Garden Project for 4-H Clubs

CIRCULAR NO. 222

(Revised)

UNIVERSITY of KENTUCKY

COLLEGE OF AGRICULTURE

Extension Division

THOMAS P. COOPER, Dean and Director

Lexington, Ky.

March, 1939

Published in connection with the agricultural extension work carried on by co-operation of the College of Agriculture, University of Kentucky, with the U. S. Department of Agriculture, and distributed in furtherance of the work provided for in the Acts of Congress of May 8 and June 30, 1914.

REQUIREMENTS

1. Members must be enrolled by March 15.

2. Each member must do his or her own work on the project.

3. Each member must keep a complete record of expenses, receipts and dates of harvesting and make a summary of expenses and receipts to complete the project record.

4. Each member will attend meetings of the club group whenever possible.

5. Where there is opportunity for an exhibit, each garden project member should make a planned effort to take part.

6. The project closes November 1. The record will be turned in to the local leader for approval.

Reprinted, April, 1941

Circular No. 222

(Revised)

GARDEN PROJECT FOR 4-H CLUBS

By JOHN S. GARDNER

PURPOSES OF THE PROJECT

The purposes of the 4-H garden project are several. One is to teach the club member the best and latest ways of raising vegetables. Another is to teach him orderliness as a result of his making his garden record complete and correct. Another is to teach him perseverance in carrying thru and doing well what he starts. Still another is to teach him the value of cooperation, as taking over the care of part of the family garden, to make him partner with his parents. Another is to teach him business principles, to have him so do his work as to show a profit from the undertaking, the incidental money he makes being his to spend, preferably on his clothes or other needs his parents would otherwise have to provide; thus, again, he becomes his parents' partner.

THE NATURE OF THE PROJECT

A "Garden project" may mean several things, but usually it is a separate garden containing a variety of vegetables, managed by the club member. The produce that results may be sold, preferably to the parents of the member, not necessarily for cash, but as "credit" towards the shoes and other things they customarily provide him.

The project garden may be part of the family garden, certain crops being the member's to grow, or he may share in the conduct of the whole garden. Altho no cash, as such, may result from a project of this kind, the record can be kept to show "credit," as above.

The garden project may be the management of a planting of one or several vegetables, which thus are provided in quantities adequate for sale.

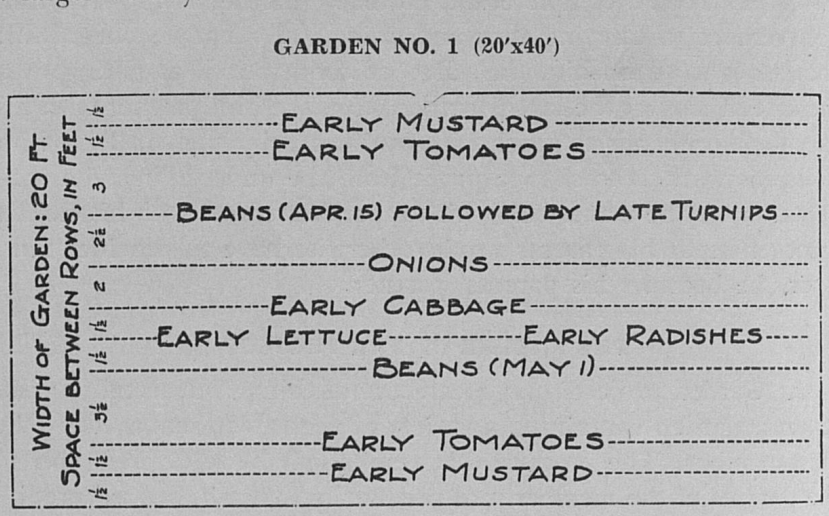
Another form the garden project may take is that of a joint gardening-canning enterprise with groups of girls and boys partici-

pating. In this case, there should be not too great a number of varieties of vegetables.

