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Family Vegetable Garden Series: Use Winter Months to Plan Ahead (#7, 11, 15, 17, 18, 21, 22 and 25)

Michigan State University

Cooperative Extension Service

Nancy E. Smith, J. Lee Taylor, Elizabeth C. Naegele, Horticulture

July 1977

16 pages

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for may 1998 Garden & Home

KEEP THE INSECTS OUT

Root crops are not bothered by many insects, but there are a few that might give you some trouble.

Maggots and white grubs—live in the soil and eat the roots. Spray the furrow with diazinon at planting before covering the seed. Follow directions on the label.



Aphids—small gray-green insects that suck juices from under the leaves of turnips, beets and radishes. Spray with malathion or diazinon. Be sure to spray under the leaves. Follow directions on the label.



Flea beetles—small black insects that eat holes in the leaves. Spray leaves with diazinon or sevin. Follow directions on the label.

HARVESTING YOUR VEGETABLES

Root crops are ready to harvest when the roots are large enough to use. Parsnips however, usually taste better after freezing weather.

VEGETABLE	BEST SIZE (diameter-inches)
Beets	1½ - 3
Carrots	1 - 1½
Rutabagas	3½ - 5
Turnips	1¾ - 2¾

STORING ROOT CROPS

Roots can also be buried in moist sand or slightly moistened vermiculite to prevent drying out and shriveling.

Trash cans make good containers for storing roots either in the ground or above ground in a cool location. If buried in the ground, be sure to cover the top with straw, hay or other material to keep the roots from freezing.



The easiest way to store root crops, except radishes, is to leave them in the ground and mulch them heavily with straw or leaves. They then can be dug throughout winter and spring. This practice will, in fact, increase the sugar content of parsnips.

Roots other than radishes can also be stored in plastic bags or other containers for months. Store as close to 32°F as possible (without freezing) and in high relative humidity. Perforated plastic bags or garbage can liners are useful for keeping the humidity high.

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family
**Vegetable
Garden**
series

EXTENSION BULLETIN E-824 (7)

Root Crops

Robbi Austin, Ingham County Extension Horticulture Aide and J. Lee Taylor, Department of Horticulture

Root crops are vegetables such as beets, carrots, radishes and turnips which are grown for their roots. They are high in vitamins, but low in calories. We eat the roots either raw or cooked. Root crops are very easy to grow and few insects or diseases bother them.

BEST VARIETIES MEAN SUCCESS

These varieties grow best in Michigan. Choose them when buying your seeds.

VEGETABLES	VARIETY	SPROUTING TIME (days)	GROWING TIME (days to harvest)
Beets	Ruby Queen	7 to 14	60
	Detroit Dark Red	7 to 14	63
Carrots	Pioneer	14 to 21	67
	Nantes	14 to 21	68
	Spartan Bonus	14 to 21	77
Parsnips	All America	7 to 25	105
	Model	7 to 25	120
Radishes	Champion	4 to 7	28
	Cherry Belle	4 to 7	24
Rutabagas	American Purple Top	4 to 14	90
	Laurentian	4 to 14	90
Turnips	Just Right	3 to 7	40
	Tokyo Cross	3 to 7	35

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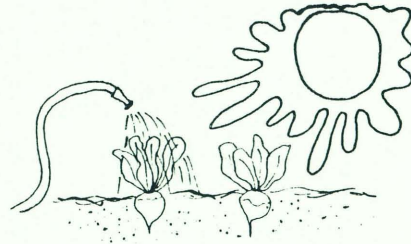
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ROOT CROPS NEED:

- light rich soil. In hard crusty soil roots will grow twisted and be short and tough.
- room to grow.
- sunshine most of the day, but they can grow in a spot that gets some shade.
- plenty of water.



GET READY TO PLANT

Root crops are cool season crops and do best when grown during cool weather. Except for turnips and rutabagas, they should be planted early in the spring (late March to early April). Rutabagas and turnips are usually planted in June or July respectively for a fall crop (another cool time of the year). Follow directions on the seed packet.

Select a spot in your garden that gets at least 8 hours of sunlight a day.

Spread one pound of fertilizer such as 5-20-20 for every 100 square feet before the soil is turned over and another pound per 100 square feet after spading or plowing.

Dig down into the soil with your shovel for 10 to 12 inches and turn over the soil. Remove all stones and other trash. Crumble the soil with your hoe until it runs easily through your fingers. If available, work some peat moss, compost or rotted manure into the soil with a hoe.

PLANT STEPS

1. Mark off straight rows 18 to 24 inches apart (6 to 12 inches for radishes).
2. With your hoe make a shallow furrow ½ inch deep along each row.
3. Sprinkle the seeds into the furrow putting 15 to 20 seeds in each foot of row.
4. Rows of slow germinating kinds (beets, carrots, parsnips) are often marked with a few radish seeds—just sprinkle a few radish seeds in the furrow along with the other seeds before covering. Radish seeds germinate quickly and will let you know where the row is.
5. Cover the seeds lightly with fine, crumbled soil mixed with peat moss or vermiculite if you have it.
6. Sprinkle water over each row and keep the rows damp until the seeds sprout.

THINNING YOUR PLANTS

When your plants have grown several inches, you should thin out some of the plants to make room for the best ones to grow large. Leave the biggest plants and pull out the little ones in between. Sometimes the thinnings are large enough to eat.

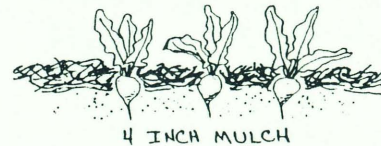
THINNING RECOMMENDATIONS

VEGETABLE	WHEN TO THIN (height-inches)	HOW FAR APART (inches)
BEETS	 6" HIGH	 2-3" APART
CARROTS	 3" HIGH	 1-2" APART
PARSNIPS	 4" HIGH	 3-4" APART
RADISHES	 2" HIGH	 1-2" APART
RUTABAGAS	 3" HIGH	 4-6" APART
TURNIPS	 2" HIGH	 4-6" APART

CARE THROUGH THE SUMMER

Keep weeds out of the rows. Weeds will crowd out the vegetables and rob them of food, light and water. Removing weeds during the first few weeks is very important since seedlings of most root crops are very small and grow slowly at first. Radishes and turnips germinate quickly.

Give plants a good soaking once a week when it doesn't rain. Water each row until the top few inches of soil are moist.



Mulch plants with straw, leaves, or other materials to keep weeds from growing and to hold moisture in the soil. Use 4 inches of mulch along each row.

Add a high nitrogen fertilizer such as ammonium nitrate or urea when the plants are well established. Use about ½ cup of fertilizer per 100 square feet and place it 4 inches from the row and carefully work it into the soil.

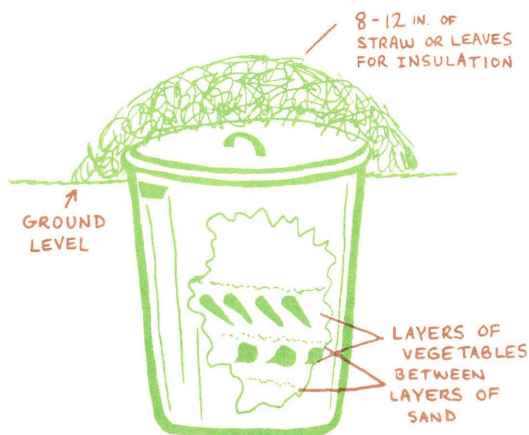
Make additional plantings of radishes about every 10 days if you want to harvest them over a long period of time. Radishes become hot, woody, or go to seed as they become old.

