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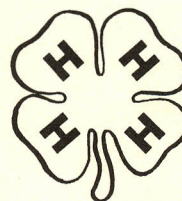
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4-H GARDEN MANUAL



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COOPERATING
W.V. LAMBERT, DIRECTOR

C.2

FOREWORD

A good garden will provide you with a supply of nutritious, fresh vegetables plus some for storing. By developing a market for some of your produce, you will get a cash return from your project. By keeping accurate records of everything you harvest, you will be able to show a higher return compared to actual cost than from most other projects.

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4-H Club Garden Manual

by Wayne C Whitney, Extension Horticulturist

Part I Project Requirements

Size of Garden

No minimum size required. Size should be governed by the amount of land available and/or the physical ability of the 4-H member.

Kinds of Vegetables

A 4-H garden should include at least five kinds of vegetables, and these should be selected from at least four of the following groups, in addition to radishes, lettuces, and green onions.

Group 1

Cabbage
Cauliflower
Broccoli
Brussels Sprouts
Kale

Group 2

Peas
Green Beans
Lima Beans
Wax Beans
Pinto Beans
Pole Beans

Group 3

Onions
Beets
Irish Potatoes
Sweet Potatoes
Carrots
Parsnips
Turnips

Group 3 (Con't.)

Rutabagas
Kohlrabi

Group 4

Swiss Chard
Chinese Cabbage
Spinach

Group 5

Tomatoes
Peppers
Eggplant
Sweet Corn
Popcorn

Group 6

Cucumbers
Squash
Watermelon
Cantaloupe
Pumpkins
Gherkins

Recommended Varieties for Nebraska

ASPARAGUS

Mary Washington
Paradise

BEANS

(Bush-green)

Contender
Top Crop
Giant Stringless Greenpod
Bountiful
Logan

(Bush-wax)

Pencil Pod Blackwax
Cherokee
Top Notch

(Pole-green)

Improved Kentucky Wonder
Blue Lake

LIMA BEANS

Peerless Bush Lima
Henderson Bush Lima
Early Baby Potato
Triumph

BEETS

Asgrow Wonder
Crosby's Egyptian
Detroit Dark Red

CABBAGE

Marion Market (Yellows-Resistant)

Wakefield
Golden Acre
Copenhagen Market

Imperial 456
Cosberg
Imperial 44

CHINESE CABBAGE

Chihili
Michihili

MUSKMELONS

Iroquois
Early Sunrise
Hearts of Gold

CARROTS

French Forcing (early)
Chantenay
Nantes
Danvers Half Long

ONIONS

Hybrids (x)
Utah Sweet Spanish
Early Grano

CAULIFLOWER

Snow Ball
Dwarf Erfurt

PARSNIPS

Hollow Crown

CHARD

Lucullus

PEAS

Alaska
Burpee Early Dwarf
Little Marvel
Bonner
Wando

CUCUMBERS

(Pickling)
Chicago Pickling
National Pickling

PEPPERS

Illinois F₅
Worldbeater
Penn Wonder
Ruby King
California Wonder

(Slicing)
Burpee's Hybrid
Sure Crop Hybrid
Marketeer
Straight Eight

POTATOES

(Eastern Nebraska)
Red Warba
White Cloud
Irish Cobbler

EGGPLANT

Black Beauty
Extra Long Purple

(Western Nebraska)
Progress
Triumph

KOHLRABI

White Vienna
Purple Vienna

RADISHES

Cavalier
Comet
French Breakfast
Scarlet Globe
Sparkler
White Icicle

LETTUCE

(Leaf)
Early Curled Simpson
Prizehead
Grand Rapids
Black Seeded Simpson

RUTABAGAS

American Purple Top

(Head)
Penn Lake
Premier Great Lakes

SPINACH

Bloomsdale Savoy (very early)
Nobel
Kind of Denmark

SQUASH & PUMPKINS

(Winter)

Table Queen
Buttercup
Butternut
Green Gold
Hubbard
Rainbow
Uconn (bush type)
Cheyenne (bush type)

(Summer)

Cocozelle
Caserta
Early White Bush Scallop

SWEET CORN (arranged by season)

Marcross
Golden Cross Bantam
Golden Bantam
Golden Bounty
IoChief
Ioana

SWEET POTATOES

Orange Little Stem
Nancy Gold
Red Bermuda
Porto Rico (Southeastern Nebraska
only)
Maryland Golden

TOMATOES

Red Cloud (early)
Sioux (midseason)
Rutgers (late)
Hybrids (x)

WATERMELONS

Early Kansas
Hybrids (x)
Sixie Queen

(x) Some hybrids may be very well adapted for Nebraska conditions, but it is not possible to recommend specific hybrids because of the lack of adequate tests.

