Vegetable Growing

for 4-H Club Members

A. G. B. Bouquet

FEDERAL COOPERATIVE EXTENSION SERVICE OREGON STATE COLLEGE CORVALLIS

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Club Series D-14 4-H Vegetable Garden Project

Oregon 4-H Vegetable Garden Project

The 4-H Vegetable Garden Project will help you learn about vegetable varieties, how to order seed and plants, how to prepare the soil and fertilize a garden properly, how to plant and care for a garden, and how to control insects and diseases. You also will learn how to select vegetables for exhibit, and how to keep records and their value. You will have something of your own to care for, and you will have fun doing it.

▶ **Age.** To be a 4-H Club member in Oregon you must be 9 years old—but under 21—before January of the current club year.

▶ **Size of garden.** First-year garden club members, 9 to 11 years of age, must have at least 200 square feet of garden, with five kinds of vegetables. Older members should grow larger gardens and more kinds of vegetables. You are responsible for planning, soil preparation, planting, caring for, and harvesting your vegetables.

▶ **Starting date.** Garden projects should start with the preparation of the soil in the fall, winter, or early spring and must be started before June 1.

▶ **Records and reports.** Fill out your *project enrollment card* when you start your garden. Keep your record book up to date. Use the *daily harvest record sheet* to keep a record of vegetables. Your record book is a required part of your 4-H exhibit. Give your completed record book to your 4-H Club leader or send it to your County 4-H Extension Agent at the end of the club year.

▶ **Tours.** Attend 4-H tours whenever possible. Tours give you a chance to see what others are doing and to learn more about vegetables and gardening.

▶ **Demonstrations.** Learn how to tell and show others how to do something. Give a demonstration. Enter the demonstration contest at your county fair.

▶ **Judging.** Learn to select good vegetables and tell why. Enter a 4-H vegetable judging contest. Vegetable garden judging contests may also include the identification of vegetables, common garden weeds, and insects.

▶ **Exhibits.** Plan to exhibit at local and county fairs. Plant some of your vegetables to be ready for exhibit at fair time.

▶ **Contests.** Enter a 4-H garden contest. Ask your club leader or County 4-H Extension Agent about them. Contests include the Sears-Roebuck Foundation 4-H Garden Contest, the National 4-H Garden Awards Program, and the National Junior Vegetable Growers Contest.

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GROWING VEGETABLE CROPS as 4-H Club projects has many values to recommend it to boys and girls of Oregon. These values may be summarized as follows:

(1) Vegetables grow rapidly and return a cash income in a shorter time than almost any other farm crop. Such vegetables as lettuce, radishes, early cabbage, green onions, peas, spinach, early beets, and carrots will have completed their growth and a cash income will be derived from them within 3½ months or less. Even vegetables that take a longer growing season, such as tomatoes, sweet corn, beans, squash, and onions, yield income before the end of the growing season.

(2) The 4-H Club member can choose from a wide range of crops, for there are more than 30 vegetables from which to select the five or more to be grown in a project. A single crop that may be suited particularly well to the soil and climate of the club member's garden may be grown commercially.

(3) Since a small piece of ground intensively farmed will produce a large quantity of vegetables, only a small area is necessary for a garden crop project.

(4) Insofar as sales of crops are concerned, the high gross value of vegetables makes them attractive crops to grow. Furthermore, there is usually a ready sale for fresh vegetables.

(5) The garden products grown by the club member may be shared by members of his family, the fresh vegetables supplying the table for the needs of all.

(6) Because vegetables are extremely important as an element in the healthful diet of the family they are becoming more popular each year. In the nutrition of the American family today the vegetable occupies a very important place. You should feel, therefore, that in carrying out a garden club project you are assisting in maintaining the health and economical living of the family.

Choice of Crops

In choosing vegetables for a project, you should select those best suited to local climatic conditions, which vary considerably over the state. The warm-season crops, such as tomatoes, cucumbers, melons, peppers, eggplant, beans, sweet corn, etc., naturally grow particularly well in the warmer sections of the state. In the Willamette Valley it does not make a great deal of difference what kind of vegetables you select, for almost all kinds can be grown with equal success. In the cooler sections of the state, such as the coast

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CLIMATE AND LENGTH OF GROWING SEASON FOR VEGETABLES

Vegetable	Tender (T) or Hardy (H) to frost	Warm (W) or Cool (C) season crop	Short (S) Medium (M) or Long (L) season crop	Remarks
Bean	T	W	M-L	Good for all season.
Beet	H	C	S-M	Early or late crop.
Brussels sprouts	H	C	L	Usually too late for exhibitions.
Cabbage	H	C	M-L	Early, main, or late.
Cauliflower	H	C	M-L	Fall crop.
Celery	Med. H	C	L	Fall crop.
Chinese cabbage	H	C	S	Fall crop.
Chard	H	C (All season)	L	Good all season.
Carrot	H	C (All season)	M-L	Summer or fall crop.
Corn, sweet	T	W	M-L	Crop good for all summer.
Cucumber	T	W	L	Good until frost.
Eggplant	T	W	L	Good until frost.
Endive	H	C	S	Makes good fall crop.
Kale, curly	H	C	L	Very hardy for all winter.
Kohlrabi	H	C	S	Spring or fall crop.
Lettuce	H	C	S	Early or late crop.
Muskmelon, Watermelon	T	W	L	Excellent fall exhibition crop.
Onion	Med. H	(All season)	L	Excellent fall exhibition crop.
Pea	H	C	S	Spring and early summer.
Pepper	T	W	L	Excellent fall crop.
Pumpkin	T	W	L	Good fall crop to show.
Radish	H	C	S	Crop good at any time.
Spinach	H	C	S	Spring or fall crop.
Squash	T	W	L	Excellent fall exhibition vegetable.
Tomato	T	W	L	Excellent fall exhibition vegetable.
Turnip	H	C	S	Spring or fall crop.

