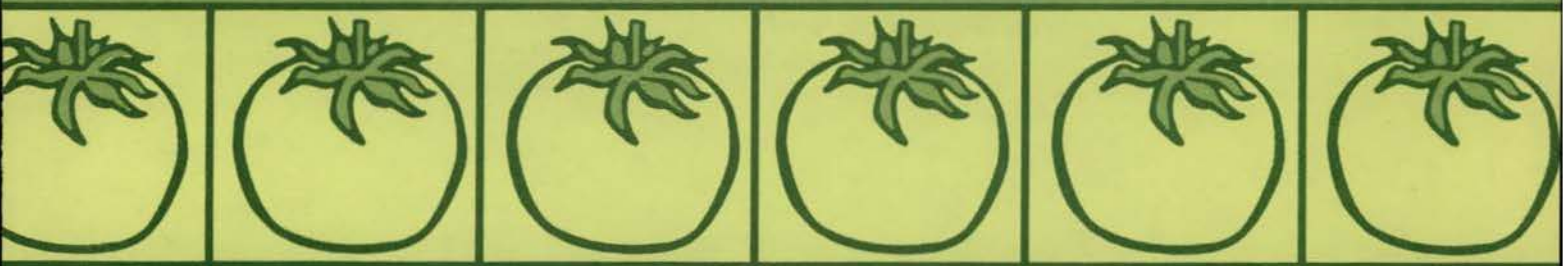


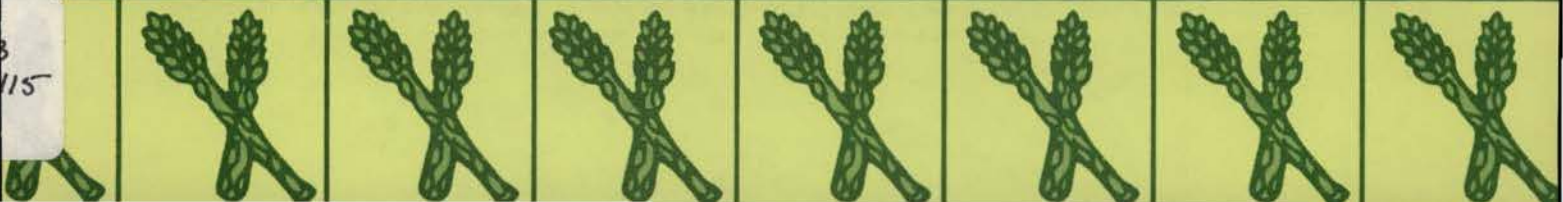


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# The Home Vegetable Garden



Cooperative Extension Service • University of Idaho • College of Agriculture



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### *About the Authors*

Anton S. (Tony) Horn is extension ornamental and fruit specialist and extension horticulturist, District Extension Office, Boise; Arthur Walz is area extension potato specialist, Southwest Idaho Research and Extension Center, Parma; and James A. Benson is extension crop management specialist and extension agronomist, University of Idaho Research and Extension Center, Sandpoint.

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# The Home Vegetable Garden

*Anton S. (Tony) Horn, Arthur Walz, James A. Benson*

We have had "Depression Gardens" and then "Victory Gardens" and now, in the inflation period, "Budget Gardens" or "Inflation Gardens." All have been successful because of high yields, and quality of vegetables produced in most of Idaho.

## Site Selection

A garden 50 x 100 feet should be large enough for the average family. A small well cared for garden will produce as much as a larger neglected garden. The size and location will be determined by the area available to you. If you have opportunity to choose, select an area that will have as much sunlight as possible because practically all vegetables grown in the garden will do better in full sunlight. Also avoid low wet areas that are slow to dry out and slow to warm up in the spring. Earliness is a key to a successful garden. The best garden soil is a sandy loam, but usually you do not have a choice of soils and have to use what you have. Most soils can be amended to produce an excellent garden.

## Soil Preparation and Fertilization

Spade or have your garden spot plowed when the soil is not too wet. To determine if the soil is dry enough to work, squeeze a handful into a tight ball and break it apart with the fingers. If the ball crumbles, it is safe to spade or plow. But if the soil clings together and is sticky, it is too wet.

A new garden site will benefit from a good application of manure or some other type organic matter such as compost, rotted sawdust, etc. An old garden site will also benefit from such an application but probably not to the same extent as the new. Use sterilized manure or other organic matter to avoid the possibility of introducing many viable weed seeds into the garden.

Apply the manure or organic material to the area before tilling and work it into the top 6 to 8 inches of soil. Apply the manure at a rate of 1 to 2 tons for each 5,000 square feet of garden. If the garden is small, figure a bushel of manure to 30 square feet of garden. Chicken manure is higher in nitrogen so the amount used should be cut in half. Some people burn plants by being careless with chicken manure but chances of burning can be lessened by distributing the manure evenly over the site and incorporating it into the soil. If you add a material such as rotted sawdust or straw, add nitrogen fertilizer to compensate for the nitrogen tied up by the decomposition of the material. Add a nitrogen fertilizer such as ammonium sulfate or ammonium nitrate at the rate of 1 cup fertilizer for each bushel of sawdust added.

Many good gardens are grown without the use of commercial fertilizers but most people find it is more practical to use them. Remember, the plant can only take up the nutrients in the inorganic form, whether the nutrients are added as organic material or as inorganic salts in commercial fertilizer. A pint fruit jar holds a



pound of most commercial fertilizers. The following table lists some fertilizers of different analysis and the rates at which they should be used:

Fertilizer analysis	lb. per 100 sq. ft.	Cups per 100 sq. ft.
2-3-2	10.0	20
4-10-10	5.0	10
6-10-4	3.4	6 2/3
8-10-8	2.4	5
10-10-5	2.0	4
11-55-0	2.0	4
12-12-5	1.6	3 1/3
13-13-13	1.5	3 1/3
15-10-0	1.2	2 2/3
16-20-0	1.2	2 2/3
20-16-0	1.0	2
20-0-0	1.0	2
33-0-0	0.6	1 1/4
45-0-0	0.4	1

The fertilizer analysis is shown on all containers. The first number gives the percentage of nitrogen (N), the second, percentage available phosphorus (P<sub>2</sub>O<sub>5</sub>); and the third, percentage water soluble potash (K<sub>2</sub>O). A 10-10-5 fertilizer analysis contains 10 pounds N, 10 pounds P<sub>2</sub>O<sub>5</sub> and 5 pounds K<sub>2</sub>O per 100 pounds of fertilizer. A 16-20-0 fertilizer analysis contains 16 pounds N, 20 pounds P<sub>2</sub>O<sub>5</sub> and no K<sub>2</sub>O per 100 pounds of fertilizer. The fertilizer can be applied broadcast before seeding and tilled into the soil or can be applied in the row. When applying in the row, put the fertilizer below or to one side of the seed by a distance of 2 to 3 inches. Do not put the fertilizer in direct contact with the seed.