THE SIZE OF THE PROJECT

The size of the project should be governed by the age of the member, but even for a beginner, 10 years old, if a general garden is chosen, it should not be smaller than 20 feet by 40 feet (see suggestive plan of garden number 1) and should not contain fewer than 6 vegetables. Members carrying the project for a second year should have a larger garden, 40 feet square, for example (see plan of garden number 2) containing not fewer than 10 vegetables. A small number of vegetables is suggested, so that there may be enough of each to be really helpful, rather than merely samples of a larger variety.

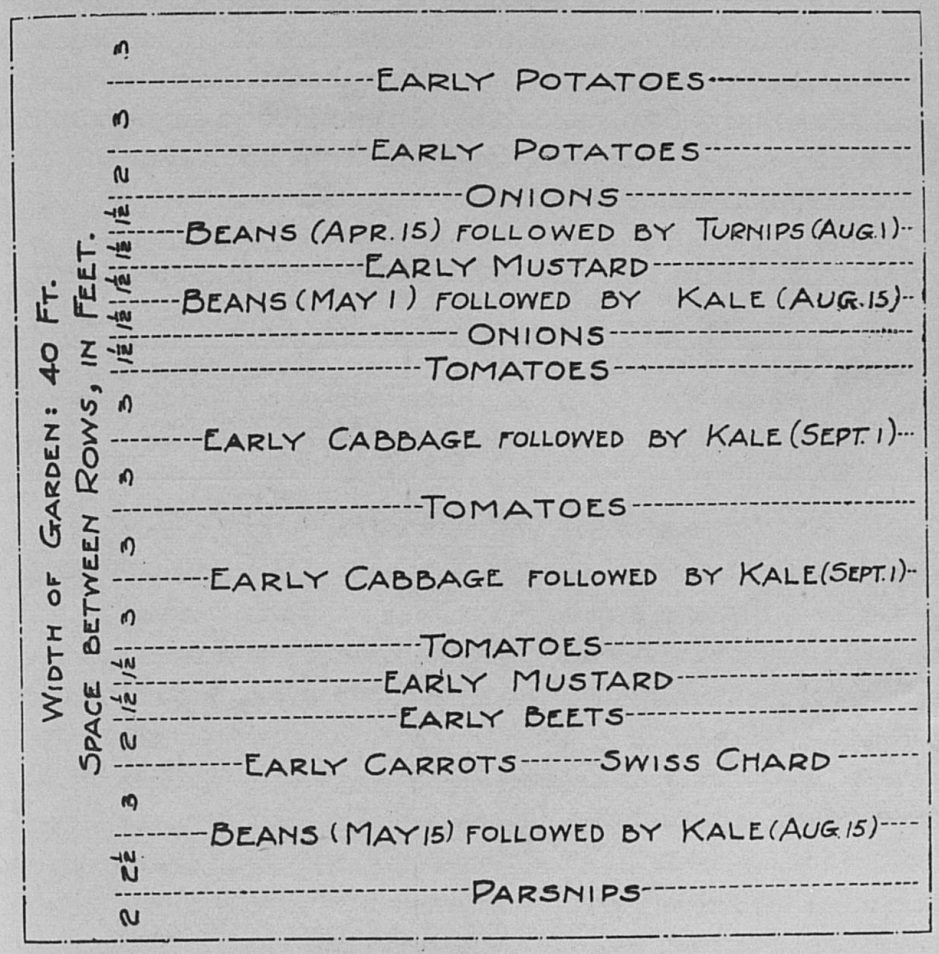
GARDEN NO. 1 (20'x40')



The seed and plant list for Garden No. 1 follows:

2 doz. tomato plants (1 pkt. seed). 2 rows, 40 ft. long, or 80 ft.
2 doz. early cabbage plants (1 pkt. seed). 1 row, 40 ft. long.
1½ lbs. beans. 2 rows, 40 ft. long, or 80 ft.
½ oz. mustard. 2 rows, 40 ft. long, or 80 ft.
1 qt. onion sets. 1 row, 40 ft. long.
1 pkt. lettuce. ½ row, 40 ft. or 20 ft.
1 pkt. radish. ½ row, 40 ft. or 20 ft.
½ oz. turnip. 1 row, 40 ft. long.

