**Growing Plants for Hawaiian Lei**

### ageratum

**Other Common Names:** floss flower, maile-hohono  
**Scientific Name:** Ageratum houstonianum  
**Family:** Asteraceae (formerly Compositae) (aster family)  
**Natural Setting/Location:** Central America  

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**CURRENT STATUS IN THE WILD IN HAWAI‘I:** naturalized in some areas, but its rangy form of growth in the wild generally precludes wild-collected flowers being used in lei  

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**Growing your own**

**Handling Caution:** the plant contains coumarin and is toxic if eaten; contact can irritate mucous membranes in people sensitive to it

**Propagation**

**Form:** seeds  
**Planting Depth:** broadcast seeds; do not cover with any soil or medium; light aids germination  
**Germination Time:** 7–10 days

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**Preferred Production Conditions**

**General Soil Characteristics:** best in rich, moist, well-drained media; generally produced in pots  
**Light:** full sun to partial shade  
**Water:** irrigate abundantly  
**Soil Temperature:** 75–82°F  
**Salt Tolerance:** poor

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**Management**

**Fertilizer Needs:** light  
**Recommended Spacing:** 6–10”  
**Adaptation to Growing in Containers:** yes, 3–4” pots

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**Special Cultural Hints:** liberally reseeds itself and may become a pest
ageratum

**Plant characteristics**

**HEIGHT:** 6–9” (dwarf); 2–2½’ (other varieties)

**SPREAD:** 6–20”

**GROWTH HABIT:** loose, spreading, herba-
aceous

**FLOWERS**

**SIZE:** ¼–½”

**COLOR:** shades of blue, light purple, pink, white

**SHAPE:** tassel-like flowers in dense clus-
ters

**FRAGRANCE:** none

**TIME TO FLOWERING:** 12–13 weeks for
dwarf varieties; others take several weeks longer

**INDUCING AND MAINTAINING FLOWERING:**
remove dead and old flowers to pro-
mote development of new ones

**PESTS**

**COMMON DISEASES:** powdery mildew, root rot

**OTHER PESTS:** aphids, slugs, snails, spider mites, whiteflies

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**Harvesting considerations**

**WHAT IS HARVESTED:** flower with 1–2” of stem free of leaves

**HARVESTING TECHNIQUES:** cut

**BEST TIME OF DAY TO HARVEST:** early morning

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**Notes on lei making**

**BEST WAY TO TRANSPORT FROM PICKING AREA:** plastic bag

**AVOID CONTACT WITH THESE PRODUCTS:** smoke, car exhaust, ripening fruits, wilting flowers

**BEST FOR WHICH TYPE OF LEI:** neck, head, wrist, ankle

**VASE LIFE:** 1 day

**CLEANING OF PLANT MATERIALS:** cut stem, remove old foliage; avoid wetting flower heads

**STORING RAW LEI MATERIALS:** put stems in water with flower heads above water; flower heads tend to blacken with overwatering and being covered with paper; refrigerate at 40°F for up to 5 days

**PREPARING FOR USE IN LEI:** clip wrinkled, limp, or poor-quality areas before adding to lei

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**References and further reading**


Growing Plants for Hawaiian Lei

**Growing your own**

**PROPAGATION**

**FORM:** primarily seeds; has a low level of self-sowing from one year to the next

**PLANTING DEPTH:** broadcast seeds; do not cover with any soil or medium; light aids germination; best to water seeds with warm water

**GERMINATION TIME:** 7–10 days

**PREFERRED PRODUCTION CONDITIONS**

**GENERAL SOIL CHARACTERISTICS:** well drained, average fertility; will grow in poor soils

**LIGHT:** full sun to partial shade

**WATER:** moderately

**SOIL TEMPERATURES:** 78–80°F

**MANAGEMENT**

**FERTILIZER NEEDS:** light

**RECOMMENDED SPACING:** 8”

**ADAPTATION TO GROWING IN CONTAINERS:** yes, 5” pots

**SPECIAL CULTURAL HINTS:** can be cut back repeatedly and fertilized lightly after each cut; may stop flowering in periods of extreme heat; can be produced in pots

**FLOWERS**

**SIZE:** tiny

**COLOR:** white, pink, lavender, yellow

**SHAPE:** 4-petaled (with the petals of equal size)

**FRAGRANCE:** honey-like

**TIME TO FLOWERING:** 10–11 weeks

**INDUCING AND MAINTAINING BLOOMING:** to prolong flowering season, cut them down by half after the first flush of flowers and they will bloom again; flowers profusely under cool (60–68°F) temperature

**Plant characteristics**

**HEIGHT:** 4–8”

**SPREAD:** 10–15”

**GROWTH RATE:** medium

**GROWTH HABIT:** low, branching, trailing

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**a** **lyssum**

**OTHER COMMON NAMES:** sweet alyssum, sweet alison

**SCIENTIFIC NAME:** Lobularia maritima (L.) Desv.

**FAMILY:** Brassicaceae (mustard family)

**NATURAL SETTING/LOCATION:** Mediterranean

**CURRENT STATUS IN THE WILD IN HAWAI’I:** naturalized in Kula, Maui

Growing Plants for Hawaiian Lei

**PESTS**

**COMMON DISEASES:** sensitive to damping off, powdery and downy mildew  
**COMMON INSECT PESTS:** aphids, thrips

**Harvesting considerations**

**WHAT IS HARVESTED:** flowers  
**HARVESTING TECHNIQUES:** cut  
**BEST TIME OF DAY TO HARVEST:** early morning  
**BEST WAY TO TRANSPORT FROM PICKING AREA:** cooler or wet newspaper  
**AVOID CONTACT WITH THESE PRODUCTS:** smoke, car exhaust, ripening fruits, wilting flowers

