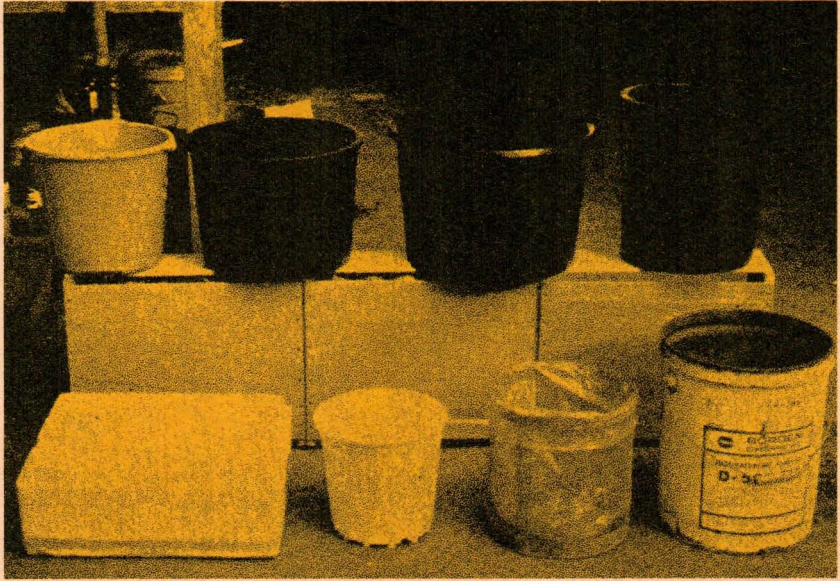


VEGETABLE GROWING IN CONTAINERS

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1. Various types of containers can be used for growing vegetables. Size of container is determined by the vegetable to be grown.



2. A 1:1 ratio of soil to organic compost will make a good potting media. Add about a pound of 10-20-20, 10-30-10 or similar fertilizer per 4-cubic foot of mix.

VEGETABLE GROWING IN CONTAINERS

Steven Fukuda and Kenneth Takeda^{1,2}

Hawaii's warm year-round sunshine and its tropical conditions give local gardeners the opportunity to grow many types of vegetables during any month of the year. You can grow vegetables whether the garden area is a balcony of an apartment or behind your town house—there is always a place for a garden, especially when using containers to grow your vegetables.

Growing vegetables in containers can be fun and relaxing for youngsters as well as for the elderly. It is not necessary that you be familiar with growing plants—not if you have the patience to follow a few instructions. The conditions and materials needed for container vegetable growing are a protected sunny area, some containers, seeds, fertilizers and some growing media (potting mix or you may use soil mixed with well rotted compost).

For containers, you can use plastic or clay pots, metal gallon cans and 5-gallon containers, plastic bags, wire baskets lined with plastic or burlap, and even wooden boxes. Your containers should be large enough to hold the plant when it is fully grown. For example, ½ to 1-gallon containers are satisfactory for chives and American parsley. Radishes, green onions, bush beans, etc. will do in 1½ to 2½ gallon size containers. For your larger growing plants such as eggplants, tomatoes and zucchinis, it is better to use a 3 to 5-gallon container for each plant. Generally, it is better to use a larger container rather than one too small. The major disadvantage in using a larger pot is that you will need more media. However, if you use a small pot for a plant which requires a larger one, you may encounter growth restrictions and find it necessary to water your vegetables more than once a day.

Make sure you allow for drainage in your containers by drilling several ¼-inch holes, spaced evenly preferable along the sides of the container, near the bottom. Then to further help drainage, put about ½-inch of coarse gravel on the bottom of each container.

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The next item needed is the growing media (soil mix). Basic requirements of the growing media are to supply nutrients, moisture and support the plant upright. Commercial ready to use growing media are available from seed dealers and garden supply centers. Or if you wish to prepare your own media, it is suggested that you mix a 1 to 1 ratio of soil to organic compost and add about a pound of 10-20-20, 10-30-10 or similar fertilizer per 4-cubic foot of mix. Drainage and aeration are important in a media mix, as it is necessary for excess water to drain from the media for healthy root growth. Fill the containers with media up to $\frac{1}{2}$ to 1 inch from the top to make it easier for watering.