If you have a fertilizer showing an analysis not listed in the table, select closest analysis from the table and

apply this rate. For a 10-10-5 analysis, apply 4 cups per 100 square feet. Check with your local Extension Agent to determine requirements for phosphorus, potassium and micronutrients for your particular area.

## Garden Layout

Plant perennial crops such as asparagus, rhubarb, horseradish and garlic to one side of the garden.

Put tall-growing crops such as sweet corn, staked tomatoes and pole beans together as a group. Likewise, group low-growing crops such as lettuce, carrots and beets.

Plant early-seeded, fast-growing, quick-maturing crops such as lettuce, radishes, spinach, onion sets, etc., in one area. They mature 30 to 50 days after planting.

Group long-season crops such as sweet corn, tomatoes, squash and cucumbers for efficient use of space.

A typical succession might be beans after lettuce and carrots, and carrots after green onions have been harvested.

You can spread the harvest by planting several varieties with different maturity dates at the same time. For example, in the warmer parts of the state, you can plant sweet corn varieties like Tokay Sugar for use early, Barbecue for midseason and Jubilee for late use.

You can achieve the same thing by planting the same variety at intervals of 2 weeks or whenever the first planting is up. If you plant corn late in the season, use an early variety like Marcross or Tokay Sugar so it has time to mature. In the cooler areas, you may be able to grow just one crop of an early-ripening sweet corn and an early-ripening tomato.

GARDEN PLOT (50' x 100')

Row No. and Width	← 100' →				50'
1-4'	Asparagus	Rhubarb	Horseradish	Perennial Onions	
2-1½'	Onion sets		Spinach	Parsley	
3-3'	Potatoes				
4-3'	Potatoes				
5-1½'	Leaf Lettuce		Turnips	Kohlrabi	
6-1½'	Peas (Lettuce and snap beans late)				
7-2'	Early Cabbage			Late Cabbage	
8-2'	Carrots			Beets	
9-1½'	Parsnips planted with radishes			Swiss Chard	
10-3'	Early Sweet Corn		Midseason Sweet Corn	Late Sweet Corn	
11-3'	Early Sweet Corn		Midseason Sweet Corn	Late Sweet Corn	
12-3'	Early Sweet Corn		Midseason Sweet Corn	Late Sweet Corn	
13-1½'	Snap Beans				
14-2'	Egg plant		Peppers	Bush Lima Beans	
15-3'	Tomato Plants		Cucumbers		
16-6'	Watermelons			Muskmelon	
17-6'	Summer Squash			Winter Squash	







## Starting Plants Indoors

Many garden plants can be started indoors and later transplanted into the garden when the weather has warmed enough and the danger of frost is past. Idaho Agricultural Experiment Station Bulletin 494 from your local Extension office can give you the average date of the last spring frost in your area. Tomatoes are probably the one plant that most home gardeners start indoors but peppers, eggplant, cabbage, cauliflower, broccoli, onions, cucumbers and others can also be started indoors.

Equipment for starting plants can be simple — milk cartons cut in half, egg cartons, etc. — or you can be more sophisticated and purchase jiffy pots or other kinds of containers. Many different kits for starting plants are on the market but materials found around the home can work just as well. Depending upon your degree of enthusiasm, you can start the plants in the house by the window or you can construct a coldframe or even a small greenhouse. Whichever you choose, you should be able to control four important factors: light, temperature, moisture and fertility.

With inadequate light, seedlings become very tall and spindly. If your location does not provide enough light, you might consider supplementing with one of the convenient artificial lights available for this purpose. You should also be able to control temperature between 75 and 85°F. during the germination period. After the plants have emerged, the temperature can be cooler than this and the plants will still make good growth.

You should be able to control the moisture in the soil or medium in which you are starting the plants. Keep the surface moist during germination. This can be done by putting a piece of plastic wrap over the container. After the plants have emerged, allow the surface to dry out since this lessens the danger of "damping off," a disease that can kill young seedlings. The containers should allow for adequate drainage to prevent the starting medium from getting waterlogged.

You can choose from several different kinds of starting mixtures. The most convenient would be to purchase the ready-mixed, sterilized medium from the garden store. This is also the most expensive. You can mix your own starting medium or use your garden soil. However, you will probably have better results with an artificial mix of vermiculite, peat moss and sand, 1/3 each by volume. You can add or substitute other materials such as perlite and fine bark. The end product should have good water-holding capacity and at the same time allow good air movement.

If you use garden soil, sterilize it to kill the organisms that cause damping off. The soil can be sterilized by heating in the oven. Place soil not more than 4 inches deep in nonplastic containers such as seed flats, clay pots or baking pans. Level the soil but do not pack it. Cover each container with aluminum foil. Insert a meat or candy thermometer through the foil into the center of the soil. Set the oven between 180 and 200°F and heat for 30 minutes after the soil temperature reaches 180°. Do not allow the temperature to go above 200° since this can

cause products toxic to plants to develop in the soil. After treatment, leave the aluminum foil on the pans until ready for use.

If you mix your own artificial soil mix, you will need to add plant nutrients by using either a commercial fertilizer or organic plant food. Use a commercial fertilizer such as 10-20-10 that is low in nitrogen and high in phosphorus. The simplest way to insure a continuous supply of nutrients to the plants is to make a solution of commercial fertilizer and water the plants with it every 10 to 14 days. (See section on Starter Solutions). Some of the ready-mixed potting soils already have nutrients added and will say so on the bag or container.