**Notes on lei making**

**BEST FOR WHICH TYPE OF LEI:** neck, head, wrist, ankle  
**VASE LIFE:** 1 day  
**CLEANING OF PLANT MATERIALS:** cold water soak  
**STORING RAW LEI MATERIALS:** refrigerate at 40°F for up to 10 days  
**PREPARING FOR USE IN LEI:** clean leaves and old seed pods, cut 2", place stem in water  
**STORING A COMPLETED LEI BEFORE WEARING:** immerse whole lei in water and drip dry; place in wet tissue, then place in sealed plastic container and refrigerate  
**PRESERVING A LEI FOR LONG-TERM STORAGE OR DISPLAY:** cannot be preserved

**References and further reading**


**ALERT:** *Lobularia maritima* can be an invasive species and cause problems in natural areas in Hawai‘i. It scores a rating of 8 on the Hawai‘i-Pacific Weed Risk Assessment (HPWRA). The HPWRA predicts whether any given plant is at low or high risk of becoming invasive in Hawai‘i or similar Pacific islands and is about 95% accurate. Any score above 6 indicates the potential for invasiveness though there are varying levels of concern. The HPWRA score does not necessarily mean you should remove established plants from urban landscapes or avoid planting them at all, but *L. maritima* should not be introduced to areas where it is not already growing. *L. maritima* has already naturalized in some places on O‘ahu, Moloka‘i, and Maui and Hawai‘i Island. The plant can be spread by seeds. If fertile material is used, lei should not be discarded in areas where *L. maritima* is not naturalized and where the seeds can germinate and grow. Use of native plants or non-native, non-invasive species in lei will minimize the spread of weeds. See the Plant Pono website for more information about potentially invasive species: http://www.plantpono.org.

The lei shown also contains asparagus fern, ageratum, dusty miller, and ‘ōhi’a lehua.
**Growing Plants for Hawaiian Lei**

**celosia**

**OTHER COMMON NAMES:** cockscomb, lepe-a-moa

**SCIENTIFIC NAME:** *Celosia argentea* var. *cristata* and var. *plumosa*

**FAMILY:** Amaranthaceae (amaranth family)

**NATURAL SETTING/LOCATION:** tropical Africa

**CURRENT STATUS IN THE WILD IN HAWAI‘I:** not found


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**Growing your own**

**PROPAGATION**

**FORM:** seeds

**PLANTING DEPTH:** broadcast; do not cover with any soil or medium; light aids germination

**GERMINATION TIME:** 11–12 days

**PREFERRED PRODUCTION CONDITIONS**

**GENERAL SOIL CHARACTERISTICS:** rich, well drained, high in organic matter; tolerates dry soil

**LIGHT:** full sun to partial shade

**WATER:** abundantly

**SOIL TEMPERATURE:** 75–78°F

**MANAGEMENT**

**FERTILIZER NEEDS:** light

**RECOMMENDED SPACING:** 8–18" (8" for single harvests, 18" for continual harvests)

**ADAPTATION TO GROWING IN CONTAINERS:** yes, 6" pots

**PRUNING:** cut off spent flowers regularly

**SPECIAL CULTURAL HINTS:** control damping off by limiting moisture and applying preventative fungicides; both types of celosia are extremely sensitive to high soluble-salt levels in media; symptoms of salt damage include reduced leaf size and plant height, leaf chlorosis at tips or margins, and increased variability among the plants
**Celosia**

**Plant characteristics**
- **Height:** 6–20"
- **Spread:** 8–12"
- **Growth Rate:** fast
- **Growth Habit:** erect, branching, herbaceous

**Flowers**
- **Size:** large if they are at the apex of the plant, smaller if they arise from the axillary shoots
- **Color:** solid colors of red, yellow, orange, gold, pink
- **Shape:** either spire-like plumes of flowers (var. cristata) or Y-shaped, convoluted, flat-topped flowers resembling a “rooster’s comb” (var. plamosa)
- **Fragrance:** none
- **Time to flowering:** 12–15 weeks
- **Inducing and maintaining blooming:** remove dead and old flowers to promote development of new ones

**Pests**
- **Common Diseases:** damping off, leaf spots, nematodes
- **Other Pests:** aphids, spider mites

**Harvesting considerations**
- **What is harvested:** half-open flower spike
- **Harvesting techniques:** cut
- **Best time of day to harvest:** early morning
- **Best way to transport from picking area:** cooler
- **Avoid contact with these products:** smoke, car exhaust, ripening fruits, wilting flowers

**Notes on lei making**
- **Best for which type of lei:** neck, head, wrist, ankle, horse
- **Vase life:** to 6 days
- **Cleaning of plant materials:** cut stem, remove all foliage; avoid wetting flower heads
- **Storing raw lei materials:** store in container with water and refrigerate at 40°F for up to 6 days
- **Preparing for use in lei:** clip wrinkled, limp, or poor-quality areas before adding to lei
- **Storing a completed lei before wearing:** place in sealed plastic container and refrigerate
- **Preserving a lei for long-term storage or display:** place on hat and let dry naturally in cool, dark area; red flowers give the best results

**References and further reading**

The lei shown also contains pa’iniu, strawflower, globe amaranth, and rose.
### chrysanthemum

**OTHER COMMON NAMES:** mum (florist mum, garden mum), feverfew, pua pākē  

**SCIENTIFIC NAME:** *Chrysanthemum* species and hybrids  

**FAMILY:** Asteraceae (formerly Compositae) (aster family)  

**NATURAL SETTING/LOCATION:** China, Japan, Europe

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### Growing your own

**HANDLING CAUTIONS:** flowers of certain types contain pollen to which some people are allergic

**PROPAGATION**

**FORM:** cuttings; seeds (takes longer); division (runner plants)  

**PLANTING DEPTH:** keep runner root crown just below soil level  

**GERMINATION TIME:** 5–14 days

**PREFERRED PRODUCTION CONDITIONS**

**GENERAL SOIL CHARACTERISTICS:** well drained, all-purpose  

**LIGHT:** full sun  

**WATER:** keep damp  

**SOIL TEMPERATURE:** 60–70°F

### MANAGEMENT

**FERTILIZER NEEDS:** light to medium  

**RECOMMENDED SPACING:** 8–12" apart  

**ADAPTATION TO GROWING IN CONTAINERS:** yes, 6" pots  

**PRUNING:** cut off spent flowers regularly

### SPECIAL CULTURAL HINTS:

blooms with short days; there are specific budding and flowering times for various mums; colors differ in the second blooming, so a variety of colors can be obtained by allowing a second crop to flower after cutting back the fall crop

