

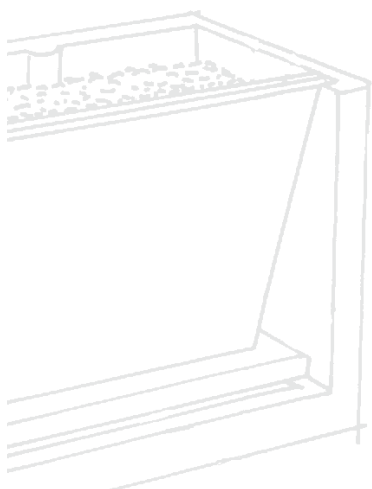


GUIDE TO GROWING

ROOTVUE

FARM®

**WATCH SEEDS BURST INTO LIFE BEFORE YOUR EYES!
WELCOME TO THE WORLD OF UNDERGROUND SECRETS!**



**WARNING:
CHOKING HAZARD**

Small parts
Not for children under 3 yrs.

WELCOME to the world of underground secrets! Watch seeds burst into life before your very eyes. Learn to nurture your Root-Vue Farm and see how roots develop into vegetables.

Be a pioneer with your Root-Vue and try other types of seeds that will intrigue you with their various root systems. This guide will explore the basics of how plants grow and develop, so dig in and experience your green thumb!

WHAT'S INCLUDED IN YOUR KIT:

- ★ High Density Plant Growing Box with self-watering wicking shelf and built-in water basin/drainage reservoir
- ★ Sturdy Acrylic Viewing Window - *NOTE: BLUE PROTECTIVE COVERING MUST BE REMOVED FROM BOTH SIDES*
- ★ Styrene White Light Shield to protect roots when not viewing
- ★ Expanding Soil Wafers - Scientifically formulated for fast growing
- ★ Carrot, Radish and Onion Seeds - These are full packs of seeds, more than enough for one growing season; you can save some of the seeds and use next year. Seeds are good for at least two years past the sell date.
- ★ Water wick material to create self-watering system to keep soil properly moist
- ★ Identification Markers to label when planting
- ★ Instructions and Experiments (in this booklet) along with plant data sheets and grow charts

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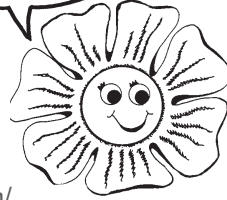
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LET'S GET STARTED!

TO ASSEMBLE YOU WILL NEED:

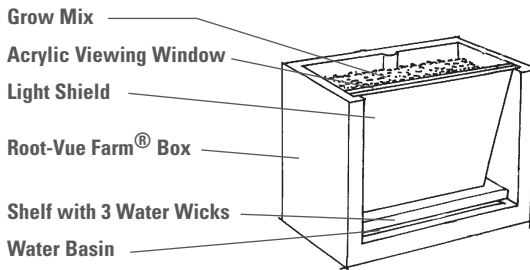
- Scissors
- Bucket or Large Container
- 5+ Cups of Warm Water
- Pencil or Marking Pen

I CAN'T WAIT TO START GROWING!



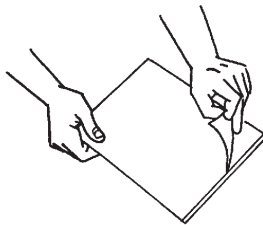
To watch a video of the set-up process, visit <https://www.hspnaturetoys.com/product/root-vue-farm/>

When fully assembled, the Root-Vue Farm[®] will look like this:

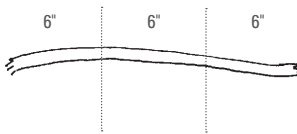


SET UP INSTRUCTIONS:

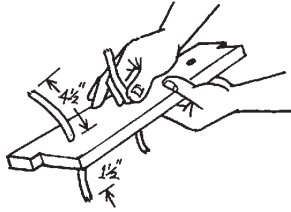
- 1** Remove acrylic viewing window and peel off the protective blue film from both sides.



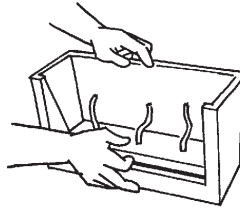
- 2** Cut the 18" water wick material into three 6" wicks.



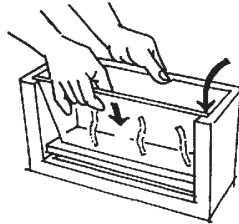
- 3** Remove shelf from Root-Vue Farm[®] unit and insert the three 6" self-watering wicks in the 3 holes of the shelf with 1 1/2" of wick below the shelf to draw water from the built-in basin and 4 1/2" above to wick the water up into the soil.