Most of the seeds can be obtained from seed dealers, garden supply centers and some from the University of Hawaii, Department of Horticulture. Check dates on packets to insure that you are purchasing fresh seeds for planting this year.

In watering your vegetables, do not keep media too wet otherwise plant roots may die from lack of oxygen or from root rot diseases. Daily watering will usually be necessary for most container grown vegetables. At times, twice a day watering may become necessary for plants grown in small containers.

Fertilize your plants regularly, incorporate into the top inch of your media about 1 teaspoon of 15-15-15, 16-16-16 or similar fertilizer per gallon of soil 2 to 3 weeks after germination and again every other week. This should keep your plants healthy and producing well.

Vegetables grown in containers are as susceptible to attack by insects and diseases as those grown in a garden plot. Watch for aphids, mites, scales, white flies, leaf miners, etc. If you encounter situations where insects cause serious damage, apply an insecticide when the infestation first appears. For best results in controlling fungal and bacterial diseases, apply a fungicide before there is evidence of plant damage. Repeat treatment every week to 10-days, more frequent applications or wider plant spacings may be necessary during moist weather when fungus diseases tend to be most severe. Watch for damping-off, leaf spots, rots, blights, mildews, etc. When using a pesticide, be sure to read and follow manufacturer's directions on the label. For virus diseases, usually the insect vector (usually aphids), is responsible for its spread and it should be controlled. Symptoms to watch for include wilts, yellows, mosaic pattern, etc.



3. Seedlings can be started in cans or paper containers for later transplanting. A sterile media such as vermiculite is recommended to start seedlings.



4. Tomatoes can be easily grown in a 5-gallon container.



5. Bell peppers require a 3-gallon container or larger for best growth.



6. A 3-gallon container is adequate for cauliflower and broccoli.



7. Large plants like summer squash require a 5-gallon container.



8. Chives and Swiss chard can be easily grown in a 2-gallon container.



9. A 5-gallon container is best for soybeans. Several plants can be planted in the container.



10. Ung choy (swamp cabbage) does well in a 5-gallon container. Three cuttings can be planted per container.

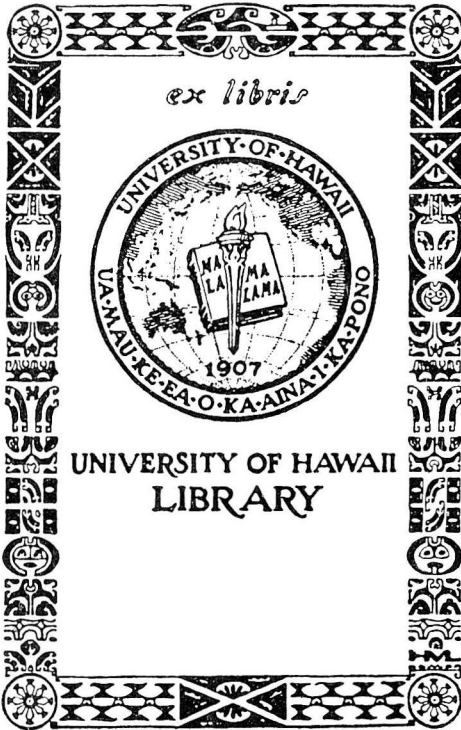
Crop	Suggested Cultivars (Varieties) or Types to Grow	Suggested		Suggested		Time to Plant	Approximate days to harvest
		Container Size in Gallons	Number of Plants per Container	Ground Culture Plant Spacing Between (inches)			
				Plant	Rows		
Arrowroot	West Indian	3	1 piece- 2 oz. root	16-18	24-30	yr. round	95-120
Artichoke	Jerusalem	5	1 piece- 2 oz. root	20-24	24-30	Sept.- April	270-300
Bean-snap type							
bush-flat podded	Green Crop	5	4	4- 6	16-18	yr. round	50- 55
-round podded	Harvester, Tendercrop	5	4	4- 6	16-18	yr. round	50- 60
pole-flat podded	Hawaiian Wonder, Manoa Wonder Kentucky Wonder	5	4	12-15	42-48	yr. round	50- 60
Bean-lima							
bush-large seeded	Fordhook 242	5	2	14-16	24-30	yr. round	75- 85
-small seeded	Henderson, Thorogreen	5	2	14-16	24-30	yr. round	65- 75
pole-large seeded	Burpee's Best, King of the Garden	5	1	20-24	48-60	yr. round	80- 90
-small seeded	Florida Butter	5	1	20-24	48-60	yr. round	80- 90
Bean-garbanzo, chickpeas		3	1	18-20	24-30	yr. round	80- 90
Bean-mung		2	1	4- 6	20-24	yr. round	80- 90
Bean-soy (vegetable)	Kahala, Kailua	5	6	3- 4	16-18	yr. round	70- 75
Bean-yard-long							
bush	Red Seeded	5	2	10-12	16-18	yr. round	65- 70
pole	Red Seeded, Black Seeded	5	1	14-16	48-54	yr. round	75- 80
Beet-roots	Detroit Dark Red, Ruby Queen	5	5	4- 6	10-12	yr. round	85- 90
Beet-tops	Lutz Green Leaf, Green Top, Bunching Early Wonder	5	7	2- 3	14-16	yr. round	60- 70
Broccoli	De Cicco, Green Comet, Greenbud, Corona Express, Green Duke	3	1	16-18	36-40	yr. round	105-115