**CURRENT STATUS IN THE WILD IN HAWAI‘I:** not found  

**CULTIVARS:** many cultivars are available from commercial sources; new ones are developed frequently
**Plant characteristics**

**HEIGHT:** 8–12"

**SPREAD:** 10–12"

**GROWTH RATE:** moderate to fast

**GROWTH HABIT:** erect, branching, herbaceous

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**FLOWERS**

**SIZE:** small-flowered types (1–2”) best for use in lei

**COLOR:** pink, orange-bronze, yellow, cream

**SHAPE:** pompon, daisy, button

**FRAGRANCE:** yes, but not sweet

**TIME TO FLOWERING:** 11–12 weeks

**INDUCING AND MAINTAINING BLOOMING:** short-day types require covering to shorten long summer days; covering must completely block light

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**PESTS**

**COMMON DISEASES:** foliar diseases, petal blight, stunt virus

**OTHER PESTS:** aphids, spider mites, thrips

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**Harvesting considerations**

**WHAT IS HARVESTED:** flowers

**HARVESTING TECHNIQUES:** cut when flower is open but center is still tight

**BEST TIME OF DAY TO HARVEST:** early morning

**BEST WAY TO TRANSPORT FROM PICKING AREA:** plastic bag

**AVOID CONTACT WITH THESE PRODUCTS:** smoke, car exhaust, ripening fruits, wilting flowers

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**Notes on lei making**

**BEST FOR WHICH TYPE OF LEI:** neck, head, wrist, ankle, horse

**VASE LIFE:** 7–10 days, depending on the cultivar

**CLEANING OF PLANT MATERIALS:** remove all leaves; cut above base of stem where hard and woody to assist water uptake

**STORING RAW LEI MATERIALS:** store in container with water and refrigerate at 40°F for up to 10 days

**PREPARING FOR USE IN LEI:** clip off wrinkled, limp, or poor-quality areas

**STORING A COMPLETED LEI BEFORE WEARING:** soak in water, drip dry, wrap in dry paper towel, and refrigerate in sealed plastic container

**PRESERVING A LEI FOR LONG-TERM STORAGE OR DISPLAY:** *C. parthenium* is suitable for drying

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**References and further reading**


The lei shown also contains moa, kikānia, and rondeletia.
Growing Plants for Hawaiian Lei

**cornflower**

**OTHER COMMON NAMES:** bachelor’s button

**SCIENTIFIC NAME:** *Centaurea cyanus*

**FAMILY:** Asteraceae (formerly Compositae) (aster family)

**NATURAL SETTING/LOCATION:** native to Europe

**CURRENT STATUS IN THE WILD IN HAWAI‘I:** not found

**CULTIVARS:** ‘Florence Pink’, ‘Pink Ball’, ‘Blue Diadem’, ‘Ultra Dwarf Blue’

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**Growing your own**

**PROPAGATION**

**FORM:** seeds

**PLANTING DEPTH:** cover seeds ¼” deep with fine medium

**GERMINATION TIME:** 12–14 days

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**PREFERRED PRODUCTION CONDITIONS**

**GENERAL SOIL CHARACTERISTICS:** dry to moist

**LIGHT:** full sun

**WATER:** moderate

**SOIL TEMPERATURES:** 65–70°F

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**MANAGEMENT**

**FERTILIZER NEEDS:** light

**RECOMMENDED SPACING:** 6–9”

**ADAPTATION TO GROWING IN CONTAINERS:** yes, dwarf cultivars in 3- to 5-gallon tubs

**SPECIAL CULTURAL HINTS:** very sensitive to being root-bound; does not transplant well and is best seeded directly into the garden; grows best by starting under short days, followed by long days; acts as a perennial by reseeding itself; provide supplementary lighting to increase daylength during short winter days
cornflower

**Plant characteristics**

- **Height:** 12–36" 
- **Spread:** 6–12" 
- **Growth Habit:** erect, branching, herbaceous 

**Flowers**

- **Size:** 1–1½" wide flowerheads 
- **Color:** blue, white, pink, purple 
- **Shape:** long-stalked 
- **Fragrance:** none 
- **Time to Flowering:** 5–6 months 
- **Inducing and Maintaining Blooming:** remove dead and old flowers to promote development of new ones 

**Pests**

- **Common Diseases:** Botrytis, aster yellows, downy mildew 
- **Common Insect Pests:** leafhoppers, aphids 

**Harvesting considerations**

- **What is Harvested:** flowers beginning to open 
- **Harvesting Techniques:** cut 
- **Best Time of Day to Harvest:** early morning 
- **Best Way to Transport from Picking Area:** cooler 
- **Avoid Contact with These Products:** smoke, car exhaust, ripening fruits, wilting flowers 

The lei shown also contains hydrangea, baby's breath, asparagus fern, and pa’iniu.

