinger.

The cultivars section of this guide and selected recipes were excerpted/adapted from the 2003 *Herbarist* article by Madalene Hill and Gwen Barclay, "Basils for the Gardener's Kitchen: Herb of the Year, 2003." *The Herbarist*. 69 (2003): 4-11.

### *Photo credits*

Thank you to Susan Belsinger, Madalene Hill and Gwen Barclay for providing the images included in this guide.

Cover photos by Gwen Barclay, clockwise from top, *Ocimum basilicum* 'Well Sweep Miniature Purple,' *O. gratissimum*, *O. xcitriodorum* 'Lesbos.'

## Description

---

Basil belongs to the genus *Ocimum* and is a member of the mint family (Lamiaceae). The genus includes over sixty species of annuals, non-woody perennials and shrubs native to Africa and other tropical and subtropical regions of the Old and New World. There is some disagreement in the literature as to the exact number of species in the genus. This is due to the fact that the genus is still being studied by researchers and to basil's "promiscuous" nature (78, 79). Basils cross easily, and recent studies have led to a reclassification of portions of the genus (65, 66, 78). The final word on species is still not in! To complicate matters, there are other plants outside the *Ocimum* genus with the common name of basil, including basil thyme (*Acinos arvensis*) and wild basil (*Clinopodium vulgare*) (75). These plants are not traditional basils and will not be discussed at length in this guide.

Physically, basils are characterized by square, branching stems, opposite leaves, brown or black seeds (also called nutlets) and flower spikes, but flower color and the size, shape, and texture of the leaves vary by species. Leaf textures range from smooth and shiny to curled and hairy, and flowers are white to lavender/purple. Leaf color can also vary, from green to blue/purple, and plants can grow to from 1 to 10 feet in height, depending on the species.

Most people are familiar with sweet basil, *Ocimum basilicum*, the common culinary basil, but the world of basils offers a wide array of plants with a great diversity of flavors, scents, and uses. There are many species and cultivars of basil. Some of the more popular basils include sweet, specialty fragrant (cinnamon, lemon and Thai/anise), purple-leaved, bush, and miniature or dwarf. See the Uses, Species and Cultivars sections of this document for additional information on the distinguishing characteristics of the different types.

## Chemistry

---

Have you ever wondered what gives basils their unique aromas? The distinctive scents and flavors of the many basil species and cultivars are due to the composition of essential oils found in the leaves and other parts of the plant. Most basils contain methyl chavicol, eugenol and linalool. The amount of each of these chemical constituents varies depending on the species or variety. Methyl chavicol provides a sweet flavor that has been compared to anise and French tarragon, linalool produces a floral scent, and eugenol is reminiscent of cloves (14, 21, 24, 79).

Sweet basils tend to have a higher percentage of methyl chavicol while spicy basils get their "spice" from large amounts of eugenol (79). Other scents come from thymol (thyme), trans-methyl cinnamate (cinnamon), camphor, citral (lemon), and geranial (rose) (14, 21, 24, 79).

## Nutrition

---

Sweet basil is low in calories, has almost no fat, and is a good source of vitamin A. Five fresh basil leaves (2.5 grams) has less than 1 calorie, 96.6 IU of vitamin A, 3.85 mg of calcium, 11.55 mg of potassium plus smaller amounts of vitamin C and other vitamins, minerals, protein and fiber (80). Basil seeds, in particular, are high in dietary fiber (57). Basil also includes flavonoids (67) and antioxidants (57, 72).

Sweet basil (*O. basilicum*) is on the USDA's GRAS (Generally Recognized as Safe) list at 2-680 ppm (parts-per-million) for the leaf and .01-50 ppm for the oil (79), but some suggest that it may be hazardous in excessively large doses due to possible carcinogens (29, 67). Note that the amount of essential oil that is considered GRAS is very small, and basil essential oil should not be taken internally (29, 67).

## History & Folklore

---

Basil has a long and interesting history steeped in legend. Probably originating in Asia and Africa (73), it is thought to have been brought to ancient Greece by Alexander the Great (356-323 B.C.E.), to have made its way to England from India in the mid 1500s and arrived in the U.S in the early 1600s (21). It was grown in medieval gardens (18, 40) and is mentioned in many classic herbals, including those of Culpeper, Gerard, Parkinson and Dioscorides (19, 33, 64).

Basil's folklore is as complex as its flavor and aromas. In terms of its legend and symbolism, basil has been both loved and feared. Its associations include such polar opposites as love and hate, danger and protection, and life and death.

The generic name, *Ocimum*, derives from the ancient Greek word, *okimon*, meaning smell (21, 24, 79), which suggests the impressive nature of basil's fragrance. The specific epithet, *basilicum*, is Latin for *basilikon*, which means kingly/royal in Greek (21, 24, 79). Henry Beston, in *Herbs of the Earth*, suggests that basil was so named for the regal "Tyrian" purple color [of its flowers] (11). According to Parkinson, basil's scent was "fit for a king's house" (35). Many authors suggest that basil's negative associations stem from the similarity of its Latin specific epithet, *basilicum*, to the name of the basilisk (or basilicus), the mythical serpent with the lethal gaze.

According to Helen Noyes Webster's 1936 *Herbarist* article, the first mention of basil was by Chrysippus (pre-206 B.C.E.): "*Ocimum* exists only to drive men insane" (78, 82). In his seventeenth-century herbal, Parkinson claimed basil could be used "to procure a cheereful and merry heart" (66). Gerard praised basil as a remedy for melancholy but also repeated Dioscorides' warning that too much basil "dulleth the sight...and is of a hard digestion" (33). Culpeper and Gerard claimed basil would cure scorpion and bee stings, and Gerard mentioned that basil could spontaneously generate worms if chewed and left in the sun (19, 33). Basil was also reputed to cause the spontaneous generation of scorpions and to cause scorpions to grow in the brain (19, 35). This connection with scorpions persists to this day in basil's association with the astrological sign, Scorpio (69). Culpeper sums up the disagreement among ancient writers by deeming basil "the Herb which all Authors are together by the Ears about, and rail at one another like Lawyers" (19).

### **Religious Legends**

Basil is a part of religious traditions around the world, from Christianity to Hindu. Although there is no mention of basil in the *Bible* (21), the plant is said to have grown at the site of Christ's crucifixion (21, 24) and is associated with St. Basil, whose feast day is celebrated in Greece on January 1 by having basil blessed at church (21, 45).

Holy basil, *Ocimum tenuiflorum*, is particularly sacred in Hindu tradition. It is thought to be the manifestation of the goddess, Tulasi, and to have grown from her ashes. There are several versions of the legend, but according to a widely known one, Tulasi was tricked into betraying her husband when she was seduced by the god Vishnu in the guise of her husband. In her torment, Tulasi killed herself, and Vishnu declared that she would be "worshipped by women for her faithfulness" and would keep women from becoming widows (37). Thus, holy basil, which also goes by the common name tulsi, an obvious reference to the goddess, became a Hindu symbol of love, eternal life, purification and protection (21, 30, 37). In addition to basil's role in the death of Tulasi in the Hindu legend, basil has played a role in burial rituals and has been grown on graves in various countries (21, 35).

### **Love and Courtship**

Basil's love symbolism isn't limited to India. It has been considered an aphrodisiac by some, is associated with the pagan love goddess, Erzuli (20, 56 in 75), and is used in love spells (20). In Italy, where sweet basil is called "kiss me Nicholas," "bacia-nicola," it is thought to attract husbands to wives (21), and a pot of basil on a windowsill is meant to signal a lover (75). In Moldavian folklore, if a man accepts a sprig of basil from a woman, he will fall in love with her (21). As is typical for its folklore, while being linked to love and attraction, basil has also conversely been associated with chastity. In Sicilian folklore, basil is associated with both love and death when basil sprouts from the head of [L]isabetta of Messina's slain lover (21).

### **Protection and Luck**

Basil is considered a good luck charm in some folklore. It is reportedly used in exorcisms, for protection and to attract wealth (20, 26, 75).

### **Language of Flowers**

Basil's symbolism in the Victorian language of flowers also reflects its dual nature. It signifies both hatred (for common basil) and best wishes (for sweet basil) (34).

See the Literature & Art section of this guide for additional information on symbolism.

## Literature & Art

References to basil can be found in poetry, prose and art from the Middle Ages to the present. Although basil is not mentioned in any of Shakespeare's works, it was included in *Polyolbion* by Michael Drayton, an Elizabethan poet and one of Shakespeare's contemporaries: "With Basil then I will begin/ Whose scent is wondrous pleasing" (35, 36).

Basil appears in a wide variety of poetry, including Percy Bysshe Shelley's *To Emilia Viviani* (68), and the work of John Keats (50). It is the subject of twentieth-century American poet Edna St. Vincent Millay's *Steepletop: I* (59), and *Sweet Basil* by little-known, contemporary American poet, Sally Allen McNall (58). Searching Poem Finder, an online database available through many public and university libraries, will turn up numerous references to the herb.

Basil's most famous literary role is probably in *The Decameron*, by Italian author Giovanni Boccaccio (1313-1375), which tells the tragic tale of Lisabetta (Isabella), whose lover Lorenzo is murdered by her brothers (13). When Lisabetta learns from a dream that Lorenzo has been killed, she finds his body, removes the head and places it in a pot where she grows a basil plant. The story was retold by John Keats in his poem, *Isabella, or The Pot of Basil*:

From verse 52:

...She'd wrapp'd it up; and for its tomb did choose  
A garden-pot, wherein she laid it by,  
And cover'd it with mould, and o'er it set  
Sweet Basil, which her tears kept ever wet.

The basil grows vigorously, nourished by Isabella's tears and the gruesome organic fertilizer. Not realizing that it contains the head of Lorenzo, her brothers steal the pot in an effort to remedy her despair. By the end of the poem, the basil comes to represent Lorenzo to Isabella. When it is taken from her, she dies of grief.

Verse 63:

And so she pined, and so she died forlorn,  
Imploring for her Basil to the last.  
No heart was there in Florence but did mourn  
In pity of her love, so overcast.  
And a sad ditty of this story born  
From mouth to mouth through all the country pass'd:  
Still is the burthen sung-'O cruelty,  
To steal my Basil-pot away from me! (50)

Boccaccio's tale has been depicted by the artists, William Holman Hunt and John White Alexander (36, 74). In addition to images of *The Decameron*, basil played a similarly tragic role in Greek paintings where basil at the side of a woman in rags was a symbol for poverty (17, 35, 36).

On a lighter note, basil can also be found in popular fiction and is included in the mystery novels of Ellis Peters as part of Brother Cadfael's medieval, monastic herb garden (76).

## Cultivation

Whether started indoors or sown in the garden, growing basil can be a rewarding experience for gardeners of all levels of experience. This section of the guide will discuss recommendations for both indoor and outdoor growing, with the help of some of HSA's expert members.

As a tropical plant, basil requires plenty of heat and light. Most basil varieties are hardy only in very warm climates where there is no chance of frost (79), but they can be grown outdoors during the warmer months in northern climates. Typically, basil varieties are hardy in zone 10 or higher (14, 47), but keep in mind that this zone number is a guideline rather than a rule. Even though some species are annuals and some are tender perennials, many are grown as annuals in the north. Likewise, some annual basil varieties can be grown as short-lived perennials.

### **Propagation**

Basil can be grown from seed or cuttings. 'African Blue' and non-seeding varieties like the cultivar 'Lesbos' (syn. 'Greek Columnar,' 'Aussie Sweetie') can only be grown from cuttings (1, 24). According to James Adams, Curator of the National Herb Garden, growing basil from cuttings is relatively easy and is important if you want to prevent crossing. This is particularly helpful for preserving the integrity of unusual varieties (1). To grow basil from cuttings, cut a 4-inch portion of the stem before it flowers, remove the leaves from the lower section of the stem and place the stem in a small cup of water. Place on a windowsill and change the water daily until roots form. After roots have emerged, basil can be moved to a small pot (24).

Another thing to keep in mind about seeds is labeling. Basil seed packets are notorious for being mislabeled (21, 24). Keep an open mind and a watchful eye and realize that you may not always get what you were planning on. One way to increase the likelihood of accuracy is to get seeds from reputable sources or from friends who have saved seed (21).