STORING FRESH VEGETABLES

STORING VEGETABLES IS PERHAPS THE LEAST EXPENSIVE OF ALL METHODS OF FOOD PRESERVATION. TEMPERATURE AND HUMIDITY ARE THE MOST IMPORTANT FACTORS FOR GOOD STORAGE, AND VARY FOR EACH TYPE OF VEGETABLE. THE TABLE BELOW LISTS THE BEST CONDITIONS FOR STORING SPECIFIC CROPS.

COOL AND MOIST 32° to 40°F HUMIDITY 90-95%	COOL AND MODERATELY MOIST 32° to 40°F HUMIDITY 80-90%	DRY AND COOL OPTIMUM 32°F Low HUMIDITY	DRY AND WARM 50° to 58°F LOW HUMIDITY
CARROTS BEETS PARSNIPS TURNIPS	CABBAGE CAULIFLOWER POTATOES	ONIONS	PUMPKINS WINTER SQUASH GREEN TOMATOES
USUALLY STORED BETWEEN LAYERS OF MOIST SAND, LEAVES, OR SAWDUST IN A BOX IN BASEMENT OR GARAGE OR IN A CAN OR BARREL BURIED OUTDOORS.	POTATOES MUST BE KEPT IN DARK, PUT IN SLATTED CRATES - NO SAND. FOR CABBAGE AND CAULIFLOWER, PULL UP ROOTS AND REPLANT IN SAND OUTDOORS. ENCLOSE IN WOODEN FRAME AND COVER WITH A HEAVY LAYER OF STRAW OR LEAVES.	AN ATTIC OR COLD, DRY ROOM IN BASEMENT IS BEST. DO NOT PUT IN CLOSED CONTAINERS. USE SLATTED CRATES OR MESH BAGS.	STORE IN A DRY ROOM ON SHELVES. DO NOT ALLOW TO TOUCH EACH OTHER.

FOR COOL AND MOIST STORAGE



CLEAN GARBAGE CAN OR BARREL

Other bulletins in this series provide additional information on vegetable gardening.

GENERAL STORAGE HINTS

- VEGETABLES FOR STORAGE SHOULD BE PLANTED SO AS TO MATURE LATE IN THE SEASON.
- HARVEST VEGETABLES DURING COOLEST PART OF THE DAY (USUALLY EARLY MORNING) SO THEY CONTAIN LESS FIELD HEAT WHICH MUST BE REMOVED BEFORE STORAGE.
- NEVER STORE VEGETABLES WITH APPLES OR PEARS BECAUSE THEY GIVE OFF THE CHEMICAL ETHYLENE WHICH MAY REDUCE STORAGE LIFE AND QUALITY.
- CHECK PERIODICALLY FOR SPOILAGE.
- ONCE REMOVED FROM STORAGE THE VEGETABLES DO NOT KEEP LONG, SO USE PROMPTLY.

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Family Vegetable Garden series

EXTENSION BULLETIN E-824 (11)

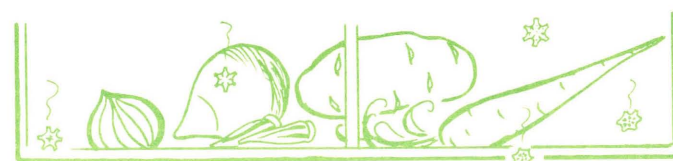
Drying and Storing Vegetables

by margaret pudlo and robert c. herner

DEPT. OF HORTICULTURE

GOOD FOOD AT A SAVINGS

DURING THE COLD, SNOWY DAYS OF WINTER YOUR FAMILY MAY LONG FOR A TASTE OF HOME-GROWN VEGETABLES. SATISFY THOSE LONGINGS BY DRYING OR STORING YOUR EXTRA GARDEN CROPS. DRYING ALLOWS YOU TO STORE A LOT IN A SMALL SPACE AND IN A LIGHT-WEIGHT FORM. STORING FRESH VEGETABLES, ACCORDING TO THEIR INDIVIDUAL REQUIREMENTS, MEANS YOU CAN EAT THEM LATER AS IF YOU HAD JUST PICKED THEM OUT OF THE GARDEN. PRESERVING FOOD BY DRYING AND STORING IS MUCH LESS EXPENSIVE THAN FREEZING AND CANNING.



CHOOSE ONLY YOUR BEST VEGETABLES

KEEP IN MIND THAT THE QUALITY OF YOUR PRODUCTS MAY BE MAINTAINED BUT IS RARELY IMPROVED BY DRYING AND STORING. THEREFORE, YOU MUST START WITH THE BEST. THE VEGETABLES YOU DRY OR STORE SHOULD BE:

- MATURE (NOT TOO RIPE, NOT TOO GREEN)
- FIRM (NOT MUSHY OR WILTED)
- FREE FROM BRUISES AND CRACKS
- FREE FROM INSECT AND DISEASE DAMAGE

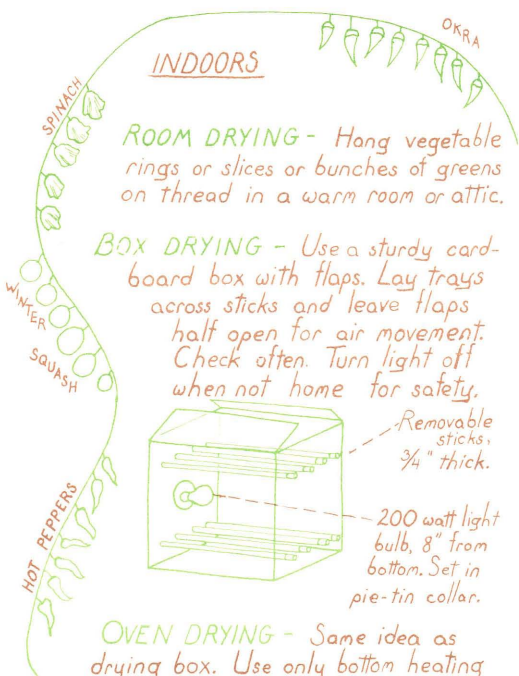
HANDLE YOUR VEGETABLES CAREFULLY TO AVOID BRUISING THEM!



DRY IT ~ YOU'LL LIKE IT!

GENERAL PROCEDURES FOR DRYING INDOORS AND OUTDOORS

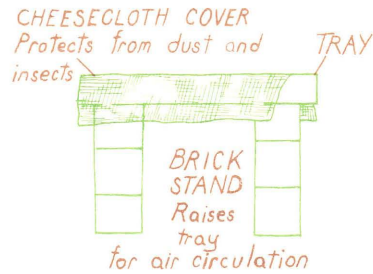
- * FOLLOW PREPARATION AND STEAM RECOMMENDATIONS IN CHART.
- * STEAM VEGETABLES IN A BOILER TO CONDITION THEM FOR EASIER AND MORE EVEN DRYING.
- * PLACE VEGETABLE PIECES LESS THAN 1/2" DEEP ON COOKIE SHEET OR TRAY.
- * IF DRYING OUTDOORS, TURN PIECES OVER ONCE IN THE MORNING AND ONCE IN THE AFTERNOON; INDOORS, TURN ABOUT EVERY HALF HOUR.
- * ALLOW A PIECE TO COOL BEFORE TESTING ITS DRYNESS (SEE CHART).
- * AFTER THE VEGETABLE PASSES ITS DRYNESS TEST, REMOVE IT FROM TRAYS. PILE PIECES LOOSELY ON A CLEAN SURFACE IN A DRY PLACE. PROTECT FROM DUST AND INSECTS. LET DRY 10-15 DAYS. STIR PIECES EVERY DAY.
- * AFTER DRYING IS FINISHED, THE FOOD MUST BE PASTEURIZED. SPREAD PIECES ON A COOKIE SHEET OR SHALLOW PAN IN THIN LAYERS. PLACE IN OVEN FOR 5 MINUTES AT 180°-200°F. THIS HELPS PREVENT SPOILAGE DURING STORAGE.
- * WHEN THOROUGHLY COOL, PLACE IN COVERED GLASS OR PLASTIC CONTAINERS OR PLASTIC BAGS.
- * TO USE THE FINISHED PRODUCT: BEFORE COOKING, SOAK ALL VEGETABLES, EXCEPT GREENS, IN ENOUGH WATER TO COVER THEM UNTIL NEARLY RESTORED TO ORIGINAL TEXTURE. ALWAYS SOAK THEM IN THE WATER THEY HAVE SOAKED IN. COVER GREENS WITH BOILING WATER AND SIMMER UNTIL TENDER.