**Notes on lei making**

- **Best for Which Type of Lei:** neck, head, wrist, ankle 
- **Vase Life:** 6–10 days 
- **Cleaning of Plant Materials:** cut stem off at 2" 
- **Storing Raw Lei Materials:** store in container with water and refrigerate at 40°F for up to 3 days; do not cover flower heads 
- **Preparing for Use in Lei:** clip off wrinkled, limp, or poor-quality areas before adding to lei 
- **Storing a Completed Lei Before Wearing:** sprinkle with water, drip dry, place in sealed plastic container, and refrigerate 
- **Preserving a Lei for Long-Term Storage or Display:** cannot be air dried; sand and borax methods used 

**References and further reading**

dianthus

**OTHER COMMON NAMES:** sweet william, ponimo’i-li‘ili‘i

**SCIENTIFIC NAME:** *Dianthus* species and hybrids

**FAMILY:** Caryophyllaceae (carnation family)

**NATURAL SETTING/LOCATION:** Europe

**CURRENT STATUS IN THE WILD IN HAWAI‘I:** not found

**CULTIVARS:** ‘Wee Willie’, ‘Round-about’, ‘Summer Beauty’, ‘Indian Carpet’

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**Growing your own**

**PROPAGATION**

**FORM:** seeds; stem cuttings; division; air layering

**PLANTING DEPTH:** sow seeds ⅛” deep; keep division root crown just below soil level

**GERMINATION TIME:** 7–12 days

**CUTTING ROOTING TIME:** 10–15 days

**PREFERRED PRODUCTION CONDITIONS**

**GENERAL SOIL CHARACTERISTICS:** best in well-drained, preferably sandy soil

**LIGHT:** full sun to partial shade

**WATER:** moderate

**SOIL TEMPERATURE:** 70–75°F

**MANAGEMENT**

**FERTILIZER NEEDS:** light

**RECOMMENDED SPACING:** 10–12” in the ground

**ADAPTATION TO GROWING IN CONTAINERS:** yes, 6” pots

**SPECIAL CULTURAL HINTS:** very sensitive to salt; for early flowering, increase light; acts as a perennial by reseeding itself; avoid standing water
## dianthus

### Plant characteristics

**HEIGHT:** 6–18"

**SPREAD:** 10–12"

**GROWTH RATE:** fast

**GROWTH HABIT:** upright, herbaceous

### FLOWERS

**SIZE:** ½–1" across

**COLOR:** red, white, pink, purple, bicolors

**SHAPE:** fringed or toothed petals

**FRAGRANCE:** sweetly scented

**TIME TO FLOWERING:** 15–16 weeks

**INDUCING AND MAINTAINING BLOOMING:** remove dead and old flowers to promote development of new ones

### Notes on lei making

**BEST FOR WHICH TYPE OF LEI:** neck, head, wrist, ankle

**VASE LIFE:** 5–9 days

**CLEANING OF PLANT MATERIALS:** cold water soak; clip all leaves and cut stem 2" below base of calyx

**STORING RAW LEI MATERIALS:** refrigerate at 45°F for up to 4 days

**PREPARING FOR USE IN LEI:** clip off wrinkled, limp, or poor-quality areas before adding to lei

**STORING A COMPLETED LEI BEFORE WEARING:** soak lei in water, drip dry, wrap in newspaper, place in plastic bag, and refrigerate

**PRESERVING A LEI FOR LONG-TERM STORAGE OR DISPLAY:** cannot be preserved

### References and further reading


The lei shown also contains rose, statice, Peruvian lily, moa, agapanthus, shinobu, and ‘ōhi’a lehua.
Growing Plants for Hawaiian Lei

**globe amaranth**

**OTHER COMMON NAMES:** bozu, clover, lehua-pepe, lei-hua; also sometimes called by the misnomer “bachelor button”

**SCIENTIFIC NAME:** *Gomphrena globosa*

**FAMILY:** Amaranthaceae (amaranth family)

**NATURAL SETTING/LOCATION:** tropics of the Eastern Hemisphere

**CURRENT STATUS IN THE WILD IN HAWAI’I:** not found

**CULTIVARS:** ‘Buddy’, ‘Cissy’, ‘Strawberry Fields’

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**Growing your own**

**PROPAGATION**

**FORM:** seeds

**PRETREATMENT:** soak seeds in water overnight.

**PLANTING DEPTH:** sow $\frac{1}{16}$ to $\frac{1}{8}$" deep (barely covered with medium)

**GERMINATION TIME:** 10–14 days

**PREFERRED PRODUCTION CONDITIONS**

**GENERAL SOIL CHARACTERISTICS:**
light, well drained

**LIGHT:** full sun

**WATER:** lightly

**SOIL TEMPERATURE:** 72–75°F

**MANAGEMENT**

**FERTILIZER NEEDS:** light

**RECOMMENDED SPACING:** 6–9"

**ADAPTATION TO GROWING IN CONTAINERS:**
yes, 6–10" pots

**SPECIAL CULTURAL HINTS:**
taller varieties may need to be staked; avoid overwatering for best germination, root growth, and control of disease; very sensitive to most pesticides
globe amaranth

**Plant characteristics**

**HEIGHT:** 24–36"

**SPREAD:** 12–15"

**GROWTH RATE:** fast, once established

**GROWTH HABIT:** upright, herbaceous

**FLOWERS**

**SIZE:** ¾"

**COLOR:** pink, purple, white, lavender, orange, red, yellow

**SHAPE:** clover-like

**FRAGRANCE:** none

**TIME TO FLOWERING:** 10–14 weeks

**INDUCING AND MAINTAINING BLOOMING:** remove dead and old flowers to promote production of new ones

**PESTS**

**COMMON DISEASES:** mildew

**OTHER PESTS:** few, if any

**Harvesting considerations**

**WHAT IS HARVESTED:** flowers

**HARVESTING TECHNIQUES:** cut

**BEST TIME OF DAY TO HARVEST:** early morning

**BEST WAY TO TRANSPORT FROM PICKING AREA:** plastic bag

**AVOID CONTACT WITH THESE PRODUCTS:** smoke, car exhaust, ripening fruits, wilting flowers

**Notes on lei making**

**BEST FOR WHICH TYPE OF LEI:** neck, head, wrist, ankle, horse

**VASE LIFE:** 7–10 days

**CLEANING OF PLANT MATERIALS:** cold water soak; clip stems to 2" and place in water

**STORING RAW LEI MATERIALS:** refrigerate at 40°F for up to 10 days

**PREPARING FOR USE IN LEI:** clip off wrinkled, limp, or poor-quality areas before adding to lei

**STORING A COMPLETED LEI BEFORE WEARING:** soak lei in water, drip dry, place in paper bag or paper box, and refrigerate