GARDEN NO. 2 (40'x40')



The seed and plant list for Garden No. 2 follows:

10 lbs. seed potatoes. 2 rows, 40 ft. long, or 80 ft.
2 qts. onion sets. 2 rows, 40 ft. long, or 80 ft.
2 lbs. beans. 3 rows, 40 ft. long, or 120 ft.
1 oz. mustard (5 pkts.). 2 rows, 40 ft. long, or 80 ft.
2 doz. tomato plants (1 pkt. seed). 2 rows, 40 ft. long, or 80 ft.
4 doz. cabbage plants (1 pkt. seed). 2 rows, 40 ft. long, or 80 ft.
½ oz. beet (4 pkts.). 1 row 40 ft. long.
1 pkt. carrot. ½ row, 40 ft. long, or 20 ft.
1 pkt. Swiss chard. ½ row, 40 ft. long, or 20 ft.
¼ oz. parsnip (2 pkts.). 1 row, 40 ft. long.
2 oz. kale. 3 rows, 40 ft. long, or 120 ft.

After the second year, the member is ready to manage larger gardens. Accordingly, he will need help beyond that which this circular provides, and should consult Kentucky Extension Circular

355, The Vegetable Garden. The size of the project garden and the nature of the project itself should be left to the leader to determine, from his knowledge of the member and his capabilities. IN NO CASE, should more be undertaken than the club member is well able to carry thru successfully. In the event a single-crop project is chosen, the minimum size is one-tenth acre. (But see "The Tomato Project" and "The Potato Project.")

VARIETIES GOOD FOR A HOME GARDEN, WITH INFORMATION GARDENERS NEED

Vegetable	Variety	Planting date	Space between rows	Time to maturity	Seed 100 feet row	Expected crop 100 feet
			feet	days		
Beans (Pole)	Kentucky Wonder	May 15 to July 1	3	75	8 ozs.	4 bu.
Beans (Bush)	Stringless Greenpod	Apr. 15 to July 20	3	70	1½ lb.	4 bu.
Beans (Lima)	Henderson Bush	May 1	3	75	1 lb.	4 bu.
Beets	Crosby Egyptian	April 1	2	60	1½ oz.	1½ bu.
Cabbage (E.)	Wakefield	March 15	3	100	60 plts.	90 lbs.
Carrots	Chantenay	April 1	2	100	1 oz.	1½ bu.
Celery	Golden Self-blanching	April 15	3	170	150 plts.	150 stalks
Chard (Swiss)	Lucullus	April 1	2	60	1½ oz.	3 bu.
Kale	Siberian	March 15	2	40	1 oz.	2 bu.
Mustard	Southern Curled	March 15	2	40	1 oz.	2 bu.
Lettuce	Grand Rapids	March 15	1½	40	1 oz.	3 bu.
Onions	Yellow (sets)	March	1½	60	2 qts.	1½ bu.
Parsnip	Guernsey	March 15	2	200	1 oz.	2 bu.
Potatoes	Irish Cobbler	Mar. 15 to Apr. 10	3	120	6 lbs.	1½ bu.
Radish	Scarlet Turnip	March	1	25	1 oz.	300 radishes
Tomatoes	Bonny Best	May 1 to 15	4	70	30 plts.	6 bu.
Turnip	Strap-leaf Purple-top	March	1½	40	1 oz.	1½ bu.

PLANNING

Before the project is undertaken it should be planned to completion. Planning begins with choosing the nature of the project and its size. A map should be made of the ground to be used,

giving its exact shape and size, and on it should be shown the rows of vegetables to be grown.

Planning includes making complete arrangements for the preparation of the ground and the necessary stable manure or fertilizer. Tools to be used in cultivating the crops should be put in order, and also the spray apparatus and materials which are to be used against insects and disease. Sure sources for spraying or dusting materials should be located, so there will be no delay when need for them arises. A seed catalogue and the list of varieties (page 6) should be consulted and a seed list made, and the seed itself procured early while desired varieties may still be had. Thus, when gardening weather arrives, the work can go forward without hitch or delay, and the garden will perform with satisfaction.