### **INDOOR**

Disclaimer: The Herb Society of America would like to encourage gardeners to cultivate plants appropriate to their region and season. We realize, however, that opinions on the appropriateness of indoor growing vary, and indoor cultivation is the only way that some herb enthusiasts will be able to enjoy truly fresh basil.

### **Starting Seed Indoors**

Growing basil indoors is challenging but not impossible. Even if you are planning on transplanting to your outdoor garden, you may want to get a head start and compensate for unruly spring weather by starting seeds indoors. Generally, seeds should be started about 4-6 weeks before the last frost. According to James Adams, a common mistake made by gardeners is starting plants too early. Plants get leggy and must recuperate; it is better to start later so plants are smaller before being moved outside (1).

Most basil varieties take 8-14 days to germinate (72, 79). To start seeds, use plug trays, flats or small cells. Author, lecturer and HSA member, Susan Belsinger, prefers using cells and planting two seeds per cell,

because the slightly larger cell means one less repotting step. Seed can be planted extremely shallowly or even simply placed on top of the soil and wetted (8, 84). Madalene Hill and Gwen Barclay like to add seeds to soil that has been pre-moistened to prevent seeds from being “washed around” (45). Seeds should remain wet in order for germination to take place (8, 84). After sowing seeds, cover your cells with plastic and keep in a warm, dark place. (24, 38, 62, 84). In warmer climates, newspaper can be used to cover seeds. If you are using plastic, make sure cells are only loosely covered (45). See the Containers section for information on what type of pots will support your basil as it grows.

### Soil

The best growing medium for starting basil actually isn't soil at all, but a soilless mix. Mark Langan of Mulberry Creek Herb Farm in Ohio, likes a peat and aged bark based potting soil since aged bark aids drainage and helps prevent root rot (51). Madalene Hill and Gwen Barclay, authors and herbal experts, recommend a good sphagnum, perlite and wood chip mix and warn against “cheap” “garden center” brands. The mix should be pasteurized to ensure that it is free of pests and diseases (44).

Pasteurized compost can also be added to enrich soil (8, 84). Tina Marie Wilcox of the Ozark Folk Center in Arkansas recommends pasteurizing homemade compost by steaming it in a garbage can with holes in the bottom for drainage. Pour compost into a garbage can through ½-inch hardware squares to remove large chunks. Add boiling water, mix with a fork or shovel and cover with the lid to steam. Tina repeats this process two more times to complete pasteurization, then allows the soil to cool for about an hour. This method serves the double purpose of pasteurizing and warming the soil. Basil does best in warm soil. If you are growing indoors, Tina suggests using an electric rubber heat mat to maintain a soil temperature of 70-72°F (84).

### Light

When growing basil indoors, whether starting seeds for transplant or maintaining an indoor basil collection, your chances of success will increase if you can simulate the sun with grow lights. Cool white or warm white fluorescent tubes on a timer work best (24). There are different theories about the best use of lights. Susan Belsinger recommends 16 hours on and 8 hours off in the winter noting that placing mylar or aluminum foil over the light source can increase light reflection (8). Mark Langan suggests 12-16 hours on (51). There are even some commercial growers who use 24-hour lights for high yields (79). If you have a greenhouse, like Madalene Hill, Gwen Barclay and James Adams, you won't need lights. If you do use fluorescent lights, they should be placed about 2-3 inches above seedlings (24, 84). Keep in mind that lights should only be used after germination.

### Containers

We have already talked about containers for starting seeds, but after your seedling has emerged, it will need to be moved to a successively larger series of pots. Basil is often considered a “pot herb” (21), but this refers to its use in kitchen gardens and cooking rather than its suitability for growing in pots (3, 79). Nevertheless, basil can indeed be grown in pots. Clay and plastic are the most common options, and each has advantages and disadvantages. Clay pots are attractive but are also heavy, breakable and promote water loss. Plastic pots are preferred by many gardeners since they retain moisture and heat and are lightweight. Dark colored containers can be helpful to protect roots from light (24). Whatever type of container you choose, be sure it has plenty of drainage holes.

After leaves appear in 2-3 weeks, basil should be moved from cells to a larger pot (24) and then repotted in successively larger pots every few weeks as the plant grows (79). Be careful not to move your basil to a pot that is too large or it can suffer from fungal diseases like root rot (1, 24). Many sources recommend initial pot sizes of 2-3 inches, then moving the plant to a 4-6-inch pot a few weeks later. If necessary, basil can then be moved to even larger pots or transplanted into the garden. James Adams suggests that the schedule for potting up depends on the amount of light the plant gets and its rate of growth and that a good guideline is to increase pot size when roots fill the container but before the plant becomes root bound (1).

### **Water**

Basil requires lots of water but must also have proper drainage. As general guideline, water when the soil begins to lighten (24) or become flaky (25). Don't wait until your basil is wilting.

Watering needs will vary depending on your region and the developmental stage of the plant (45). If you are nurturing young seedlings in a Southern greenhouse, you may need to water as often as two to three times a day (45). Otherwise, watering every couple days can suffice (8). Keep in mind that if you use clay pots, basil may need to be watered more frequently.

### **Fertilizer**

When it comes to fertilizer, basil requires nitrogen, potassium and phosphate. Many sources recommend fish emulsion, an organic fertilizer (24, 62, 84). Susan Belsinger suggests kelp, added every 7-10 days, or every 3 weeks if plants are still in flats (8). James Adams uses a half strength 10-10-10 solution twice as often as package directions suggest and points out that a solution with high nitrogen is good for promoting leaf growth (1). Mark Langan also likes high nitrogen fertilizers, especially dry mixes that can be added to potting mix (51). He prefers organic fertilizers and locally made composted manure-based fertilizers. Madalene Hill and Gwen Barclay like to fertilize weekly using a half strength 14-14-14 liquid fertilizer "once seedlings have two sets of true leaves" (45). They prefer a balanced fertilizer and believe that although high nitrogen fertilizer produces larger leaves, it can compromise the flavor (45).

## **OUTDOOR**

### **Starting from seed**

To sow basil seed in the garden, Thomas DeBaggio and Susan Belsinger recommend sowing seed "close together" but not touching at about 1/8 inch depth. This spacing may seem very close, but plants will need to be thinned later to spacing similar to that appropriate for transplants after the appearance of the first set of "true leaves" (24).

In the South, direct seeding is often not practical due to "unpredictable rainfall" (45). Heavy rains can wash away seeds and seedlings before they have a chance to become established. Instead, Southern gardeners may prefer to transplant or grow in pots (45).

### **Soil**

If you decide to sow basil directly into the garden rather than starting plants indoors, be sure to wait until the soil is warm enough. Evening temperatures should be at least 60°F (24, 79). Mark Langan recommends warming the ground by covering it with a clear plastic sheet 2 weeks before planting (Remember to remove the sheet before planting.) (51). Adding mulch with straw to the soil is a natural and easy way to help retain moisture and warmth and deter weeds (8). Madalene Hill and Gwen Barclay use a hardwood bark mulch added to the top of the soil and suggest that gardeners find mulches that are available locally (45). Mark Langan also prefers bark mulch to wheat straw because it can help prevent rot diseases in high humidity areas (51).

For best results, soil pH should be about 6.4 (79), but keep in mind that basil can grow in a variety of soils, with pH ranging from 4.3 to 9.1 (28, 42, 79). Many university agricultural extensions offer soil tests that assess pH and the presence of necessary minerals and organic compounds like nitrogen, phosphorous and potassium. See the USDA Cooperative State Research, Education, and Extension Service website <http://www.ree.usda.gov/1700/statepartners/usa.htm> to locate an extension in your area.

### **Transplanting to the Garden**

The soil temperature and pH recommended for sowing seeds also applies to transplants. Susan Belsinger points out that the time to transplant will vary by region, with northern gardeners moving plants outside later (8). Madalene Hill, who gardens in Texas, always transplants after the Easter holiday and points out that since Easter occurs at a different time each year it can be a good “indicator of the weather” (44, 45).

Spacing for transplants will vary based on species/cultivars, since some species are much larger than others. As a general rule, most basils can be spaced 1-2 feet apart, but James Adams and Tina Marie Wilcox suggest that some smaller cultivars, like ‘Piccolo,’ can be planted even closer together (1, 84). Susan Belsinger generally grows about forty basil plants, spaced 2- 2½ feet apart (8). Tina Marie Wilcox spaces larger species, like *O. gratissimum* and *O. sel-loi*, 3-4 feet apart (84). Spacing is important to maintain proper air circulation (1, 51).

Some gardeners, like Susan Belsinger, plant with the lunar cycles. Susan points out that since basil is an above ground crop, it should be planted (sown or transplanted) with the waxing moon, (first or second quarter new moon to full) (8). See the Containers section for more information on transplanting.



Photo by Susan Belsinger

### Light

For best results, basil requires full sun. In *Basil: An Herb Lover's Guide*, Thomas DeBaggio and Susan Belsinger suggest at least 4 hours after 10 a.m. (24). Madalene Hill and Gwen Barclay advise gardeners that basil's sun requirements are similar to roses and tomatoes and recommend "at least 6 hours of sun," preferably in the morning (45).

### Water

Basil is a water loving plant, requiring about 53 inches of rain or water per year (24) but surviving with between 23 and 165 inches (72). Be sure soil is well aerated and has proper drainage. Madalene Hill and Gwen Barclay emphasize the importance of drainage over specific water requirements and point out that "more plants are lost to non-draining soil than for any other reason," especially in the South (45). Raised beds can help to promote drainage and aeration (44). In *The Big Book of Herbs*, Art Tucker and Thomas DeBaggio recommend using "trickle irrigation" to keep leaves dry and prevent fungal infections (79).

### Fertilizer

Adding compost to your soil at the beginning of the season is a great way to enrich the soil organically. James Adams uses this method to prepare for plantings at the National Herb Garden (1). Some gardeners, like HSA's garden consultant, Joan DeLauro, prefer compost to other types of fertilizers (25).

Mark Langan suggests using a balanced fertilizer with equal amounts nitrogen, phosphorous and potassium at the start of the season and then switching to a nitrogen-rich fertilizer like bloodmeal (which is organic) as the season progresses. Mark believes that it's important to supplement nitrogen because it is depleted from soil faster than other nutrients (51). Plants should be fertilized after each heavy pruning or harvest (44, 45, 72, 79).

### Containers

Container growing for basil isn't limited to indoor cultivation. Basil can be grown outdoors in pots as well. Madalene Hill and Gwen Barclay like to start with at least an 8-inch pot (in the South) and then pot up for larger basil (45).

Mark Langan prefers to place his tender perennial basil in the ground, pot and all, using 8-inch pots. Because the plant's roots can grow through the pot's drainage holes, basil won't become root bound. If you decide to purchase a basil that has already been started, Mark suggests buying a plant in a 2 to 4-inch pot 2 weeks before the last frost and repotting immediately in an 8-inch black plastic pot. Keep the plant on a sunny stoop until the ground is warm enough to transplant. The dark plastic helps the soil absorb heat from the sun and protects the plant from colder spring weather. When the ground has warmed up, the plant can be put into the ground. At the end of the season, plants can be cut back and easily removed for overwintering. According to Mark, this method reduces the risk of transplant shock at both the beginning and end of the season (51, 52).

See the Indoor Cultivation section for more information on types of pots.

### *Companion Planting*

Basil is most often used as a companion plant for tomatoes. Although some gardeners claim that basil can improve the growth and flavor of tomatoes and repel insects, this is more folklore than science. One good reason to plant basil and tomatoes together is for convenience (51). Both plants have similar growth requirements (84), and their complementary flavors make close proximity a boon for harvesting (51).

Mark Langan cautions gardeners to take care when planting basil with tomatoes. He recommends planting the basil 3 feet from the tomato and on the south side so that the tomato plant doesn't shade the basil or impede air circulation. As an alternative, Mark suggests planting one basil and one tomato in an 8-inch pot and allowing the tomato to trail over the side (51).

James Adams encourages gardeners to think of basil as a companion plant, but in the ornamental rather than the traditional sense. He mentions that purple basil looks great with gray plants and brighter colors. 'African Blue' can be grown with pineapple mint and oregano for a nice looking combo. Basils also look great with flowers (1). Susan Belsinger has interplanted with marigolds (8). 'Magical Michael' is attractive ornamental with dark bracts and flowers that mixes well with different garden flowers (1).