Crop	Suggested Cultivars (Varieties) or Types to Grow	Suggested		Suggested		Time to Plant	Approximate days to harvest
		Container Size in Gallons	Number of Plants per Container	Ground Culture Plant Spacing Between (inches) Plants Rows			
Cabbage—head (white)	Copenhagen Market, Golden Acre	2	1	14-16	18-24	yr. round	100-110
	(hybrids)—CG Cross Golden Acre	2	1	14-16	18-24	yr. round	100-110
(red)	Red Acre and (hybrid)—Ruby Ball	2	1	14-16	18-24	yr. round	100-110
Cabbage—Chinese head	Nagaoka WR 55—days, Burpee hybrid	2	1	14-16	18-24	Nov.—Feb.	55- 75
	Saladeer	2	1	14-16	18-24	yr. round	55- 60
Cabbage—green mustard	Waianae Strain, Kai choy	1	1	10-12	14-16	yr. round	40- 50
Cabbage—spoon	Sakushina, Taisai, Pak choy	1	1	10-12	14-16	yr. round	45- 50
Cabbage—swamp	Ung choy (non-paddy or garden type)	5	3 cuttings	16-18	30-36	yr. round	45- 50
Carrot	Nantes strains, Chantenay	5	6	3- 4	14-16	Nov.—Feb.	90-100
Cauliflower	Puakea	3	1	16-18	54-60	yr. round	80- 90
Celery	Utah types 52-70, 52-75	3	1	10-12	16-18	Nov.—Feb.	130-150
Celtuce	Celtuce	2	1	12-14	18-20	yr. round	75- 85
Chard	Fordhook Giant, Large White Ribbed, Rhubarb Swiss Chard	2	1	14-16	20-24	yr. round	50- 55
Chayote	Green types, white types	5	1	40-48	56-60	yr. round	90-100
Chicory	(Belgian endive)	2	1	6- 8	20-24	Nov.—Feb.	100-125
Chrysanthemum—Garland	Shingiku	2	1	6- 8	18-20	yr. round	55- 65
Cress—upland	Local types	1	1	4- 6	16-18	yr. round	35- 40
Cress—water	Local types	5	6 cuttings	8-12	8-12	yr. round	45- 50
Corn—sweet	(hybrids)—H-68 or Tropic 3.	5	2	14-16	36-42	yr. round	70- 80
	Golden Jubilee, Southern Belle	5	2	14-16	36-42	Mar.—Sept.	70- 80
	(non-hybrids)—Hawaiian Sugar, Hawaiian Supersweet No. 6	5	2	14-16	36-42	yr. round	70- 80