SOIL PREPARATION

To have quality, vegetables must grow quickly. To this end, the soil should be prepared in the best way possible. It should be loose in texture so that it may absorb and hold moisture and not bake or crack in a dry, hot season but remain easy to work thruout the summer. A loose soil is needed, too, to grow shapely root vegetables and potatoes.

The best way to put soil in gardening condition is to plow under quantities of stable manure or straw or litter to rot into humus. Besides conditioning soil, stable manure also provides plant food, but because it is not balanced to the needs of most vegetables, plant food should be added in the form of commercial fertilizer (see "Fertilizing"). A 2-inch coat of stable manure plowed under every year will keep garden soil in top condition.

Garden land should be plowed deep. Some professionals plow 14 inches deep, but this is possible only with tractors. Good depth is 10 inches, but if the custom has been not to plow so deep, this depth should be approached an inch a year, to give the turned-up subsoil time to become mellow. If possible, the land should be broken a month before actual gardening is to begin.

The seed bed is prepared by disking thoroly, to cut up clods, and then dragging or harrowing with an A-harrow, or both, to make it fine all the way down. A seed bed is considered in good condition when the soil particles are as small as the seed to be sown.

FERTILIZING

The usual way to fertilize a garden is to cover it with stable manure, and this is a good start, for manure is rich in plant food. The trouble with manure, however, is that its plant food is not balanced to the needs of all vegetables. For example, it contains a high proportion of nitrogen which helps leaf growth and thus favors the growing of cabbage, onions, greens and other leaf crops. On the other hand, this nitrogen makes tomatoes, potatoes and radishes grow to top and produce light yields because these crops need phosphorus to develop. There are no exact rules for fertilizing a garden, but here are suggestions.

If fresh manure can be had, spread a good one-horse load (½ ton) over a space 40 feet by 40 feet and plow it under. Then, when the seed bed is being finished, broadcast 15 pounds of 20 percent superphosphate and work it in a few inches deep, where most of the vegetable roots lie.

If older manure is to be used, or if only straw can be had, plow it under, as above, but instead of the superphosphate, use 25 pounds of complete fertilizer, 3-8-6, 4-8-8 or 5-10-5. The figures on a fertilizer sack stand for the percentages of the 3 plant foods. For example, "3-8-6" means 3 percent of nitrogen, 8 percent of phosphoric acid and 6 percent of potash.

CULTIVATION

The success of the garden depends on how it is cultivated. Cultivation has for its aims just two things. One is to keep the garden surface broken so that it can readily absorb the moisture from even a light shower. The other is to remove weeds, for these rob the vegetables of both moisture and plant food.

The time to remove weeds is while they are small, before they have taken much food from the vegetables and before their roots have gone deep. At this time all that is needed is to stir the top inch of soil, turning the weed roots to the sun. This kind of cultivation is the best that can be given; it requires least work and, better, the roots of the vegetables are not harmed. This is not true when deep "working" is done.

The garden surface should be kept level. There should be no

hills and ridges, for they require much unnecessary work and, in a dry season cause loss of moisture that the vegetables could well use.

An excellent tool with which to cultivate is a good hoe with the blade flat with the surface so that the soil can be literally shaved, or "scalped." But a wheel hoe fitted with side hoes is better because with it the job can be done so much more rapidly.

THE VEGETABLES

The vegetables to be discussed here will be those that appear in the first-year and second-year garden plan suggestions, pages 4 and 5. Advanced project gardeners will find a complete discussion of all vegetables in Kentucky Extension Circular 355, "The Vegetable Garden." As similarity in their culture permits, the vegetables are discussed in groups, to complete the information given in the table on page 6.

Mustard, Kale, Lettuce, Swiss Chard

All these are leaf crops and benefit from nitrogen in the form of side-dressings, in addition to the general fertilizing plan given on page 8. When the seedlings are two weeks old, apply nitrate of soda, 1 pound to 100 lineal feet or square feet (in "beds") or dry chicken manure, 1 bushel to 200 feet.

Mustard, lettuce and kale may be sown broadcast, the seed raked in, or in rows, but covered lightly, because the seed is small. The seed bed should be exceptionally well prepared.