### **Pests & Diseases**

---

Basil has a reputation as an insect repellent, particularly for mosquitoes. Despite its insect repellent properties, basil is subject to a variety of pests, including Japanese beetles, grasshoppers, slugs, aphids, spider mites, whiteflies, cutworms and nematodes.

Whiteflies are primarily a problem for young plants in the greenhouse (1, 8). Susan Belsinger and James Adams recommend blasting plants with a stream of water to remove whiteflies (1, 8). The water pressure should be strong enough to eliminate the pests but not so strong that it bruises the plant (45). Susan also suggests using a homemade garlic and hot pepper spray, or a natural insecticidal soap like Safer's (8).

Cutworms can kill plants in the first few weeks after transplanting (62, 85). To prevent infestation, add wood ashes (38, 62) or diatomaceous earth to soil (31) or place a cutworm collar around the base of the plant (31, 38, 71). Researchers at the University of Hawaii at Manoa have found that adding compost to soil can combat nematodes (79, 81). Slugs can be deterred with 5-inch copper fencing. The copper reacts with the slug's natural body chemistry to create a "non-lethal electrical charge" in the slug's body (24). Many adult insects can be avoided by covering plants with fabric row covers during the day (24, 45).

Pests may vary depending on your region. In the Ozarks, where Tina Marie Wilcox gardens, mealybugs, fungus gnats and spit bugs are a problem. To control mealybugs, Tina deters the ants that carry the mealybugs on to the plants with diatomaceous earth, blasts mealybugs from pots, growing tables, and plant parts with water, sprays with natural Safer's soap, and swabs mealybug egg masses with alcohol

(85). According to Tina, “there really is no simple way to control mealybugs. It takes constant attention and action to stay on top of the mealybug pest” (85). Orange oil can also be used to treat mealybugs as well as aphids and white flies (45).

Grasshoppers and June bugs are the major troublemakers in Texas. Madalene Hill reminds gardeners in her region to avoid planting basil near outdoor night-lights since the lights will attract June bugs. To combat grasshoppers, Madalene and Gwen use Nolo bait, “a grain chaff impregnated with a bacteria that affects only grasshoppers and locusts” (44, 45).

Basil is also subject to a variety of bacterial and fungal diseases. Basil’s most notorious disease is probably Fusarium wilt, an infection caused by the fungus *Fusarium oxysporum* f. sp. *basilicum* that stunts growth and, as the name implies, causes wilting (27, 79). One way to prevent Fusarium wilt is to plant resistant varieties like the cultivar ‘Nufar.’ *Fusarium* can infect seeds and live in soil (24, 79). Preventative measures include crop rotation, soil solarization (heating soil to temperature that will kill pathogens and pests using a plastic covering) (32) and insuring proper sanitation, aeration and drainage (24, 79). If your basil does succumb, pull and discard the infected plant before it has a chance to infect its neighbors (1, 8, 84), but don’t throw it in the compost pile where *Fusarium* can survive and infect future generations of plants (45, 84).

Basil is also subject to root rot caused by the fungi *Pythium* and *Phytophthora* and aggravated by overwatering (25, 24, 51). Bacterial soft rot, *Erwinia*, can also be a problem but can be prevented using pine and hardwood bark mulches (79). For additional information on basil’s diseases, see *The Big Book of Herbs* by Arthur O. Tucker and Thomas DeBaggio and *Basil: An Herb Lover’s Guide* by Thomas DeBaggio and Susan Belsinger.

With proper care, basil can be relatively pest and disease free. To prevent pests and diseases, make sure your basil plants have a healthy living environment including proper drainage and aeration and sterilized potting medium and/or compost. If you will be reusing containers, sterilize them with a 10% bleach solution (84). Crop rotation and the introduction of beneficial insects can also be helpful (25, 71). Be wary about using insecticides, especially on plants that will be eaten. Insecticides can be toxic for basil as well as the insects, although some sources suggest that pyrethroids, plant-based insecticides, can be used without problems (47).

## Pruning & Harvesting

---

According to Madalene Hill and Gwen Barclay, proper pruning and harvesting is the “secret” to growing basil (44). Consider pruning a means for continual harvest. By pruning your basil often, the plant will stay healthy and robust and will produce many harvests throughout the season.

Different sources have different recommendations on when to start pruning. Madalene and Gwen like to “nip off the end growth of each branch to encourage new growth” just prior to transplanting (45). Susan Belsinger recommends pruning when the plant has three sets of true leaves (8). In *The Big Book of Herbs*, Art Tucker and Tom DeBaggio suggest pruning when plant has three leaf pairs and is 1 foot tall (79). Others recommend pruning when plants have six to eight sets of true leaves (24, 38, 45). James Adams usually prunes basil when it has four to five nodes (1).

## Basil: An Herb Society of America Guide

For the first pruning, cut the plant just above its second set of leaves (8, 44). Plants should be pruned in this manner whenever repotted or transplanted (45). Continue to prune every 3-4 weeks (8, 44), cutting plants back to the lower one-third of the plant (51) or just above the lowest two to four leaves (45) or second leaf node (8). Harvesting in this manner can produce as much as 15-24 cups of basil in a season from a single plant (8).



Photo by Susan Belsinger

If you prefer to harvest more frequently and less dramatically, snip off the top set of leaves just above the next lower node as needed. Depending on your basil's growth rate, this may be as often as once a week (1).

After flowering, when seeds have matured, basil will stop producing new leaves (24, 44, 45). To ensure continued growth, cut off any flower buds that begin to form (8, 62). Be sure to cut the branch rather than just the tips or new buds will quickly appear (45).

Many basil lovers claim that flowering will also cause the leaves to have a bitter taste. Mark Langan points out that preventing flowering is only required for annual basil (rather than perennial), since flowering marks the beginning of the end of an annual plant's life cycle. Mark believes that flowering doesn't affect the flavor of tender perennial basil (51). Try growing a variety of basil, and judge for yourself!

Even annual basil can and should be allowed to flower at the end of the growing season. Flowers can be enjoyed for their beauty, then harvested and used in a variety of dishes.

### Harvest Time

Traditionally, the best time to harvest basil is in the morning when the essential oils are strongest, after the morning dew but before the heat of the afternoon sun. Contrary to popular wisdom, however, University of Michigan researchers have found that harvesting basil in the evening between 6 and 10 p.m. increases its shelf life (79). This finding may be of particular interest to commercial basil growers (45). If all else fails, and you only need a small amount of basil to add to a favorite dish, follow the lead of Madalene Hill and Gwen Barclay and harvest when you have the time. For large harvests, however, Madalene and Gwen recommend harvesting in the morning and hosing basil off the previous evening to rinse off any dust (44, 45).

## Preserving & Storing

---

Most experts agree that there is no comparison between fresh and dried basil in terms of flavor. The fresh leaves have a flavor complexity and intensity that is largely lost in the dried form. If storing for a week or less, basil can be wrapped in several layers of paper towels and placed in an airtight or ziplock bag and stored in the highest section of the refrigerator where it will stay fresh for several days (44, 45). It can also be stored for a few days in a glass of water placed on a countertop (44, 84).

### *Drying*

For longer term storage, basil can be dried, but this is not the preferred method for many basil lovers since dried, crumbled basil doesn't have the same robust flavor. In *Basil: An Herb Lover's Guide*, Susan Belsinger and Thomas DeBaggio point out that leaves must remain whole when drying since broken leaves are less flavorful due to the loss of essential oils (24).

One easy method for drying basil is simply hanging it in bundles (8). Basil can also be dried by placing a thin layer of stripped leaves between two folded sheets of newspaper on a wire rack and turning leaves twice a day (44). Drying between sheets of paper prevents oxidation and discoloration (45). Some herb lovers like to dry on screens and finish by baking on baking sheets at a low temperature for several minutes (24), but Madalene Hill and Gwen Barclay don't recommend oven drying since high temperatures can cause a loss of essential oils and reduced flavor (22 in 57, 44). Dried basil should be stored in closed jars away from heat and light and will keep for about a year (24, 38).

### *Freezing & Oil Preservation*

There are many options for freezing basil, and for many herb enthusiasts, freezing is the preferred storage method. Leaves can be frozen on cookie sheets and then stored in plastic bags or containers labeled with name and date (24, 38). Basil can blacken with freezing, but Susan Belsinger suggests chopping, covering with oil and freezing in baggies to keep leaves green (8). Leaves can also be combined with olive oil in a food processor or mortar/pestle and frozen in ice cube trays (51, 62, 84). Frozen basil can then be added to soups, sauces or pesto (8, 62). Basil can also be made into pesto and frozen. Thomas DeBaggio and Susan Belsinger recommend freezing pesto minus the garlic and adding that fresh (23).

Madalene Hill and Gwen Barclay prefer oil concentrates to other preservation methods. To make a concentrate, blend 2 cups firmly packed fresh leaves with ½ cup vegetable oil. Do not strain out the leaves. This will produce a thick paste about the consistency of pesto (44). All herbal oil products, including pesto, should be stored in plastic or glass containers and kept in the freezer to prevent botulism. Concentrates can be stored for up to 2 years (45).

### ***Preserving in Oil & Salt***

Basil can also be preserved by placing leaves in a jar over ½ inch of olive oil, layering the leaves with oil and a sprinkling of salt, and storing in the refrigerator (38, 62). Individual basil leaves can be removed and used as needed. One problem with this method is the potential for botulism to develop, even in the refrigerator. For safety, do not keep oil longer than 2 weeks, or use another preservation method (23).

Leaves can also be preserved by layering in salt alone (9, 38). Susan Belsinger recommends layering sea salt and basil leaves in a glass pint jar with a plastic lid and storing in the refrigerator. Leaves will stay fresh and last until the next harvest season. Salt can then be used in soups and sauces or sprinkled over vegetables (8).



Photo by Susan Belsinger

## **Uses of Basil**

### ***Culinary***

Most people think of basil as a standard culinary herb, complimenting tomatoes and an essential ingredient in pesto, but this is really just scratching the surface. Basil leaves can be combined with a variety of other herbs including garlic, juniper, marjoram, mustard, oregano, paprika, parsley, pepper, rosemary, sage and thyme (41, 62) and can be used in soups, stews, stuffings and rices as well as with fish, chicken, vegetables and meats. They can also be a key ingredient in cheeses, vinegars, oils, jellies, teas, drinks and liqueurs, and seeds can be used in beverages (14, 21, 24, 57, 72, 73, 75, 79). Purple basil makes nice colorful vinegars, and lemon and cinnamon basil can be unexpected but flavorful additions to desserts.

Larger leaves can be torn, chopped or minced. Small leaves can be added whole to salads, vegetable dishes, pasta and rice. To prevent blackening of leaves and insure best flavor, add to salads and other cold dishes soon after cutting (45).

Non-woody stems and branches can be steeped in liquids for poached fruit, beverages, soups and steamed meat, poultry and seafood (45). Even basil's flowers are edible and can be candied or added to salads and other dishes (5, 38). For optimum flavor, add basil in the last few minutes of cooking (45).

The following recipes showcase some of the culinary possibilities:

**Recipes**

**MEDITERRANEAN HERBAL BLEND**

*Use for any Mediterranean inspired dish, from appetizers to soups and salads to vegetables.*

- 2 large cloves garlic, peeled and cut into small pieces
- ½ cup fresh parsley leaves and tender stems
- ¼ cup fresh sage leaves
- ¼ cup fresh thyme leaves and tender stems
- ¼ cup fresh rosemary leaves
- ½ cup fresh basil leaves and tender stems
- ½ cup fresh oregano leaves and tender stems (mild variety such as *O. xmajoricum*)
- ½ cup garlic chives, cut in 1-inch pieces
- 4 large fresh bay leaves, center stem removed (crumble stemmed dry bay leaves very fine to substitute)
- ½ to 2/3 cup extra virgin olive oil
- Salt and pepper to taste

Blend all ingredients until smooth in food processor, adding enough olive oil to completely coat chopped leaves. Consistency should be like that of sour cream. To keep oil-based mixtures fresh and safe, use immediately or store up to 2 years in an airtight container in freezer; we do not recommend making in ice cube trays as the flavors are dissipated more quickly when frozen in small quantities.