ROOM DRYING - Hang vegetable rings or slices or bunches of greens on thread in a warm room or attic.

BOX DRYING - Use a sturdy cardboard box with flaps. Lay trays across sticks and leave flaps half open for air movement. Check often. Turn light off when not home for safety.

OVEN DRYING - Same idea as drying box. Use only bottom heating element, if electric. Set for lowest temperature. Leave door open 6". Use cookie sheets for trays, with bottom sheet 8" from heat source.

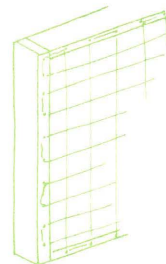


TAKE trays of food indoors every evening
 BEGIN testing for dryness after second day.
 If you live near a busy street or high pollution area, it would be better to dry
INDOORS

VEGETABLE	PREDRYING TREATMENT	STEAM TIME IN MINUTES	TESTS FOR DRYNESS	STORES WELL FRESH
BEANS, SNAP	With larger varieties split pods lengthwise to dry faster. Keep whole for hanging.	15-20	Brittle	
BEETS	Steam first with 1/2" tops. Trim. Peel. Slice 1/8" thick or shred coarsely. Steam.	25-35	Slices leathery Shreds brittle	X
CABBAGE	Remove outer leaves. Quarter. Cut out core. Shred coarsely. Steam.	8-10	Thin edges of shreds crumble	X
CARROTS	Steam. Trim. Peel. Cut into 1/8" rings or shred.	20-30	Slices leathery Shreds brittle	X
CUCUMBERS & SUMMER SQUASH	Wash. Cut into 1/8" thick slices. Steam squash only.	5	Brittle	
EGGPLANT	Peel. Slice 1/4" thick. Steam.	15-20	Leathery	
OKRA	Use young, tender pods. Dries best hung in dry room. No need to steam.	-	Brittle	
ONIONS	Peel. Slice 1/8" thick. Steam.	5	Brittle	X
PEPPERS, HOT	Use mature, dark red peppers. Thread through stems and hang. No need to steam.	-	Pods shrunken, dark, bend without snapping.	
PEPPERS, SWEET (GREEN OR BELL)	Split. Core, remove seeds. Cut into quarters. Steam.	10-12	Brittle	
SPINACH & OTHER GREENS	Use young, tender leaves. Cut out tough midribs. Steam.	4-6	Crumbles easily	
SQUASH, WINTER & PUMPKIN	Split. Peel. Remove seeds. Shred coarsely or cut into 1/8" slices. Steam.	6-10	Slices leathery Shreds brittle	X
TOMATOES	Cut into wedges. Steam.	2-5	Leathery	

TO MAKE YOUR OWN TRAYS

MAKE A FRAME of thin wooden strips 1-2" wide. Trays made 3" shorter than a drying box can be used in the box as well as outdoors. Then either:

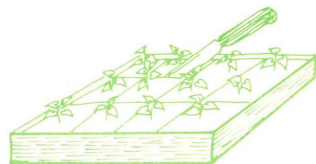


Tack a piece of bedsheet about 2" up the side of the frame to make a strong bottom or loop jute or strong cord around short nails 1/2" apart and weave a bottom across the frame.

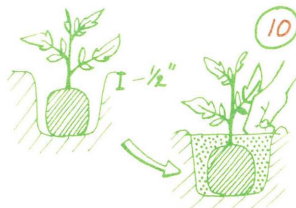


NEVER USE METAL - IT CORRODES TOO QUICKLY

8 If your plants are growing in one container without divisions, separate them with a sharp knife a week before planting.



9 Set plants in garden at recommended time. Pick a cloudy day or plant in the evening so plants won't wilt.



10 Plant 1/2 to 1 inch deeper than in container. Press soil down around plant. Set tall tomato plants deep in soil at an angle. Roots will form along stem.



11 Water well, preferably with a starter fertilizer solution high in phosphorus such as 10-55-10 (can be bought from garden center, seed catalogs, etc.). Follow directions on container. This helps root growth when the soil is cool (see No. 3 in this series: Planting).



middle number is phosphorus

PROBLEMS ?

If seeds sprout, then suddenly wilt and die, it may be due to a disease called "damping off." **THROW AWAY** seedlings, soil and containers and **START AGAIN.** Make sure you **sterilize soil and containers!**



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TAWAN



KEYS
TO
SUCCESS

- Use quality seed.
- Plant recommended varieties.
- Start at right time - not too early!
- Place in lots of light.
- Harden off plants.

Other bulletins in this series provide additional information on vegetable gardening.

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family Vegetable Garden series

EXTENSION BULLETIN E-824 (15)

Starting Plants at Home

by Elizabeth C. Naegele and J. Lee Taylor,
Department of Horticulture

WHY START PLANTS EARLY?

Some vegetables, like tomatoes, take a long time to grow. If you seed them outdoors, you may not get fruit before the first frost. Other vegetables, like broccoli, are "cool-season" crops and must mature before the weather gets warm.



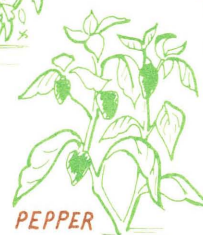
These take
a long time.

So start these vegetables early indoors or buy transplants. Plant them outside on the dates shown on page 2.

EGG-PLANT



(For a fall crop of cool-season vegetables, plant seeds outside May 20 to June 10.)



These
need
cool
weather.

BEFORE YOU START—

You can usually buy better transplants than you can grow yourself. However, by starting your own you can grow varieties not sold at local garden stores.

When buying transplants:



Check for signs of insects or disease. Avoid wilted or spindly plants. Pick a variety that grows well in Michigan (see Extension Bulletin E-760(a)).



WHEN TO START — (based on conditions in southern lower Michigan)

Don't start plants too early. They get tall and spindly and may die outside.

Vegetable	Time to Plant Seeds Indoors	Date to Transplant into Garden
Broccoli	Feb. 20 - Mar. 20	Mar. 20 - Apr. 20
Brussels sprouts	Mar. 1 - 20	Apr. 1 - 20
Cabbage	Mar. 1 - 20	Apr. 1 - 20
Cauliflower	Mar. 1 - 20	Apr. 1 - 20
Eggplant	Mar. 20 - Apr. 1	May 20 - June 1 (after last frost)
Onions	Feb. 20 - Mar. 20	Mar. 20 - Apr. 20
Peppers	Mar. 20 - Apr. 1	May 20 - June 1 (after last frost)
Tomatoes	Apr. 20 - May 1	May 20 - June 1 (after last frost)

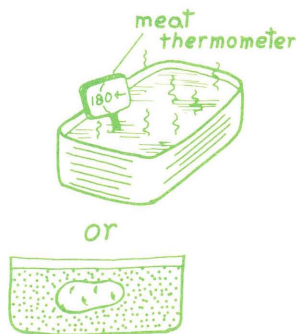
Start melons and winter squash indoors 2 weeks before planting outdoors to insure harvest before frost.