Before transplanting, the plants should be hardened off to reduce the shock when the plant is taken out of its protected environment and placed outside. For several days before transplanting, set the plants outside during the day and bring them in at night or when the temperature might get cold enough to damage them. Use caution in where you set the plants. Do not put them in a windy, exposed area. If you are using a cold frame, you can start the hardening off process by leaving the top open a little more each day.

The best transplants are young, vigorously growing plants that have not been stunted or held back to keep them from getting too big. To obtain a plant like this, the seed should not be seeded too early indoors. If you can control all the factors (light, temperature, moisture and fertility) and provide optimum growing conditions for the young seedlings, then they should be seeded 6 weeks before you plan to put them in the garden. If your conditions for growing the plants are less than optimum, plant the seeds 7 to 8 weeks before time for them to go in the garden.

## Row Space and Planting Depth

Use string or wire as a row marker. Straight rows permit easier cultivating and pest control. Your garden will look better too. Since space is limited in many town gardens, straight rows will make better use of the available space. See the planting chart for planting distance and planting depth for the different vegetables.

## Setting Out Plants

You can grow your own plants or you can purchase them from your local florist, market gardener, seed store or other source. Set the plants out as soon as you can after purchase, but be sure you set them out at the proper time. Water the flat several hours before transplanting so the soil sticks to the roots and transplant with a ball of earth to lessen transplant shock. Plant them deeper than they were in the seed flat or plant band in which they grew. Use a starter solution or mix a small amount of commercial fertilizer in the soil where you will set the plants. Press the soil firmly around the plants. Don't pinch or damage the stems.

The best time for transplanting is on a cloudy day or late in the afternoon. Shading the plants a few days will help prevent wilting. Shade them, but don't cut off air



circulation. You can shade them by a shingle or a wide board placed on the southwest side of the plant, or use plant protectors (hot caps) made of paper or plastic to also protect from wind and cold. If the temperature is warm during the day, remove the protector during the day and put it on again at night.

Plants in peat-type containers, if growing properly, will have roots starting to grow through the pot walls at transplanting time. If the pot walls have dried out, the roots will not penetrate them and will curl around inside, resulting in a pot-bound plant. If you set those plants, they generally remain stunted. You should moisten peat pot walls to the point of crumbling before setting in the ground. Don't let pot walls extend above the soil surface; they may serve as a wick to draw moisture out of the soil.

### Starter Solutions

Starter solutions are made up of soluble fertilizers and are used at planting time to help overcome the shock of transplanting. Some starter solution fertilizers are available in garden stores or through seed catalogs. For these, follow instructions on the package.

You can make your own starter solutions by dissolving commercial fertilizers in water. Most of these fertilizers are not completely soluble in water, so make up the starter solution several hours before needed, stirring it occasionally. Almost all of the soluble part of the fertilizer will be in solution when you are ready to set out the plants. You can use this table as a guide:

Fertilizer	Amount per gallon of water	Amount per plant
Ammonium nitrate (32% nitrogen)	1 Tbl.	1 to 1½ pt.
Ammonium sulfate (21% nitrogen)	1½ Tbl.	1 to 1½ pt.
16-20-0 (16% nitrogen)	2 Tbl.	1 to 1½ pt.
15-10-0	2 Tbl.	1 to 1½ pt.
10-10-5 (or similar analysis)	2 Tbl.	1½ to 2 pt.
6-10-4 (or similar analysis)	3 Tbl.	2 pt.

Apply the solution on the soil around the roots of each plant after transplanting. Avoid getting any of the solution on the foliage of the plant and if you accidentally do, wash it off with water.

### Longevity of Seeds

Buy the best quality seed possible. Good seed has a high germination percentage, grows plants true to

variety and is disease-free. You may use leftover garden seed if it has been stored in a cool dry place. You should plant old seed at a slightly greater rate than new seed because viability decreases as seed ages.

Vegetable seed may be divided into the following general groups on the basis of longevity:

1. Comparatively short-lived, usually not good after 1 to 2 years — sweet corn, leek, onion, parsley, parsnip, salsify.

2. Moderately long-lived, often good for 3 to 5 years under favorable conditions — asparagus, bean, Brussels sprouts, carrot, cauliflower, celery, chicory, cress, endive, kale, kohlrabi, lettuce, okra, peas, pepper, radish, spinach, turnip, watermelon.

3. Comparatively long-lived under favorable conditions, may be good for more than 5 years — beets, cucumber, muskmelon, mustard, tomato. Vegetable seed keeps longer in Idaho because of the low relative humidity during most of the year.

You can test seed viability by making a trial planting in a flower pot or tray with soil or sand. Keep the temperature approximately 70°F and check germination in about a week.

Remember, sweet corn will cross with field corn. You would be wise not to save hybrid seeds of any kind. You cannot save watermelon seed if citrons are grown in the neighborhood. Cabbage, kohlrabi, kale, collards, broccoli and cauliflower will cross with each other so you cannot save seed unless the particular crop is isolated from all of the others.

Vegetable seeds should be dried before storage. They may be dried outdoors when the relative humidity is low, but not in direct sun. In the fall when the air is moist, you can dry the seed in the house when the temperature is above 70°F, preferably in the 80s.

If dried outdoors, collect seed in late afternoon when it is dried and place in a moisture-proof container. You can use a fruit jar with a new lid or a clean plastic bag. The bag should be sealed with a hot iron or by twisting the top of the bag and tying it tightly with a loop knot. Seed may be stored at room temperature, but is better stored in a cool cellar and still better in a refrigerator at about 45°F. For long storage, a deep freeze may be used since most seed will not be harmed if properly dried before freezing.