**Yield:** about 1 1/3 cups

**Note:** All herb measurements are firmly packed.

Recipe © Madalene Hill and Gwen Barclay. Printed with permission.

## **CHERRY TOMATOES MARINATED WITH BASIL, CHIVES & BALSAMIC VINEGAR ON BRUSCHETTA**

*A winning summertime combination—basil, chives, and tomatoes—on toasted garlic bread is the perfect way to start a meal. For small appetizers you can slice the baguette into rounds. If you serve these as a main course for lunch, allow two per person. Imported olives make a nice accompaniment.*

Serves 4 or 8

1 pint cherry or pear shaped tomatoes, quartered lengthwise and halved crosswise  
About 4 tablespoons olive oil  
1 tablespoon balsamic vinegar  
1 clove garlic, minced  
¼ cup chopped chives, common or garlic  
Salt  
Freshly ground pepper  
1 long baguette or loaf of good-quality country-style bread  
1 or 2 cloves garlic, peeled  
1 cup basil leaves, cut into chiffonade  
½ cup crumbled feta cheese, optional

Combine the tomatoes in a bowl with 2 tablespoons of the olive oil, the balsamic vinegar, the minced garlic, and chives. Salt and pepper generously and toss well. If you are using the feta, scatter it over the tomatoes.

Meanwhile, slice the baguette or country bread into ½-inch slices and place them on a baking sheet. Toast them in a 400°F oven for about 6 to 8 minutes, turning them once. While the bread is toasting, add the basil to the tomatoes and toss well.

Remove the toast from the oven when it is crusty on both sides and firmly rub the cut sides with a clove of garlic. Brush the cut sides with the remaining olive oil.

Spoon the tomato and herb mixture evenly over the baguettes, and drizzle a little of the marinade juices over all. Serve immediately.

Recipe © Susan Belsinger. Printed with permission. Adapted from *The Greens Book* by Susan Belsinger and Carolyn Dille, Interweave Press, 1995 (10).

### SOUTHEAST ASIAN PESTO

2 or 3 large cloves garlic, cut into several pieces  
2 cups peeled and coarsely chopped fresh ginger or galangal - about 5 to 6 ounces unpeeled  
¼ cup firmly packed sliced fresh lemon grass, white fleshy portion only  
2 cups sliced green onions (use whole onion)  
2 cups **each** firmly packed fresh basil, parsley and cilantro (coriander) leaves and tender stems  
2 to 1 teaspoon chopped hot fresh chile to taste, seeds and stem removed  
2 cups toasted almonds - sliced or slivered, natural or blanched  
2/3 to ¾ cup peanut oil or other mild vegetable oil  
2 teaspoons toasted sesame oil  
¼ to 1/3 cup rice wine vinegar, lemon juice or lime juice  
1 teaspoon salt

Combine garlic, ginger and lemon grass in a food processor; process until smooth. Add remaining ingredients, using only as much vegetable oil as needed to achieve a smooth paste. Taste and adjust salt and vinegar as needed. To keep oil-based mixtures fresh and safe, **use immediately or store up to 2 years in an airtight container in freezer.**

Yield: about 3 cups.

Recipe © Madalene Hill and Gwen Barclay. Printed with permission.

### ITALIAN-STYLE PESTO

5 cloves garlic, peeled and sliced  
¼ cup pine nuts  
4 cups basil leaves  
Salt  
½ cup freshly grated parmesan cheese  
About ¾ cup extra-virgin olive oil

Combine the garlic and pine nuts in a large mortar and crush them with the pestle into a smooth paste. Add the basil to the mortar, a handful at a time, crushing the leaves against the sides with the pestle. The mixture will be like a coarse, thick paste until the oil is added. Add a few pinches of salt to the basil.

Drizzle the olive oil in slowly, a bit at a time, as you work it in. The pesto should become very smooth and there should not be any big pieces. Stir in the cheese. Once most of the oil is added, taste for seasoning and adjust with a little more oil, cheese, or salt.

If you are using a food processor, combine the garlic, pine nuts, basil, a few pinches salt, and a few tablespoons of the oil. Process until mixed. Add the cheese and most of the remaining oil and process until smooth and homogenous. Taste for seasoning, and add the rest of the oil, and a little more cheese or salt, if desired.

Makes about 1½ cups; enough to dress 1 pound of dry pasta or about 1½ pounds fresh pasta.

Recipe excerpted from *Basil: An Herb Lover's Guide* by Thomas DeBaggio and Susan Belsinger, Interweave Press, 1996. Reprinted with permission.

## **CREAMY TAPENADE**

*A variation of the classic from Southern France.*

1 cup pitted calamata olives, well drained  
6 anchovy fillets, cut into small pieces  
2 large cloves garlic, peeled and cut into small pieces  
4 tablespoons capers  
3 to 4 tablespoons lemon juice  
¼ to ½ cup extra virgin olive oil (use less to make a spreadable mixture, more for a dip)  
½ cup basil leaves, finely chopped by hand when ready to mix sauce  
½ to ¾ cup mayonnaise  
Freshly ground black pepper and salt to taste

Chop pitted olives, garlic and capers in a food processor fitted with steel blade. Add lemon juice and add just enough olive oil to allow mixture to become smooth. Transfer olive mixture to a medium bowl and fold in mayonnaise and chopped basil; season with pepper and salt if needed to balance sharpness (beware of salty anchovy fillets!). Just add a little more lemon juice if too salty.

Serve on crusty bread for appetizer or slathered on sandwiches. Smear on sliced ripe tomatoes or drizzle on cooked/canned tuna for a delicious salad. Tapenade may be thinned with a little milk, warmed and served with grilled or sauteed fish. Refrigerate sauce to store. Will keep well at least 2 weeks. **Caution:** check olives carefully for pieces of pits before processing.

**Yield:** 2½ to 3 cups

Recipe © Madalene Hill and Gwen Barclay. Printed with permission.

## FRESH BASIL OIL CONCENTRATE

### Basic Recipe:

- 2 firmly packed cups basil leaves and tender stems – sweet basil, cinnamon or lemon recommended as most useful
- ½ cup good quality vegetable oil (we do not recommend olive oil since it has a distinct taste of its own and limits use of oil concentrate).

**Directions:** Combine in electric blender or food processor, using pulse control. It may be necessary to stop and push down material in blender. A processor creates a mixture with more texture, while it will puree in the blender. To keep oil-based mixtures fresh and safe, use immediately or store up to 2 years in an airtight container in freezer; we do not recommend making in ice cube trays as the flavors are dissipated more quickly when frozen in small quantities.

**Uses:** Substitute for fresh basil – about 1/3 to ½ the normal amount. Use in sauces, soups, salad dressings, basting mixtures, vegetable salads, in sour cream or yogurt for quick sauces. Herbal concentrates should be used in very small amounts, about 1 tablespoon per 2 cups of meat or vegetables, or per cup of sour cream or yogurt as a dip or dressing.

**To Convert Basil Oil to Basil Pesto:** Use about 1 cup of basil oil concentrate (above recipe) in place of fresh basil measurement in pesto recipe; do not add all of oil measurement for pesto at once.

**Yield:** Approximately 2 cups

Recipe © Madalene Hill and Gwen Barclay. Printed with permission.

## BASIL BUTTERS

*These savory blends are not just for breads.*

- I. ½ pound butter
  - 1 tablespoon chopped fresh parsley
  - 1 tablespoon chopped fresh onion chives
  - 1 tablespoon chopped fresh sweet basil
  - 1 tablespoon chopped fresh cilantro
  - 1 tablespoon chopped capers
  - ¼ teaspoon freshly ground black pepper
  - 2 teaspoons grainy mustard
  
- II. ½ pound butter
  - 1 tablespoon chopped fresh parsley
  - 1 tablespoon chopped fresh chives
  - 1 tablespoon chopped fresh licorice or other scented basil
  - 2 teaspoons chopped fresh orange zest
  - 1 teaspoon curry powder

- III. ½ pound butter
  - 1 tablespoon chopped fresh parsley
  - 1 tablespoon chopped fresh garlic chives
  - 2 tablespoons chopped fresh lemon or other scented basil
  - 2 teaspoons chopped lemon peel
  - 1 tablespoon fresh lemon juice
  - 1 tablespoon ground coriander seed
  - ½ teaspoon salt, if using unsalted butter

Soften butter (but do not melt) and beat with wooden spoon or in an electric mixer with other ingredients. Do not mix in a food processor. Always chop basil just before combining with butter to keep leaves from turning dark.

Form herb butters into rolls using plastic film and freeze for later use. It can be sliced directly from freezer; replace balance in freezer immediately. Mold butter into balls; or pack into small dishes for serving. Use butters for dressing steamed vegetables, as a topping for grilled or broiled meats, poultry or fish. Butters are delicious for dressing pasta or stirred into hot cooked rice.

Recipe © Madalene Hill and Gwen Barclay. Printed with permission.

### **SPICY BASIL WINE JELLY**

- 2 cups wine of choice – jug type is fine or a moderately priced wine – White Zinfandel is especially beautiful
- 1 cinnamon stick – 3” long, broken into several pieces
- ½ teaspoon whole cloves
- 1/3 cup firmly packed basil leaves and tender stems
- 3 cups granulated sugar
- 3 tablespoons lemon juice
- 1 pouch liquid pectin

Combine part of wine with cinnamon sticks and clove in a medium saucepan. Bring to a boil, lower heat and simmer for 5-6 minutes. Remove from heat and add basil leaves, stirring well to mix. Let mixture stand to steep at least 10 minutes. Strain out all solids, pressing firmly to extract seasoned wine. Pour into a heatproof 2 cup measure; add remaining wine, and more if needed, to equal 2 cups.

Transfer mixture to a heavy, large pan. Place pan over high heat; add sugar and lemon juice, and bring to a full rolling boil that cannot be stirred down. Add pectin quickly, continue stirring and heat again to full rolling boil. Boil hard for 1 minute. Remove from heat, stir and skim off foam quickly.

Pour jelly immediately into sterilized containers. Seal and process 5 minutes in hot water bath, according to jar manufacturer’s instructions. Let cool out of drafts and do not disturb for 24 hours. Alternately, pour jelly into a heatproof container and store in refrigerator.

Serve with cheeses and meats as a condiment, or with breads. Jelly makes an excellent glaze to finish roasted poultry or pork.

**Yield:** approximately 3 to 4 jars, ½ pint each

Recipe © Madalene Hill and Gwen Barclay. Printed with permission.

### **CINNAMON BASIL - GINGER POUNDCAKE**

3 cups all-purpose flour  
1 tablespoon baking powder  
2 teaspoons salt  
12 ounces butter (3 sticks)  
2½ cups granulated sugar  
6 whole, large eggs  
¾ cup half & half cream  
2 teaspoons vanilla  
2 teaspoons ground ginger  
1½ tablespoons peeled and grated fresh ginger  
½ cup minced crystallized ginger  
2 tablespoons finely chopped cinnamon basil\* (do not chop until ready to add to batter)  
Powdered sugar to dust top of cake

Pre-heat oven to 325°F. Grease well a 10-cup bundt pan or 2 large loaf pans; dust with flour, removing excess by tapping against side.

Combine flour, baking powder and salt in a medium bowl, mixing well with a wire whip; set aside. In electric mixing bowl, cream butter and sugar until light and fluffy. Add eggs, one or two at a time, mixing well. Combine half & half cream with vanilla, then add to creamed mixture alternately with dry ingredients. When completely mixed, beat in gingers and basil. Pour batter into prepared pan(s), smoothing tops with rubber spatula; tap pans lightly on counter to settle and eliminate air pockets.

Bake until cakes pull away from sides of pan and tester inserted in center comes out clean, about 1 hour. Cool in pans on rack about 10 minutes before turning out to cool completely. Dust top of cake with sifted powdered sugar before serving. Cake may be wrapped well and frozen for 1 month.

\* Substitute 1 tablespoon Cinnamon Basil Oil Concentrate

**Yield:** 12 to 16 servings.

Recipe © Madalene Hill and Gwen Barclay. Printed with permission.

