

UC Santa Cruz

For the Gardener Series

Title

Seed Starting Tips

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# Seed Starting Tips

Whether you're a first-time seed starter or a seasoned propagator, there's a sweet satisfaction that comes with raising your own garden seedlings—browsing seed catalogues and seed racks, dropping tiny seeds into moist soil, watching seedlings emerge, and planting out the starts you've raised. By starting your own seeds you can also save money, experiment with a wider range of varieties, and support small, independent seed companies.

As manager of the Farm Garden at the UC Santa Cruz Farm, Christof Bernau has honed his propagation skills over 30 years of greenhouse work. Here he offers some tips for home gardeners as we look toward the gardening season.

## GREENHOUSE OPTIONS FOR THE HOME SCALE GARDENER

A home greenhouse can be as simple as a PVC frame with a poly plastic covering that includes a series of shelves to hold planting trays. You can find these online or at local garden stores. Other options include small kit greenhouses, though the small size means they can quickly overheat. They're great for winter frost protection and early season seed starting but be careful with them in warm weather.

The smallest, cheapest option is a plastic cover called a propagation dome/humidome, designed to fit over a 10"x20" seeding tray. For about \$8, a humidome and 1020 tray offers a small, portable, easy to store option and can last for years. You can raise hundreds of seedlings in them. And if you're really starting small, say with just a few six packs of seedlings, then a bright, sunny windowsill offers plenty of light and warmth.

Whatever option you choose, sanitation is important: if you're reusing containers, wash them in a mild bleach solution 1 part bleach:10 parts water- to reduce the chance of transmitting diseases.

## OPTIMAL COMMERCIAL SEED STARTING MIXES

Look for a certified organic mix that includes seed starting, propagation, or seedling mix in the description. These usually feature ingredients that balance drainage, aeration, and water retention but often don't provide much fertility. If fertility is lacking, you can enhance a commercial mix with about 25% good quality compost, or mix in 1 tablespoon of bloodmeal per gallon of soil mix to provide readily available nitrogen.

If your seedlings are growing slowly or appear stunted, water daily with a soluble nutrient mix such as a diluted solution of fish emulsion and/or kelp that will provide a quick boost to developing plants.

## SELECTING SEEDS

Be aware of your neighborhood's microclimate when selecting seeds—a tomato variety that thrives in the heat of Bonny Doon may not mature in the cool coastal conditions on West Cliff. Beyond climate considerations, be aware of the opportunities and limitations of your gardening site. Read varietal descriptions carefully to make sure they fit your soil conditions and fertility, light availability, and other on-site factors.

Most gardeners want to harvest crops over a long period of time, so look for varieties that promise a long yield. For example, you can find broccoli varieties that produce side shoots after the main head is harvested, offering a weeks-long harvest period. Renee's Garden Seeds offers an "all seasons" blend that mixes several varieties that provide staggered maturation. If you want to harvest in bulk, such as for making tomato sauce, look for a determinate variety that matures all at once. For salad tomatoes, pick indeterminate varieties that produce fruit throughout the growing season.

Other things to pay attention to on seed packs include planting depth and the range of planting densities. If your soil is well amended and particularly fertile, you can place plants closer together, while choosing a wider spacing if soil fertility is limited. If you've had disease issues in the past, you may want to space plants farther apart to increase air circulation. Seed packs will also provide days to germination and days to harvest, so that you can plan your plantings accordingly.

## FOR THE GARDENER

### SEED PLANTING TIPS

Fill your planting containers six pack or other container to the top—the soil will settle once it’s watered. Make sure it’s moist but not saturated—you can add water to the mix gradually if it’s too dry.

Make a small hole for the seed with the tip of a pencil, your fingertip, or a chopstick, then drop the seed into the center of the hole. The hole depth should be twice the seed’s width or circumference, or check the seed pack for recommended planting depth.

Sift a layer of soil over the top of the seeds to cover them and make sure there’s good soil to seed contact, but don’t bury them too deep.

### IRRIGATION PRACTICES

Maintain high relative humidity and fairly continuous soil moisture from sowing through germination.

Exceptions include cucurbits and sunflowers; these larger seeds are more prone to rotting, so you should let the soil dry to the depth of the seed before watering again.

Once seeds germinate, then think about less frequent but deeper watering—as roots develop, provide moisture to the roots’ depths, then let the surface dry before watering again.

Use a watering can or hose end that provides a gentle stream of water to avoid dislodging or overburying your seeds and reduce soil compaction and crusting. You can also “float” your six packs or planting trays in a shallow pan or cookie sheet to water from the bottom up.