## VEGETABLE PLANTING CHART

Vegetable	Classification by resistance to frost	Weeks from seeding to transplanting	Depth to plant (inches)	Amount of seed	Days to maturity (will vary with location)	Planting distance (inches)		Row length (feet)	Estimated production
						In rows after thinning	Between rows		
Asparagus	Hardy		6 to 8	12 plants	2 to 3 yrs	18 to 24	60	20	6 lb
Beans, lima	Very tender		1 to 2	½ lb	65 to 88	6 to 8	24 to 30	50	4 lb shld
Beans, snap	Tender		1 to 2	¼ lb	50 to 68	3 to 4	18 to 24	15	7 lb
Beets	Half hardy		½ to 1	¼ oz	60 to 65	2 to 3	18 to 24	25	25 lb
Broccoli	Hardy	4 to 6	(plants)	12 plants	55 to 74	24	30 to 36	25	10 lb
Brussels sprouts	Hardy		(plants)	15 plants	90 to 95	18 to 24	24 to 30	25	8 lb
Cabbage	Hardy	4 to 6	(plants)	6 plants	63 to 100	15 to 24	24 to 30	12	6 heads
Carrots	Half hardy		½ to 1	½ pkt.	68 to 85	1 to 3	18 to 24	15	15 lb
Cauliflower	Half hardy	4 to 6	(plants)	5 plants	60 to 85	18 to 24	30 to 36	10	5 heads
Celeriac	Half hardy		⅛	½ pkt.	120	6	30	10	6 lb
Celery	Very tender	10 to 12	(plants)	30 plants	100 to 125	4 to 8	30 to 36	15	30 stalks
Chinese cabbage	Half hardy		½	¼ pkt.	70	10 to 12	24 to 36	10	12 heads
Collards	Half hardy	4 to 6	½	½ pkt.	75	6 to 8	24 to 30	25	20 lb
Cucumbers	Very tender	4	1 to 2	½ pkt.	50 to 72	12 to 24	48 to 72	10	6 lb
∞									
Eggplant	Very tender	8 to 10	(plants)	3 plants	72 to 80	24 to 30	30 to 36	6	12 fruits
Endive	Half hardy		½	10 plants	85 to 98	8 to 12	12 to 18	6	10 heads
Garlic	Hardy		1½	4 cloves	115	3	12 to 18	1	4 bulbs
Kale	Hardy		½ to 1	6 plants	55	8 to 15	18 to 24	6	6 heads
Kohlrabi	Hardy	4 to 6	1 to 1½	24 plants	55	4 to 8	18 to 24	12	24 stems
Leeks	Hardy		½	1 pkt.	130	1 to 2	15 to 18	10	30 bunches
Lettuce (head)	Hardy	4 to 6	¼ to ½	18 plants	73	8 to 15	15 to 18	15	15 heads
Lettuce (leaf)	Hardy		¼ to ½	1 pkt.	45 to 50	6 to 12	6 to 12	5	2½ lb
Muskmelon	Very tender	4	1 to 2	½ pkt.	82 to 90	36 to 72	48 to 84	16	18 fruits
Mustard	Half hardy		½	¼ pkt.	35 to 45	1	18 to 24	10	5 lb
Okra	Very tender		½	¼ pkt.	55 to 58	12 to 15	36	8	5 lb
Onion (sets)	Hardy		1 to 2	½ lb	90	2 to 3	12 to 18	10	5 lb
Onion (transplants)	Half hardy		(plants)	120	90 to 115	2 to 3	12 to 18	30	25 lb
Onion (seeds)	Hardy	4 to 6	½	1 pkt.	105 to 130	2 to 3	12 to 18	30	25 lb
Parsley	Hardy		¼ to ½	⅓ pkt.	75 to 85	6	12 to 18	3 plants	3 bunches
Parsnips	Half hardy		½	⅓ pkt.	130	3 to 4	24	15	15 lb
Peas	Hardy		1 to 2	1 lb	62 to 69	2 to 3	18 to 24	100	28 lb



## VEGETABLE PLANT CHART (continued)

Vegetable	Classification by resistance to frost	Weeks from seeding to transplanting	Depth to plant (inches)	Amount of seed	Days to maturity (will vary with location)	Planting distance (inches)		Row length (feet)	Estimated production
						In rows after thinning	Between rows		
Peppers	Very tender	8 to 10	(plants)	6 plants	62 to 80	14 to 18	18 to 24	10	6 lb
Pop corn	Tender		2 to 2½	½ pkt.	90 to 120	10 to 12	30 to 36	25— 2 rows	1 peck
Potatoes	Half hardy		4	5 lb	100 to 120	10 to 12	24 to 36	50	50 lb
Potatoes (sweet)	Very tender		(plants)	25 plants	150	12 to 18	36 to 48	25	10 lb
Pumpkins	Very tender		½	½ pkt.	100 to 120	72 to 96	72 to 96	3 hills	30 lb
Radishes	Hardy		½	1 pkt.	24 to 28	1 to 2	6 to 12	12	8 lb
Rhubarb	Hardy		(plants)	3 plants	365	36 to 48	48	9	20 stalks
Rutabaga	Hardy		½	½ pkt.	90 to 92	6 to 10	18 to 24	15	15 lb
Salsify	Half hardy		½	½ pkt.	120	3 to 4	15 to 18	5	15 lb
Spinach	Hardy		¼ to ½	⅛ oz.	46 to 70	3 to 6	12 to 18	10	5 lb
Squash (summer)	Very tender		1 to 1½	½ pkt.	49 to 55	36 to 48	36 to 48	2 hills	24 fruits
Squash (winter)	Very tender		1 to 1½	1 pkt.	85 to 110	48 to 60	60 to 72	4 hills	10 fruits
Sweet corn	Tender		2 to 2½	¼ lb	63 to 94	10 to 12	30 to 36	25— 2 rows	40 ears
Swiss chard	Half hardy		½	¼ pkt.	60	6 to 8	18 to 24	8	7 lb
Tomatoes	Tender	4 to 6	(plants)	10 plants	62 to 83	36 to 60	36 to 48	40	6 bushels
Turnips	Hardy		1 to 1½	½ pkt.	58 to 60	4 to 6	18 to 24	20	20 lb
Watermelons	Tender	4	1 to 2	½ pkt.	88 to 90	72 to 96	72 to 96	2 hills	4 melons

Hardy - Plant as soon as ground can be worked, about 6 to 8 weeks before last killing frost.

Half hardy - Plant 2 to 4 weeks before last killing frost.

Tender - Not planted before last killing frost, plant about 10 days later.