Swiss chard is always sown in rows, the seed spaced about an inch. When the seedlings are all up, they should be thinned to a stand of 10 inches. In harvesting, only the outer leaves are removed, leaving the heart to grow out more leaves, continuing thruout the summer, and until quite severe frost.

Early Cabbage

Cabbage, too, is a leaf crop and the same method of fertilizing is recommended as for mustard, etc., except that because cabbage takes longer to mature, it is worth while to give 3 nitrogen side dressings, the first at setting and again in two weeks, and in two weeks again. The seed bed need not be so fine as for the greens, but the better its preparation the better the cabbage will thrive.

Onions

Onions are leaf vegetables, and exactly the same soil preparation and fertilizing should be given as for early cabbage.

Onions intended for winter storage may be pulled when the "necks" have broken over and the tops have begun to dry. If the weather is clear, the pulled onions may be left lying in the garden until the tops are entirely dry. Then they should be twisted off, the onions put into slatted crates and set in an airy place so they will dry thoroly; or they may be spread on the floor of a barn loft to dry. For the winter, onions should be stored in a place where they will not freeze, but cool enough to keep them from sprouting. The best temperature is between 40 and 50 degrees, and the air should be dry.

Radishes, Beets, Carrots, Parsnips, Turnips

All these are root vegetables and as such need only general fertilizing as given on page 8. They are sown in rows, but turnips are sometimes broadcast. Because this seed is small, the seed bed should be fine and covering should be light. Even then, parsnips and carrots have difficulty coming up, but they may be assisted by sowing some radish seed with them. In fact, all the early radishes may be so sown, and thus a row in the garden is saved for something else.

The root vegetables are easily stored for the winter, by burying them as is the custom with potatoes. Or, if the cellar is cool, about 40 degrees, they can be kept there in boxes or bins. In this climate, carrots may be left in the row, if they are covered with leaves and with wire netting to keep out rabbits. Parsnips may be kept in the same manner, except that no protection at all is needed. In fact, the flavor is improved by a sharp freezing or two.

Beans

The club gardener may use snap beans of the bush type or pole type, or he may prefer the Lima bean or "butterbean," too often considered a luxury. In either case he should keep in mind that if the ground is made too rich with manure there will be too much vine growth and heavy bloom, but no beans. The general fertilizing program, page 8, is the one to follow. The seed bed should be well prepared, especially for lima beans, for if the soil becomes

packed in the least, they "break their necks" in coming up. A way to reduce this danger is to plant lima bean seed with the eyes down.

Tomatoes

As tomatoes are a fruit crop they must have a combination of plant food in which there is plenty of phosphorus. Manure alone causes tomatoes to grow on top. The general fertilizing suggestion, page 8 is satisfactory.

Tomatoes may be staked and pruned to one, two or three stems, or they may be let run. By staking, the fruit is kept off the ground and will be of finer grade, but the amount is less than from an equal number of plants not staked. On the other hand, staked plants may be set closer together, and thus part of the loss, or all of it, may be made up. Where tomatoes are staked, weeds can be kept under better control and a mulch may be used, assuring moisture, to keep up fruit size and to extend the picking season, perhaps all summer, especially when more than one stem is kept.

Potatoes

Potatoes require soil fertility well balanced. If there is too much nitrogen they "grow to top," but it is safe to apply as much manure as recommended in the general fertilizing program, page 8. The complete fertilizer may be used as there suggested, but it would be better to sow it in the furrow, at the rate of one pound to 25 feet of row, and work it into the soil before the seed is dropped. The distance between seed pieces should be about 15 inches, one piece at a place.

It is suggested that certified seed be used, and that it be treated against scab and scurf. Inasmuch as only a small amount of seed is required in the second-year garden plan, page 5, it is suggested that the member get it from the seed supply for the family potato planting, but if this is not treated, he may treat his seed by soaking it for one hour in a solution made by dissolving bichloride of mercury tablets in water, a tablet to each pint of water.

In cutting the seed potatoes, the club member should use these standards:

1. Each seed piece should have at least one eye; more do not matter.
2. The seed piece should weigh about ¼ ounce or be the size of a pullet's egg.
3. The seed piece should be thick and blocky, rather than thin and flat. This prevents undue drying out.