BEGIN WITH BASICS

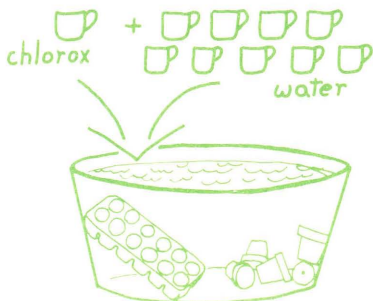
Seed: Buy varieties recommended for Michigan. Use new seeds or last year's if stored properly (old seeds may not grow as well). Do not use seeds saved from last year's plants (bean, pea and tomato seeds might be saved if the plants weren't hybrids).

Soil: Use a sterile, light-weight soil mix. Buy a prepared one or mix your own. Combine equal parts of:
garden soil
peat moss
sand, vermiculite or perlite

If you mix your own, sterilize it. Put soil in pan, moisten and cover with aluminum foil. Place in a 300°F oven. When meat thermometer in soil reaches 180°F, bake for 30 minutes more. Soil is also ready when a potato in the middle of soil is fully cooked.

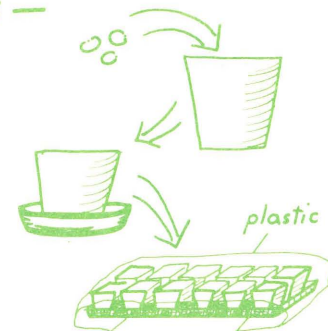


Containers: Use containers with small compartments so plant roots don't grow together — peat pots or pellets, plastic egg cartons, paper cups, clay pots, etc. Punch holes in the bottom of each pot or compartment, so water can drain out. Sterilize clay or plastic ones: mix 1 part chlorox to 9 parts water; leave clay or plastic containers in solution overnight.



TO GROW YOUR OWN TRANSPLANTS —

① Moisten soil in containers. Plant 3 seeds in each compartment at depth recommended on seed packet. Gently sprinkle water over seeds or stand container in water until saturated. Put clear plastic wrap over containers. Do not water until after seeds sprout, since plastic holds in moisture.

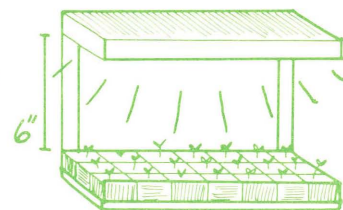


② Place containers in warm area (65-75°F) — not in sun, or seedlings may burn. After most sprout, place in cooler area.



③ If more than one seed in a container sprouts, pinch off all but the strongest one. Remove plastic as soon as most seeds sprout.

④ Place seedlings in BRIGHT LIGHT, or they will get tall and spindly. Use a south window, a cool white fluorescent light or grow-light (4-bulb fixture). You can buy these at garden or hardware stores. Place light 6 inches above seedlings. Leave on 16 to 18 hours a day.



⑤ Water plants as soon as soil starts to dry out, before seedlings wilt.

⑥ Fertilize seedlings when they begin to grow with 1 tbs. houseplant fertilizer in 1 gallon of water. Fertilize again when seedlings are 3 and 5 weeks old.

⑦ Harden off plants before placing in the garden. This means slowly getting plants used to the weather outside. To harden, water plants less and put them in a cooler area 2 or 3 weeks before transplanting. Move plants outdoors on warm days and bring in when it gets cold.



LEEKS

Leeks have a mild, delicate flavor.

- Plant seeds like onions, or plant in September for an early crop the next year.
- You may also buy or grow transplants.
 1. Place these in furrows 4 to 6 inches deep.
 2. As plants grow, fill the furrow gradually or hill up soil around plants to increase white area of roots.



Leeks from seed take about 130 days. Use like green onions; add to soups and stews. Trim tops to 5 inches.

SHALLOTS

Milder than onions, shallots are grown from cloves like garlic or from sets.

- Let them mature and eat like dry onions.
- Or, pull early and use like green onions.



Buy sets through seed catalogs or at garden centers. Harvest and store bulbs like dry onions. Sauté shallots and add to cream sauces, seafood dishes or scrambled eggs.

PRESERVING

Onions and relatives can be frozen, canned or dried, as well as stored (see No. 11 in this series: Drying and Storing Vegetables).

INSECTS AND DISEASE

See Extension Bulletin E-760 (b) or your County Extension Agent for more information.



KEYS
TO
SUCCESS

- Plant early.
- Fertilize and water well; keep weeded.
- Dry bulbs well before storing.

Other bulletins in this series provide additional information on vegetable gardening.

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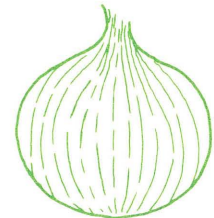
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Onion family

by Elizabeth C. Naegle and J. Lee Taylor
Department of Horticulture

SPICE UP YOUR LIFE!

No kitchen should be without ONIONS or its relatives! They are easy to grow, and many types and varieties are available.



RECOMMENDED VARIETIES Days from planting to harvest in ()

ONIONS:

Sets
Ebenezer (95-100)
Stuttgarter (95-100)

Seeds
Autumn Spice (96)
Abundance (100)
Spartan Era (100)
Spartan Gem (105)
Downing Yellow Globe (110)
Ruby Red (115)

Transplants
Sweet Spanish (95-100)

Bunching
Beltsville Bunching (65)
White Portugal (100)

LEEKS: American Flag (120)

GARLIC: Creole (120)
Italian (120)

Plant onions and relatives as early as possible in spring (Mar. 20 - Apr. 20). They grow best in cool weather and can stand frost.

THE BASICS

soil: Onions grow best in a well-drained and well-cultivated sandy loam soil. If your soil has much clay, add organic material like grass clippings, leaves or well-rotted manure.

fertilizer: Mix in 2 pounds (4 cups) of 5-20-20 fertilizer per 100 square feet of soil before planting. Apply a high nitrogen fertilizer in June.

water: Water thoroughly during dry spells.

weeding: Weed carefully or use a mulch to prevent weeds (see No. 4 in this series: Keep 'em Growing).



ONION FAMILY - Allium Group

DRY ONIONS

Starting

Onions can be grown from seeds, sets or transplants.

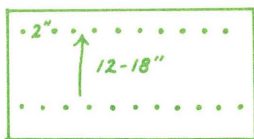
- A set is a small onion grown from seed the previous year.



- They should be no more than $\frac{1}{2}$ to $\frac{3}{4}$ inch across. Larger sets go to seed easily causing bulb growth to stop.
- Place sets 1 to 2 inches deep in rows 12 to 18 inches apart.
- Place 2 inches apart in row (closer if you use the thinnings for green onions).
- Cover with 1 inch of soil.

- Transplants (small onion plants) cost about the same as sets. They produce the largest onions.

- You can buy plants or start your own.
- Space plants the same as for sets.



- Seed is the cheapest way to start onions, but produces irregular bulbs and is only good for early-maturing varieties.



- Sow seeds $\frac{1}{2}$ inch deep in rows 12 to 18 inches apart.
- Thin to 2 to 3 inches between plants.

Harvesting

- Dig onions when tops dry and fall over.
- Dry well before storing. Spread them on the floor of a garage, porch, shed, etc.
- Store in a dry place near 32° F.
- Leave 1 inch of stem on onions for storing.

If properly dried and stored, onions will last all winter. White onions do not keep as well as yellow and red varieties.

ONION TYPES

a good, all-purpose cooking onion



YELLOW GLOBE



BERMUDA

use raw, in salads and on hamburgers.



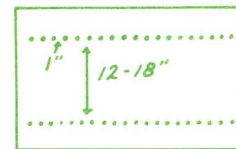
SWEET SPANISH

sweet and mild

GREEN ONIONS

These are the same as dry onions, but are harvested sooner.