Very tender - Plant when soil and weather are warm; 2 to 3 weeks after last killing frost.



## GROWING DIFFERENT KINDS OF VEGETABLES



### Perennial Vegetables

These are the vegetables that live over the winter and come up every spring. They include asparagus, rhubarb, horseradish, chives, parsley and others. Plant them in rows at the end or side of the garden. Some of these are discussed in the following paragraphs.

#### *Asparagus*

Asparagus plants are grown from seed. The 1-year old plants or crowns may be dug the next spring or purchased from a garden center or grower. The plants are spaced 18 to 24 inches apart in rows that are 3 feet apart. Dig a trench 18 inches wide and 8 inches deep. Set the crowns and spread and flatten the star-shaped roots. Then add about 2 inches of soil and water. After the plant has grown through this soil, add a couple more inches of soil. When the shoot has grown through this, cover with the remainder of the soil.

Allow all shoots to grow the first year to produce ferns and make food to be stored in the roots to produce shoots the next spring. The next spring whenever the shoots attain a height of 6 to 8 inches, break them off wherever they break, generally at ground level. Some people cut them at ground level. After 6 to 8 weeks of cutting shoots, let some shoots grow to make ferns to produce food for next year's cutting of shoots or spears. You may leave the tops or ferns over winter and disk them into the soil in early spring. Be careful not to disk so deep as to disturb the roots. Your asparagus patch will last 15 years or more. Asparagus spears are the finest of vegetables and should be eaten fresh in season. Freeze or can the surplus. Asparagus spears lose edible quality rapidly after harvest and should be cooled quickly and stored at 32 to 36°F.

The so-called wild asparagus plants that grow in orchards or on ditch banks in the irrigated areas of Idaho are escapes of garden varieties and are usable.

#### *Horseradish*

Horseradish is grown for its roots. Dig the roots in the fall and grate them. Enough roots are left in the soil to preserve the patch. To produce strong well-shaped roots, a deep well-drained soil is desirable.

Horseradish is propagated by root cuttings. These are pieces of root 6 to 8 inches long at least the thickness of a lead pencil. You can save these when preparing larger roots for grating or you can buy them from seedsmen. In planting, place the cuttings at an angle with their tops near the surface of the ground in a trench 5 inches deep. Good roots will be produced the first year.

Use white wine vinegar in preserving the grated roots; this will prevent them from losing their fresh white color.

Varieties of horseradish are limited, so take what you can get. Maliner Kren is a well-known variety.

The horseradish patch should last a lifetime. Be sure it is at the end or side of the garden.

#### *Rhubarb*

Rhubarb does well anywhere in Idaho. A few hills at the side of the garden near the fence will produce enough for most families. This plant produces best in a deep, well-drained, fertile soil. Before planting, spade in generous quantities of well-rotted manure to a depth of a foot or more.

Either buy crowns from a seedsman or obtain pieces of crown with three buds or more from a neighbor who is forced to divide his crown because they have become too crowded. If the hills are not divided, they become too thick, producing only weak slender stems. Plant in hills 3 or 4 feet apart.

You'll find many good rhubarb varieties. They include Crimson Wine (red stem), Canada Red (red stem), McDonald (red stem), Red Valentine (red stem), Cherry (red stem), German Wine (green stem), Victoria (green stem) and Ruby (red stem). Harvest by pulling out the stems and twisting off the leaves. Place the leaves next to the plant so they will shade the ground, prevent the growth of weeds and act as a mulch. Eat only the stems. Rhubarb leaves contain injurious substances including too much oxalic acid and therefore are considered poisonous.

The stems are a delicacy and especially good for the teeth. They were considered a spring tonic dating back into history. They make excellent sauce and pies.



### Annual Vegetables — Greens

Annuals are vegetables that only occupy the garden one season under Idaho conditions. Greens are the leaves and leaf stems of immature plants which in their green state are boiled for food.

#### *Spinach*

Spinach seed is planted in fall or spring in furrows an inch deep and covered with ½-inch of soil. After the plants have 3 or 4 leaves, thin to 4 inches apart. Spinach prefers a well-drained fertile soil. Harvest and process before hot weather or before the plants start to bolt, i.e. produce a flower stalk. If you see the plants starting to bolt, harvest the entire planting immediately.



## Chard

Swiss chard is a type of beet that has been developed for its top instead of its roots. You can harvest crop after crop of the outer leaves without injuring the plant. The leaves are large and freeze better if the mid rib is cut. The mid rib can be diced and creamed for a delightful dish. Thin plants 6 inches apart. One planting will last the entire summer.

## Kale

Kale or borecole, a member of the cabbage family, is high in vitamin C. It does especially well in the cooler climates. Kale is sown in rows 18 to 24 inches apart in the fall when competition from weeds is at a minimum. Kale can follow beans or potatoes. The seed may be broadcast lightly and raked into the soil.

You can harvest kale by cutting the entire plant or just the larger leaves. Remember, old kale is tough and stringy.

## Turnip Greens

You can grow turnips for greens as well as roots. Seven Top is a leafy variety that produces no edible root. Shogoin is a variety grown for greens and its all-white roots.



## Annual Salad Vegetables

This group is usually eaten raw with salt, vinegar and salad oil or mayonnaise and other dressings.

## Lettuce

This is a cool-weather crop that does especially well on a fertile soil. You can start lettuce indoors or in a hot bed and transplant it into the garden when the plant has four or five leaves. Lettuce will withstand temperatures to 28°F. You can sow both spring and fall lettuce in rows and thin.

## Parsley

This leaf vegetable lives over the winter in much of Idaho. Soak seeds overnight before planting. You can sow seed indoors and transplant the plants to the garden. You don't need many plants to supply the family.



## Annual Root Vegetables

## Beets

Table beets are best quality when they grow rapidly. They thrive on fertile well-drained soils. You can sow at

intervals of 3 weeks and have a continuous supply of young tender beets during the season. Seed should be covered with an inch of soil. Thin the seedlings 3 to 4 inches apart in the rows.