## BASIL BLUEBERRY MUFFINS

*This is a wonderfully delicious and fragrant muffin; it is sweet like cake. The addition of blue corn is fun and tasty—gives a bit of added texture and the corn is sweet. If you aren't familiar with blue cornmeal, try it and you will find its earthy taste is good in cornbread, muffins, and blue corn pancakes. You can use yellow or white cornmeal if you don't have the blue. Use a combination of lemon and cinnamon basil for the fragrance and flavor; the citrus and the spice go well with the blueberries. However, if you don't have both basil, either one can be used on its own and still make a tasty muffin.*

Makes 1 dozen

½ cup unsalted butter, melted  
1 2/3 cups unbleached flour  
1/3 cup blue cornmeal  
2 teaspoons baking powder  
½ teaspoon salt  
1/3 cup packed light brown sugar  
1/3 cup granulated sugar  
1/8 teaspoon freshly ground nutmeg  
1 generous cup blueberries  
1 cup milk  
2 extra large eggs  
Generous ¼ cup minced lemon and cinnamon basil leaves

Preheat oven to 400° F. Use a little of the butter melted for the recipe to lightly brush the muffin tin. Set aside the remaining butter to cool.

In a mixing bowl, combine the flour, cornmeal, baking powder, salt, sugars, and nutmeg and toss well. Rinse the blueberries, pick over them, and drain well. Put them in a small bowl and toss them with 1 tablespoon of the flour mixture to coat them.

In a small bowl, lightly beat the eggs with a fork or a whisk, add the milk, and blend well. Stir in the melted butter and minced basil. Pour the liquid ingredients into the dry ingredients and stir to barely combine. Add the blueberries, folding them in gently, until they are just incorporated into the batter. Do not overmix.

Spoon the batter evenly into the muffin tins filling them about two-thirds full. Place in the middle of a hot oven and bake for about 20 minutes, until just golden brown, or a tester comes out clean. Cool in the tin for 5 minutes or so, loosen with a metal spatula and cool on baking racks or eat them warm.

Recipe © Susan Belsinger. Printed with permission.

## **BASIL SYRUPS**

*Herb syrups are wonderful flavor essences that can be added in place of the liquid in cakes, pie filling, and sorbets. They are good on all kinds of fruits, in fruit salads and used in drinks and punches.*

1 ½ cups water

1 ½ cups sugar

About 8 to 10 sprigs of anise, cinnamon, green or lemon basil

Combine the water and sugar in a small saucepan, bruising the leaves against the side of the pan with a spoon. Place over moderate heat and bring to a boil. Cover, remove from heat and let stand for at least 30 minutes. Remove the leaves and squeeze them into the syrup to extract their flavor. This syrup can be made ahead and kept in the refrigerator for about 2 months and frozen for 3 to 4 months.

Recipe © Susan Belsinger. Printed with permission.

## **BASIL PINEAPPLE-ORANGE COOLER**

6 cups fresh or reconstituted frozen orange juice

1 46-ounce can pineapple juice

¼ -½ cup sugar, depending upon personal taste

2-3 tablespoons fresh lemon juice if desired

Fresh branches of cinnamon, clove, lemon, sweet Thai and/or sweet basil – no woody stems

Combine orange and pineapple juices, along with sugar in a non-reactive (glass or plastic) container fitted with a lid; stir until sugar is dissolved. Add lemon juice to brighten flavor and adjust sugar if needed. Bruise branches of basil by twisting to release essential oil. Add to container of juices, filling as much as possible. Cover and refrigerate overnight, allowing juice to become flavored. Let stand at least 8 hours.

Strain juices, pressing out as much liquid as possible. Check for sweetness and serve over ice. Ice cubes may be pureed with juice to create a basil “icee.” If using frozen orange juice, decrease water measurement and add ginger ale or lemon-lime soda to create a “fizzy” treat.

**Yield:** 16 to 20 servings with ice.

Recipe © Madalene Hill and Gwen Barclay. Printed with permission.

### Craft Uses

Basil's uses extend far beyond the dinner table. Basil can also be used in crafts and homemade cosmetics. Leaves can be added to bath bags, facials and hair rinses (38) as well as potpourris, nosegays/tussie mussies and wreaths (11, 54, 79, 82). Seed head stems can be used in wreaths by wrapping the stems on a single heavy wire with waxed string or embroidery thread (45). Looking for a functional craft? Try making an herbal moth repellent bag with equal parts camphor basil, lavender and rosemary (16).

### Economic Uses

The essential oil of basil is used in a variety of common products including soaps, cosmetics, dental products, colognes/perfumes, prepared foods and beverages (14, 21, 72, 73, 79). *O. americanum* is used in soaps and toiletries (75), and *O. kilimandscharicum* is used in fragrances (75) and as a flavoring additive (83). The oils of *O. gratissimum*, *O. kilimandscharicum* and *O. basilicum* are classified as economic materials in their own right (83), and European and Egyptian varieties are primary sources of *O. basilicum* oils (72). The essential oil of some types of *O. basilicum* is used in aromatherapy and in soaps, cosmetics and foods (55).

As mentioned in the Pests & Diseases section, basil does have insect repellent properties. The essential oils of *O. gratissimum* and *O. basilicum* are used in commercial insect repellents (14), the seeds and leaves of *O. kilimandscharicum* have repellent properties (14), and *O. gratissimum* is used as a mosquito repellent as a live plant (14, 79).

### Medicinal & Ethnobotanical Uses

Most people don't generally think of basil as a medicinal plant, but it has been used in traditional medicine in countries around the world and is showing promise for a variety of medical conditions. *O. americanum* has been used in Brazil for kidney problems and rheumatism and in Sudan and India for skin parasites (75). The leaves and roots of *O. kilimandscharicum* have been used to treat colds and stomach complaints in Africa (21). *O. basilicum* has been used in traditional Chinese medicine for kidney problems, gum ulcers and as a hemostyptic in childbirth (67) and for problems as diverse as earache, rheumatoid arthritis, anorexia, skin conditions, menstrual irregularities, and malaria in India (67).

*O. basilicum* alone has over fifty medicinal activities, from analgesic to vermifuge, and is reportedly used to treat over 100 conditions, including acne, fevers, headaches and fungal infections (29). Many of these uses are folkloric and have not been verified in scientific studies, but others have begun being tested in controlled animal experiments (29). A recent animal study of *O. suave* (*O. gratissimum*) found anti-ulcer effects (77), and a study of *O. canum* (*O. americanum*) suggests that it can lower blood sugar levels and aid "insulin release" in rats (61). *O. tenuiflorum* has demonstrated anti-inflammatory effects in animal studies (46, 79).

Several basil species have antimicrobial and antifungal properties. *O. basilicum* (12, 63, 67) and *O. gratissimum* (60) are reported to be antimicrobial/antibacterial and antifungal (46), and the oils of *Ocimum xcitiodorum* 'Citriodorum' and *Ocimum kilimandscharicum* are antifungal (79).

Despite its ethnobotanical history and potential, it's important to keep in mind that basil has not been approved for medicinal use by the German Commission E. Due to a possibly carcinogenic component,

## Basil: An Herb Society of America Guide

estragole, *O. basilicum*, which is the only basil listed in the *PDR for Herbal Medicines* and *Commission E Monographs*, is not recommended for pregnant women and children (12, 67). Interestingly, some studies suggest that the leaves of holy basil, *O. tenuiflorum*, may have anti-cancer properties (2 in 57, 46).

### Garden Uses

Basil's uses in the garden aren't limited to traditional herb and kitchen gardens. James Adams reminds gardeners that basil also makes a nice ornamental plant. According to Adams, 'Magical Michael' is an attractive ornamental with dark bracts and flowers that mixes well with garden flowers, and purple basil look great with gray plants and brighter colors (1). Madalene Hill and Gwen Barclay like to use 'African Blue' as a landscape plant (44). Basils can also be used in the landscape as edgings (21) and annual borders (79) and in knot gardens and mazes (38, 70).

Basil's impressive scent makes it ideal for fragrance gardens and gardens for the blind (21). It can also play a primary role in children's gardens, bee gardens (21), and as a nectar plant in butterfly gardens (4).

### Basil Species Highlights \*

#### ***Ocimum americanum***

Synonyms: *O. canum*

Common names: hoary basil, hairy basil, American basil, lemon basil, spice basil

Form: annual but can be grown as short-lived perennial

Flower color: white to lavender

Height: 6-28"

Width: 3-15"

Hardiness Zone: 10

Uses: culinary, medicinal, economic

Scent/Flavor: camphor, cinnamon, citrus or lavender

#### ***Ocimum basilicum***

Common name: sweet basil

Form: annual but can be grown as short-lived perennial

Flower color: white to violet

Foliage color: green; purple for some cultivars

Height: 12-40"

Width: 6-15"

Hardiness Zone: 9 or 10

Uses: culinary, medicinal, economic

Scent/Flavor: varies but can include cloves, spice, floral, anise, cinnamon, citrus



***Ocimum basilicum*** 'Mrs. Burns' Lemon'

Photo by Susan Belsinger

\* Profiles compiled from 14, 79, 24, 48, 15, 47, 65. Widths and heights based on highest and lowest published in sources.

***Ocimum campechianum***

Synonyms: *O. micranthum*

Common names: least basil, Peruvian basil, spice basil

Form: annual

Flower color: white to lavender

Foliage color: dark green

Height: 10.5-40"

Width: 11.5"

Hardiness Zone: 10

Uses: culinary

Scent/Flavor: eucalyptus, carnation, clove, cinnamon, spice, and camphor



***Ocimum campechianum***

Photo by Susan Belsinger

***Ocimum xcitriodorum***

Common name: lemon basil

Form: annual

Flower color: white

Foliage color: green

Height: 12-18"

Width: 10"

Hardiness Zone: 50°F or higher

Uses: culinary

Scent/Flavor: citrus

***Ocimum gratissimum***

Synonyms: *O. viride*, *O. suave*

Common names: African basil, tree basil, shrubby basil

Form: perennial

Flower color: white to yellow-green

Foliage color: green

Height: 2-10'

Width: 2-3'

Hardiness Zone: 10

Uses: medicinal, culinary, economic

Scent/Flavor: thyme, lemon, cloves, cinnamon, rose or carnation



***Ocimum gratissimum***

Photo by Gwen Barclay

***Ocimum kilimandscharicum***

Common names: camphor basil, feverplant

Form: perennial shrub

Flower color: white or pink

Foliage color: light green/grayish

Height: 3-6.5'

Width: 2'

Hardiness Zone: 10

Uses: medicinal, economic

Scent/Flavor: camphor

***Ocimum tenuiflorum***

Synonyms: *O. sanctum*

Common names: holy basil, sacred basil, tulsi

Form: perennial

Flower color: white, pink or purple

Foliage color: green with purple veins

Height: 1-3'

Width: 6-12"

Hardiness Zone: 10

Uses: medicinal, culinary, economic

Scent/Flavor: camphor, clove, cinnamon

***Ocimum tenuiflorum***  
**'Thai'**

Photo by Gwen Barclay



Basil Cultivar Examples \*

***Ocimum americanum* Cultivars**

**Genoa Profumatissima**

***Ocimum americanum* 'Genoa Profumatissima'**

To some discerning cooks, this 24-30" basil is considered one of the best for pesto. They say the leaves seem to have more of a spicy pungency of licorice, clove and cinnamon.

***Ocimum basilicum* Cultivars**

**Anise or Licorice**

***Ocimum basilicum* 'Anise'**

Leaves have a spicy aroma that some people detect only as licorice while other people smell more cinnamon or clove fragrance.

**Bush Green**

***Ocimum basilicum* 'Bush Green'**

Leaves have the typical basil perfume of clove, cinnamon and anise.

**Cinnamon**

***Ocimum basilicum* 'Cinnamon'**

Leaves have a spicy aroma as well as leaving a warm feeling on the tongue when tasted alone. Good in teas and baked goods (7).



***Ocimum basilicum***  
**'Cinnamon'**

Photo by Gwen Barclay

\* This section was excerpted/adapted from "Basil for the Gardener's Kitchen: Herb of the Year, 2003." *The Herbarist*. 69 (2003) by Madalene Hill and Gwen Barclay (43). Information from other sources is noted in the text.

***Ocimum basilicum* 'Genovese'**

With its very large leaves and 30" height, it has the typical familiar aroma as well as taste of the numerous basils called "sweet basil." An ideal pesto basil.