- Plant sets the same as for dry onions, but space 1 inch apart. Every few weeks, plant more sets for a fresh supply all summer.



- Transplants may be bought or started yourself.
- Use seeds from any standard onion variety. Plant the same as for dry onions. Or, use a bunching variety which does not form bulbs.

You can also use thinnings from dry onions as green onions. Pull before bulbs start to swell.

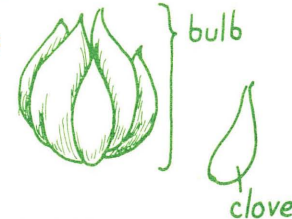


ONION RELATIVES

GARLIC

Grow garlic from the cloves which make up the bulb.

- Plant single cloves $1\frac{1}{2}$ inches deep, 3 inches apart, with 12 inches between rows.
- Harvest garlic like dry onions.



Buy cloves through seed catalogs or the supermarket. Use garlic in salads, bread or sauces.

CHIVES

Plant seeds or transplants. Chives are perennials with pretty purple flowers.

- Sprinkle seeds in rows 12 inches apart, or in a pot.
- Leave 12 inches between transplants in a row.



To harvest, cut tops as needed. Add to cottage cheese or dips. Bring chives inside in the fall and grow on a windowsill.

HARVESTING AND STORAGE

- Pick when fully red or yellow and before the first frost.
- Select perfect fruits for storage in the fall.
 1. Pink ones will ripen at room temperature or can be stored a week at 55° to 65° F.
 2. Full-sized green tomatoes can be pickled or fried. Or, you can wrap them in paper when picked before frost and store them 3 to 6 weeks at 55° to 65° F. Leave stems on and check often. Throw out any that look bad. Move them to room temperature to ripen.
 3. Cherry tomato plants can be pulled up and hung in a cool place to ripen the fruit. Pick as needed.
- Store fully ripe tomatoes in the refrigerator.

INSECTS AND DISEASE

- Protect young plants from cutworms by wrapping the stem with newspaper or by paper collars buried 1 inch in the soil. Or, use an insecticide when planting.
- Plant disease-resistant varieties where possible.
- If insects or disease become a problem, see Extension Bulletin E-760(b) or your County Extension Agent for the recommended pesticide to use.



**KEYS
TO
SUCCESS**

- Plant recommended varieties.
- Transplant after danger of frost.
- Plant in sunny location.

Other bulletins in this series provide additional information on vegetable gardening.

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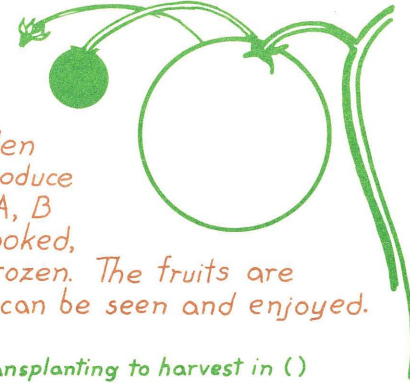
EXTENSION BULLETIN E-824 (18)

Tomatoes

by Elizabeth C. Naegele and J. Lee Taylor
Michigan State University

mm mm GOOD!

Tomatoes are the most popular garden vegetable! They are easy to grow, produce a lot of fruit and are rich in vitamins A, B and C. They can be used fresh or cooked, in salads or sauces, or canned or frozen. The fruits are attractive, so plant them where they can be seen and enjoyed.



RECOMMENDED VARIETIES Days from transplanting to harvest in ()

Early: • New Yorker (64)
• Springset (67)
• Red Pak (71)

Yellow: Golden Boy (78)
+ Sunray (83)

Mid-season: • Setmore (71)
• Jetstar (72)
• Campbell (73)
• Heinz 1350 (75)
• Roma (76) for paste

Small-fruited: (suitable for container gardening)
• Pixie (52)
• Presto (60)
• Small Fry (68)
• Yellow Pear (70)

Late: • San Marzano (78) for paste
• Supersonic (79)
• Burpee (80)
+ Manalucie (86)

• resistant to verticillium and fusarium wilt diseases
• only resistant to verticillium
+ only resistant to fusarium

START EARLY

Tomatoes take a long time to grow, so buy transplants or start them early indoors (see No. 15 in this series: Starting Plants at Home). You'll probably get better plants if you buy them.



THIS!

If you buy transplants:

- Choose dark-green, stocky plants 6 to 10 inches tall with stems the thickness of a pencil.
- Don't buy tall, spindly plants or those with spots or yellow or curling leaves.
- Avoid plants with flowers or fruit on them.

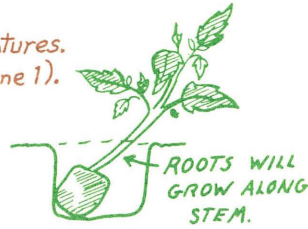


NOT THIS!

TRANSPLANTING

Tomatoes cannot withstand cold temperatures.
Plant after the last frost (May 20-June 1).

1. Set plants 1 inch deeper than they were in containers. If tall and leggy, set deeper and on a slant.



2. Water well, preferably with a starter fertilizer solution.

3. If there are frost warnings, the small plants can be covered at night with boxes, milk cartons, etc. Remove covers during the day when it's warmer.

BASICS

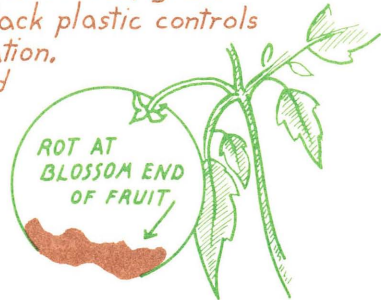
Tomatoes need full sun for high yields!



soil: Plant in well-drained soil.

fertilizer: Before planting, mix in 2 pounds (4 cups) of 5-20-20 fertilizer per 100 square feet of soil. Sprinkle a high nitrogen fertilizer 4 inches from plants after fruits begin to form.

weeding: Mulching with a 3 to 5 inch layer of leaves, grass clippings or straw or a sheet of black plastic controls weeds with less work than cultivation. Mulching also keeps soil moist and fruits clean.



water: Provide plenty of water. You can help prevent blossom end rot by keeping the soil evenly moist.

VARIETIES



• There are tomatoes for fresh eating and for paste as well as cherry-sized ones, and red and yellow colors.

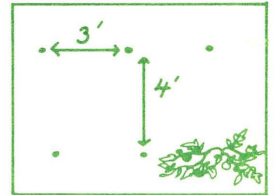
• Plant an early variety for early harvest. The midseason and late varieties taste better, so save most of your space for them.

TRAINING TOMATOES

If you let tomatoes grow naturally along the ground they are less work and produce more fruit. However, plants grown in cages or on stakes produce cleaner fruit and make harvesting easier. More plants can be grown in a limited space if they are trained.

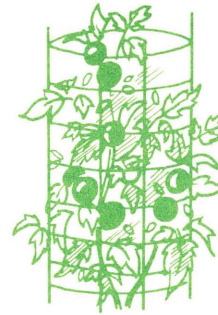
On ground

To keep fruits from rotting on ground, spread a mulch (see p. 2) around plants. Set plants 3 feet apart in rows 4 feet apart.



Caged

This is less work than staking, and yields are greater.



1. To make a cage, take a 6 x 5 foot section of 6 x 6 inch or 8 x 8 inch mesh wire. (Concrete reinforcement wire works well.)
2. Roll into a cylinder and hook ends together.
3. Remove bottom rung to make prongs that you can push into soil around plants.
4. Let plants grow up inside the cage.
5. Set plants 2 to 3 feet apart with 5 feet between rows.

Staking

This is more work than caging, but requires less space to store stakes over winter.