Cucumber	(hybrids)—Lehua, Burpee's slicing types	3	1	16-18	48-60	yr. round	45- 55
Daikon —oriental radish	Chinese ½-long	5	6	4- 6	16-18	yr. round	45- 50
Dasheen	Araimo	5	1 corm or huli	42-48	56-60	Jan.—Mar.	180-240
Eggplant—long	Waimanalo long	5	1	36-42	48-54	yr. round	105-115
Eggplant—round	Florida Market, Black Beauty, Mission Bell, Burpee Hybrid	5	1	36-42	48-54	yr. round	105-115
Endive	Florida Deep Heart, Green Curled, Salad King	2	1	8-10	16-18	Nov.—Mar.	85- 95
Garlic	Extra Select	2	3 piece (sets)	2- 4	16-18	Sept.—Mar.	100-120
Ginger	Chinese type	5	4 oz. piece	16-18	30-36	Jan.—Mar.	240-270
Jute—greens	Saluyote	5	3	10-12	30-36	yr. round	45- 55
Kailaan	Chinese kale, Chinese broccoli	1	1	10-12	14-16	yr. round	55- 75
Kale	Vates	2	1	10-12	24-30	Nov.—Feb.	75- 85
Kohlrabi	Early Purple Vienna, Early White Vienna	5	5	4- 6	18-24	yr. round	70- 80
Leek	Broad London	5	4	2- 4	16-18	Nov.—Jan.	145-155
Lettuce—head	Mesa 659, Great Lakes 659	2	1	14-16	18-20	Nov.—Jan.	75- 85
Lettuce—semi-head	Green Mignonette (Manoa), Anuenue	1	1	8-10	10-12	yr. round	45- 55
		1	1	10-12	12-14	Oct.—Mar.	60- 70
Lettuce—romaine	Dark Green Cos	2	1	14-16	14-16	Nov.—Jan.	75- 85
Lettuce—leaf	Grand Rapids, Oak Leaf	2	1	14-16	14-16	Nov.—Jan.	50- 60
Mizuna	Pot herb mustard	1	1	8-10	12-14	yr. round	35- 45
Okra (gumbo)	Dwarf Green Long Pod, Perkins Spineless	5	2	20-24	36-42	yr. round	55- 65
Onions—bulb (dry)	Yellow Bermuda, Yellow Granex, Texas Grano (mild types)	5	6	3- 4	14-16	Sept.—Feb.	150-160
	Awahia (pungent type)	5	6	3- 4	12-14	Sept.—Feb.	150-160
	Early Harvest, San Joaquin (mild types)	5	6	3- 4	14-16	Apr.—May	120-130
Onion—green bunching	Dividing types, Hawaiian types, Shallot	2	3 piece divisions	6- 8	12-14	yr. round	55- 65
Parsnip	Hollow Crown	5	6	4- 6	20-24	Nov.—Jan.	100-120