### HOW TO KNOW WHEN A SEEDLING IS READY TO TRANSPLANT TO THE GARDEN

If you’re growing in a cell or plug type tray, look for above-ground characteristic –at least 2-4 sets of true leaves. The root system should be developed enough so that when you pull out the individual cell, you can see the “root knit,” with the roots holding the root ball and soil together. A seedling that lacks well-developed root knit may experience stress when planted out.

The less you handle your seedlings, the better—ideally, you should sow and grow in a container large enough that it can accommodate the seedling to plant-out size. If you can’t get your starts transplanted in time and they start to become rootbound or fade in vigor due to waning fertility, move them into a larger cell size so that you have continued and uninterrupted growth. That step requires extra effort, space, soil, etc., but will ultimately make for a healthier seedling.



Wherever you have started your seedlings in terms of environmental conditions, you want to transition them to the outdoors before transplanting in a process known as “hardening off.” This will help condition the plants and minimize transplant shock.

Expose seedlings to outdoor conditions for up to a week before transplanting. A longer hardening off period is preferable for those that are more heat dependent, such as tomatoes, peppers, and eggplants, or where conditions are more extreme between indoor and outdoor settings.

During this acclimation period the day/night temperature fluctuation will build the seedlings’ carbohydrate reserves, and exposure to full sun and wind outdoors will strengthen cell walls so that the plants are better able to tolerate outdoor conditions.

When your seedlings are ready to transplant, ideally you will choose a cool, windless day, and plant out either early or late in the day when light intensity is less pronounced. Transplanting during more mellow environmental conditions will reduce stress and the possibility of transplant shock. Once your seedlings are in the ground be sure to follow up with a thorough watering in and continue to provide water as weather conditions and seedling development warrant.

–Martha Brown

*This material was produced by the Center for Agroecology and Sustainable Food Systems CASFS- at the University of California, Santa Cruz. For more information and additional publications, see [casfs.ucsc.edu](http://casfs.ucsc.edu).*

**Fall Seed Planting Guide in the Monterey Bay Area**

VEGGIES	Sow in ground	Start indoors	Days to germination	Approx. days to harvest/maturity	Months to start from seed
Arugula	x		7-14	40	Sept-May
Beets	x		7-10	55	Aug-Sept
Bok choy	x	x	7-10	45	Aug-Oct
Broccoli		x	7-10	63	July-Aug
Brussels sprouts		x	7-10	95	July-Aug
Cabbage		x	7-10	65	July-Aug
Carrots	x		10-20	70	July-Aug
Cauliflower		x	7-10	60	July-Aug
Chard	x	x	7-10	50	Feb-Sept
Collards		x	7-10	55	Aug-Sept
Endive	x	x	7-14	80	Aug-Sept
Fennel, bulbing		x	14-21	90	July-Aug
Kale	x	x	7-10	25	Aug-Sept
Leek	x	x	14-21	110	July-Aug
Lettuce	x	x	7-14	58	Sept-April
Mache	x		14-28	90	Sept-Feb
Mustard	x	x	7-14	38	Feb-Sept
Onion	x	x	7-10	95	Sept-Oct
Peas	x	x	7-10	60	July-Aug
Radishes	x		5-7	28	April-May
Scallions / green onion	x	x	10-20	65	Aug-Sept
Spinach	x	x	5-10	39	Aug-Sept
Stir fry greens	x		7-10	45	Feb-Sept
Turnips	x		7-9	45	Aug-May

FLOWERS	Sow in ground	Start indoors	Days to germination	Planting depth	Months to start from seed
Agrostemma		x	14-21	1/4"	Sept-Nov
Alyssum	x		10-14	1/4"	July-Sept
Bishop's Lace	x	x	12-15	1/4"	July-Sept
Bulbs	x		varies	varies	Sept-Nov
Calendula	x	x	7-14	1/4"	Aug-Oct
Cerinth	x	x	5-21	3/4"	Aug-Sept
Clarkia	x	x	7-14	1/8"	Oct-April
Forget-Me-Not	x	x	7-14	1/4"	Aug-Oct
Larkspur		x	14-21	1/4"	Sept-April
Nigella	x	x	10-15	1/4"	Aug-Oct
Pansies		x	10-14	1/4"	July-Aug
Perennials		x	N/A	varies	Aug-Nov
Poppies	x		7-14	barely cover	Oct-Dec
Snapdragons		x	14-21	barely cover	Aug-April
Stock		x	7-14	1/4"	Oct-April
Sweet peas	x	x	12-28	1"	Sept-March
Wildflower mix	x		9-16	1/4"	Sept-April