counties and those neighboring the coast counties, it is necessary to select vegetables that grow well under the cooler temperatures, such as cabbage, head lettuce, spinach, cauliflower, peas, beets, carrots, parsnips, turnips, celery, and kohlrabi.

You must decide also whether you are going to grow early vegetables, with a view of having these grown and sold before the summer has progressed very far, or the later crops that mature, for the most part, in the fall. There are advantages and disadvantages to both the early and late crops. The advantage in growing the early vegetables is that they can be grown and disposed of quickly. A particular disadvantage of the early crop project, however, is that it is not possible for the club member to participate in fall exhibitions.

In choosing a single crop, climate and soil types are most important. If the crop is grown commercially, the market is also important.

It may be possible to select some early crops and some that mature later so that you may participate in exhibitions that are held during Au-

gust and September. Long-season crops must be cared for throughout the entire summer, with no neglect during the critical period of their growth through the summer and early fall.

Whatever the selection of crops, your motto should be "Don't start anything that you can't finish." In other words, the enthusiasm and eagerness with which the crops are started in the spring should be continued and maintained through the entire growing season, in order that vegetables may be grown to maturity and be in fine condition for exhibition in the fall.

Influence of Seed on the Crop

The foundation of good crops is good seed. This applies to vegetables as well as to other farm crops produced by club members. The character, yield, and quality of vegetables are determined to a very great extent by the purity and breeding of the seeds planted. Club members in other projects, such as poultry, livestock, and various farm crops, take particular care to see that the foundation of their work is sound, that they start with well-bred stock or selected seed. The results of this principle are well known in producing animals or plants of uniformity and high excellence. This same principle applies in buying vegetable seed. Buy your seed from some well-known seed house of good reputation. If there is no means of your getting seed from such a firm except by mail order, do not hesitate at all to send away for your seed.

Ample time should be given to considering what seed is required, and you should be prepared to pay what is necessary to purchase good seed, which usually costs more than the poorer grades. The seed cost in gardening work is probably the least of all cost items, but at the same time seed selection is of the greatest importance; hence you should give it careful consideration before the growing season begins.

Proved Varieties

Why is it important to grow certain varieties of each vegetable produced?

The variety expresses the character of the vegetable just as Stokesdale, for example, carries certain definite characters of shape, size, color, and quality in a tomato. Learn to know vegetables by varietal names and to recognize their characters by observation.

The number of varieties of different vegetables is large but the following list includes some well-known kinds that have proved their value over many seasons:

Asparagus—Washington.

Beans, Bush

Green Podded—Stringless Green Pod, Tendergreen.

Wax Podded—Pencil Pod Black Wax.

Pole—Kentucky Wonder, Blue Lake, Oregon Giant.

Shell—Oregon Lima, Henderson's Bush Lima.

Beets—Early Model, Detroit Dark Red.

Broccoli—Green or sprouting—Calabrese.

Broccoli, Cauliflower—S. Valentine.

Brussels Sprouts—Perfection, Long Island Dwarf.

Main—Copenhagen Market, Glory.

Late—Danish Ballhead, American Savoy.

Cabbage, Early—Golden Acre.

Carrot—Chantenay, Nantes, Imperator.

Cauliflower—Snowball, Giant Easy Blanching.

Celery — Golden Self Blanching, Utah Green.

Chard, Swiss—Fordhook, Rhubarb.

Chinese Cabbage—Pe Tsai, Wong Bok, Chihli.

Corn, Sweet — Golden Bantam, Golden Cross Bantam, Carmelcross, Golden Giant, Tendergold Ioana.

Cucumber — Davis Perfect, Lemon, Vaughan, Boston Pickling.

Eggplant—Black Beauty, New York Improved.

Kale—Dwarf or Tall Scotch Curled.

Kohlrabi—White or Purple Vienna.

Lettuce—New York Supreme, New York B, Imperial 847.

Muskmelon—Spear, Hale's Best, Golden Beauty.

Onion—Yellow Danvers, Sweet Spanish, White or Yellow Bermuda.

Parsnip—Harris Model, Tender Heart.

Pea—Laxton's Progress, Hundredfold, World's Record, Stratagem, Gradus, Alderman, Thos. Laxton.

Pepper—California Wonder, Pimiento.

Potato, Sweet—Nancy Hall, Puerto Rico.

Pumpkin — Winter Luxury, Sugar Pie, Table Queen.

Radish—Scarlet Globe White-Tipped, Scarlet Globe.

Rhubarb—Any good plants from selected strain having good color.

Rutabaga—Improved Purple-top Yellow.