**PRESERVING A LEI FOR LONG-TERM STORAGE OR DISPLAY:** air-dry

**References and further reading**


**ALERT:** *Gomphrena globosa* can be an invasive species and cause problems in agricultural areas in Hawai‘i. It scores a rating of 8 on the Hawai‘i-Pacific Weed Risk Assessment (HPWRA). The HPWRA predicts whether any given plant is at low or high risk of becoming invasive in Hawai‘i or similar Pacific islands and is about 95% accurate. Any score above 6 indicates the potential for invasiveness though there are varying levels of concern. The HPWRA score does not necessarily mean you should remove established plants from urban landscapes or avoid planting them at all, but *G. globosa* should not be introduced to areas where it is not already growing. *G. globosa* has already naturalized in some places on Kaua‘i and O‘ahu. The plant spreads by seed. If fertile material is used, lei should not be discarded in areas where *G. globosa* is not naturalized and where the seeds can germinate and grow. Use of native plants or non-native, non-invasive species in lei will minimize the spread of weeds. See the Plant Pono website for more information about potentially invasive species: http://www.plantpono.org.

The lei shown also contains crownflower and epidendrum orchid.
**Marguerite Daisy**

**Other Common Names:** ‘okika

**Scientific Name:**
*Argyranthemum frutescens*

**Family:** Asteraceae (formerly Compositae) (aster family)

**Natural Setting/Location:** found worldwide

**Current Status in the Wild in Hawai‘i:** not found

**Cultivars:** many are available

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**Growing your own**

**Propagation**

**Form:** cuttings (non-flowering side shoots) or purchased liners

**Preplanting Treatment:** use a medium rooting hormone

**Planting Depth:** insert base of cutting 1–2" into medium

**Preferred Production Conditions**

**General Soil Characteristics:** well drained; use peat-perlite medium when growing in containers

**Light:** full sun

**Water:** keep evenly damp

**Soil Temperature:** 45–85°F

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**Management**

**Fertilizer Needs:** light

**Recommended Spacing:** 3–4'

**Adaptation to Growing in Containers:** yes, 1-gallon pots or larger

**Pruning:** pinching will cause more branching and more flowers but will delay flowering period

**Special Cultural Hints:** drench with broad-spectrum fungicide when planting liners
Growing Plants for Hawaiian Lei

Plant characteristics

**HEIGHT:** 40–48”, new dwarf varieties are 14–18”

**SPREAD:** 48–60”, new dwarf varieties, 18–24”

**GROWTH RATE:** moderate

**GROWTH HABIT:** bushy, herbaceous

**FLOWERS**

**SIZE:** 1–1½”

**COLOR:** large yellow disc with white or yellow petals; also, new cultivars with pink hues are available

**SHAPE:** daisy-like; new cultivars with double flowers are available

**FRAGRANCE:** none

**TIME TO FLOWERING:** 5 months from liners

**INDUCING AND MAINTAINING BLOOMING:** remove dead and old flowers to promote production of new ones

**PESTS**

**COMMON DISEASES:** root rots in wet soils, several viruses

**OTHER PESTS:** aphids, thrips, whiteflies

**Harvesting considerations**

**WHAT IS HARVESTED:** flowers

**HARVESTING TECHNIQUES:** cut individual flowers at the base

**BEST TIME OF DAY TO HARVEST:** early morning

**BEST WAY TO TRANSPORT FROM PICKING AREA:** plastic bags

**AVOID CONTACT WITH THESE PRODUCTS:** smoke, car exhaust, ripening fruits, wilting flowers

The lei shown also contains Mexican creeper, ‘ākia, palapalai, crown flower, bleeding heart, and moa.

Notes on lei making

**BEST FOR WHICH TYPE OF LEI:** neck, head, wrist, ankle

**VASE LIFE:** 4–7 days

**CLEANING OF PLANT MATERIALS:** cut stems, strip leaves, and place in water; do not cover heads.

**STORING RAW LEI MATERIALS:** store dry in a plastic container and refrigerate at 40°F for up to 8 days

**PREPARING FOR USE IN LEI:** clip off the wrinkled, limp, or poor-quality areas before adding to lei

**STORING A COMPLETED LEI BEFORE WEARING:** sprinkle with water, drip dry, wrap in dry tissue, store in plastic container, and refrigerate

**PRESEVING A LEI FOR LONG-TERM STORAGE OR DISPLAY:** cannot be preserved

References and further reading


### marigold

**Other Common Names:** French marigold (*Tagetes patula*) or American marigold (sometimes listed as African) (*Tagetes erecta*), ‘ökole-‘oi’oi

**Scientific Name:** *Tagetes* cultivars

**Family:** Asteraceae (formerly Compositae) (aster family)

**Natural Setting/Location:** Mexico and Guatemala

**Current Status in the Wild in Hawai‘i:** not found

**Cultivars:** *T. patula*: Aurora series, Bonanza series, Safari series, ‘Bolero’; *T. erecta*: Antigua series, ‘Apollo’, ‘Snowdrift’

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**Growing your own**

**Handling Caution:** the plant contains substances that may induce photodermatitis

**Propagation**

**Form:** seeds

**Planting Depth:** sow ¼–½” deep in medium

**Germination Time:** 9–12 days

**Preferred Production Conditions**

**General Soil Characteristics:** well drained, moist, fertile

**Light:** full sun to partial shade

**Water:** keep evenly damp

**Soil Temperature:** 70–75°F

**Management**

**Fertilizer Needs:** light

**Recommended Spacing:** 6–12”, depending on variety

**Adaptation to Growing in Containers:** yes, 6–10” pots

**Special Cultural Hints:** mulching between plants helps conserve soil moisture; keep soil pH above 6.0 to avoid micronutrient toxicities
marigold