## Carrots

Carrots do best in sandy loams and peats but will grow on any fertile, moist soil. Sow as early in the spring as the ground can be worked. Plant at intervals of 3 weeks for a continuous supply of tender carrots. The carrot seed should be covered with ½-inch of soil. For best results thin to a stand of 10 or 15 plants per foot of row. However, carrots will stand some crowding. Carrots should be stored before hard frosts occur. Some gardeners mulch them and leave them in the ground all winter but they will generally freeze unless the winter is mild.

## Parsnips

Parsnip seed not more than a year old may be sowed thickly but the seedlings need to be thinned to 3 inches apart. Because parsnip seeds are slow to germinate, cover seed with leaf mold or sand in a soil that is likely to crust. You can add radish seed to help break crust and mark the row.

Parsnips may either be stored or left in the ground until used. Freezing in ground improves quality. There is no basis to the belief that parsnips are poisonous if they remain in the ground over winter and start growth in spring.

## Potato

The potato prefers well-drained fertile soils. Heavy clay soils produce misshapen tubers. Use certified seed which is disease-free and is usually obtainable from a garden store. Seed pieces should be 1½ ounces and have at least one eye. Potatoes emerge from the soil after 2 to 3 weeks. Sprouts that have emerged will frost if the temperature is critical but the soil may freeze slightly without injuring the plant when no sprouts have emerged. Young plants that have been damaged by frost generally renew growth from uninjured portions of stem.

Potatoes are probably the principal root crops you will store. Potatoes can be eaten from the time they are of sufficient size for early use until storage time and during storage. When potatoes are **harvested before maturity**, the skin may flake off easily. They are all right for **immediate use, but not for storage**. Immature potatoes shrink badly, bruise easily and will not keep well. For storage, potatoes should be allowed to mature and develop a thick skin. When the top of the plant dies, a few days later the tubers should be mature enough for storage. Dig potatoes carefully to avoid bruises for better storage life.

Handle new dug potatoes with care until the surface has dried or cured a few hours or more. You can keep them in baskets or slatted crates in single layers.



Store sound, mature tubers in darkness at a minimum relative humidity of 95% and 45 to 48°F for highest quality. For very long storage keep at a temperature of 38 to 40° to prevent sprouting. The starch changes to sugar if the tubers are held below 45°F. The potatoes may not show any external effect from exposure to these lower temperatures but sometimes darkened tissue will be seen if the potato is cut and exposed to air. Light causes considerable "greening" in potatoes and should be avoided. The green portion contains an undesirable substance that causes a bitter flavor.

### **Sweet Potato**

A well-drained, deep sandy loam is most desirable for sweet potatoes. Start plants in a hot bed. To raise plants, place roots close together in hot bed and cover with 2 inches of sand or fine soil. Transplant plants to open ground when soil is warm and danger of frost is past.

Set plants about a foot apart on ridges 3½ to 4 feet apart. After vines have covered the ground, no more cultivation is needed although some hand weeding may be necessary.

In fall, dig roots on a sunny day when soil is not too wet. A spading fork may be used. Then let the roots lie exposed for 3 hours to dry thoroughly, then store them in containers in a warm room to cure at 85°F for 10 days. Then store at 50 to 55°F.

### **Turnip and Rutabaga**

Plant as late as possible for fall use. Turnips and rutabagas can follow early potatoes, peas or spinach. In spring, sow seed and cover lightly. When seedlings are established, thin to a spacing of 3 to 4 inches. Tops may be used for greens in thinning.



### **Vine Vegetables**

The so-called vine crops include watermelons, muskmelons, cucumbers, pumpkins and squashes. They require a lot of space and for this reason are generally omitted in the small garden.

### **Watermelon**

The watermelon is an exciting vegetable to grow. It requires a sand or sandy loam to do its best. And since the hills are 8 feet apart, it requires a lot of space. Generally plant several seeds in a ring a foot in diameter, then thin to three plants per hill. Seed when the ground is warm and danger of frost is long past.

When ripe watermelons are cut from the vine, leave a 1-inch piece of stem attached. Ripeness is sometimes difficult to determine. In ripe melons the ground color changes from white to yellow. And when the melon is thumped the sound should be dull rather than sharp and

hollow. The curlicue or tail should be dried. Actually the safest way to determine ripeness is plugging, but that destroys the sale of the melon if it is still green.

Melons need a long, hot season to mature properly. In the higher altitudes and other short-season areas, small midget melons like New Hampshire Midget or Rhode Island Red are often grown. Crimson Sweet and Striped Klondike are the principal varieties grown in Idaho.

To obtain the largest melon for exhibit in the fair, select a healthy vine containing an extra large melon. Then remove the other fruits so the strength all goes to this one melon. It will grow abnormally large.

### **Muskmelon**

This vegetable likes much the same soil and climatic conditions as the watermelon. Space muskmelon seeds 3 to 6 feet apart in rows 4 to 8 feet apart.

If about half the stem remains attached to the melon when the other part has separated under pressure from your fingers, the condition of the melon is referred to as half slip. If the entire stem separates from the melon under pressure, the condition is called full slip. Muskmelons of netted type generally have enough sugar in them to be harvested for shipping when the stem is at half slip. For immediate sale or use, the muskmelons are ripe when the stem is at full slip and yellowish in color. Other types are harvested when the background color becomes lighter.

Hale's Best No. 36 and Edisto are among the best for the warm irrigated areas of Idaho.

### **Cucumbers**

While cucumbers are a warm weather crop, they are not restricted to the warm areas of Idaho. In the cooler areas they should be planted on a slope with a southerly exposure or trained on strings to grow up the south wall of a white building to capture all the warmth possible.

Cucumbers need a lot of runners for production under irrigated conditions. Plants spaced 6 feet apart in the row will give high yields. Rows may be spaced 4 feet apart. You can use the hill system with the hills 6 feet apart each way. Plant 7 or 8 seeds per hill, then thin to 2 plants per hill. Cucumbers prefer a sandy loam. If they must be grown in a heavy soil, cover the seed with a mixture of soil and coarse sand so the soil doesn't bake and prevent the seedlings from growing through.