Salsify—Sandwich Island.

Spinach—Thick leaf.

Squash—Winter or true squash, Hubbard, Delicious, Golden Delicious, Banana.

Squash, Summer — Yellow Straightneck, Zucchini (In reality pumpkin).

Tomato—Stokesdale, Pritchard, John Baer, Wasatch Beauty.

Turnip—Purple-top White Globe, Golden Ball.

Watermelon—Hungarian Honey, Black-seeded Ice Cream, Kleckley's Sweet.

Plants for Transplanting

Several important vegetables included in a gardening project are grown from plants that have been started earlier in the season, either under glass or in an outdoor seedbed. Plants that must be grown under glass for transplanting to the garden at the proper season include tomato, early cabbage, early head lettuce, pepper, eggplant, and celery. The vegetables grown from plants started in an open or outdoor seedbed without artificial heat are fall cabbage, cauliflower, curly kale, Brussels sprouts, broccoli, and late celery.

If you intend to include in this project vegetables of the first-named group, you must have suitable equipment in the form of hotbed sash and frame or a small greenhouse in which to start the plants of tomato, pepper, etc. If this equipment is not available, plants of the variety desired must be purchased. While it is excellent practice for you to grow and take care of the young plants in their early stages, this may be impossible unless the glass equipment is sufficiently good to insure the growth of good plants. Growing seedlings by the light of a window or in the general conditions of a living room is undesirable. It would be better to purchase vigorous plants from a commercial grower, aiming to get the best plants of the correct varieties at reasonable cost.

In the event that plants can be grown at home, however, time the operation of the hotbed so that plants are ready for the field at the proper season for transplanting.

In the second group of vegetables including late cabbage, etc., you should start plants in an outdoor seedbed, no glass equipment being necessary. Sow the seed thinly—about 18 to 24 seeds

to the lineal foot—in rows that are wide enough for a wheel cultivator or shove hoe, usually 18 to 22 inches apart. Time of seeding for members of the cabbage tribe is during the second or third week in May. Transplant the young plants about 7 weeks following seeding. Cabbage plants should be set out slightly earlier than cauliflower, which is usually transplanted during mid-July. Take advantage of any cloudy or showery weather during late June and early July to shift the plants from the seedbed to the permanent place in the garden. These dates are also suitable for curly kale, Brussels sprouts, and celery. If no cold or cloudy weather prevails, shade the plants until they are established and beginning to grow well by placing a shingle on the southwest side of the row.

Because the seedbed plants of late cabbage, etc., are likely to be infested with green worms and lice, they should be dusted once or twice as a protective measure against these insects. If maggots are known to be a pest in the vicinity the rows of young plants should be treated with corrosive sublimate, 1 ounce to 12 gallons of water, soon after the plants are up in the seedbed. You should carefully examine the plants for maggots when they are dug up before transplanting to the garden, and treat if maggot infected.

Soil Preparation

No farm land requires as much preliminary work in preparation as the soil for growing vegetables. Good drainage, depth, fineness, smoothness, freedom from coarse material and large clods, etc., are essential characters of a good garden soil. The soil should not be plowed or worked until it is physically right. If you plow your land too early—when still wet—you may have to contend with cloddy soil all the rest of the season. You should have little trouble, however, putting the soil in the finest state of preparedness for seeding or transplanting. The extent to which soil moisture can be maintained during the summer will depend largely on the manner in which the soil is prepared in the spring.

Soil Fertilization

So that vegetables may grow steadily to provide the best yield and quality, the soil must not only be in fine mechanical condition but it must also contain an ample supply of available plant food. There is not much danger of your having soil that is too heavily fertilized for vegetable growing, except in one or two cases where some plants make too much vine growth at the expense of fruit, as sometimes happens in tomato growing. In general, there is no better garden fertilizer than fine, well-rotted stable manure, which should be spread evenly over the ground and thoroughly mixed with the soil.

Supplementary soil fertilization

Just as many hundreds of club members buy special feed for the stock they are raising, so vegetable growers may find that a small amount of money invested in some quick-acting commercial fertilizer may be of great benefit in stimulating their veg-

etables. You can apply commercial fertilizer either by broadcasting it over the garden before seeding or transplanting in the spring; or by using it as a side dressing to the rows of vegetables after they have started to grow, when the rows can be seen plainly. Nitrate of soda or sulfate of ammonia alone may be used safely to stimulate the growth of such early vegetables as peas, early cabbage, spinach, green onions, beets, carrots, and lettuce. Use the following amounts in a side dressing for 100 linear row feet in the garden, with rows at different distances apart:

Rows spaced—	*Amount to use*
18 inches apart	14 to 18 ounces
24 inches apart	1 to 1½ pounds
30 inches apart	1½ to 2 pounds

Keep fertilizing material off leaves and stems, placing it 2 inches or so from the plants in the rows. Apply before, during, or just after a rain, so that the fertilizer will dissolve as quickly as possible.

Complete fertilizers

If a complete vegetable fertilizer is used, such as garden fertilizer 6-10-4, which can be bought from a fertilizer or seed merchant, the amount for 100 linear row feet should be 1 to 2 pounds for rows 24 inches apart.