Crop	Suggested Cultivars (Varieties) or Types to Grow	Suggested		Suggested		Time to Plant	Approximate days to harvest
		Container Size in Gallons	Number of Plants per Container	Ground Culture Plant Spacing Between (inches) Plant Rows			
Peanut	Valencia, Spanish types	3	1	8-10	30-36	yr. round	120-140
Pea—edible pod	Manoa Sugar, Dwarf Grey Sugar	5	6	3- 4	36-48	yr. round	70- 80
Pea—shelling	Burpeeana Early, Little Marvel	5	6	3- 4	36-48	Nov.—Feb.	65- 75
Pea—southern (cowpea)	California Black Eye, Floricream	5	4	4- 6	36-48	yr. round	70- 80
Pepper—bell (sweet)	Keystone Resistant Giant, Yolo Wonder, Emerald Giant	3	1	14-16	24-30	yr. round	110-120
Pepper—hot	Cayenne types, chili types, Hawaiian types	3	1	14-16	24-30	yr. round	100-110
Potato—spuds	Kennebec, Bliss Triumph, Waimea, Red Pontiac, Pele, Red Lasoda	5	1-2 ounce piece	14-16	30-36	Oct.—Jan.	120-130
Potato—sweet dry type	Waimanalo, Red, Onokeo	5	1 stem cutting	10-12	36-48	yr. round	120-150
Potato—sweet wet or baking type	Kona-B, Onolena, Jewel	5	1 stem cutting	10-12	36-48	yr. round	140-150
Radish—round red	Scarlet Globe, Cherry Ball, Red Boy	5	15	1- 2	12-14	yr. round	21- 25
—round white	Burpee's White	5	15	1- 2	12-14	yr. round	21- 25
—long white	White Icicle	5	15	1- 2	12-14	yr. round	21- 25
Rutabaga	Laurentian	2	1	6- 8	30-36	Nov.—Feb.	80- 90
Spinach	Ceylon type, Malabar type	2	1 stem cutting	10-12	24-30	yr. round	50- 60
Spinach	Chinese type	1	10	½- 1	12-14	yr. round	35- 45
Spinach	Horensa type—Benkei hybrid, Tohko Long Spined	3	3	4- 6	14-16	Nov.—Feb.	50- 60
Spinach	New Zealand type	5	2 stem cutting	20-24	30-36	yr. round	50- 60
Spinach	Tahitian type (Belembe)	3	1 piece division	20-24	24-30	yr. round	80- 90
Spinach	Mustard type, Komatsuna	3	3	4- 6	14-16	yr. round	45- 55
Squash—summer bush type	Crookneck, Straightneck, Scallop, Zucchini, Cocozelle	5	1	24-30	36-48	yr. round	55- 65
Sunflower	Mammoth	5	1	20-24	36-48	yr. round	80- 90
Tomato	(varieties)—Healani, Anahu, Kalohi (unstaked ground culture)	5	1	36-48	48-60	yr. round	95-105
	(varieties)—Tropic, Floradel (staked & pruned ground culture)	5	1	16-18	48-60	yr. round	105-115
	(hybrids)—N-5, N-11, N-52, N-69 (staked & pruned ground culture)	5	1	16-18	48-60	yr. round	105-115
Tomato—small	San Marzano, Roma	5	1	36-48	48-60	yr. round	80- 90
Tomato—husk	Ground cherries, Poha	5	1	36-42	48-60	yr. round	85- 95
Turnip—greens	Shogoin Turnip	5	12	3- 5	10-12	yr. round	40- 50
—roots	Purple Top White Globe	5	6	4- 6	16-18	yr. round	50- 60
Yam—bean root	Chop suey potato	3	1	36-48	48-60	yr. round	180-200
Anise	<i>Pimpinella anisum</i>	2	1	4- 6	24-36	yr. round	70- 80
Balm	<i>Melissa officinalis</i>	2	1	4- 6	24-36	yr. round	60- 70
Basil—sweet	<i>Ocimum basilicum</i>	2	1	6- 8	24-36	yr. round	75- 85
—Japanese (shiso)	<i>Perilla frutescens</i>	2	1	4- 6	24-36	yr. round	50- 60
—Italian	<i>Ocimum basilicum</i>	2	1	4- 6	20-24	yr. round	60- 70
Borage	<i>Borago officinalis</i>	2	1	4- 6	20-24	yr. round	75- 85
Caraway	<i>Carum carvi</i>	2	1	4- 6	20-24	yr. round	65- 75
Catnip (catmint)	<i>Nepeta cataria</i>	2	1	6- 8	24-36	yr. round	65- 75
Chervil	<i>Anthriscus cerefolium</i>	1	1	4- 6	12-14	yr. round	50- 60
Coriander	<i>Coriandrum sativum</i>	1	1	4- 6	12-14	yr. round	35- 45
Chive—American (cylindrical leaf)	<i>Allium schoenoprasum</i>	2	3 piece divisions	4- 6	12-14	yr. round	75- 85
—Chinese (flat leaf)	<i>Allium tuberosum</i>	2	3 piece divisions	4- 6	12-14	yr. round	75- 85
Cumin	<i>Cuminum cyminum</i>	1	1	4- 6	10-12	yr. round	75- 85
Dill	<i>Anethum graveolens</i>	2	1	6- 8	24-30	yr. round	65- 75