- 4** Insert shelf and wicks into lower part of Root-Vue Farm[®].



- 5** Insert Viewing Window at an angle as shown. The top of the window should be even with the top of the unit.



- 6** Put the GROW MIX wafers into a bucket or large container. Slowly add 4-5 cups warm water and stir. Add more water if necessary and continue to stir and fluff the mix until the desired texture is obtained.



1. Drop wafers in container

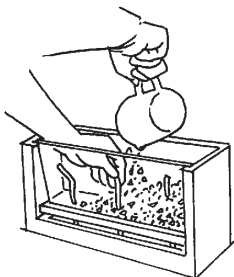


2. Add warm water

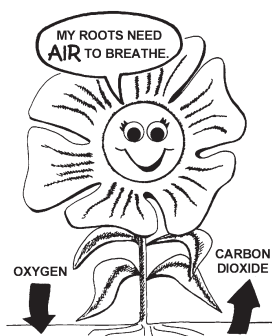


3. Stir and fluff grow mix

- 7** Hold water wicks upright inside unit and add GROW MIX to the Root-Vue Farm unit.



The soil should be loose, not compacted, so that there is a flow of carbon dioxide out of the soil.



- 8** Fill the self watering tray (under the shelf) with approximately 1 cup of water. Be sure you have submerged the water wicks down into the basin. Continue to keep the basin filled with water throughout the growing cycle.

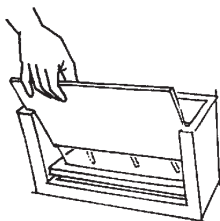
Note:

Be careful not to fill the self-watering tray so full that a sudden movement of the RootVue Farm[®] would spill the water. Use aluminum foil, plastic or a flat pan under planter to avoid water stains, particularly on wood surfaces.

- 9** Select seed type and plant two or three seed's 1/4" deep and very close to the window, 1 1/2" apart. Cover the seeds with the moist soil mix.

- 10** When planting is completed, write the seed name and the date planted on an Identification Label. Insert in soil behind each planting hole.

- 11** Insert Light Shield outside Viewing Window. This keeps light off the roots when you are not viewing them and will keep them growing at the window. Remove Light Shield for viewing. Then replace so that it fits snugly against the clear window.

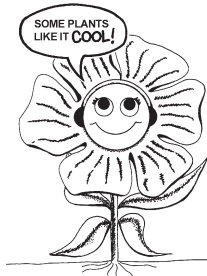
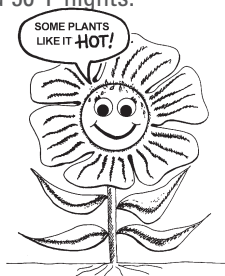


- 12** Place the Root-Vue Farm[®] in a warm and bright location. A sunny window works well or you can use a “Gro-Lite” bulb available at garden centers or hardware stores. Do not let the unit get cold at night as this can result in mold growth. Vegetables need warm temperatures to thrive.

Note:

Warm-season plants, like vegetables grown in the summer months, grow best in 70°F-80°F day temperatures with a low night temperature no less than 64°F.

Cool season plants, like pansies or primroses, grow best in moderate temperatures of spring and fall, or winter in mild climates. Best temperatures for them are 55°F-70°F days and 50°F nights.



- 13** For fast seed sprouting keep the temperature warm and avoid drafts. At 75° the radishes should sprout in 3-4 days. Carrots should sprout in 6 days. Cooler temperatures add several days to sprouting time.

- 14** Normally more than one seedling will grow at each planting spot. Save the strongest seedling and carefully pull out the others. Keep the unit in a warm, sunny location and periodically remove the Light Shield to see how the roots are growing!

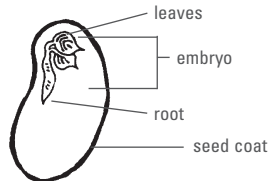


ALL ABOUT SEEDS

Have you ever seen a seed? Maybe you took a bite of a juicy red apple and saw the small seeds inside. Perhaps you helped plant flower seeds or watched a squirrel gather acorns. A seed is a package of plant life. Each seed has a little plant inside. Many seeds hold food, too. Seeds are created by the male and female parts of flowers. Most seeds live inside fruit until they are ready to begin to grow into plants.