If you desire, you may broadcast from 5 to 6 pounds of this complete fertilizer per square rod (272 square feet) over the garden area, and harrow it into the soil when you prepare it in the spring.

In the growing of such crops as melons, cucumbers, squash, tomatoes, etc., 2 to 3 ounces of this complete fertilizer may be used to each hill or individual plant. The fertilizer should be well mixed with the soil just before seeding or transplanting the plants.

Be careful about the application of wood ashes. If they are applied to excess, they make the soil too alkaline and unproductive. If the soil is not acid, it will not need liming. Extension Bulletin 612, *Garden Soil Management,* is a good reference.

Maintenance of the Garden

Just as the livestock of club members requires daily care, so it is necessary for you to give regular attention to the crops growing in the garden area. There are three important divisions of crop maintenance: First, weed control; second, maintenance of proper soil moisture; and third, pest control.

Cultivation

You should cultivate the soil mainly for the purpose of controlling weeds and maintaining a desirable physical condition. It is not wise or necessary to cultivate frequently a garden soil that already has a desirable mulch. If it does not rain to make a soil crust, the soil mulch already present should be left undisturbed. Use a flat-bladed tool for weed elimination.

Soil moisture

Remember that the best growing months of the year are the driest months. It is necessary, therefore, to conserve all possible soil moisture unless irrigation water can be applied to the vegetables. You may be sure that both the quantity and quality of the crop will be improved greatly by the application of water, which should preferably be applied in furrows along the rows. Give the plants a thorough watering infrequently rather than a light amount quite often. To grow to

the best advantage, vegetables need 1 inch of rainfall every 10 days; so it can be readily understood how important irrigation is during the dry periods of the summer. Close up and cultivate the furrows in which the water flows down the rows just as soon after irrigation as the soil texture will permit, unless the foliage of the crop covers the soil between the rows.

Information concerning the various forms of irrigation equipment and methods of irrigating can be obtained from County Extension Agents.

Pest control

Pest control is a serious and most important feature of vegetable growing. Whether or not the insect pest is controlled oftentimes may mean success or failure in growing certain vegetables. There are few crops, indeed, that are able to get by the season uninjured by insects unless the grower takes steps to prevent injury. Insects must positively be kept under control. Some of the worst garden crop insects are the twelve-spotted beetle, lice of various kinds, miscellaneous worms, such as the green cabbage-worm, sweet corn earworms, cutworms, wireworms, flea-beetles, etc. You should observe each pest and its habits carefully, diagnose the injury properly, and decide on the correct prescription to effect control. In general, dusting powder is most useful in small gardening areas; calcium arsenate dust for the worms and beetles, and nicotine dust for the lice are standard control materials. A useful general dust for either leaf-eating or sucking insects is a complete garden dust consisting of calcium arsenate, nicotine sulfate, and a filler, which is usually sulfur or lime. This complete dust can be obtained from your nearest dealer in fertilizers and insecticides. (See Extension Bulletin 676.)

Special Cultural Hints

For lack of space in this publication, complete details regarding the growing and preparation of all vegetables for exhibits cannot be included. The more important crops are discussed briefly in the following paragraphs. To supplement this material, you may obtain mimeographed circulars on individual vegetables from your local County Extension Agent. Extension Bulletin 614, *Farm and Home Vegetable Garden,* gives directions for time and method of seeding or transplanting in the garden.

Beans

Snap beans make a good crop in a vegetable project, particularly if the plants can be watered and made to bear pods until the time of fall exhibition. If you make several plantings in succession, there will be a continuous harvesting of tender snap beans. The pole bean varieties are most productive and easiest to harvest. Well-fertilized ground will grow good yields of beans, and watering will prolong the picking season and improve the grade and quality of the pods. You may find it necessary to control the twelve-spotted beetle (see Extension Bulletin 676, *Vegetable Garden Insect Pest Control*). Do not have the bean plants too close together in a row. Sow the seed in such quantity as to warrant one bean plant to every 2 or 3 inches. If plants are closer than this, production will be impaired. Do not call this vegetable a "string bean" but rather "snap or stringless bean."

Beets

To have beets of proper size for the late summer and fall exhibition, sow seed about 70 to 80 days before the desired harvest time. Spring-sown seed will produce beets that will be too large by the end of the summer. Beet sowings can be made before or following a rain in June or early July and, if the plants are watered at intervals thereafter, a nice crop of fall beets can be obtained. Sow the seed carefully and moderately thin, bearing in mind that the seed itself is a fruit producing more than one plant. Thin the plants to stand 2 or 3 inches apart. Roots of not less than 2 inches or not more than 3 inches in diameter are most desirable. They should be almost spherical with a thin neck and a fine, thin taproot.

Cabbage

To have good heads of cabbage in the fall, start the plants in an open seedbed during April and transplant after 6 or 7 weeks. Allow from 90 to 100 days for growing the main crop of cabbage, and 120 to 130 days for late varieties such as Danish Ballhead. Since cabbage does not do well in acid soil, liming the soil should help to make better plants and heads. Fertilize the soil either with well-rotted manure or a complete fertilizer having an analysis of possibly 3-10-10. To grow clean cabbage, dust or spray to control lice and green worms. Begin to treat the plants soon after they are set out, and they will never become seriously infected. For exhibition and local marketing, 3- to 5-pound solid heads, trimmed weight, are best.