Part II Planning the Garden

You could just plant some seeds some place and have a garden. If you do some planning first, it could be a lot better garden -- you would have more fun with it, and probably make more money to.

This planning should be done on paper. You can change the garden on paper easily, or tear up the first sheet and start over. After the seeds or plants are in the ground, it is hard to move them.

The best garden plan is drawn to scale. Compare the size of the garden with the size of your paper. For example, using a scale of one inch to four feet, you can put a 30' x 40' garden on an 8 1/2" x 11" page.

As you start your plan, think about these things:

1. Which vegetables will you try to grow?
2. How much space in the row and between rows does each vegetable need to grow well?
3. When should each vegetable be planted and how long before it is harvested?
4. How will you get into the rows to weed and cultivate and harvest the crop?
5. Which way will the rows run - lengthwise or crosswise of the garden, or on the contour?
6. Will you plant and cultivate with hand tools (hoe, rake, trowel), or with a garden planter and wheel cultivator, or power equipment?
7. Will you water your garden, and how?
8. Will you mulch some of the garden?
9. Will you use succession planting?
10. Will you use companion planting?

11. What will you use for windbreak?

Your mother or father or club leader can help you answer these questions. You can find some suggestions in this circular and references are given for further study. When your plan on paper is finished, start planting according to your plan.*

Succession Planting

In Nebraska the practice of succession planting will greatly increase the production of a garden. Succession planting is the practice of planting another vegetable in the row where an earlier vegetable has been harvested. An example is the planting of green beans (for a fall crop) following the harvesting of peas. As soon as the peas are through producing, immediately pull the vines and plant beans in that row. Other examples: Chinese cabbage (August 1) following Early Green Beans. Tomatoes, eggplant, peppers following radishes, lettuce, green onions. Plants can be set in rows before harvest of the original crop is completed.

Companion Cropping

Companion cropping is another method of increasing production from a given area and the crops are of benefit to each other. For example: plant radish (thinly) and carrot seed in the same row. The radish seed germinates more quickly and is a stronger seedling than carrot, so it forces its way out of the soil and breaks the crust at the ground surface. The crust or firm layer on top of the soil may have been caused by rain or watering. It should be broken by cultivation, or by a strong seedling like radish. Radishes could also be planted (thinly) with beets, parsnips, and lettuce as a companion crop. The radishes mature much earlier than their companion crop and as they are harvested, you are thinning the companion crop. Thinning means the removal of plants from the row thus giving the remaining plants more room

* Additional References

Page 9, USDA Suburban & Farm Vegetable Gardens, Home and Garden Series #9

Page 12, E. C. 1274, "Garden Vegetables"

in which to grow.

These practices, as well as the spacing between rows, must be taken into consideration when planning your garden. The spacing between rows depends somewhat on the type of cultivation you plan to use. That is, are you going to use power machinery, hand tools such as a hoe, or hand cultivator, or a mulch to control weeds.*

Windbreaks

Every Nebraska garden needs a windbreak for protection from south and west winds. Wind in Nebraska causes damage to garden crops in three ways. (1) Actual physical damage to plants by breakage or blowing over, (2) damage to leaves and flowers from blowing soil and (3) excessive evaporation of moisture from soil and plants.

A permanent type of windbreak such as a row of shrubs around the outside of the garden area is desirable. A good productive windbreak would be a row of grapes or asparagus for these offer food as well as garden protection. But, for this year's garden, we may have to use a temporary type. A row of tame sunflowers or castor beans are possibilities. Or, planting two or more rows of sweet corn or popcorn around the edges of the area work well from midsummer on. However, gardens need wind protection early in the season. Slat cribbing or snowfence is very satisfactory as a garden windbreak.