HERBS	Sow in ground	Start indoors	Days to germination	application rate	Months to start seed
Chervil		x	10-14	1/4"	Sept-Oct
Cilantro	x	x	10-14	1/4"	Sept
Parsley		x	18-21	1/4"	Aug-Oct
Watercress	x	x	7-10	don't cover	Aug-Sept

COVER CROP	Sow in ground	Start indoors	Days to germination	application rate	Months to start seed
Fava beans	x		5-10	1/2# per 100 sq'	Oct-Nov
Bell beans	x		5-10	1/2# per 100 sq'	Oct-Nov
Hairy Vetch	x		5-10	1# per 100 sq'	Oct-Nov
Winter rye	x		7-10	1/2# per 100 sq'	Oct-Nov
Mustard	x		5-10	1 oz. per 100 sq'	Oct-Nov

TUBERS & ROOTS	Sow in ground	Start indoors	Days to germination	application rate	Months to start seed
Garlic	x				Nov

**Seed Sources**

LARGE TRADITIONAL	Phone	URL
Burpee	800-888-1447	<a href="https://www.burpee.com">https://www.burpee.com</a>
Gurney's	513-354-1491	<a href="https://www.gurneys.com">https://www.gurneys.com</a>
Harris Seeds	800-544.7938	<a href="https://www.harriseseeds.com">https://www.harriseseeds.com</a>
Park Seed	800-845-3369	<a href="http://www.parkseed.com">www.parkseed.com</a>
Stokes	800-396-9238	<a href="http://www.stokeseeds.com">http://www.stokeseeds.com</a>
Thompson & Morgan	0 844 573 1818	<a href="https://www.thompson-morgan.com">https://www.thompson-morgan.com</a>

**SPECIALTY OR SMALL**

Baker Creek	417-924-8917	<a href="https://www.rareseeds.com">https://www.rareseeds.com</a>
Evergreen Seeds		<a href="http://www.evergreenseeds.com">http://www.evergreenseeds.com</a>
Fedco	207-426-9900	<a href="https://www.fedcoseeds.com">https://www.fedcoseeds.com</a>
Johnny's Select Seeds	877-564-6697	<a href="http://www.johnnyseeds.com">www.johnnyseeds.com</a>
Kitazawa	510-595-1188	<a href="https://www.kitazawaseed.com">https://www.kitazawaseed.com</a>
Nichols Garden Seeds	800-422-3985	<a href="https://www.nicholsgardennursery.com/store/index.php">https://www.nicholsgardennursery.com/store/index.php</a>
Renee's Garden Seeds	888-880-7228	<a href="https://www.reneesgarden.com">https://www.reneesgarden.com</a>
Territorial Seed	800-626-0866	<a href="http://www.territorialseed.com">http://www.territorialseed.com</a>
Wood Prairie Farm	207-429-9765	<a href="http://www.woodprairie.com">http://www.woodprairie.com</a>

**SEED EXCHANGES & ORGANIC**

Southern Exposure	540-894-9480	<a href="http://www.southernexposure.com">http://www.southernexposure.com</a>
Seed Savers Exchange	563-382-5990	<a href="https://www.seedsavers.org">https://www.seedsavers.org</a>
High Mowing Seeds	866-735-4454	<a href="https://www.highmowingseeds.com">https://www.highmowingseeds.com</a>
Seeds of Change	888-762-7333	<a href="https://www.seedschange.com">https://www.seedschange.com</a>

**COVER CROP**

Peaceful Valley Farm Supply	888-784-1722	<a href="https://www.groworganic.com">https://www.groworganic.com</a>
Green cover seed		<a href="https://www.greencoverseed.com">https://www.greencoverseed.com</a>
Urban Farmer	317-600-2807	<a href="https://www.ufseeds.com/cover-crops">https://www.ufseeds.com/cover-crops</a>

**SEED LIBRARIES**

SANTA CRUZ GROWS at Live Oak Public Library  
 2380 Portola Drive, Santa Cruz  
 831-427-7711 <https://timebanksantacruz.org/seed-library>  
 Demeter Seed Library @ UC Santa Cruz  
 Demeter Seed Project at Oakes College, UC Santa Cruz, CASFS  
 1156 High Street  
 Santa Cruz, CA 95064 <https://casfs.ucsc.edu/farm-to-college/demeter-seed.html>

Fall Planting Guide and Seed Sources provided by Delise Weir