Cauliflower

This is the most refined member of the cabbage tribe and, if you can grow good cauliflower, it shows your ability as a gardener. This vegetable does not reach its peak of perfection in central or western Oregon until the cool weather of the fall. At that time the heads are finer in texture and color. This crop matures a little too late for early fall exhibition, but the coast counties can produce fine cauliflower through the summer and early fall. Handle as you do cabbage, but do not omit to tie the large leaves over the small heads when they are first forming, or are about the size of a teacup.

Rich soil is necessary for fine cauliflower. A head measuring 4 to 6 inches in diameter, pure white, and of the right maturity, that is a tight, unsegmented curd (head), brings the best price and the first premium.

Celery

Fine celery can be grown in any area of the state where the summers are not too warm. This vegetable is a good one to include in the vegetable project of the coast counties. If celery is to be shown in September, you should plan to start the plant about 130 days before the fair, or about April 15 to May 15. Make two or three successive spring seedings, so the plants may be of different sizes in the garden for continuous harvesting through the fall. For harvesting November celery set out the plants about July 4 to 15. This crop requires a rich soil and a good supply of water. Ask for a copy of the special circular on this vegetable available at the office of the County Extension Agent. Green celery is increasing in popularity, so learn how to grow this crop as it is one of much interest and value.

Carrots

Carrots generally are a popular crop in 4-H Club gardening. The most widely grown varieties are Chantenay,

Nantes, and Imperator. Approximately 75 to 100 days are required to grow carrots of desirable size. The roots will be straighter and smoother in soils of a sandy or silt-loam type, and irrigated carrots are improved in yield and quality. The seed is small and must be sown carefully and thinly. Plants should stand as for beets when thinned. Do not waste seed and extra time and labor for thinning by seeding thick.

Cucumbers

Cucumbers are easy to grow but generally the main trouble has been the tendency of the young gardener to plant too early for fall exhibition, with the result that the cucumbers are too large and too old by September. To avoid this condition make a later seeding about 75 days before good fruits are desired. For harvesting about September 15, seedings should be made in late June or early July. Well-fertilized soil in the hills and thorough irrigation are necessary for fine cucumbers. Dark green fruit, 8 inches in length and 2 inches in diameter, is most desirable.

Sweet corn

Sweet corn will be in fine condition for early fall harvesting if seed is sown 85 to 90 days before the desired time for picking. For fairs and exhibitions in September, therefore, sow corn about June 1 to 10. In past years too many young gardeners have depended on the first sowing to produce ears for exhibition in the fall. Sweet corn seed should be sown every 2 weeks until late June. It is better to plant corn in several short rows in the form of a rectangle than in a few long rows. In the counties of the state where temperatures are cooler in the summer, allow more time for development of ears. The hybrid corn varieties such as Golden Cross Bantam are among the newer developments in sweet corn varieties and are uniform in the production of a fine type of ear. Almost all corn plantings should be dusted for earworm control. Refer to Extension Bulletin 676, *Vegetable Garden Insect Pest Control.*

Swiss chard

There are some fine new strains of Swiss chard now available including Fordhook, and Rhubarb, the purple-colored type. This is a fine "cut and come again" vegetable and a continuous producer from late spring to autumn's frost. Sow the seed thin, as the plants should stand not closer than 8 to 12 inches apart in the row.

Eggplant

Eggplant is an especially useful vegetable for growing in warm, interior valleys. The plants are productive and reach their prime during late August and through September. They are subject to attack by the twelve-spotted beetle, and must be kept dusted with calcium arsenate or cryolite dust.

Kohlrabi

An excellent substitute crop for turnips is kohlrabi which is not subject to maggots as are turnips. See Extension Bulletin 594, *Growing Fall and Early Winter Vegetables,* on how to grow kohlrabi.

Lettuce

An excellent vegetable in an early garden project, lettuce in the interior of the state is usually not of good quality in early September. In the coastal areas, however, it makes fine development in the summer and early fall. To have good lettuce of the New York variety, seed thin and later thin

out to 12 to 14 inches apart in the row. It is not true that lettuce plants must be transplanted to make solid heads. Obtaining a good strain of seed is of greater importance. Lettuce requires about 75 days to grow from seed to the development of the head. A well-fertilized but not too rich soil is best. Heavily manured soil oftentimes will cause leafy, soft heads subject to tipburn and slime. You can grow good head lettuce by fertilizing the soil with a complete commercial fertilizer such as might be used for cabbage.

Muskmelons

Where there is a season long and warm enough to ripen the fruit, muskmelons are a popular crop. Cantaloupes of the netted type are in their prime by September fair and exhibition time. Plant a sufficient number of hills so that you can obtain a good selection of the fruit. Soil conditions are similar to those for cucumbers. When melons are exhibited they should be ripe, for little consideration can be given, except in certain cases, to green, immature melons. For sections of the state having a short season, grow melon plants in individual containers in a hotbed or greenhouse and cap the plants when they are transferred to the field, using a variety like Emerald Gem or Spear.