LOOK INSIDE A SEED

You wear a coat to protect you from the cold. Seeds from flowering plants have seed coats to protect them. Inside the seed are one or two food storage parts. Next to the food storage parts is a baby plant, the embryo (em-bree-oh). The embryo has tiny leaves, a stem, and roots.

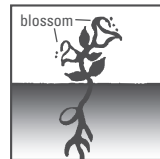
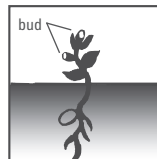
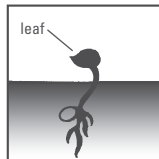
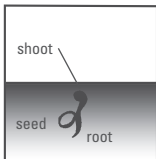


You wouldn't believe how many seeds plants make! Some seeds are eaten, and others fall in places where they can't grow. Some seeds freeze. Others get soaked and spoil. A few seeds, though, end up in places where they get the right temperature and enough air, water, and light to begin to grow, or germinate (jur-muh-nate).

FROM SEED TO PLANT

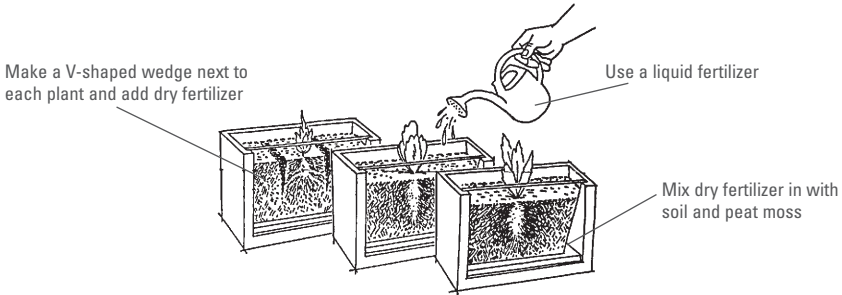
This is how a new plant grows from a seed:

- The seed swells with water and bursts through its seed coat, or germinates.
- The roots grow down into the soil.
- The shoot grows up toward the sunlight. Leaves grow from the shoot.
- The plant gets bigger each day.
- Buds appear on the plant.
- Blossoms appear on the plant.



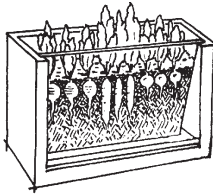
EXPERIMENTS

SEE HOW DIFFERENT WAYS OF FERTILIZING AFFECT ROOT GROWTH



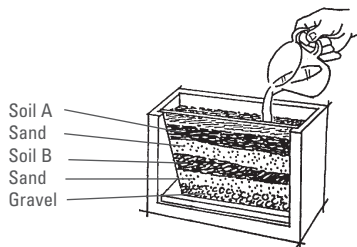
SEE HOW RADISHES GROW FROM SEEDS TO MATURITY

Plant different varieties and watch how they grow.



Radishes are fast growers. Much of the action happens underground before the first leaves appear above the soil.

SEE HOW WATER TRAVELS THROUGH DIFFERENT KINDS OF SOIL



See how the water moves from one type of soil layer to another. Notice how it must build up in one layer before it can move down to the next layer.

SEE HOW HEAT AND COLD AFFECT SPROUTING WHAT HAPPENS TO SEEDS IN WARM, COLD, AND SUN BAGS?

You will need

- 3 pieces of paper towel folded to fit in a plastic bag
- 3 plastic bags
- radish seeds
- labels for bags

- 1** Put 3 pieces of paper towel in water. Place the same number of radish seeds on top of each moist folded towel, (use at least 3 each).
- 2** Use three (3) plastic bags. Label the first bag “warm”, the second bag “cold”, and the third bag “sun”. Place the radish seeds and paper towels inside each plastic bag. (Seeds should be visible from outside the bag)
- 3** Put the bag labeled “cold” in the refrigerator. Put the bag labeled “warm” in the kitchen (or some warm location without sun) and the bag labeled “sun” in a warm sunny window.



Check the bags every day and observe the following:

Do seeds sprout at the same time?

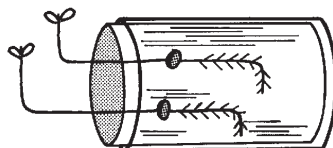
Do they sprout slower in the sun, the warm room or the refrigerator?

How many seeds sprouted in each bag?