Soils

Soil ready for planting should have been worked to a depth of six to eight inches and be of fine texture (free from clods), moist, and rather firm. The cultivation operations (harrowing, leveling or raking) following plowing or spading will make the soil firm enough for planting. Few of you will have an ideal garden soil available for your garden, so you will have to use the soil you have. However, there are several things you can do to improve the soil, such as adding organic matter (compost, manure, leaves, straw, etc.) cover crops, and fertilizer. A soil test will indicate

*References: Page 10, USDA, Suburban and Farm Vegetable Gardens Home and garden Series #9

what kind and how much is needed. (Ask your County Agent).

Most of our Nebraska soils do not need lime, particularly in central and western parts of the state. Time of year and methods used in preparing your garden soil for planting are also considered under soil improvement. Under most conditions, land which is fall plowed will work down into the most satisfactory garden spot. Because most garden seeds are small, they require a firm moist seedbed for best germination and growth. Fall plowed or spaded land can be raked or harrowed into planting condition earlier in the spring. Any necessary leveling can be done at this time and harrowing or raking tends to firm the seed bed. *

Part III Planting the Garden

Spacing and Depth of Planting

Planting distances vary with the kind of plant, size of garden, method of cultivation, etc. Plenty of space should be allowed to give plants room to develop naturally and reach full size. Spacing can be closer with hand cultivation than if tractor cultivators are used.

Time to Plant

The time to plant most kinds of vegetables depends upon the date of the last killing frost in your locality. Some can be planted before that date. You must determine the average frost-free date in your area. Use of the maps on the following page will be of value to you in finding this date. **

* References: Garden Soils
Pages 2-4 E.C. 1274, "Garden Vegetables"

Pages 2-6 Suburban and Farm Vegetable Gardens

** References: Page 11, E.C. 1274, "Garden Vegetables"

Page 11, USDA #9, Suburban and Farm Vegetable Gardens

Page 18 and 20, USDA Suburban and Farm Vegetable Gardens, Home and Garden Series #9 Table 4, Pages 24 - 25

Plant these early: Vegetables that should be planted early (before the frost-free date) are: Broccoli and Cabbage (plants), Kohlrabi, Onion (seed, sets, or plants) Peas, Radishes, Spinach, Turnips.

A week or two later the following may be planted: Potatoes, Lettuce, Swiss Chard, Carrots, Parsnips, Rutabaga, Cauliflower (plants), Beets, Endive, and Celery (plants).

Plant these after frost-free date: Snap Bush Beans, Pole Beans, Sweet Corn, Popcorn, and Cucumbers.

Plant these after soil has warmed considerably: Cantaloupe, Lima Beans, Pumpkin, Squash, Melons.

Transplant these after all danger of frost has past: Tomato, Pepper, Eggplant, Celery.