Onions

Since the full growing season from April to September is required for onions, the earlier seed is planted in April the better starts the plants will make before hot weather. The Danvers and Sweet Spanish varieties usually are planted from seed, whereas the Bermudas are grown from transplanted plants. Onion sets of the average store type vary considerably in type of dry onions produced later, and it would be best in growing dry onions to use pedigreed seed. If onion plants can be irrigated you will get an increased yield and greater uniformity, although this is not necessary on beaverdam ground. Onions are a useful crop because they are in good condition for fall exhibition, and they do not have to be sold immediately as they keep well and are not perishable. They make a good crop for a single vegetable project. The best onions are about 3 inches in diameter for Danvers and larger for Valencias. The neck should be thin and the base well rounded. Bulbs should be well cured or matured before storage.

Peas

Only in the coastal counties can you find peas available for exhibition in September, but early and main crops of peas can be included profitably in an early vegetable crops project. For successive pea picking sow some of the early dwarf varieties in succession, and during April plant seed of the later varieties such as Stratagem and Alderman. The growth of pea vines and pods may be improved by the use of side dressings with commercial fertilizer (see page 8 on the use of commercial fertilizers). Keep the plants free from lice by early and regular dusting or spraying. For coast gardeners, the average pea varieties require 70 to 80 days from seeding to the first harvest.

Pepper

Peppers grow under conditions suitable for tomatoes or eggplants, but the plants are set closer together in the row. They require rich land and produce abundantly with irrigation, the fruits being at the peak of production in September.

Pumpkin and squash

Either pumpkin or squash makes a good crop for a five-crop project. Because they can be stored, the fruits are useful throughout a long season. True squash have round, thick, rather soft stems. True pumpkins, which include all the so-called summer squash, have thin, furrowed, or ribbed stems that are rough and hard. The seed should be sown as soon after the frosts as possible. Do not overmanure the hills. Irrigated plants bear a better sized fruit. Be on the lookout for the twelve-spotted beetle and squash bug (see Extension Bulletin 676, *Vegetable Garden Insect Pest Control*).

Tomatoes

One of the most popular and useful vegetables for home use, sale, and exhibition is the tomato. The essentials for a good tomato crop include a well-protected location, a well-drained warm soil, good strong plants, sufficient soil fertilization to make ample plant foliage, and good sized fruits. If possible to have irrigation the water will prevent the fruit from being affected by the blossom end or dry rot. A forkful of well-rotted manure, applied to the soil preferably 2 or 3 weeks before transplanting the plants, is helpful in stimulating a good plant growth. Superphosphate also is a good tomato fertilizer. During the blossoming season shake blossom clusters occasionally in order to assist in getting the fruit to set freely. Before the moisture gets low in July begin to irrigate to prevent dry rot. After the regular harvesting season put the green or partly colored fruit away before frost injures it, and exercise care in determining that the fruit is not too ripe if it is to be sent some distance for exhibition. Tomatoes will color in transit and should be sound and free from blemish to stand up well.

Groupings for Conservation of Space

The following groupings of crops serve to show you how crops fall into certain practical classes with relation to land use and planting seasons.

EARLY CROPS THAT MAY BE FOLLOWED BY OTHERS

Bush bean	Early or late	Early corn	Lettuce	Peas	Spinach
Beet	cauliflower	Kale	Mustard	Early potatoes	Turnip
Early cabbage	Carrot	Kohlrabi	Green onion	Radish	Rutabaga

All of the crops in this group with the exception of late cauliflower, kale, and rutabaga can be grown as early crops and followed by later ones.

LATE CROPS THAT MAY FOLLOW OTHERS

Bush bean	Carrot	Kale	Radish	Broccoli	Cauliflower
Beet	Late corn	Lettuce	Late potato	Brussels	Turnip
Early cabbage	Celery	Mustard	Spinach	sprouts	

Most of the crops in this list can follow early, half-season vegetables.

CROPS OCCUPYING THE GROUND ALL OF THE GROWING SEASON

PERENNIAL	ANNUAL				
Asparagus	Pole beans	Eggplant	Parsley	Late potato	Winter squash
Rhubarb	Lima beans	Muskmelon	Parsnip	Pumpkin	Tomato
Artichoke	Swiss chard	Onion	Pepper	Salsify	Watermelon
	Cucumbers				

Perennial crops are set at one side in the garden. The long distance annuals occupy the soil from April or May to October.

CROPS THAT CAN BE SOWN BEFORE LAST SPRING FROST

Pea	Lettuce	Turnip	Beet	Chard	Potato
Spinach	Onion	Kohlrabi	Carrot	Radish	

With the exception of the potato, the plants listed above are able to withstand light frosts.

CROPS SUBJECT TO FROST

Bean	Tomato	Squash	Eggplant	Melon
Sweet corn	Cucumber	Pepper	Pumpkin	

These warm-season annuals should not be seeded or transplanted until weather is consistently frost free.

GOOD FALL AND EARLY WINTER GARDEN CROPS

Late beans	Late cabbage	Turnip	Chard	Parsnip	Chinese cabbage
Broccoli	Cauliflower	Rutabaga	Late beet	Salsify	Mustard
Brussels sprouts	Kale	Spinach	Carrot	Celeriac	Potato

Oregon Extension Bulletin 594 discusses the detailed culture of many of these useful vegetables that complete an important season of the gardening year.