1. Set 6-foot stakes 10 inches deep in the soil, about 3 inches from the plant's base.
2. As the plant grows, tie stem loosely to the stake every 12 inches with pieces of cord or cloth.
3. Remove side shoots so there is one main stem.
4. Set plants 2 to 3 feet apart with 3 feet between rows.



Remove stakes and cages at the end of the season and save for next year.

CONTAINERS

Grow tomatoes in containers if you don't have much space (see No. 12 in this series: Space Saving Ideas).



RECOMMENDED VARIETIES Days from planting to harvest in ()

Early: Buttervee (58)
Spring Gold (67)
Bravo (68)
Sprite (bicolor) (69)
Sundance (69)

Midseason: Northern Belle (74)
Butter and Sugar (bicolor) (74)
Goldcup (80)
Wonderful (82)

Late: Silver Queen (92)
Golden Queen (94)

- There are yellow, white and bicolor varieties of sweet corn as well as early, midseason and late kinds. The later ones are the best quality.
- Popcorn, Indian corn (ornamental corn) and field corn are different types of corn. They are usually harvested when fully mature and dry. Do not plant them next to sweet corn or you may get ears with mixed kernels.

PROBLEMS

- To help prevent seeds from rotting early in the spring, use seeds treated with a fungicide (see No. 13 in this series: Controlling Pests).
- Insects may be troublesome, especially corn earworms. If a problem arises, see Extension Bulletin E-760(a) or your County Extension Agent for the recommended pesticide to use.
- Make sure seeds are covered well with soil so as not to attract birds and animals.



- KEYS TO SUCCESS**
- Plant a number of short rows rather than a single long row.
 - Plant mostly midseason and late varieties (better quality).
 - Make successive plantings.

Other bulletins in this series provide additional information on vegetable gardening.

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OPERATIVE EXTENSION SERVICE
MICHIGAN STATE UNIVERSITY

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EXTENSION BULLETIN E-824 (21)

Sweet Corn

by Elizabeth C. Naegele and J. Lee Taylor
Department of Horticulture

discontinued

NOTHING SWEETER!

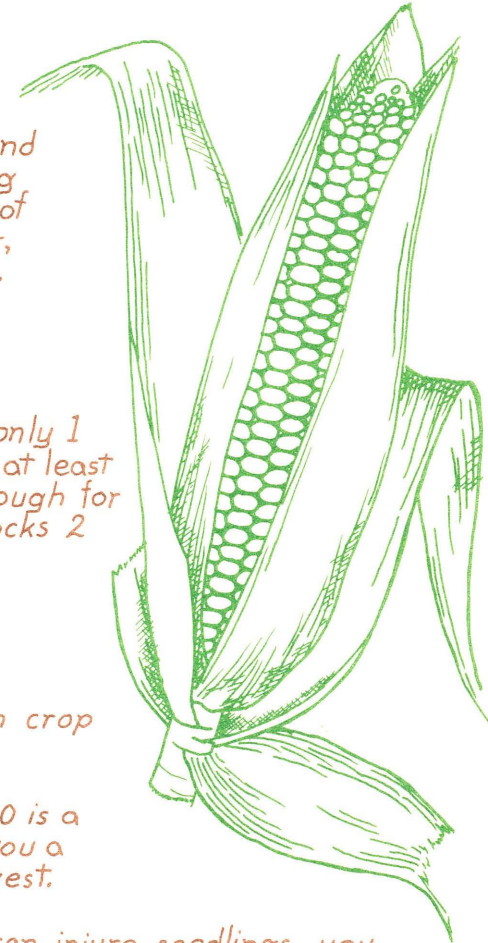
Sweet corn is easy to grow and good for you. There's nothing better than the sweet taste of freshly picked corn! However, it does require a lot of space.

FOR BIG GARDENS

Since each plant produces only 1 or 2 ears, you need to plant at least 80 feet of row to produce enough for a family of four. (Plant in blocks 2 or more rows wide.)

WARM SEASON

- Sweet corn is a warm season crop and requires full sun.
- Planting corn before May 20 is a little risky, but it does give you a chance for an earlier harvest.
- Early Crop: Although frost can injure seedlings, you may plant a few seeds (of any variety) from late April to May (when there is still danger of frost). Frost will not injure seeds before they sprout.
- Main Season Crop: Wait to plant most of your corn after danger of frost (late May).



PLANTING

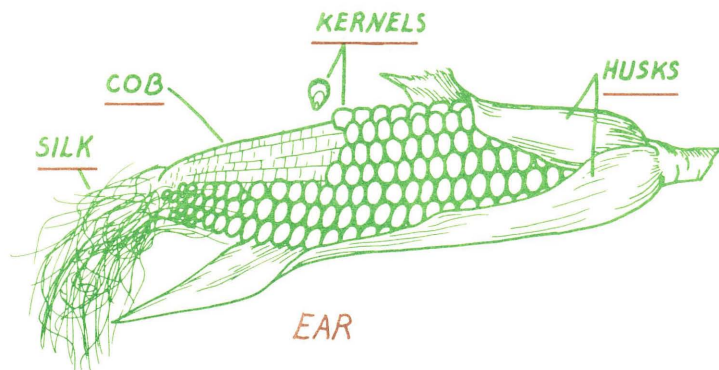
- Plant seeds 2 to 2½ inches deep, 5 or 6 inches apart.
Thin to 10 to 12 inches apart.
Space rows 2½ to 3 feet apart.
- Corn can also be planted in "hills" (groups of seeds, not mounds). Plant 5 or 6 seeds per hill and thin to 3 seedlings. Space hills 3 feet apart.

SUCCESSION PLANTING

- To lengthen the harvest period, plant early, midseason and late varieties all at the same time.
- Make successive plantings of a midseason or late variety until late June. Wait until each planting is about 2 inches high before you plant the next one.

AT LEAST TWO

Since corn is wind-pollinated, it's better to plant at least 2 short rows of one variety rather than 1 long one. This way, pollen is blown from one row to the next. You may also plant in hills. Poor pollination produces cobs with missing kernels.



THE BASICS

soil: Corn will grow in most soils if they are well-drained. It grows best in a clay loam soil.

fertilizer: Corn is a heavy feeder and should be fertilized before planting with 2 pounds (4 cups) of 5-20-20 fertilizer per 100 square feet of soil. Apply a high nitrogen fertilizer when plants are knee-high (see No. 2 in this series: Start with Soil).

weeding: Keep corn free of weeds. Cultivate with a hoe, but be careful not to injure shallow roots. Or use a mulch which will also keep in moisture (see No. 4 in this series: Keep 'em Growing). Do not remove suckers (side shoots) as this may reduce yields.

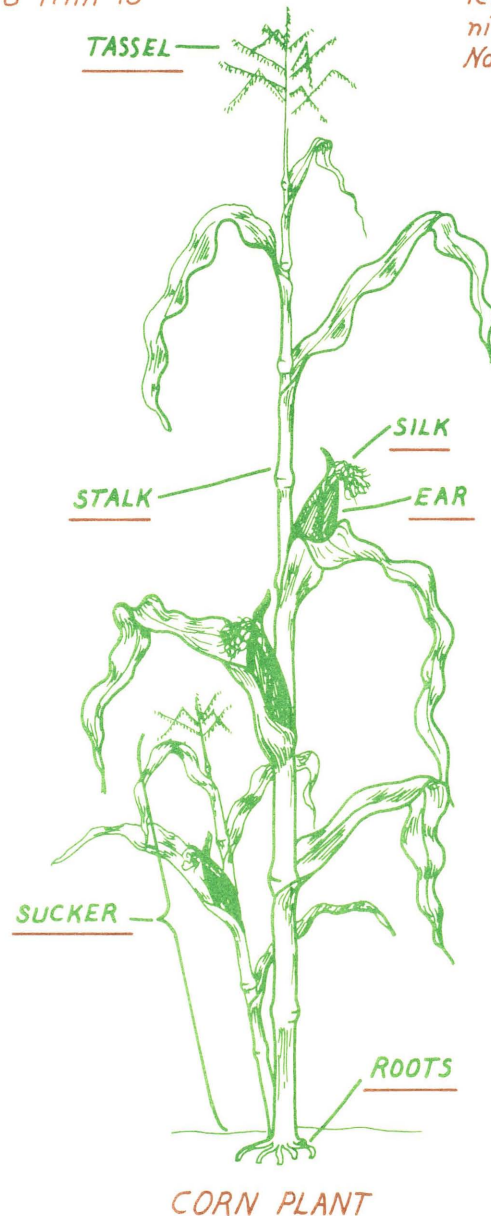
watering: Corn needs lots of water, especially from the time tassels appear until harvest. If it doesn't get at least 1 inch of rain per week during warm weather, water it.