**Plant characteristics**

**HEIGHT:** 12–36”

**SPREAD:** 12”

**GROWTH RATE:** fast

**GROWTH HABIT:** branching, herbaceous

**FLOWERS**

**SIZE:** ½–4”

**COLOR:** yellow, gold shades, crimson, orange

**SHAPE:** flat to globular

**FRAGRANCE:** pungent

**TIME TO FLOWERING:** 8–12 weeks

**INDUCING AND MAINTAINING BLOOMING:** remove dead and old flowers to promote development of new ones

**PESTS**

**COMMON DISEASES:** Botrytis, powdery mildew, wilt and stem rots, leaf spot

**COMMON INSECT PESTS:** aphids, slugs, spider mites, whiteflies

**Harvesting considerations**

**WHAT IS HARVESTED:** fully open flowers

**HARVESTING TECHNIQUES:** cut

**BEST TIME OF DAY TO HARVEST:** early morning

**BEST WAY TO TRANSPORT FROM PICKING AREA:** plastic bag

**AVOID CONTACT WITH THESE PRODUCTS:** smoke, car exhaust, ripening fruits, wilting flowers

**Notes on lei making**

**BEST FOR WHICH TYPE OF LEI:** neck, head, wrist, ankle, horse

**VASE LIFE:** 5 days

**CLEANING OF PLANT MATERIALS:** cold water soak

**STORING RAW LEI MATERIALS:** refrigerate at 40°F for up to 7 days

**PREPARING FOR USE IN LEI:** clip off wrinkled, limp, or poor-quality areas before adding to lei

**STORING A COMPLETED LEI BEFORE WEARING:** soak in water, drip dry, place in newspaper then in plastic bag, and refrigerate

**PRESERVING A LEI FOR LONG-TERM STORAGE OR DISPLAY:** hang and air-dry

**References and further reading**


The lei shown also contains bougainvillea and epidendrum orchid.
pansy

OTHER COMMON NAMES: pāneki, po’okanaka
SCIENTIFIC NAME: Viola x Wittrockiana
FAMILY: Violaceae (violet family)
NATURAL SETTING/LOCATION: Europe, including Britain; North Africa

CURRENT STATUS IN THE WILD IN HAWAI‘I: not found

Growing your own

PROPAGATION

FORM: seeds
PLANTING DEPTH: sow ¼–¾” deep, barely covered with medium; light aids germination
GERMINATION TIME: 7–9 days

PREFERRED PRODUCTION CONDITIONS

GENERAL SOIL CHARACTERISTICS: moist, fertile, well drained
LIGHT: full sun to partial shade
WATER: keep evenly damp; don’t allow to dry out
SOIL TEMPERATURE: 65–75°F

MANAGEMENT

FERTILIZER NEEDS: very light
RECOMMENDED SPACING: 10–12” apart on raised bed
ADAPTATION TO GROWING IN CONTAINERS: yes, 6” pots
PRUNING: remove faded flowers to keep the plants blooming

SPECIAL CULTURAL HINTS: reduce moisture after about 5 days for best germination; control root rot by limiting moisture, lowering pH, and applying fungicides; often reseeds itself
Plant characteristics

**HEIGHT:** 6–8”

**SPREAD:** to 12”

**GROWTH RATE:** slow to moderate

**GROWTH HABIT:** low growing, herbaceous

**FLOWERS**

**SIZE:** 1–2”

**COLOR:** usually 2 or 3 colors with “smiling face” (yellow, gold shades, crimson, orange, blue, purple, white)

**SHAPE:** round

**FRAGRANCE:** sweet

**TIME TO FLOWERING:** 15–17 weeks

**INDUCING AND MAINTAINING BLOOMING:** remove dead and old flowers to promote development of new ones

**PESTS**

**COMMON DISEASES:** *Botrytis*, powdery and downy mildew, root rot

**COMMON INSECT PESTS:** aphids, brown caterpillar, cutworm

Harvesting considerations

**WHAT IS HARVESTED:** almost-open flowers

**HARVESTING TECHNIQUES:** cut

**BEST TIME OF DAY TO HARVEST:** early morning

**BEST WAY TO TRANSPORT FROM PICKING AREA:** coffee can

**AVOID CONTACT WITH THESE PRODUCTS:** smoke, car exhaust, ripening fruits, wilting flowers

Notes on lei making

**BEST FOR WHICH TYPE OF LEI:** neck, head, wrist, ankle

**VASE LIFE:** 2 days

**CLEANING OF PLANT MATERIALS:** cut stems, place in water

**STORING RAW LEI MATERIALS:** refrigerate at 40°F for up to 5 days

**PREPARING FOR USE IN LEI:** clip off wrinkled, limp, or poor-quality areas before adding to lei

**STORING A COMPLETED LEI BEFORE WEARING:** sprinkle with water, place in sealed container with ti leaf bottom, and refrigerate

**PRESEVING A LEI FOR LONG-TERM STORAGE OR DISPLAY:** cannot be preserved

References and further reading


The lei shown also contains dusty miller.
salvia

OTHER COMMON NAMES: scarlet sage (Salvia splendens); blue sage, mealycup sage (S. farinacea)

SCIENTIFIC NAME: Salvia splendens, S. farinacea

FAMILY: Lamiaceae (mint family)

NATURAL SETTING/LOCATION: S. splendens native to South America, S. farinacea native to Texas

Growing your own

PROPAGATION

FORM: seeds; cuttings (soft wood taken from young shoots, 3–4" long)

PREPLANTING TREATMENT: use a mild rooting compound on cuttings, or none

PLANTING DEPTH: sow seeds on surface of medium, do not cover; light aids germination; insert base of cutting 1" into medium

GERMINATION TIME: 12–14 days

PREFERRED PRODUCTION CONDITIONS

GENERAL SOIL CHARACTERISTICS: moist, well drained

LIGHT: full sun

WATER: keep evenly damp

SOIL TEMPERATURE: 70–78°F

MANAGEMENT

FERTILIZER NEEDS: light

RECOMMENDED SPACING: 10–12"

ADAPTATION TO GROWING IN CONTAINERS: yes, 4–8" pots

SPECIAL CULTURAL HINTS: sensitive to salts in early stages and if salt-injured will take longer to bloom (especially S. farinacea); avoid standing water