**Genoa Green**

***Ocimum basilicum* 'Genoa Green'**

Flavors include spice, licorice and mint. Perfect for pesto (7). According to Susan Belsinger, if she could only have one basil it would be 'Genoa Green' (8).

**Lettuce Leaf**

***Ocimum basilicum* 'Lettuce Leaf'**

This basil grows to about 24" in height. To most noses, the large leaves have an aroma of both licorice and cinnamon. The excellent flavor is popular for use in salads, pestos and with sliced tomatoes.

**Magical Michael**

***Ocimum basilicum* 'Magical Michael'**

'Magical Michael' is an attractive ornamental with dark bracts and flowers that mixes well with different garden flowers (1). An All America Seed Selection for 2001 (7).

**Mammoth**

***Ocimum basilicum* 'Mammoth'**

'Mammoth' is very similar in growth but has larger leaves than *O. basilicum* 'Lettuce Leaf.' The taste is similar and it is popular for pestos and salads.

**Mrs. Burns' Lemon**

***Ocimum basilicum* 'Mrs. Burns' Lemon'**

Grown since the 1920s and introduced by Mrs. Burns in 1939, 'Mrs. Burns' Lemon' is a large basil growing to 3' with a strong lemon aroma. Great in vinaigrettes, beverages and desserts (7).

**Napoletano**

***Ocimum basilicum* 'Napoletano'**

This basil, which grows to about 20", has the typical aroma of licorice or anise with a spicy overtone of cinnamon and clove. Very popular for sauces and salads.



***Ocimum basilicum* 'Genovese'**  
Photo by Susan Belsinger



***Ocimum basilicum* 'Lettuce Leaf'**  
Photo by Susan Belsinger



***Ocimum basilicum* 'Magical Michael'**  
Photo by Susan Belsinger

### New Guinea

#### *Ocimum basilicum* 'New Guinea'

This basil has narrow green leaves with dark purple coloring. Grows to about 18" with small violet flowers. The strong licorice flavor is both flowery and spicy. A fine basil for container growing.

### Nufar

#### *Ocimum basilicum* 'Nufar'

'Nufar' is a Fusarium wilt resistant cultivar that is similar to 'Genovese' and has a nice flavor (6).

### Osmin

#### *Ocimum basilicum* 'Osmin'

Developed in Germany and named after a character in Mozart's opera *Die Entführung Aüs dem Serail* (The Abduction from the Seraglio). Some noses detect a combined aroma of cinnamon, cloves and vanilla with a reminder of anise or licorice. The flavor is mild but the spicy flavor sometimes leaves the tongue a little numb, a bit like the reaction to tarragon. 'Osmin' leaves are burgundy in color, and it is one of the best basils to hold its coloring in hot weather in the South. Most colored varieties tend to become bronzy in color during the long summers with high heat.

### Piccolo

#### *Ocimum basilicum* 'Piccolo'

Some people find the tiny leaves are spicy with mint and a touch of anise while others maintain this basil smells more "herby" and flowery than anise.

### Purple Ruffles

#### *Ocimum basilicum* 'Purple Ruffles'

A 1987 All America Selection. This 18" basil is a robust, showy basil bred for its ornamental value. It has a nice sweet cinnamon or spicy aroma, but the taste is rather bland. In some areas of the South, this basil tends to lose its deep purple coloring, becoming an unattractive bronzy purple.

### Siam Queen

#### *Ocimum basilicum* 'Siam Queen' or 'True Thai'

A new introduction from Thailand, having a nice spicy aroma. This basil grows only about 18" tall and has purple blossoms forming a cone called a thyrse, rather than a spike of blossoms. Nice for cooking and flower gardens (7).

### *Ocimum basilicum* 'Sweet'

This is a catchall term for many sweet scented varieties that appear each year. These basils have a balanced fragrance of cinnamon, clove and anise making them very popular.



*Ocimum basilicum* 'New Guinea'

Photo by Gwen Barclay



*Ocimum basilicum* 'Purple Ruffles'

Photo by Susan Belsinger



*Ocimum basilicum* 'Siam Queen'

Photo by Gwen Barclay

### Well-Sweep Miniature Purple

#### *Ocimum basilicum* 'Well-Sweep Miniature Purple'

This basil grows from 12-16" with deep purple coloring. The tiny leaves have a sweet, spicy scent but with a slight bitterness. A fine plant for borders.

### *Ocimum xcitriodorum* Cultivars

#### *Ocimum xcitriodorum* 'Lemon'

The dominant aroma of this 24" basil comes through as a lemon balm scent. Flowers develop on this basil sometimes when it is only a 4 or 5" plant. It is difficult to keep this 1940 Thailand basil introduction from blooming, thereby reducing the fragrance of the leaves. Drastic pruning to encourage new leaf production is the solution.

#### Lesbos

#### *Ocimum xcitriodorum* 'Lesbos'

'Lesbos' has fine flavor with dark green leaves, with upright growth and seldom blossoms. This plant is also known as 'Aussie Sweetie' and 'Greek Column' (Columnar).

Great in baked goods and teas (7).

#### Spicy Globe

#### *Ocimum xcitriodorum* 'Spicy Globe'

'Spicy Globe' is a compact plant growing only to about 10" tall. It has a strong spicy aroma. The flavor on the tongue is perfumed but pungent and slightly hot. When growing from seed it is necessary to make selections if this basil is to be used as a border plant. There will be some variance in leaf size and some plants will grow more than 10" tall. They are easily spotted and can be sorted out before planting.

#### Sweet Dani

#### *Ocimum xcitriodorum* 'Sweet Dani'

'Sweet Dani' was developed and introduced by Dr. James Simon, formerly at Purdue University. Leaves have a lemon aroma. This 24" tall basil is named for his daughter, Dani.



*Ocimum xcitriodorum* 'Lesbos'  
Photo by Susan Belsinger



*Ocimum xcitriodorum*  
'Sweet Dani'  
Photo by Susan Belsinger

### Other Basil Cultivars

#### **African Blue**

***Ocimum* 'Dark Opal' x *O. kilmandscharicum* 'African Blue'**

'African Blue' is a large bushy plant growing to 4'. Not usually considered a culinary basil, but useful in flower arrangements and as a landscape plant. Flavor is sweet, but to some this basil has strong balsam tones with a hint of turpentine.

#### **Clove**

***Ocimum gratissimum***

**(clove chemotype, alias *O. suave* or *O. trichodon*)**

This basil will grow into a 5' small tree if container grown and protected in winter. Leaves are strong with a clove aroma as well as a clove flavor. Leaves can be used in fruit punches and poaching liquid. It is sometimes incorrectly referred to as *O. gratissimum* 'Clove.' However, it is not a cultivar; it is just one of several chemotypes of *O. gratissimum* having different signature fragrances.

#### **Red Rubin**

***Ocimum basilicum* x *O. forskolei* 'Red Rubin'**

A relatively new basil from Denmark with leaves that are cinnamon-scented. 'Red Rubin' grows to about 20" and holds its lovely color in hot summers. A beautiful plant to grow and use.

#### **Thai**

***Ocimum tenuiflorum* 'Thai'**

This plant also has the common name holy basil. This 24" basil in either the purple or green form has a delicate taste of clove. The aroma also resembles clove.



***Ocimum tenuiflorum* 'Thai'**  
Photo by Gwen Barclay

**See the *Promising Plants* section of the HSA website for more information on promising basils.**

## Literature Citations

1. Adams, James. 2003. Interview by Michele Meyers. June 5.
2. Aruna, K. and Sivaramakrishnan, V. 1992. Anticarcinogenic effects of some Indian plant products. *Food chem. toxicology*. 30: 953-956.
3. Bagust, Harold. 1992. *The gardener's dictionary of horticultural terms*. London: Cassell. (HSA Library)
4. Becker, Jim. 2000. Herbs are for butterflies, too. *The herbarist*. 66: 59-62. (HSA Library)
5. Belsinger, Susan. 1990. *Flowers in the kitchen: a bouquet of tasty recipes*. Loveland, CO: Interweave Press. (HSA Library\*)
6. \_\_\_\_\_. 2002. A 21-basil salute. *Organic gardening*. Sept/Oct: 34-37.
7. \_\_\_\_\_. 2003. *Get to know the basil!* (unpublished handout).
8. \_\_\_\_\_. 2003. Interview by Michele Meyers. June 3.
9. \_\_\_\_\_. 2003. Personal correspondence. July 7.
10. Belsinger, Susan and Carolyn Dille. 1995. *The greens book*. Loveland, CO: Interweave Press. (HSA Library\*)
11. Beston, Henry. 1935, 1990. *Herbs and the earth*. Boston: David R. Godine. (HSA Library\*)
12. Blumenthal, Mark, ed. 1998. *The complete German Commission E monographs: therapeutic guide to herbal medicines*. Austin, TX: American Botanical Council. (HSA Library)
13. Boccaccio, Giovanni. 1921. *The decameron of Giovanni Boccaccio* [online]. Trans. J.M. Rigg. London. [accessed May 29, 2003]. Available from World Wide Web (<http://dev.stg.brown.edu:8080/decameron/engDeclIndex.jsp>).
14. Bown, Deni. 2001. *The Herb Society of America new encyclopedia of herbs and their uses*. New York: DK, 2001. (HSA Library\*)
15. Brickell, Christopher and Judith D. Zuk, eds. 1996. *The American Horticultural Society a-z encyclopedia of garden plants*. New York: DK. (HSA Library)
16. Buchanan, Rita. 1987. Herbal moth repellents. *The herbarist*. 53:35-42. (HSA Library)
17. Clarkson, Rosetta E. 1942. *Magic gardens: a modern chronicle of herbs and savory seeds*. New York: Macmillan. (HSA Library\*)
18. Cranch, Robbie L. 1991. Herbs for a medieval feast. *Herb companion*. Dec/Jan 3(2): 14-23.
19. Culpeper, Nicholas. 1652. *The English physitian: or an astrologo-physical discourse of the vulgar herbs of this nation* [online]. London: Peter Cole. [accessed May 28, 2003]. Available from World Wide Web (<http://www.info.med.yale.edu/library/historical/culpeper/b.htm>).
20. Cunningham, Scott. 2000. *Cunningham's encyclopedia of magical herbs*. St. Paul, Minnesota: Llewellyn Publications. (HSA Library\*)
21. Darrah, Helen H. 1980. *The cultivated basil*. Independence, MO: T.E. Thomas. (HSA Library\*)
22. Dean, S., Svoboda, K. and Bartlett, M. 1991. Effect of microwave oven and warm-air drying on the microflora and volatile oil profile of culinary herbs. *Journal of essential oil research*. 3: 341-7.
23. DeBaggio, Thomas and Susan Belsinger. 1996. A basil harvest. *The herb companion*. Aug/Sept 1996: 32-40. (HSA Library)
24. \_\_\_\_\_. 1996. *Basil: an herb lover's guide*. Loveland, CO: Interweave Press. (HSA Library\*)
25. DeLauro, Joan. 2003. Interview by Michele Meyers. May 30.
26. Dobelis, Inge N. 1984. *Magic and medicine of plants*. Pleasantville, NY: Reader's Digest Association. (HSA Library)
27. Dudai, Nativ et al. 2002. Breeding of sweet basil (*Ocimum basilicum*) resistant to Fusarium wilt