Cucumbers are difficult to transplant unless started in bands, berry boxes or peat pots. Plant three seeds in each container and later thin to one plant. To avoid injuring the roots in transplanting, set the container in the soil with the bottom removed. Do not set in field until danger of frost is past. Plant protectors such as hot caps are desirable to promote earliness.

Remember, cucumber plants produce male (staminate) and female (pistillate) flowers. The male flowers appear first causing many people to believe their cucumbers are not setting. Soon the female flowers (which have an enlarged portion at the base) appear and,



after pollination, the cucumber fruits will be evident. Bees are desirable for pollination. If temperatures are below 60°F, the bees are not active and no pollination takes place. Gynoecious cucumber varieties have a preponderance of female flowers. Also plant some seed from standard varieties to assure pollination.

If you want cucumbers primarily for pickling, plant types such as Chicago Pickling or National Pickling because they produce more small cucumbers that are desirable for pickling. Those not pickled will furnish you some slicers. If you are primarily interested in slicing cucumbers, grow slicing varieties such as Ashley, Marketer, White Spine and Straight Eight.

Harvest cucumbers before they turn yellow and have hard seeds. Leaving over-ripe cucumbers on the vine will reduce later yield.

### **Pumpkins**

The pumpkin is grown much like other vine crops, but will thrive in partial shade. It is often grown in the corn field or with other plants that shade it. Plant in hills 10 feet apart each way.

Harvest pumpkins before they are injured by hard frosts. Best storage temperature is 50°F or slightly above.

### **Squash**

Squashes are hardier than cucumbers and melons. This vegetable may be classified into summer and winter squashes. Seed summer squash when danger of frost is past in hills 3 feet apart and thin to 3 plants per hill. The fruits of summer squash such as the Zucchini, Crookneck, Straightneck and Scallop should be used when young and tender while the rind can still be punctured by the thumbnail.

Five seeds of winter squash are seeded in hills 60 inches apart and plants thinned to 3 per hill.

Winter squash such as Hubbard, Banana, Table Queen, Butternut, Buttercup, etc. have hard rinds and may be stored at 50 to 55°F. They should be cured at 85°F to heal cuts, etc. for 10 days and then stored. Harvest before hard frosts occur.



**Legumes**

### **Beans**

Since beans are tender plant seed when the soil is warm and danger of frost is past. They need little fertilizer since they are legumes and will thrive on fertilizer left over from the previous crop.

If planted on heavy soils that may bake, cover seed with about an inch of soil and sand mix that won't harden and allow the new growth to come through. You can plant earlier if you use plant protectors such as hot caps.

Don't call this vegetable string beans; refer to it as snap beans. Plant breeders have bred the strings out of most beans. Kentucky Wonder is an old pole bean variety still popular. The Blue Lake is a high quality pole bean used by processors. Blue Lake bush beans are also available. Other good snap beans with a bush habit of growth include Tendercrop, Tendergreen, Early Gallatin, Tempo and Canyon. Canyon is a curly top-resistant snap bean introduced by the University of Idaho that is both a good canner and freezer.

Pick the bean pods when they are young and before the seeds in them start to enlarge and harden. Most people prefer canned beans to frozen beans, but if you freeze them, pick the beans a little sooner than needed for fresh use or for canning. Follow proper canning procedures for safe use.

### **Peas**

English peas are planted as soon as the ground can be worked, about 6 to 8 weeks before the last killing frost in the spring.

Because this is a cool season crop, the season in most of Idaho is limited to the spring. Some varieties like Wando have some heat resistance. For best quality, pick the pods early in the morning and process or cook as soon as possible. Keep cool or ice the pods if you have more than you can handle in a short time.

### **Lima Beans**

Some people prefer to raise their own Lima beans rather than buy them. Most Lima beans take a full season to grow so use varieties that mature in about 65 days or less. Grow only the small-seeded varieties such as Clarks Bush, Jackson Wonder, Nemagreen, Henderson's Bush or Early Thorogreen. Plant around May 15 or when danger of frost has passed. Pick and shell before the seeds get hard. Harvest before any pods turn "buckskin" color for best quality. Lima beans can be either frozen or canned.



**Cabbage or Cole Group**

This group is hardy and does well in cool areas having a fertile soil and sufficient moisture.

### **Brussels Sprouts**

These are hardier than cabbage and will live over the winter in the warmer parts of Idaho. Plants live over winter most years at Twin Falls.

The sprouts or small heads are formed in the axils of the leaves. When the heads begin to crowd, break the lower leaves from the stem of the plant to give them more room. Be sure to retain the top leaves to supply nourishment.



For winter use in severely cold areas, you can take up the plants that have plenty of heads and set them close together in a cold frame, pit or cellar with soil firmed around the roots. Keep cool but not freezing.

### **Broccoli**

Many new hybrid lines of broccoli are available. The old lines like DeCicco or Waltham take more room to grow and plants should be spaced 3 feet in the row. The old lines could be picked up to 5 times during a season. Many of the hybrids are a "one pick" crop. The hybrid plants usually are small and can be planted 1 foot apart in the row. The king head will be large and you will find a few second heads. You can use transplants or can direct seed in April. The plants are hardy and will stand some frost. Pick the heads before the buds start to open. Broccoli makes an excellent frozen product.

### **Cabbage**

Plants should be started indoors or in greenhouses or hot beds 6 weeks before planting time.

Spring cabbage plants are planted 6 to 8 weeks before the last killing frost. They may be planted earlier if hot caps or other plant protectors are used. Early Jersey Wakefield and Golden Acre are good early varieties. Flat Dutch and Danish Ballhead are good for late plantings. In the warmer areas, late cabbage may follow early potatoes, peas, beets, etc.

### **Cauliflower**

Cauliflower is not quite as hardy as cabbage but still hardy. It is grown in spring and fall. Too much warm weather prevents heading. Plant the fall crop so heading time occurs in cool weather. For all varieties except Purple Head tie the leaves together when the heads or buttons begin to form, to keep the heads white. The Purple Head variety turns green when cooked. Cauliflower does not keep long after the heads form, so don't grow more than you can use. Cauliflower freezes well if the curd is not too mature. It also makes excellent pickles.