INSECTS AND DISEASES

All the vegetables suffer more or less from insect damage and from disease, but all these pests fall into just a few groups, as to control. Accordingly, controlling them is not so difficult as some suppose, but requires only a bit of study to find in which general group a troublesome insect belongs.

For example, there are two general classes of insects; those that weaken plants by draining the sap, and those that consume the leaves. Leaf consumption is serious, for the leaves of a plant are its digestive apparatus.

Insect Control

Close watch should be kept for the first sign of injury. If it consists of holes in the leaves, the insect is a chewing one and all that is needed is to put the control material where it feeds.

On cabbage, mustard, turnips or kale, for the CABBAGE WORM, use dust No. 1 or spray No. 1, page 13.

On beans, for the MEXICAN BEETLE, several ways for control are suggested. The best is a dust or spray containing poison, as Dust No. 2 or Spray No. 2, but either must NEVER be used after pods have begun forming. After that time, Dust No. 1, or Spray No. 1 should always be used. A very important part of successful control of Mexican bean beetle is to begin in time; one dare not wait until the bean leaves are riddled. The right time for the first dusting or spraying is when the first few "hard-shell" adults are seen, so as to kill the first young hatched from the eggs they lay. Ten days later a second application should be made, to catch larvae that hatch last. Sometimes, a third application is needed, 10 days after the second.

On potatoes, the COLORADO BEETLE is a common pest, but easily controlled by applying Dust No. 2 or Spray No. 2, page 13. These contain poison, but it does not go thru the vines to the potatoes, as some persons suppose.

This takes care of the chewing insects that may injure the vegetable listed, but sometimes the sucking insects, notably the plant lice, are troublesome. Regardless of the crop on which lice are found, the remedy is to use Dust No. 1, or Spray No. 1, or Spray No. 3, page 13, but the sprays must be so applied that the lice themselves are hit. Killing should result in less than 30 minutes; if not, repeat.

Another sucking insect is the HARLEQUIN CABBAGE BUG, the many-colored 3-cornered bug that attacks cabbage, kale, mustard and sometimes turnips. When young, this insect is soft bodied and can be controlled with the remedy suggested for plant lice. After the insects reach their hard-shell adult stage, no way remains but to pick them off by hand and destroy them.

Dusts and Sprays

Dust No. 1

Non-poisonous; for all insects. ¾% or 1% Rotenone dust*

Spray No. 1

Non-poisonous; for all insects
Rotenone spray, made from extract; directions on the bottle

Dust No. 2

Contains poison; for all chewing insects
Magnesium arsenate**—1 pound
Hydrated lime—6 pounds

Spray No. 2

Contains poison; for all chewing insects
Magnesium arsenate**—1 rounded tablespoonful
Water—1 gallon

* Best purchase ready mixed.
** NOT Magnesium arsenate mixture; pure magnesium arsenate.

Spray No. 3

Tobacco extract and water; directions on the container, or made at home from tobacco steeped in water.

Disease Control

Several diseases affect vegetable crops. The septoria leafspot of tomatoes is a common and frequently injurious disease, especially in old gardens. It may be controlled by spraying with Bordeaux mixture just after the plants are set, again 2 weeks later, and a third spray in two weeks. This spray is also beneficial to potatoes if applied first when the plants are 3 to 6 inches tall, again two weeks later, and a third spray two weeks later. These sprays also serve to control the black flea beetle present early in the season. Bordeaux mixture is prepared as follows:

1. In 5 quarts of water, dissolve 1 pound of bluestone (blue vitriol). Hung in a sack high in the water, bluestone will dissolve with no stirring, in about 1 hour.
2. Into the tank of a 3-gallon sprayer, pour 9 quarts of water, add 1 quart of the dissolved bluestone and a handful (4 ounces) of hydrated lime, close the sprayer, shake endwise, 10 to 15 times. The result is 2½ gallons of 4-4-50 Bordeaux.

Bordeaux should be used immediately after it is made. When done spraying the sprayer tank should be washed thoroly with clear water, for bluestone corrodes galvanized metal. A brass tank is better. To be effective, the Bordeaux must cover both sides of the leaves. A sprayer must be used.