CROPS STARTED FROM HOMEGROWN OR NURSERY PLANTS

Early cabbage	Tomato	Late cabbage	Brussels sprouts	Celery
Early lettuce	Eggplant	Cauliflower		Melon
Pepper	Onion	Broccoli	Kale	

Plants in the first two columns on the left, and celery and melon on the right, are grown with artificial heat. Late celery and the members of the cabbage tribe are grown from plants in an open, unheated plant bed.

CROPS THAT CAN BE HARVESTED MORE THAN ONCE

Asparagus	Brussels sprouts	Pepper	Parsley	Bean	Cucumber
Rhubarb		Squash	Mustard	Pea	
Chard	Tomato	Melon	Sweet corn	Broccoli	

These are all "cut-and-come-again" vegetables with numerous, continuous harvestings.

CROPS THAT CAN BE STAKED TO SAVE SPACE

Pole bean	Tall pea	Tomato	Cucumber

In a small garden vertical training of these plants is important.

Preparation of an Exhibit

It formerly was considered the proper thing in exhibiting vegetables to select and show the largest specimens, regardless of their market quality and value. During recent years, however, there has been an entirely new idea on the value of an exhibit of vegetables. Now it is necessary for you to bear in mind that the vegetable exhibit must consist of specimens that have the characteristics of superior market quality and value. Extreme sizes of products are undesirable.

Selection of specimens

Select good, sound vegetables that represent the variety as closely as possible. Begin by taking the best specimens of any crop to be shown, and from these discard the inferior specimens until there are 10 or 12 remaining. From these select very carefully the number required for the exhibit, aiming to have the specimens meet as fully as possible the requirements stated below.

Harvest the vegetables with care, especially the more tender and perishable ones, such as tomatoes. Bruises and blemishes discount the scoring by the judge, so it is very important that there be no rough handling of any perishable vegetables.

Follow the instructions given in the 4-H fair premium lists stating the requirements of the exhibit insofar as number of specimens is concerned, and be sure that the individual entry has the required number of specimens.

Market characteristics

The most important points in determining the value of the exhibit in the opinion of the judge will be those relating to the market characteristics of the vegetable. Here are several points the judge will consider.

Uniformity of size. The word *uniformity* means all specimens alike as far as possible. In putting vegetables on the exhibit table it is preferable to have the individual specimens of medium size. There is still a tendency on the part of some exhibitors to show specimens that are too large, or in some cases too small. It is better to have a cabbage weighing from 3 to 5 pounds than one weighing 10 pounds, or a plate of tomatoes that will average 4 to 6 ounces apiece rather than to have fruits weighing $\frac{1}{2}$ pound or more. Roots like carrots and beets should be of medium size, which would be desirable for table use. The specimens, however, should not be too small, as has been noted in some fairs in which the value of exhibits has been impaired by the small size of the specimens exhibited.

Uniformity of shape. It is desirable that all specimens in an exhibit be as smooth and regular in outline as possible, for vegetables that have these characteristics are attractive and bring a higher market price than those that are rough or irregular in outline. This is an important characteristic for almost all vegetables.

Uniformity in color. The importance in the uniformity of color is well illustrated in the case of tomatoes, squash, celery, onions, cauliflower, and other vegetables.

Solidity. This is an important characteristic with some vegetables, especially cabbage, head lettuce, and onions.

Cleanliness. The exhibit should be free from soil, foreign material, and any such matter as would impair the

general appearance of the exhibit. Some vegetables such as beets, carrots, and parsnips look much better if they are washed, while others such as tomatoes, peppers, etc., can be wiped off satisfactorily with a clean cloth. All the blemished outside leaves of cabbage and cauliflower should be removed before the specimens are put on the exhibit table.

Supply of exhibit material. Aim to grow a sufficient quantity of exhibit material so that if you have won premiums with your vegetables in a county or community fair, and wish to show at a later fair, you may get a collection of fresh specimens of vegetables from the garden. This may not be necessary in all cases, but will apply especially to those vegetables that are highly perishable and that wilt or bruise readily. Good vegetables may be scored down considerably if they are in poor condition.

Tips for Exhibitors

- Do not show stock roots of any kind as representing table roots. Likewise, no varieties of field corn can have a place in the table vegetable entries. These should be with field crops.
- Years ago exhibitions usually contained undesirably large specimens of vegetables such as beets, onions, cabbage, carrots, squash, etc. Do not go to the other extreme and show beets and onions of marble size, or carrots a little larger in diameter than a pencil, or cabbage the size of baseballs. Observe the commercial size of these crops on the market and exhibit accordingly.
- Do not show specimens of vegetables that are not in a suitable condition, such as green tomatoes, ripe summer squash, mature sweet corn, ripe cucumbers, green or immature cantaloupes or watermelons. Crops in this condition have little or no market value and, therefore, do not have a place on the show table.
- If exhibitions of vegetables are held early in the fall or even in late summer, due consideration should be given by the judge of exhibits to the possibility of some crops not having had a sufficiently long season to become mature, such as winter squash, dry onions, etc. Under such circumstances exhibits should not be scored down because of this unavoidable immaturity of specimens.
- It is especially unfortunate that in an otherwise good display some entries of a certain vegetable do not contain the required number of specimens. If five roots are called for in a beet exhibit, for example, this number must be shown; otherwise there is the probability that the beet exhibit may be disqualified, which may mean a loss of 15 points out of a possible 25 for a full score for exhibits of five different kinds of crops.
- Do not exhibit two varieties of the same kind of crop, such as Crookneck and Zucchini. Either one of these represents the class of summer squash (in reality pumpkin, eaten when in an immature state). See page 13 in the discussion of ways to identify true squash and pumpkin by means of the stems of the two fruits.
- It is not desirable, except possibly in some unusual cases, to include dried beans as part of the exhibit. Surely it is possible to grow five crops for exhibition without having to put some dry seeds in a jar to make a crop entry. In a seed display this might be possible, but in an exhibition of crops dry seeds are not desirable.