CURRENT STATUS IN THE WILD IN HAWAII*: may be found in the wild

## salvia

### Plant characteristics

| **HEIGHT:** | 8–36" |
| **SPREAD:** | 6–12" |
| **GROWTH RATE:** | fast |
| **GROWTH HABIT:** | erect, bushy, herbaceous |

**FLOWERS**

| **SIZE:** | 1" |
| **COLOR:** |  
- *S. splendens*: red, lilac, salmon, burgundy  
- *S. farinacea*: blue, purple, white |
| **SHAPE:** | tubular |
| **FRAGRANCE:** | none |
| **TIME TO FLOWERING:** | 11–16 weeks, depending on variety |

### PESTS

| **COMMON DISEASES:** | Botrytis, damping-off of seedlings, powdery mildew, downy mildew |
| **OTHER PESTS:** | aphids, slugs, spider mites, whiteflies |

### Harvesting considerations

| **WHAT IS HARVESTED:** | flowers |
| **HARVESTING TECHNIQUES:** | cut |
| **BEST TIME OF DAY TO HARVEST:** | early morning |
| **BEST WAY TO TRANSPORT FROM PICKING AREA:** | plastic container |
| **AVOID CONTACT WITH THESE PRODUCTS:** | smoke, car exhaust, ripening fruits, wilting flowers |

### Notes on lei making

| **BEST FOR WHICH TYPE OF LEI:** | neck, head, wrist, ankle, horse |
| **VASE LIFE:** | 5 days |
| **CLEANING OF PLANT MATERIALS:** | cut stem, remove all foliage; avoid wetting flower heads |
| **STORING RAW LEI MATERIALS:** | refrigerate at 40°F for up to 7 days |
| **PREPARING FOR USE IN LEI:** | clip off wrinkled, limp, or poor-quality areas before adding to lei |
| **STORING A COMPLETED LEI BEFORE WEARING:** | soak, drip dry, place in sealed plastic container, and refrigerate |
| **PRESERVING A LEI FOR LONG-TERM STORAGE OR DISPLAY:** | some cultivars will preserve (‘Empire Lilac’) |

### References and further reading


The lei shown also contains cup-and-saucer plant, dusty miller, and asparagus fern.

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*The lei shown also contains cup-and-saucer plant, dusty miller, and asparagus fern.*
**strawflower**

*other common names:* everlasting, pua-pepa  
*scientific name:* Helichrysum bracteatum  
*family:* Asteraceae (formerly Compositae) (aster family)

**Growing your own**

**propagation**

**form:** seeds  
**planting depth:** sow seeds 1/8" deep, barely covering with medium; light aids germination  
**germination time:** 7–12 days

**preferred production conditions**

**general soil characteristics:** well drained  
**light:** full sun  
**water:** moderate  
**soil temperature:** 70–75°F

**management**

**fertilizer needs:** light  
**recommended spacing:** 10–12"  
**adaptation to growing in containers:** yes, 4–6" pots  
**pruning:** pinch shoots of young plant when 6" tall to induce branching  
**special cultural hints:** flowers appear dry, even when picked fresh from the plant; avoid high light and temperature, which promote premature flowering; needs some support (especially tetraploid types)

**natural setting/location:** Australia  
**current status in the wild in hawaii:** not found  
**cultivars:** ‘Hot Bikini’, ‘Bright Bikini’, ‘Swiss Giant Mix’
Growing Plants for Hawaiian Lei

strawflower

**Plant characteristics**

**HEIGHT:** 18–36"  
**SPREAD:** 10–12"  
**GROWTH RATE:** fast  
**GROWTH HABIT:** upright, herbaceous

**FLOWERS**

**SIZE:** 1–3"  
**COLOR:** white, yellow, orange, red, pink, purple  
**SHAPE:** round  
**FRAGRANCE:** none  
**TIME TO FLOWERING:** 3–4 months

**PESTS**

**COMMON DISEASES:** aster yellows, root rot, *Verticillium* wilt  
**OTHER PESTS:** aphids, leafhoppers

**Harvesting considerations**

**WHAT IS HARVESTED:** flowers, before fully open, when bracts are unfolding and centers are visible (if picked when open, petals turn backward as they dry, resulting in an unattractive blossom)  
**HARVESTING TECHNIQUES:** cut  
**BEST TIME OF DAY TO HARVEST:** early morning  
**BEST WAY TO TRANSPORT FROM PICKING AREA:** plastic container  
**AVOID CONTACT WITH THESE PRODUCTS:** smoke, car exhaust, ripening fruits, wilting flowers

*The lei shown also contains ti.*

**Notes on lei making**

**BEST FOR WHICH TYPE OF LEI:** neck, head, wrist, ankle, horse  
**VASE LIFE:** 7–10 days for fresh flowers, 2 years for dry flowers  
**CLEANING OF PLANT MATERIALS:** cut stem, remove old foliage; avoid wetting flower heads  
**STORING RAW LEI MATERIALS:** refrigerate at 40°F for up to 10 days  
**PREPARING FOR USE IN LEI:** clip off wrinkled, limp, or poor-quality areas before adding to lei  
**STORING A COMPLETED LEI BEFORE WEARING:** spray lightly and store in paper bag or box and refrigerate  
**PRESERVING A LEI FOR LONG-TERM STORAGE OR DISPLAY:** air-dry; for an entire lei of strawflowers, first dry flowers in bunches by stripping leaves and hanging upside down in a warm, well-ventilated area; for single flowers, leave ½–1" stem and stand them straight up in a shallow container