HARVESTING

Harvest sweet corn after the silks on the ear turn brown and dry and kernels squirt a milky juice when punctured. A clear juice means the corn is not yet ready; a thick, dough-like substance means it is overripe and tough.

STORAGE

The quality of sweet corn decreases very rapidly after picking. It loses its sweet taste and becomes starchy. So use it as soon as you can after harvesting. If you must wait, store it in the refrigerator. Freeze or can corn.



RECOMMENDED VARIETIES

Days from planting to harvest in ()
(Lima beans usually take most of the summer to mature.)

LIMA BEANS

Large Seeded, Bush

Fordhook 242 (75)
(heat resistant)

Large Seeded, Pole

King of the Garden (88)

Small Seeded, Bush

Henderson Bush (65)
* Thaxter (74)

* resistant to downy mildew disease.

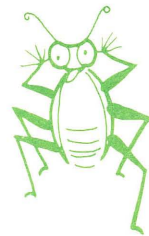
- Small-seeded lima beans mature sooner than large-seeded ones.
- Bush varieties need no support and mature faster, but pole varieties produce more beans.

OKRA

Dwarf Green Long Pod (53)
Emerald (56)
Clemson Spineless (58)

INSECTS AND DISEASE

If insects or disease become a problem, see Extension Bulletin E-760 (b) or your County Extension Agent.



KEYS

TO

SUCCESS

- Plant after all danger of frost.
- Don't plant lima beans later than June 1.
- Harvest when still tender.

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EXTENSION BULLETIN E-824 (22)

discontinued

Lima Beans and Okra

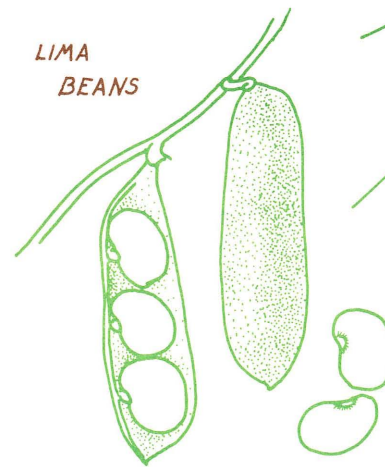
by Elizabeth C. Naegele and J. Lee Taylor
Department of Horticulture

LONG, HOT SUMMER

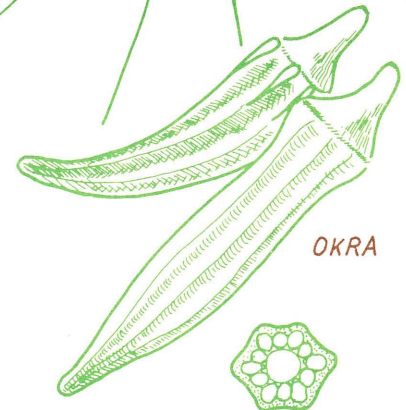
Lima beans and okra are warm season vegetables that grow best in hot weather and enjoy full sun. Lima beans need a very long growing season. However by choosing the proper variety, you should be able to harvest them before the first frost in southern lower Michigan.



LIMA BEANS



OKRA



PLANTING DATES

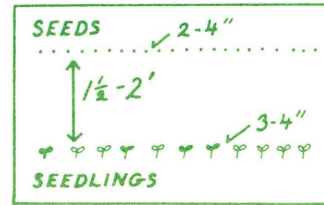
Plant lima beans and okra May 20 to June 1, after all danger of frost is past. Make sure the ground has warmed up before planting. If planted later, they probably won't have time to mature. They are commonly not transplanted.

LIMA BEANS

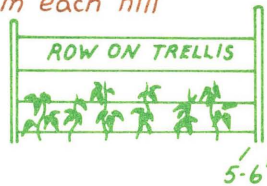
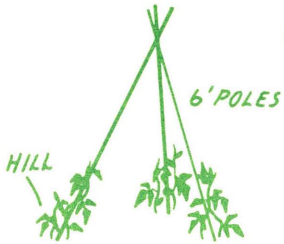
Lima beans, known as "butter beans" in the South, have similar requirements to snap beans, but are more sensitive to cold soils and have a longer growing season (about 4 months).

PLANTING

- Sow seeds 2 to 4 inches apart and 1 to 2 inches deep. Leave 1/2 to 2 feet between rows. Thin seedlings to 3 or 4 inches apart.



- Pole varieties may be planted in rows like bush varieties, or in "hills" (groups of seeds, not mounds). Plant 6 seeds in each hill and thin to 2 or 3 plants. Pole varieties should be supported (see No. 6 in this series: Garden Beans).

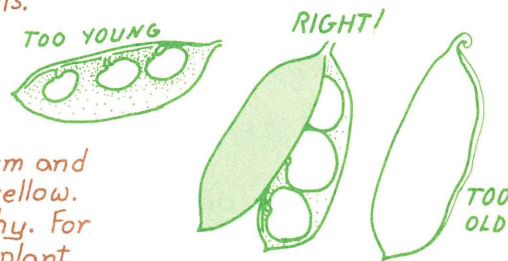


THE BASICS

- soil:** A sandy soil is best, but any well-drained soil will do. If you have a lot of clay, add organic matter such as leaves, grass clippings, well-rotted manure, etc.
- fertilizer:** Before planting, work in 2 pounds (4 cups) of 5-20-20 fertilizer per 100 square feet of soil. If leaves are light green, apply a high nitrogen fertilizer before blossoms appear. Sprinkle it 4 inches from plants and work into soil.
- weeds:** Cultivate lightly or use a mulch. Black plastic will keep the soil warm and moist.
- water:** Water during dry spells.

HARVEST AND USES

- Pick when seeds in pod feel firm and plump, but before pods turn yellow. Overmature beans are starchy. For dry beans, let them dry on plant.
- Store lima beans in the refrigerator for immediate use. Freeze or can them for later use.
- Lima beans are great cooked by themselves or added to mixed vegetables or stews.

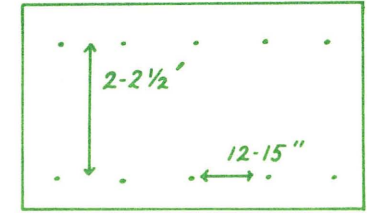


OKRA

Okra, also called "gumbo" in the South, is an easy vegetable to grow.

PLANTING

Plant seeds 1/2 inch deep. Thin seedlings to 12 to 15 inches apart. Leave 2 to 2 1/2 feet between rows.