Transplanting

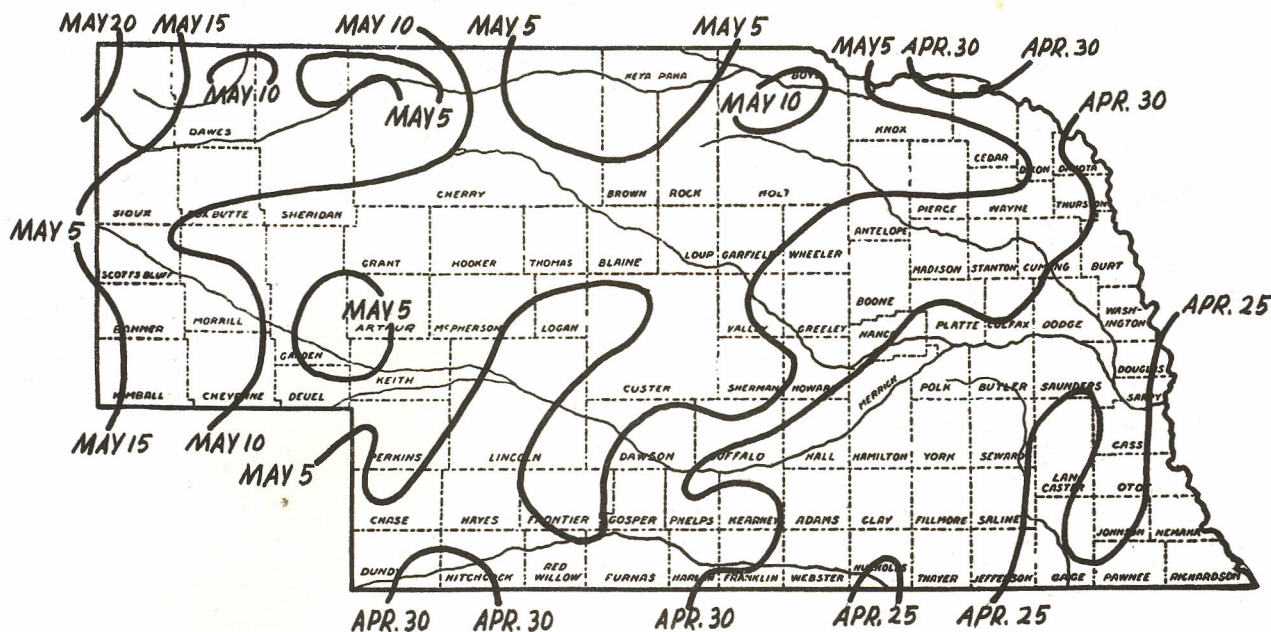
Moving of plants from hotbed, cold-frame, or other places where they have been grown should be done carefully. Before they are disturbed, wet the soil thoroughly so it will stick to the roots. Keep as much soil as possible around the roots. In taking up plants, do not injure the roots or stems. Loosen the plants in the soil -- then, slide a shingle or trowel under the roots and lift them up.

In the garden, make holes large enough to take the root system of the plant and all attached soil without crowding or cramping. Dig the hole just before setting out to avoid drying. After the plant has been set, partially fill the hole with soil then add a little water. Next, fill around the plant with drier soil and press it about the plant. Plants do best if set out on a cloudy day, before a rain, or late in the evening. Plants which have been set out should be protected from the hot sun and wind with shingles set on the south side of the plants. Set plants an inch or two deeper than they were in the plant bed soil.