“WHAT'S YOUR ANGLE?”... GRAVITY

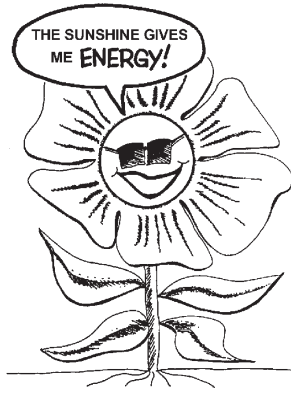
You will need

- 10 radish seeds
- a glass jar
- paper towels
- water.



Soak your radish seeds and place them in a glass jar that is lined with wet paper. Grow the seeds in the dark until the stems are about 1 inch long. Pour off the excess water from the jar and turn it on its side. Keep it in the dark. Wait 24 hours and notice the growth of the stem. Now turn the jar right side up. Put some water in again and leave it in the dark for 24 hours. What happened to the stem now? What does this experiment tell you about the growth of the stem? How about the growth direction of

PHOTOSYNTHESIS

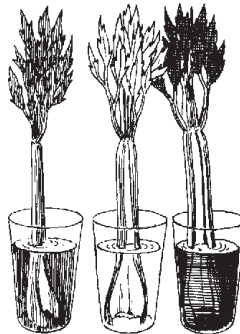


Plants can't go to the store to buy their own food, so how do they get it? Plants take water and carbon dioxide (a gas in the air), and use sunlight to turn them into a kind of sugar called glucose. The plants use the glucose as food for energy and as building blocks for growing. They get help from something called chlorophyll, which gives leaves their green color. The process where plants turn water and carbon dioxide into sugar is called "photosynthesis". It means "putting together with light".

SEE WATER TRAVEL

You will need

- Food Coloring
- Stalk of Celery with Leaves
- Glass of Water



First, put a few drops of red or blue food coloring in a glass. Next, place a stalk of celery with leaves into the glass, leaf end up. Wait a few hours. What happened to the celery? Slice the celery the short way. Look at the colored paths that carry water.

ALL ABOUT VEGGIES!

HANDY INFORMATION ABOUT ROOT VEGETABLES

Root vegetables are versatile, filling and economical, and can add variety and nutrients to your meals. They have anywhere from 9 calories (radishes) to 60 calories (parsnips) in one-half cup. They're all fair to moderate sources of fiber (1 to 2.5 grams in one-half cup) and provide some iron, potassium and vitamin C. The longer you boil any vegetable, the more vitamins and minerals they lose.

If the bulbous roots still have the green tops attached when you buy them, cut these off before you store the roots in the refrigerator. This will prolong their life. Some of these greens, such as turnip and beet, are delicious when cooked and far more nutritious than the roots. Root veggies, notably carrots, turnips, and radishes, are better when small; large ones may be tough and starchy.

Beets These contain more sugar than any other root vegetable, but still only about 35 calories in one-half cup. Good source of antioxidant phytochemicals and some iron.

Carrots One of the best sources of beta carotene and other carotenoids. The deeper the color, the more carotenoids. Rich in sugar. To retain the most nutrients, scrub carrots, but leave them unpeeled, unless the skin is tough and bitter.

Parsnips Relatives of the carrot (without beta carotene), these are a fair source of vitamin C, folic acid, and potassium.

Radishes While not outstanding nutritionally, they're a source of vitamin C and make a good, low-calorie snack. Peeling reduces the sharp taste.

Rutabagas Sometimes called yellow turnips, these relatives of the turnip are the best source of vitamin C of all root vegetables (about 20 milligrams in one-half cup).

Turnips These relatives of the cabbage are cruciferous vegetables. They come in an astonishing range of shapes and sizes. Most have white flesh. Young ones are small and tender; older ones have a thick skin and keep better. Good pureed, mashed with potatoes, or added to stews and soups.

©U.C. Berkeley Wellness Letter

TIME TO SPROUT!

Days to appearance of seedlings at various soil temperatures from seed planted at a half inch depth.*

CROP	SOIL TEMPERATURE IN DEGREES FAHRENHEIT					
	50	59	68	77	86	95
Beans, Snap	0	6	11	8	6	6
Beans, Lima	0	30	18	6	6	X
Beet	17	10	6	5	4	4
Cabbage	15	9	6	4	3	0
Carrot	17	10	7	6	6	8
Corn	22	12	7	4	4	3
Cucumber	X	13	6	4	3	3
Lettuce	7	4	3	2	2	X
Pepper	X	25	12	8	8	9
Radish	11	6	4	3	3	0
Tomato	43	14	8	6	6	9

X = little or no germination 0 = not tested

*Date compiled by Department of Vegetable Crops, University of California at Davis

Seeds planted deeper than one-half inch take more days to appear than shown in this chart. Soil temperatures are slightly cooler as you go deeper, and the seedlings have a greater distance to grow before appearing at the surface. Many seeds, when planted too early in cold soil, will rot before the temperature is right for germination.