**References and further reading**

**torenia**

**OTHER COMMON NAMES:** ʻōlaʻa beauty, wishbone flower, bluewings

**SCIENTIFIC NAME:** *Torenia fournieri*

**FAMILY:** Scrophulariaceae (figwort family)

**NATURAL SETTING/LOCATION:** Southeast Asia

**CURRENT STATUS IN THE WILD IN HAWAIʻI:** not found

**CULTIVARS:** Clown series

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**Growing your own**

**PROPAGATION**

**FORM:** seeds

**PLANTING DEPTH:** sow on surface of medium, do not cover; light aids germination

**GERMINATION TIME:** 7–15 days

**PREFERRED PRODUCTION CONDITIONS**

**GENERAL SOIL CHARACTERISTICS:** medium, well drained, compost enriched

**LIGHT:** shade to partial shade

**WATER:** keep moist

**SOIL TEMPERATURE:** 75–80°F

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**MANAGEMENT**

**FERTILIZER NEEDS:** light

**RECOMMENDED SPACING:** 10–12”

**ADAPTATION TO GROWING IN CONTAINERS:** yes, 4–6” pots

**PRUNING:** pinch shoots of young plants to encourage bushy form

**SPECIAL CULTURAL HINTS:** leggy plants indicate poor light; the plant likes moisture and should not be allowed to dry out
**torenia**

**Plant characteristics**

**HEIGHT:** 6–8”

**SPREAD:** 8”

**GROWTH RATE:** slow at first

**GROWTH HABIT:** erect, bushy, herbaceous

**FLOWERS**

**SIZE:** 1–1½”

**COLOR:** bright blue, burgundy, orchid, rose, violet

**SHAPE:** asymmetrical bell-shape

**FRAGRANCE:** none

**TIME TO FLOWERING:** 13–15 weeks

**INDUCING AND MAINTAINING BLOOMING:** remove dead and old flowers to promote development of new ones

**PESTS**

**COMMON DISEASES:** powdery mildew, Scrophulariaceae virus

**OTHER PESTS:** aphids, slugs, whiteflies

**Harvesting considerations**

**WHAT IS HARVESTED:** flowers

**HARVESTING TECHNIQUES:** cut

**BEST TIME OF DAY TO HARVEST:** early morning

**BEST WAY TO TRANSPORT FROM PICKING AREA:** plastic container

**AVOID CONTACT WITH THESE PRODUCTS:** smoke, car exhaust, ripening fruits, wilting flowers

**Notes on lei making**

**BEST FOR WHICH TYPE OF LEI:** neck

**VASE LIFE:** 2–4 days

**CLEANING OF PLANT MATERIALS:** spray with water

**STORING RAW LEI MATERIALS:** refrigerate at 40°F for up to 2 days

**PREPARING FOR USE IN LEI:** clip off wrinkled, limp, or poor-quality areas before adding to lei

**STORING A COMPLETED LEI BEFORE WEARING:** mist and refrigerate in sealed plastic container

**PRESERVING A LEI FOR LONG-TERM STORAGE OR DISPLAY:** cannot be preserved

**References and further reading**


The lei shown also contains baby’s breath, asparagus fern, and shinobu.
Growing Plants for Hawaiian Lei

**zinnia**

**OTHER COMMON NAMES:** pua-pihi, thumbelina

**SCIENTIFIC NAME:** Zinnia elegans, Z. angustifolia

**FAMILY:** Asteraceae (formerly Compositae) (aster family)

**NATURAL SETTING/LOCATION:** Southwest USA, Mexico, Central America

**CURRENT STATUS IN THE WILD IN HAWAI'I:** not found


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**Growing your own**

**PROPAGATION**

**FORM:** seeds

**PLANTING DEPTH:** lightly cover with medium

**GERMINATION TIME:** 7–10 days

**PREFERRED PRODUCTION CONDITIONS**

**GENERAL SOIL CHARACTERISTICS:** well drained; tolerates dry conditions

**LIGHT:** full sun

**WATER:** keep evenly and slightly damp, never wet

**SOIL TEMPERATURE:** 68–70°F

**MANAGEMENT**

**FERTILIZER NEEDS:** light

**RECOMMENDED SPACING:** 9–12”

**ADAPTATION TO GROWING IN CONTAINERS:** yes, 4–6” pots

**PRUNING:** pinch the tops of young plants when they are 4–6” high to encourage branching

**SPECIAL CULTURAL HINTS:** best germination if cool and dry; days of 12 hours or less stimulate flowering; seeds may be sown directly to the field or final growing container
**zinnia**

**Plant characteristics**

**HEIGHT:** 24–36”

**SPREAD:** 5–6”

**GROWTH RATE:** fast

**GROWTH HABIT:** upright, herbaceous

**FLOWERS**

**SIZE:** 1–3”

**COLOR:** any color except blue

**SHAPE:** classified according to flower type (single, double, cactus, dahlia type)

**FRAGRANCE:** none

**TIME TO FLOWERING:** 12–13 weeks

**INDUCING AND MAINTAINING BLOOMING:** remove dead and old flowers to promote development of new ones

**PESTS**

**COMMON DISEASES:** *Alternaria* blight, powdery mildew, bacterial leaf-spot

**OTHER PESTS:** aphids, beetles, slugs, spider mites

**Harvesting considerations**

**WHAT IS HARVESTED:** fully open flowers

**HARVESTING TECHNIQUES:** cut

**BEST TIME OF DAY TO HARVEST:** early morning

**BEST WAY TO TRANSPORT FROM PICKING AREA:** plastic container

**AVOID CONTACT WITH THESE PRODUCTS:** smoke, car exhaust, ripening fruits, wilting flowers

**Notes on lei making**

**BEST FOR WHICH TYPE OF LEI:** neck, head, wrist, ankle, horse

**VASE LIFE:** 6–10 days in deionized water (without salts)

**CLEANING OF PLANT MATERIALS:** cut stem, remove all foliage; avoid wetting flower heads

**STORING RAW LEI MATERIALS:** refrigerate at 40°F for up to 7 days

**PREPARING FOR USE IN LEI:** clip off wrinkled, limp, or poor-quality areas before adding to lei

**STORING A COMPLETED LEI BEFORE WEARING:** spray lightly, store in plastic container, and refrigerate

**PRESERVING A LEI FOR LONG-TERM STORAGE OR DISPLAY:** air-dry

The lei shown also contains moa, static, bougainvillea, asparagus fern, and ‘ōhi’a lehua.

**References and further reading**