Tips for Growers

✓ Choose carefully crops that are adapted to the climatic conditions of the county. Choose also from those crops that make good late summer and fall vegetables for exhibition.

✓ Buy seed to grow crops that are true to type, high yielding, and of good market value. Plan the seed-buying program early and aim to get the best.

✓ It is best to grow standard varieties. Novelties are all right in a novelty exhibition but not on the exhibition table where competition is keen.

✓ Do not underestimate the necessity for a fertile piece of land for vegetable growing. The successful gardener is careful but generous in adding plant food.

✓ If the exhibition season is the main object of the gardener, plan to start the crop so that it will be in prime condition during the exhibition period.

✓ Inasmuch as proper size of vegetable products is important in exhibition, use recommended distances of planting. Crowded plants grow less large than they should. Plants with too much room may become too large as is exemplified in the growing of root crops.

✓ Cultivate chiefly for weed control. Don't disturb the mulch if one is already formed, and there is no rain or irrigation water to disturb it.

✓ Vegetables, which have a high water content, do best in the warm summer when provided with an inch of water every 10 days or so. This means irrigation—careful, thorough watering.

✓ Use standard dusts or sprays for controlling insects. Few vegetables can get by the season without your help in keeping them protected from enemies. Be specific in your treatments and understand why, how, and when dusting or spraying should be done. Have on hand a copy of O.S.C. Extension Bulletin 676.

✓ Careful choosing of specimens for the exhibition table is of the greatest importance. Your best thought and attention may well be given to the fine details and characters of crops that win premiums.

Score Card

The following are typical scorings for a single vegetable. There will be of necessity a different score card for each vegetable according to the particular characters and points of note.

ONION—5 BULBS

Correct varietal form	20
Maturity and solidity	25
Size	15
Uniformity of exhibit	20
Color	10
Freedom from blemish	10
	100

TOMATO—5 FRUITS

Maturity and condition	25
Correct varietal form	20
Size	15
Uniformity of exhibit	20
Freedom from blemish	20
	100

Useful Tools in Gardening

You will save time, energy, and labor by using certain hand tools in growing vegetables, besides the usual variety of horse-drawn tools for preparing the garden soil.

The hand seed drill will quickly and accurately plant many kinds of garden seed. It must be adjusted properly and operated carefully on land that is well prepared and smooth. A good wire line attached at either end to a pointed iron rod with a handle helps to make straight rows, and eliminates the trouble of a broken line, so common with a twine marker. The long-handled push or shove hoe is useful for early spring weeding and covers much ground rapidly. Wheel hoes of various types are valuable in close row cultivating and weeding. If you grow crops on a more extensive scale you may find it economical to operate one of the several types of power cultivators and seeders that are on the market, or to cultivate between the rows with a horse-drawn cultivator.

Useful Publications

Station Circular of Information 447 Controlling Damping-off in Vegetable Seedlings.

Extension Bulletin 676 Vegetable Garden Insect Pest Control.

Extension Bulletin 594 Growing Fall and Early Winter Vegetables.

Extension Bulletin 612 Garden Soil Management.

Extension Bulletin 614 The Farm and Home Vegetable Garden.

Extension Bulletin 703 Booster and Starter Solutions for Vegetable Transplants.

Extension Circular 377 A Monthly Schedule of Suggested Operations in Growing Vegetables for Home Use.

Extension Circular 342 Growing Early Vegetables under Glass.

Extension Circular 459 Small Greenhouses for Amateur Gardeners.

USDA Farmers' Bulletin 1743 Hotbeds and Cold Frames.

Other Horticultural Projects

Vegetable Garden

You may continue this project until you are 21 years old.

Flower Growing

Learn how to grow flowers.
Improve the appearance of your home.

Home Beautification

For older boys and girls.

Improve the appearance of your home.
Study your home grounds, plan and make improvements.

Commercial Horticultural Crops

For older club members who are interested in growing vegetables, fruits, nuts, flowers, or nursery stock for sale.

Choice of three plans: ownership, partnership, management.
Plan projects large enough to make it practical to market the crop.

Suggested Companion Projects

Food Preservation

Can or freeze part of the produce you grow in your vegetable garden.

Entomology

Learn to identify and control the insects that may attack your garden.

4-H Club Members' Pledge

I pledge
My Head to clearer thinking,
My Heart to greater loyalty,
My Hands to larger service, and
My Health to better living, for
My Club, my community, and my country.

4-H Club Motto

TO MAKE THE BEST BETTER

February 1955—3M