PLANTING INFO

BE SURE TO MAKE PHOTOCOPIES OF THESE PAGES BEFORE MARKING ON THEM!
RECORD YOUR OWN PLANTING AND GROWING OBSERVATIONS ON THESE PAGES!

ONION

DATE PLANTED

NOTES

GROWTH STARTED

DATE HARVESTED

CARROT

DATE PLANTED

NOTES

GROWTH STARTED

DATE HARVESTED

RADISH

DATE PLANTED

NOTES

GROWTH STARTED

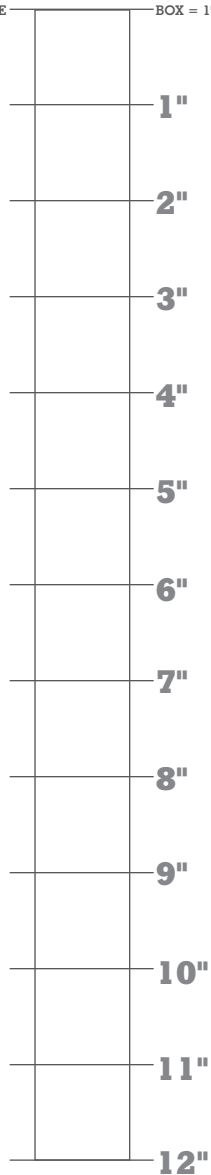
DATE HARVESTED

TRACKING GROWTH

WATCH FOR SIGNS OF ROOT GROWTH AND RECORD IT'S PROGRESS BY STARTING A MARK AT THE TOP OF THIS CHART AND MOVING DOWN AS THE ROOT GROWS!

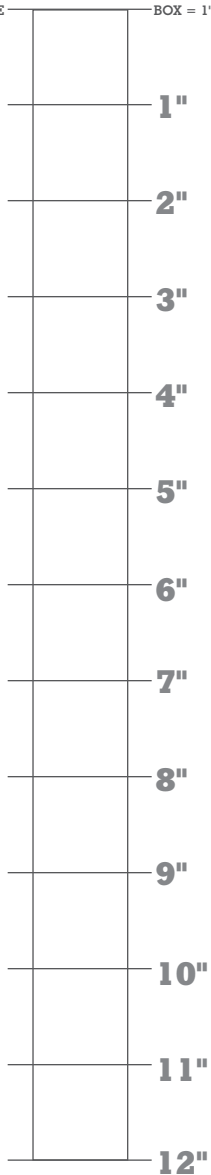
ONION

DATE _____ BOX = 1"



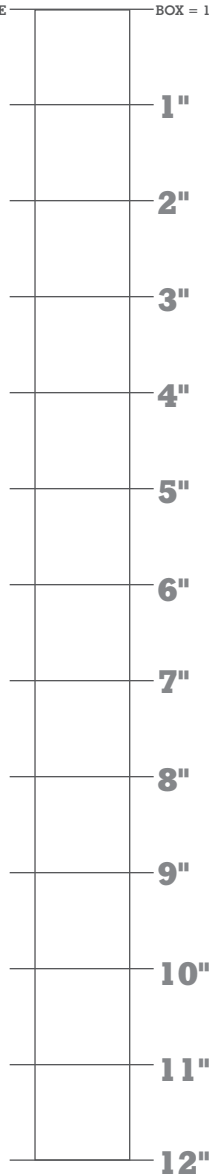
CARROT

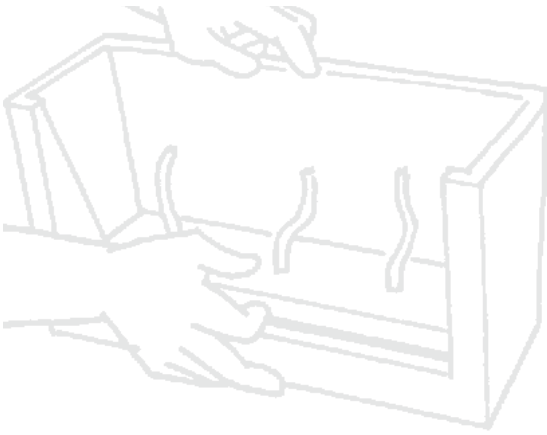
DATE _____ BOX = 1"



RADISH

DATE _____ BOX = 1"





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