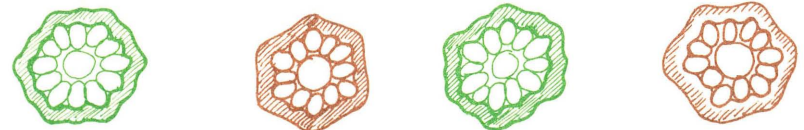


THE BASICS

- soil:** Plant in a well-drained soil.
- fertilizer:** Before planting, mix in 2 pounds (4 cups) of 5-20-20 fertilizer per 100 square feet of soil. Apply a high nitrogen fertilizer when pods first begin to form. Sprinkle 4 inches from plants and work into the soil.
- weeds:** Cultivate lightly or use a mulch. Black plastic will keep the soil warm and moist.
- water:** Water during dry spells.

HARVEST AND USES

- Harvest okra when pods are young, soon after petals fall. If you wait too long, pods become tough and stringy. Pick pods often so plants produce more.
- Add okra to stews or mixed vegetables or dip in batter and fry.
- To store okra, freeze or can pods whole or sliced. They may be dried, too (see No. 11 in this series: Drying and Storing Vegetables).



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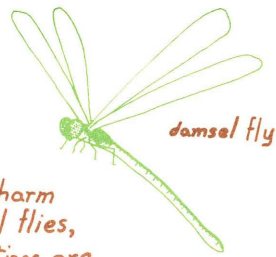
CONTROLLING PESTS

INSECT POLICE



ladybug

Some insects eat the insects that harm plants. Ladybird beetles, damsel flies, assassin bugs and praying mantises are some of these.



damsel fly



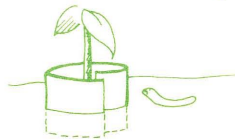
assassin bug



praying mantis

THINGS TO TRY

- 1 Put collars of paper or cardboard around plants when transplanting to stop cutworms.
- 2 Handpick insects as they appear.
- 3 Use ashes around plants where slugs are a problem.
- 4 Put a few drops of mineral oil at base of corn silks (at tip of ear) when their tips start to turn brown, to prevent damage from corn earworms.
- 5 Drown slugs by placing a shallow pan of beer (sunk to ground level) in garden.
- 6 Place boards in garden. Squash bugs, etc. will gather underneath. Check early each morning and destroy.



Although some organic fertilizers and pesticides are available at garden stores or through seed catalogs, many are not. To find them, contact your County Extension Agent for information.



KEYS
TO
SUCCESS

- Apply enough organic material to supply enough nutrients for your garden.
- Use recommended and disease-resistant varieties.
- Keep weeded and remove diseased plants.

Other bulletins in this series provide additional information on vegetable gardening.

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EXTENSION BULLETIN E-824 (25)

Organic Gardening

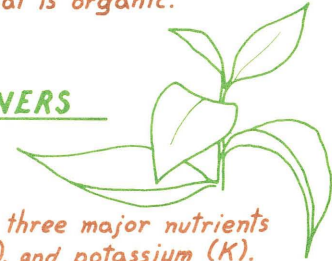
by Elizabeth C. Naegels, J. Lee Taylor and Jane Cloutier — Department of Horticulture

Organic gardening is growing vegetables without using chemical (man-made) fertilizers or pesticides. Organic means "from living things". Anything that was part of or produced by a plant or animal is organic.

FERTILIZERS AND SOIL CONDITIONERS

FERTILIZERS

Fertilizer is plant food, usually a combination of the three major nutrients needed by plants — nitrogen (N), phosphorus (P), and potassium (K).



- Inorganic (chemical) fertilizers supply these nutrients in a form plants can use right away.
- Organic materials must be broken down into chemicals before plants can use them. Fresh manure, leaves, straw, etc. will not supply many nutrients to plants until they are well rotted. They will help improve the soil by making clay soils drain better and sandy soils hold moisture better.

You'll need a lot more organic fertilizer than chemical fertilizer to get the same amount of nutrients. For example, 2 pounds of commercial fertilizer (5-20-20) equals about 25 pounds of manure plus 5 pounds of rock phosphate.

SOME ORGANIC FERTILIZERS

	Analysis (N-P-K)	Pounds needed per 100 sq. ft. of soil	Analysis	Pounds needed
Nitrogen				
dried bloodmeal	13-15-0	3		
hoof & bonemeal	14-0-0	2		
			cattle and horse manure	.5-.3-.5 20-30
Phosphorus				
rock phosphate	0-5-0	25-75	sheep and chicken manure (never use fresh)	.9-.5-.8 10-20
steamed bonemeal	.8-30-0	3-6	compost	— 20-80
Potassium				
green sand (glauconite)	0-1-6	25-75		
unleached wood ashes	0-2-6	5-15 (If soil pH is less than 6.5, use half as much.)		

(You will need to combine N sources with suppliers of P and K.)

COMPOST

Compost is a mixture of decayed materials such as leaves, sawdust, animal droppings and so on. It improves soil drainage and air space. It is weak fertilizer, though. It would take 20 to 80 pounds of compost to give enough N, P and K to grow good vegetables in a 100 square foot garden.

What to use for compost: leaves, grass clippings, sawdust, wood chips, healthy plants, straw, hay, pea pods, manure, kitchen garbage (except meat scraps)

What not to use: diseased plants, weeds with seeds, fruit pits or seeds or meat scraps (They attract rats and mice.), bones or fat, man-made things like plastic, bottles or cans.

Mix with fertilizer and leave it to rot. Keep the pile moist. When ready, mix it into soil. (See No. 2 in this series: Start with Soil, or Extension Bulletin E-727.)



GREEN MANURE AND COVER CROPS

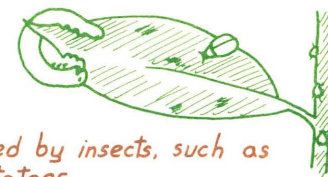
You can add organic matter to your garden by growing a crop on the garden site when not using it for vegetables.

Green manure: soybeans, rye, ryegrass, sweet clover. Grow on garden site for 1 or 2 years and then plow under. This is good if you don't plant your garden in the same spot every year.

Cover crop: rye or wheat. Plant in fall after destroying old plants. Plow cover crop under in spring before planting.

Green manure and cover crops give the same results as compost when worked into soil, with a lot less time and effort.

START RIGHT



- 1 Don't grow vegetables commonly attacked by insects, such as cabbage, cauliflower, broccoli and potatoes.
- 2 Use disease-resistant varieties. (See Extension Bulletin E-760 (a).)
- 3 Do not use plants with diseases or insects for compost.
- 4 Plant only pest-free seeds and plants.
- 5 Rotate crops. Crops hurt by the same pests should be planted in a different part of the garden each year. This keeps pests from building up in soil. Groups of vegetables injured by the same pests are:

Mustard family (cole crops)
broccoli, Brussels sprouts, cabbage, cauliflower, collards, kale, mustard, radishes

Nightshade family
eggplant, peppers, potatoes, tomatoes

Parsley family
carrots, celery, parsley

Cucumber family
cucumbers, melons, pumpkins, squash

Pea family — beans, peas

- 6 If any plants look diseased, remove and destroy them right away.
- 7 Keep weeds down — harmful insects hide in them.

ORGANIC OR NATURAL PESTICIDES



Most organic pesticides can be used up to day of harvest. However, some are more toxic (poisonous) than man-made ones.

- Petroleum oils (1 to 3% spray concentration) — Controls scale insects, aphids and spider mites.
- Pyrethrum (from plants) — A lot is needed to kill insects. It paralyzes insects quickly. Low toxicity.
- Rotenone (from plants) — Slower acting than pyrethrum, but more poisonous. Kills sucking and chewing insects. Highly toxic — more poisonous than common inorganic pesticides used in home gardens, such as malathion and sevin.
- *Bacillus thuringiensis* (trade names: Dipel, Thircide and others) — A bacteria which kills many leaf-chewing caterpillars.