### **Kohlrabi**

This vegetable is grown primarily for its swollen stem. It can be started like cabbage and transplanted to the garden, but generally is sown in place. It should be harvested while young and tender, generally when around 2 inches in diameter for best quality. Larger stems are inclined to be woody.



### **Onion Group**

Members of the onion category occupy very little space and are adapted to a variety of soils. Fertility and adequate moisture are required.

### **Chives**

Chives may be started by seeds or bulbs. These perennial onion-like plants may be grown in the garden near the other perennials at the end or side, or can be grown as the border of a flower bed. After several years the plants become too thick and should be divided and reset. Chives may be grown in pots for sale to gardeners and others.

### **Garlic**

Garlic does not produce seed so is propagated by planting the small cloves or bulbs which make up the large bulbs. Plant these small bulbs singly in the spring or fall.

When the bulbs are mature, pull them, braid them in strings or tie them in bunches and place to cure in a cool, well-ventilated place. Store in a dry, cool place but avoid freezing.

Another type of garlic, called the great-headed or elephant garlic, produces a solid bulb or large clove that is called a round. It may also divide in cloves. It is not as pungent as the regular garlic. Because of its size, it is more of a novelty.

### **Leek**

Leeks are propagated by seed, like onions. Sow seeds in a shallow trench and hill up the plants as they grow. They do not form a bulb like an onion, but produce a thick, fleshy cylinder like a large green onion. You can use leeks any time after they size. They should grow 1½ inches or more in diameter with white parts 6 to 8 inches long. You can lift them in the fall and store them like celery and cabbage in a cold frame.

### **Onion**

Any fertile soil will grow onions. You can start onions by planting sets, seedlings or seed.

The Potato (multiplier) and Top Tree onions are planted in fall or spring for use green. Sweet Spanish and hybrids such as Fiesta and El Capitan are seeded early in the spring and grown for bulbs. They store fairly well. Onions for storage should be harvested when the neck of the plant dries down and the tops have fallen over. They should be dried after harvest and then stored under cool, dry conditions.



### **Fleshy-Fruited Vegetables**

### **Eggplant**

Eggplant does well in the warmer parts of Idaho. Sow seeds in a hot bed 8 weeks before plants are transplanted. Plants must be kept growing without check from low or drying temperatures. Good plants are those that have stems that are not hard or woody.



## *Pepper*

Start pepper plants 6 to 8 weeks before needed. Plant when soil has warmed up and danger of frost is past.

## *Tomato*

Start early tomato plants from 5 to 7 weeks before they are to be transplanted to the garden. Seeds germinate best at 70°F. Seeds may be sowed in flats, pans or whatever you have. You can seed directly in 3 or 4 inch pots at the rate of 3 seeds per container and later thin plants to one. In long-season areas, seed is sometimes sowed directly in the garden rather closely in early May. Plants are later thinned. Young seedlings tolerate more frost than transplants.

If you prune to one stem, train and tie them to stakes or a trellis, you can set tomato plants 18 inches apart in 3-foot rows; if not, plant 18 to 24 inches apart in rows 4 to 5 feet apart.

The smaller type tomatoes will require less space and can be planted 12 to 18 inches apart in 3 foot rows. Staked and pruned tomatoes are more subject to blossom end rot. Yield per plant is lower than unstaked and unpruned plants.

Tomatoes are generally canned. Be sure to follow proper procedures in canning. Do not can over-ripe tomatoes because tomatoes lose acidity as they mature.

Tomatoes with soft spots or decayed areas are not suitable for canning.

## *Sweet Corn*

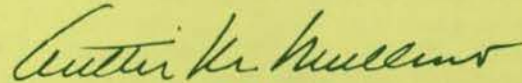
Sweet corn must be planted when the ground has thoroughly warmed and danger of frost is past. To assure a supply of fresh corn the entire summer, make successive plantings of the same variety (seed planted at intervals) or make a simultaneous planting of early, midseason and late varieties. Plant in rows 3 feet apart and space 1 foot apart within the row. Don't bother to remove suckers from sweet corn. Do not save seed from hybrid sweet corn because it does not come true to the variety from which harvested. To assure pollination, plant sweet corn in blocks rather than in a single row.

For the best in eating quality, harvest sweet corn when the kernels are plump and sweet in the milk stage. The kernel will appear milky when you puncture it with your thumbnail. When the corn is almost ready for harvest, the silks dry and the tip kernels fill out. At this stage the silks are brown and dry beyond the end of the husks. Because the kernels have developed enough size to fill the husks, the husks feel tightly fitted around the ear.

Freeze, can or cook corn immediately after picking or refrigerate until it can be used. The sugar in sweet corn quickly decreases and starch increases during a hot day. Eating sweet corn picked at the right maturity is one of the joys of having sweet corn in the garden.



*The State is truly our campus. We desire to work for all citizens of the State striving to provide the best possible educational and research information and its application through Cooperative Extension in order to provide a high quality food supply, a strong economy for the State and a quality of life desired by all.*



Auttis M. Mullins  
Dean, College of Agriculture  
University of Idaho



## SERVING THE STATE

This is the three-fold charge of the College of Agriculture at your state Land-Grant institution, the University of Idaho. To fulfill this charge, the College extends its faculty and resources to all parts of the state.

**Service** ... The Cooperative Extension Service has active programs in 42 of Idaho's 44 counties. Current organization places major emphasis on county office contact and multi-county specialists to better serve all the people. These College of Agriculture faculty members are supported cooperatively by federal, state and county funding to work with agriculture, home economics, youth and community development.

**Research** ... Agricultural Research scientists are located at the campus in Moscow, at Research and Extension Centers near Aberdeen, Caldwell, Parma, Sandpoint, Teton, Twin Falls and at the U.S. Sheep Experiment Station, Dubois and the USDA/ARS Soil and Water Laboratory at Kimberly. Their work includes research on every major agricultural program in Idaho and on economic and community development activities that apply to the state as a whole.

**Teaching** ... Centers of College of Agriculture teaching are the University classrooms and laboratories where agriculture students can earn bachelor of science degrees in any of 20 major fields, or work for master's and Ph.D. degrees in their specialties. And beyond these are the variety of workshops and training sessions developed throughout the state for adults and youth by College of Agriculture faculty.