- caused by *Fusarium oxysporum* f.sp. *basilicum*. *Journal of herbs, spices & medicinal plants*. 9(2/3): 45-51. (HSA Library)
28. Duke, James A. 1977. *Quart. j. crude drug res.* 15:189-233.
  29. Duke, James A. 2002. *Handbook of medicinal herbs*. Boca Raton: CRC Press. (HSA Library)
  30. Dyer, T.F. Thiselton. 1889. *The folk-lore of plants*. New York: D. Appleton and Company. (HSA Library)
  31. Eaton, Alan. 2000. *Cutworms* [online]. University of New Hampshire Cooperative Extension. [accessed July 2003]. Available from World Wide Web (<http://ceinfo.unh.edu/Agriculture/cutworms.pdf>).
  32. Flint, Mary Louise. 1990. *Pests of the garden and small farm: a grower's guide to using less pesticide*. Statewide Integrated Pest Management Project, University of California, Division of Natural Resources Publication 3332. Oakland, CA: University of California Regents. (HSA Library\*)
  33. Gerard, John. 1975. *The herbal or general history of plants: the complete 1633 edition as revised and enlarged by Thomas Johnson*. New York: Dover Publications. (HSA Library)
  34. Gips, Kathleen M. 1990. *The language of flowers: a book of Victorian floral sentiments*. Chagrin Falls, OH: Pine Creek Press. (HSA Library\*)
  35. Grieve, Mrs. M. 1931. *A modern herbal: The medicinal, culinary, cosmetic and economic properties, cultivation and folk-lore of herbs, grasses, fungi, shrubs & trees with all their modern scientific uses*. New York: Harcourt Brace & Company, vol. 1. (HSA Library)
  36. \_\_\_\_\_. 1934. *Culinary herbs and condiments*. New York: Harcourt Brace. (HSA Library)
  37. Gupta, Shakti M. 1971. *Plant myths and traditions in India*. Leiden: E.J. Brill. (HSA Library)
  38. Hampstead, Marilyn. *The basil book*. New York: Pocket Books, 1984. (HSA Library\*)
  39. Hanson, Beth. 2000. *Natural disease control*. Brooklyn, NY: Brooklyn Botanic Garden. (HSA Library\*)
  40. Harvey, John. 1981. *Mediaeval gardens*. Beaverton, OR: Timber Press. (HSA Library\*)
  41. Hemphill, Ian. 2000. *The spice and herb bible*. Toronto: Robert Rose. (HSA Library\*)
  42. Hill, Madalene. 2003. Personal correspondence. August 26.
  43. Hill, Madalene and Gwen Barclay. 2003. Basils for the gardener's kitchen: herb of the year, 2003. *The herbarist*. 69: 4-11. (HSA Library)
  44. \_\_\_\_\_. 2003. Interview by Michele Meyers. June 3.
  45. \_\_\_\_\_. 2003. Personal correspondence. August 6, 8.
  46. Holm, Yvonne. 1999. Bioactivity of Basil. In *Basil: the genus Ocimum*. Edited by Raimo Hiltunen and Yvonne Holm. Australia: Harwood Academic Publishers. (HSA Library)
  47. Huxley, Anthony, ed. 1992. *The New Royal Horticultural Society dictionary of gardening*, vol. 3. New York: Stockton Press. (HSA Library)
  48. Integrated Taxonomic Information System database [online]. 2002. [accessed July 2003]. Available from World Wide Web (<http://www.itis.usda.gov>).
  49. Johnson, Tim. 2002. *HerbWeb* CD-ROM. (HSA Library)
  50. Keats, John. 1990. *John Keats*. Edited by Elizabeth Cook. New York: Oxford University Press.
  51. Langan, Mark. 2003. Interview by Michele Meyers. June 5.
  52. Langan, Mark. 2003. Personal correspondence. August 27.
  53. Larran, Silvina et al. 2001. In vitro fungistatic effect of essential oils against *Ascosphaera apis*. *Journal of essential oil research*. March/April; 13: 122-124.
  54. Laufer, Geraldine Adamich. 1993. *Tussie-mussies: the Victorian art of expressing yourself in the language of flowers*. New York: Workman. (HSA Library\*)
  55. Lawless, Julia. 1992. *The encyclopedia of essential oils*. Rockport, MA: Element Books. (HSA Library)

56. Lust, J.B. 1974. *The herb book*. New York: Bantam Books.
57. Mäkinen, Seija Marjatta and Kirsti Kaarine Paakkonen. 1999. Processing and use of basil in food-stuffs, beverages and in food preparation. In *Basil: the genus Ocimum*. Edited by Raimo Hiltunen and Yvonne Holm. Australia: Harwood Academic Publishers. (HSA Library)
58. McNall, Sally Allen. 1988. Sweet basil. *Kansas quarterly*. 20(3): 147-148.
59. Millay, Edna St. Vincent. 1956. *Collected poems of Edna St. Vincent Millay*. Edited by Norma Millay. New York: Harper & Row.
60. Ngassoum, M.B. et al. 2003. Antimicrobial study of essential oils of *Ocimum gratissimum* leaves and *Zanthoxylum xanthoxyloides* fruits from Cameroon. *Fitoterapia*. Apr; 74(3): 284-7.
61. Nyarko A.K. et al. 2002. Extract of *Ocimum canum* lowers blood glucose and facilitates insulin release by isolated pancreatic beta-islet cells. *Phytomedicine*. May; 9(4):346-51.
62. Ogden, Ellen Ecker. 1990. *Growing & using basil*. Storey Communications. (HSA Library\*)
63. Opalchenova, G. and D. Obreshkova. 2003. Comparative studies on the activity of basil-an essential oil from *Ocimum basilicum* L.-against multidrug resistant clinical isolates of the genera *Staphylococcus*, *Enterococcus* and *Pseudomonas* by using different test methods. *J Microbiol Methods*. Jul; 54(1): 105-10.
64. Parkinson, John. 1904. *Paradisi in sole: paradisus terrestris, faithfully reprinted from the edition of 1629*. London: Methuen & Co. (HSA Library)
65. Paton, Alan. 1992. A synopsis of *Ocimum* L. (Labiatae) in Africa. *Kew bulletin*. 47: 403-435.
66. Paton, Alan, R.M. Harley and M.M. Harley. 1999. *Ocimum*: an overview of classification and relationships. In *Basil: the genus Ocimum*. Edited by Raimo Hiltunen and Yvonne Holm. Australia: Harwood Academic Publishers. (HSA Library)
67. *PDR for Herbal Medicines*, 2<sup>nd</sup> ed. Montvale, NJ: Medical Economics, 2000. (HSA Library)
68. *Poem finder* [online]. 2003. Roth Publishing. [accessed July, August 2003]. Available from World Wide Web (<http://www.litfinder.com/poemfinder>).
69. Reppert, Bertha. 1984. *Bertha Reppert's herbs of the zodiac*. Mechanicsburg, PA: Rosemary House. (HSA Library\*)
70. Ross, Marty. 1996. A basil knot garden. *Flower & garden*. February-March: 45-7.
71. Schulz, Warren. 1999. *Natural insect control*. Brooklyn, NY: Brooklyn Botanic Garden. (HSA Library\*)
72. Simon, James E. 1995. *Basil newcrop factsheet* [online]. West Lafayette, IN: Purdue University. [accessed May 29, 2003]. Available from World Wide Web (<http://www.hort.purdue.edu/newcrop/CropFactSheets/basil.html>).
73. Simon, James E., Alena F. Chadwick and Lyle E. Craker. 1984. *Herbs: an indexed bibliography 1971-1980: the scientific literature on selected herbs, and aromatic and medicinal plants of the temperate zone*. Archon Books. (HSA Library)
74. Skinner, Charles M. *Myths and legends of flowers, trees, fruits & plants in all ages and in all climes*. Philadelphia: J.B. Lippincott, 1911, 1925.
75. Small, Ernest. 1997. *Culinary herbs*. Ottawa: National Research Council of Canada. (HSA Library)
76. Talbot, Rob and Robin Whiteman. 1997. *Brother Cadfael's herb garden: an illustrated companion to medieval plants and their uses*. Boston: Little Brown, 1997. (HSA Library\*)
77. Tan, P.V. et al. 2002. Gastric cytoprotective anti-ulcer effects of the leaf methanol extract of *Ocimum suave* (Lamiaceae) in rats. *J ethnopharmacol*. Oct; 82(2-3): 69-74.
78. Tucker, Arthur O. 2003. Personal correspondence. May 28, July 30.
79. Tucker, Arthur O. and Thomas DeBaggio. 2000. *The big book of herbs: a comprehensive illustrated reference to herbs of flavor and fragrance*. Loveland, CO: Interweave Press, 2000. (HSA Library\*)

80. U.S. Department of Agriculture, Agricultural Research Service. 2002. *USDA national nutrient database for standard reference*, release 15 [online]. Nutrient data laboratory home page. [accessed May 27, 2003]. Available from World Wide Web (<http://www.nal.usda.gov/fnic/foodcomp>).
81. Valenzuela, Hector R. and Randall Hamasaki. 1995. Effect of composts and synthetic nitrogen fertilizer on growth and nematode infestation in lettuce and basil. *HortScience*. 30:86.
82. Webster, Helen Noyes. 1936. Seven basilis. *The herbarist*. 2: 34-41. (HSA Library)
83. Wiersema, John H. and Blanca Leon. 1999. *World economic plants*. Boca Raton: CRC Press. (HSA Library)
84. Wilcox, Tina Marie. 2003. Interview by Michele Meyers. June 24.
85. \_\_\_\_\_. 2003. Personal correspondence. August 3.

## Additional References

---

- Belsinger, Susan. "Basil Basics." *Fine Gardening*. 91: 52-54.
- Coons, Leslie. "The Rich Variety of Vietnam." *The Herb Companion*. 15(4) (April/May 2003):18-23. (HSA Library)
- Dille, Carolyn and Susan Belsinger. "Pasta & Herbs." *The Herb Companion*. 8(4) (April/May 1996): 35-41. (HSA Library)
- Hemphill, John and Rosemary. *What Herb Is That?* Mechanicsburg, PA: Stackpole Books, 1997. (HSA Library\*)
- Hill, Madalene and Gwen Barclay. *Southern Herb Growing*. Fredericksburg, TX: Shearer Publishing, 1987. (HSA Library\*)
- Holmes, Caroline. *New Shoots, Old Tips* [online]. BBC Radio 4. [accessed May 27, 2003]. Available from World Wide Web ([http://www.bbc.co.uk/radio4/discover/archive\\_features/203.shtml](http://www.bbc.co.uk/radio4/discover/archive_features/203.shtml)).
- Lange, Diana L. and Arthur C. Cameron. "Pre-and Postharvest Temperature Conditioning of Greenhouse-grown Sweet Basil." *HortScience*. 32(1) (1997):114-116.
- Loughrin, John H. and Michael J. Kasperbauer. "Light Reflected from Colored Mulches Affects Aroma and Phenol Content of Sweet Basil (*Ocimum basilicum* L.) Leaves." *J. Agric. Food Chem.* 49 (2001): 1331-1335.
- Plants for a Future Database* [online]. [accessed July 2003]. Available from World Wide Web ([http://www.ibiblio.org/pfaf/cgi-bin/arr\\_html?Ocimum+basilicum](http://www.ibiblio.org/pfaf/cgi-bin/arr_html?Ocimum+basilicum)).
- Rinzler, Carol Ann. *The New Complete Book of Herbs, Spices & Condiments*. New York: Checkmark Books, 2001. (HSA Library)
- Tucker, Arthur O. "Herbs vs. Bugs: Scents can Discourage Flies, Fleas, and Other Bothersome Insects." *The Herb Companion*. 6(5) (June/July 1994): 44-47. (HSA Library)
- VanNostrand, Gillian and Christie V. Sarles. *Alewife's Garden: 7 Radical Weeds for Brewing Herbal Ales*. Mirror Lake, NH: Radical Weeds, 2002. (HSA Library\*)

(HSA Library) = works included in HSA Library collection

\* = works that circulate to HSA members

**See the HSA Library Resources section of this guide for additional titles and information.**

## HSA Library Basil Resources

The following list is a selection of basil resources in the HSA Library collection. Items denoted with \* circulate to HSA members. The library includes a wide variety of materials with information on basil. Please contact the HSA librarian at [library@herbsociety.org](mailto:library@herbsociety.org) for additional information.

### Books

\* Bown, Deni. *The Herb Society of America New Encyclopedia of Herbs & Their Uses*. New York: DK, 2001.

Includes a general overview of the genus with profiles of *Ocimum* 'African Blue,' *O. americanum*, *O. basilicum*, *Ocimum xcitriodorum*, *O. gratissimum*, *O. kilimandscaricum*, *O. minimum*, and *O. tenuiflorum*. Also includes color photographs.

\* Darrah, Helen. H. *The Cultivated Basils*. Independence, MO: Buckeye, 1980.

A classic and often cited basil text with descriptions of major species. Includes information on essential oils, horticulture, uses, folklore and history. With black and white line drawings.

\* DeBaggio, Thomas and Susan Belsinger. *Basil: An Herb Lover's Guide*. Loveland, CO: Interweave Press, 1996.

This book from two of HSA's expert members includes history/folklore, cultivation, harvesting and recipes, with profiles of forty-four species and varieties. Considered by many to be the basil bible.