Crop	Suggested Cultivars (Varieties) or Types to Grow	Suggested		Suggested		Time to Plant	Approximate days to harvest
		Container Size in Gallons	Number of Plants per Container	Ground Culture			
				Plant Spacing Between (inches)	Rows		
Fennel—Florence	<i>Foeniculum dulce</i>	2	1	6- 8	20-24	yr. round	75- 85
—sweet	<i>Foeniculum vulgare</i>	2	1	6- 8	20-24	yr. round	75- 85
Horehound	<i>Marrubium vulgare</i>	2	1	4- 6	14-16	yr. round	75- 85
Horseradish	<i>Armoracia rusticana</i>	5	1	14-16	24-30	yr. round	90-110
Lavender—true	<i>Lavendula spica</i>	2	1	6- 8	24-30	yr. round	75- 85
Lemongrass	<i>Cymbopogon citretus</i>	3	2 piece divisions	20-24	30-36	yr. round	80- 90
Lovage	<i>Levisticum officinale</i>	2	1	8-10	16-18	yr. round	75- 85
Marjoram—sweet	<i>Marjorana hortensis</i>	2	3 piece cutting	6- 8	12-14	yr. round	70- 80
Mint—golden apple	<i>Mentha rotundifolia</i>	2	1 piece cutting	6- 8	12-14	yr. round	70- 80
—peppermint	<i>Mentha piperita</i>	2	3 piece cutting	6- 8	12-14	yr. round	50- 60
—spearmint	<i>Mentha spicata</i>	2	3 piece cutting	6- 8	12-14	yr. round	50- 60
Oregano	<i>Origanum vulgare</i>	2	1	6- 8	14-16	yr. round	80- 90
Parsley—Moss curled	<i>Petroselinum crispum</i>	1	1	4- 6	12-14	yr. round	70- 80
—Plain or single		1	1	6- 8	12-14	yr. round	60- 70
Roquette		1	2	4- 6	14-16	yr. round	70- 80
Rosemary	<i>Rosmarinus officinalis</i>	3	1	12-14	30-36	yr. round	75- 85
Rue	<i>Ruta graveolens</i>	2	1	12-14	20-24	yr. round	60- 70
Saffron—false	<i>Carthamus trinatorius</i>	2	1	12-14	24-30	yr. round	70- 80
—true	<i>Crocus sativus</i>	2	1	12-14	24-30	yr. round	70- 80
Sage	<i>Salvia officinalis</i>	2	1	14-16	20-24	yr. round	70- 80
Savory—summer	<i>Satureja hortensis</i>	1	1	6- 8	36-42	yr. round	60- 70
—winter	<i>Satureja montana</i>	2	1 piece cutting	12-16	36-42	yr. round	75- 85
Sesame	<i>Sesamum indicum</i>	3	1	8-10	24-36	yr. round	115-130
Tarragon	<i>Artemisia dracunculus</i>	3	1 piece division	10-12	30-36	Oct.-Feb.	80- 90
Thyme—common	<i>Thymus vulgaris</i>	2	1	14-16	30-36	yr. round	80- 90
—caraway	<i>Thymus herba-barona</i>	1	3 piece cutting	6- 8	24-30	yr. round	50- 60
—lemon	<i>Thymus citriodorus</i>	1	3 piece cutting	6- 8	24-30	yr. round	50- 60
Woodruff—sweet	<i>Asperula odorata</i>	1	3 piece cutting	6- 8	24-30	yr. round	50- 60

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