A disease troublesome to cabbage is Black Rot. The veins of leaves become blackened, the blackening extending into the stalk and penetrating into the head. The outer leaves turn yellow and fall. Good heads are seldom formed in an infected planting but they are small and one-sided. There is no control for this trouble once it appears in the plant bed or field but preventives are to treat the seed, from which plants are to be raised, in hot water for 25 minutes at 122 degrees Fahrenheit, remove to cold water, then dry and sow in soil which has not previously grown cabbage. Avoid setting the plants in land where this trouble has previously occurred.

Another disease which affects cabbage is known as yellows, because of yellowing and dropping of the leaves and finally death of the whole plant as head forming should begin. A similar disease known as fusarium wilt affects tomatoes causing discoloration of the veins of the stalk, yellowing and wilting of the leaves and finally death of the plant. This usually occurs when the first fruits are about half size. The use of resistant varieties is the only means of preventing these diseases in gardens where they are known to occur.

HARVESTING AND MARKETING

The men who are in gardening as a business have long learned that they must please their customers. They have learned, too, that the vegetables they sell best are those that require most care to grow, and which many home gardeners do not even attempt to produce. That is to say, generally, "specialties" return most profit. Besides, they observe these rules:

Offer only the best produce for sale.

Be sure that it is fresh and clean.

Handle it carefully, so it is not blemished.

Always grade carefully and put it up in an attractive manner.

Be neat in personal appearance.

SELECTING SHOW VEGETABLES

An excellent way to bring the year's work to a close is to make an exhibit of the garden's products at the county fair. In selecting vegetables to be shown, the following points should be kept in mind:

They should not be too large; the best size for the table is right.

They should not be too old; they should be right to serve for food.

They should be perfect; no insect holes, no disease spots.

They should have been handled carefully, so there are no bruises or cuts.

If several of the same vegetable are shown together, as in "plates," all should be of the same size and type.

RECORDS

From the beginning of the season, keep records of seed and fertilizer costs, insect and disease control materials, and horse work and hand labor for breaking, planting, cultivation and harvesting. A separate record for each vegetable is to be kept, in the following forms. If these are not enough paste in additional sheets. Get prices from a local grocer.

RECORD OF VEGETABLE

Kind of vegetable.....

Name of variety.....

Length of row..... Date of planting.....

Date gathered	Amount	Cash value
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

RECORD OF VEGETABLE

Kind of vegetable.....

Name of variety.....

Length of row..... Date of planting.....

Date gathered	Amount	Cash value

RECORD OF VEGETABLE

Kind of vegetable.....

Name of variety.....

Length of row..... Date of planting.....

Date gathered	Amount	Cash value

RECORD OF VEGETABLE

Kind of vegetable.....

Name of variety.....

Length of row..... Date of planting.....

Date gathered	Amount	Cash value
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

RECORD OF VEGETABLE

Kind of vegetable.....

Name of variety.....

Length of row..... Date of planting.....

Date gathered	Amount	Cash value
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

GARDEN RECORD

Size of garden .....

Kind of soil (sandy, loose or clay) .....

Costs

Manure ($2 per 2-horse load) .....

Fertilizer _____ lbs. .....

Seeds and plants .....

Breaking and fitting, _____ hrs. at 15 cts. .....

Hand cultivation, _____ hrs. at 15 cts. .....

Team, _____ hrs. at 10 cts. per horse per hr. .....

Pest control (tell what was used) .....

.....

.....

Harvesting, _____ hrs. at 15 cts. .....

Total cost _____

Returns

Total value of products .....

Total cost .....

_____

Net return _____

THE GARDEN STORY

Into this story put notes about special difficulties (tomato wilt, cabbage yellows, etc.), special insects, the weather and things of that sort. Such a story will prove valuable for next year's work.

STORY (continued)

STORY (continued)

STORY (continued)

STORY (continued)

GARDEN PROJECT OF

Name ..... Age .....

County ..... Date .....

Post Office ..... R. F. D. .....

Years in club work ..... Years in this project .....

Approved .....
County Agent

Date .....

5M—4-41