\* Hampstead, Marilyn. *The Basil Book*. New York: Pocket Books, 1984.

This eclectic little book includes recipes, indoor and outdoor growing information, harvesting, preserving, homemade basil cosmetic treatments, instructions for a basil maze, knot garden and salad border. Includes profiles of fourteen popular basils.

\* Hazen, Janet. *Basil*. San Francisco, CA: Chronicle, 1993.

Primarily a recipe book, including appetizers, soups & salads, entrees and desserts.

\* Hill, Madalene and Gwen Barclay. *Southern Herb Growing*. Fredericksburg, TX: Shearer Publishing, 1987.

This general reference on herbs for the South from HSA experts Hill and Barclay includes information on culture, varieties, preservation, drying, and using basil in the kitchen. Color photographs and recipes for Basil-Lime cookies and Basil Dip for Artichokes are also included.

Hiltunen, Raimo and Yvonne Holm, eds. *Basil: The Genus Ocimum*. Australia: Harwood Academic Publishers, 1999.

A collection of research articles: "Ocimum: An Overview of Classification and Relationships" by A. Paton, R.M. Harley and M.M. Harley, "Production Systems of Sweet Basil" by E. Putievsky and B. Galambosi, "Chemical Composition of *Ocimum* Species" by R. Hiltunen, "Essential Oil of *Ocimum*" by R. Hiltunen and Y. Holm, "Bioactivity of Basil" by Y. Holm, and "Processing and Use of Basil in Foodstuffs, Beverages and in Food Preparation" by S.M. Makinen and K.K. Paakkonen.

Small, Ernest. *Culinary Herbs*. Ottawa: NRC Research Press, 1997.

This in-depth text provides information on *O. americanum*, *O. gratissimum*, *O. kilimandscaricum*,

## Basil: An Herb Society of America Guide

*O. campechianum*, *O. basilicum*, and *O. tenuiflorum*. Sections include description, taxonomy, history, uses, recipe sources, importance, cultivation, harvest & storage, cultivars, chemistry, medicine, nutrition and curiosities. Also includes black and white line drawings and information on non-*Ocimum* basil.

\* Tucker, Arthur O. and Thomas DeBaggio. *The Big Book of Herbs*. Loveland, CO: Interweave Press, 2000.

This book by HSA expert members Tucker and DeBaggio provides information on *O. americanum*, *O. basilicum*, *O. campechianum*, *O. xcitriodorum*, *O. gratissimum*, *O. kilimandscharicum*, and *O. tenuiflorum*, with detailed description, nomenclature, chemistry, uses, cultivation, and pests/diseases information. Each species includes a botanical key. One of the most authoritative sources on the subject.

### Videos

\* *Sweet Basil: The Culinary Classic* - North Carolina A & T State University Cooperative Extension Program (1992) - 16 minutes

This brief video provides information for small farmers considering growing basil as an alternative crop and addresses a variety of topics including cultivation, harvesting, pests, and marketing.

### Pamphlets

\* HSA Tidewater Unit. *Basil: 2003 Herb of the Year*. Virginia Beach, VA: HSA Tidewater Unit, 2003.

The Tidewater Unit's herb study group guide for basil includes "Botany and Chemistry of Basil," "Growing Basil in Tidewater," "Propagation of Basil," plus sections on economic, medicinal and culinary uses, history and folklore, literature and art, and "Famous People Named Basil."

\* Ogden, Ellen. *Growing & Using Basil*. Storey Communications, 1990.

This 32-page booklet covers cultivation, harvesting, and profiles of sweet basil, lettuce leaf basil, bush, purple, scented and rare basil. Also includes recipes and seed/plant sources.

\* Turner, Linda Y. *Razzle Dazzle Basil*. Cleveland, OH: Western Reserve Herb Society, 2003.

Basil history, cultivation, harvesting, preserving, uses and recipes are included in this "Little Book" from HSA's Western Reserve Unit.

\* Voigt, Charles E. *Bombastic Basil: Herb of the Year 2003*. Jacksonville, FL: International Herb Association, 2003.

This brief guide includes information on popular varieties, propagation, medicinal indications, production problems, harvesting, drying, landscape use and recipes.

### Selected Articles from *The Herbarist*

Adams, Denise. "New and Unusual Herbs for the Garden." *The Herbarist*. 62 (1996): 51-52.

Includes recommendations from an Ohio nursery owner, including Mrs. Burns' Lemon basil, New Guinea basil and Thai basil.

Betts, Kay. "Resembling a Citron Pill." *The Herbarist*. 19 (1953): 47-50.

Lemon basil is one of the lemon-scented plants discussed (see page 48).

Buchanan, Rita. "Herbal Moth Repellents." *The Herbarist*. 53 (1987): 35-42.

Page 39 provides information on growing, harvesting and using *O. kilimandscharicum* (camphor basil) and includes a instructions for making herbal moth repellent bags using camphor basil.

Darrah, Helen. "The Basils in Folklore and Biological Science." *The Herbarist*. 38 (1972): 3-10.

Darrah discusses the history and folklore *O. basilicum*, *O. sanctum* (*O. tenuiflorum*), and *O. canum* (*O. americanum*) as well as her research involving *O. kilimandscharicum*, *O. sanctum*, *O. citriodorum* and different varieties of *O. basilicum*.

Darrah, Helen. "The Clove Scented Basil: *Ocimum gratissimum*." *The Herbarist*. 44 (1978): 30-37.

Description, uses and cultivation information are included with comparisons of India and Pennsylvania grown plants. Also includes comparison of *O. gratissimum* and *O. basilicum* with black and white photographs of *O. gratissimum*.

Hill, Madalene and Gwen Barclay. "Basils for the Gardener's Kitchen: Herb of the Year, 2003." *The Herbarist*. 69 (2003): 4-11.

HSA expert members Hill and Barclay discuss basil history, description, cultivation, drying, recipes and cultivars. Selected recipes and the cultivars section were excerpted for this guide.

Moody, Susan Taylor. "Herbal Traditions of Poland: A Horticulturalist's Report." *The Herbarist*. 58 (1992): 71-83.

*O. basilicum* is one of sixteen plants (not all basils) discussed in this article. Page 80 includes a recipe for Polish basil tea.

Webster, Helen Noyes. "A Correction: Notes on the True Identity of *Ocimum salinum*, the So-called "Saline Basil" of Chile." *The Herbarist*. 3 (1937): 40-41.

This article discusses *Frankenia salina*, which had been identified incorrectly in Webster's 1936 article as saline basil.

Webster, Helen Noyes. "Seven basils." *The Herbarist*. 2 (1936): 34-41.

Discusses *O. sanctum* (*O. tenuiflorum*), *O. indicum*, *O. suave*, *O. gratissimum*, *O. micranthum*, *O. basilicum* and *O. minimum*.

## **Other Articles**

"Bravos & Blessings from Basil's Biggest Fans." *The Herb Companion*. 15(5) (June/July 2003): 44-49.

*Herb Companion* contributors, including several HSA members, discuss their favorite basils and basil uses. Includes color photographs.

DeBaggio, Thomas. "Purple Basils." *The Herb Companion*. 6(4) (Apr/May 1994): 62-71.

Covers *O. basilicum* cultivars 'Dark Opal,' 'Purpurascens,' 'Rubin,' 'Purple Ruffles,' 'New Guinea,' and 'Holly's Painted' plus *O. 'African Blue,'* purple bush basils and others. Includes source list and color photos.

DeBaggio, Thomas and Susan Belsinger. "A Basil Harvest." *The Herb Companion*. 8(6) Aug/Sept 1996: 32-40.

This article is excerpted from *Basil: An Herb Lover's Guide* and includes growing, harvesting,

storing and uses, with several pages of recipes and a page devoted to pesto.

Dudai, Nativ et al. "Breeding of Sweet Basil (*Ocimum basilicum*) Resistant to Fusarium Wilt Caused by *Fusarium oxysporum* f.sp. *basilicum*." *Journal of Herbs, Spices & Medicinal Plants*. 9(2/3) (2002): 45-51.

Discusses 'Nufar' and *Fusarium* resistant varieties developed in Israel: 'Perrie,' 'Niri,' 'Hagar' and 'Cardinal.'

Gang, David R. et al. "Peltate Glandular Trichomes of *Ocimum basilicum* L. (Sweet Basil) Contain High Levels of Enzymes Involved in the Biosynthesis of Phenylpropenes." *Journal of Herbs, Spices & Medicinal Plants*. 9(2/3) (2002): 189-195.

This research article discusses the discovery that the essential oil constituents eugenol and methylchavicol, which make basil important economic plants, are found in the peltate glands of the cultivars studied. These glands are located in the plant's leaves, stems, sepals and flowers.

Hampstead, Marilyn. "Basil." *The Herb Companion*. 1(5) (June/July 1989): 20-25.

Basil history, cultivation, garden uses, harvesting and pests are covered in this article. Also includes seed sources, color photographs and a chart with width, height, flower/leaf color and comments on thirteen types of basil.

Kruger, Hans, Sabine B. Wetzel and Barbel Zeiger. "The Chemical Variability of *Ocimum* Species." *Journal of Herbs, Spices & Medicinal Plants*. 9 (4) (2002): 335-344.

A report of the chemical composition of essential oils of samples from the Institute of Plant Genetics and Crop Plant Research Gatersleben.

Ogden, Ellen. "Basil, Glorious Basil." *The Herb Companion*. 3(5) (June/July 1991): 18-23.

Includes a brief overview of sweet, bush, lettuce leaf, purple and scented basil plus cultivation information, sources and recipes. With color photos.

Rakic, Zivojin and Christopher B. Johnson. "Influence of Environmental Factors (Including UV-B Radiation) on the Composition of the Essential Oil of *Ocimum basilicum* – Sweet Basil." *Journal of Herbs Spices & Medicinal Plants*. 9 (2/3) (2002): 157-162.

Researchers studied three varieties of greenhouse grown basil for 1 year: "broad-leaved sweet basil (Vilmorin, La Verpilliere Cedex, France)," "small-leaved sweet bush basil (Megastar)" and a "small-leaved Greek variety (obtained locally)." They exposed plants to supplemental UV-B radiation by placing plants under special lights. Leaves were dried and analyzed. Results showed that seasons affected the amounts of the chemical constituents, but was less pronounced in the megastar variety. Only the broad leaved variety was affected by UV-B, increasing monoterpenes and phenyl-propanoids.

Vieira, Roberto F. and James E. Simon. "Chemical Characterization of Basil (*Ocimum* spp.) Found in the Markets and Used in Traditional Medicine in Brazil." *Economic Botany*. 54(2) (2000): 207-216.

A study of the composition of chemical constituents in the essential oils of *O. americanum*, *O. basilicum*, *O. campechianum*, *O. gratissimum* and *O. selloi*.

Voigt, Charles E. "Bombastic Basil." *The Michigan Herb Journal*. 17(1) (Spring 2003): 1,10-11.

This article includes much of the same text as the IHA booklet, *Bombastic Basil: Herb of the Year 2003*, minus the recipes.

Wetzel, et al. "Investigations on Morphological, Biochemical and Molecular Variability of *Ocimum* L. Species." *Journal of Herbs, Spices & Medicinal Plants*. 9(2/3) (2002):183-187.

This study involved varieties of *O. basilicum*, *O. americanum*, *O. xcitriodorum*, *O. campechianum*, *O. gratissimum*, *O. kilimandscharicum*, *O. minimum*, *O. selloi* and *O. tenuiflorum* and assessed differences in physical characteristics and essential oil content among varieties.

Wuerthner, Terri. "A Basil Banquet." *The Herb Companion*. (June/July 1989): 26-29.

This culinary article includes information on preserving and recipes, with specific recommendations for cooking with scented basil and several varieties of sweet basil.

*Please see the Literature Citations list for additional resources. The HSA library also includes a large selection of general books on cooking and herbal beverages that include basil recipes. Contact the HSA librarian at [library@herbsociety.org](mailto:library@herbsociety.org) for additional information.*

*For additional/current research articles, search the bibliographic databases on the library links page of the HSA website: <http://www.herbsociety.org/library/links11.htm>.*

***For a list of basil websites, see the library links pages <http://www.herbsociety.org/library/links10.htm>.***