Part IV Care of the Garden

Weeding

Weeds of any kind take water and plant



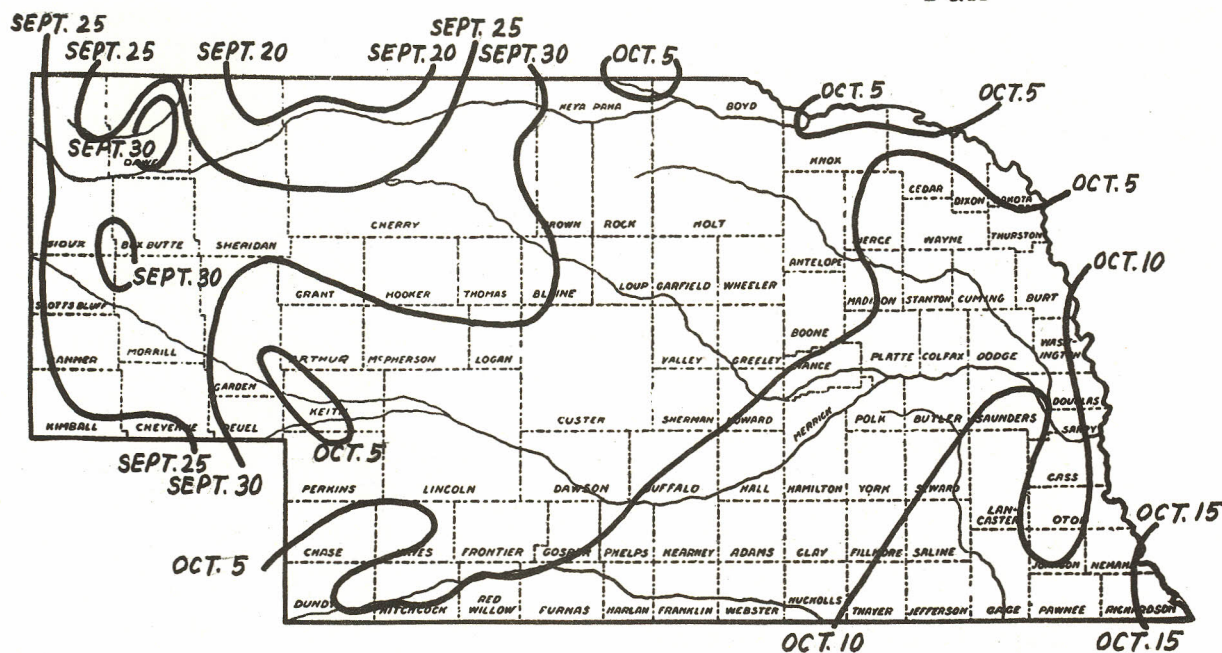
Spring

Average dates of the last killing frosts in spring and first in fall in Nebraska.

Locate the line nearest to the locality in which you live, and note the date on the line (the first figure indicates the month, the second the day).

If at all possible, use local weather information.

Fall



food away from vegetables; therefore, all weeds should be removed. The best time to kill weeds is when they are young, because at that time they are much more easily killed than when they become older. When weeds are young, their roots are very small and it does not require much effort to pull them out of the soil, where they die rapidly. One hour spent hoeing small weeds will save many hours of work later in killing big ones. Weeds should never be allowed to go to seed in the garden or around the edges of it. One weed plant will furnish enough seed for several hundred new plants next year.

Weed the garden after each irrigation while the soil is still soft and easy to work. Do not use weed killer, known as 2, 4-D, in the garden or near it. Most garden plants are easily killed by 2, 4-D. If spraying is done around the edges of the garden plot, there is always a chance of the wind carrying enough 2, 4-D onto garden plants to kill them.

Cultivating for weed control should not be more than two or three inches deep, or roots of vegetables are likely to be injured. Vegetables need these small roots to gather their food and water.

Mulches

Some of the materials that may be used as a mulch are lawn clippings, strawy manure, spoiled hay, straw, ground corn-cobs, sawdust, compost, wood shavings, alfalfa stems, and any other type of rather fine textured organic material. The mulch should be about two inches deep after it is settled.

Other types of mulching material on the market are pliofilm or plastic, and mulching paper. Some of these mulches have holes punched in them to allow moisture to pass through into the soil and for the placement of seeds or plants. Any of the mulches will control weeds and help conserve moisture.*

* References: Page 17, Suburban and Farm Vegetable Gardens

Page 11; USDA, Suburban and Farm Vegetable Gardens
E. C. 1274, "Vegetable Gardens" *

Watering and Irrigation

The garden should be located where it can be watered. In Nebraska, maximum production cannot be obtained by depending on rainfall alone. A garden requires at least one inch of rain a week during the growing season. We do not get that amount most years.

There are several ways of applying water, but the method used is not too important. The important thing is that the garden is watered well, often enough to keep the crops in a good vigorous growing condition. A thorough watering once a week should be sufficient, providing at least one inch of water is applied each time.

The quantity and quality of the vegetables you produce will be greatly influenced by the way in which you keep your garden watered. The ideal thing to do is keep your garden moist at all times. Of course, it will be impossible to keep it at the same moisture content at all times, but the important thing is not to let it dry out completely between irrigations. If the soil becomes extremely dry, the plant suffers. Even after water is added, several days are required before the plant can regain normal growth. After long periods without water, it may never completely recover. Thus, yield and quality will be low. Poor quality is indicated if vegetables are pithy, tough, shriveled, or small.*

Part V Insect and Disease Control

All sprays or dusts used to control insects and diseases in the garden must be considered as poisons and handled with care. The labels on the containers must be read carefully and followed to the letter. Do not experiment.

Insect Control

For the 4-H garden, the use of a .15% or 1% Rotenone dust to control insects is recommended. It should be applied as soon as the plants come up or are transplanted, and the plants should be dusted every week throughout the season. If you dust your garden and it rains the same evening, you

References: Page 7, Suburban and Farm Vegetable Gardens.

should dust again the next day to keep the plants protected at all times. You may not be able to locate a .75% or 1% Rotenone dust but can get a 5% dust. If this is the case, a 1% dust can be prepared as follows: In a container that can be closed, put one cupful of the 5% Rotenone powder, add four cupfuls of flour, close container and shake well to mix. This mixture is a 1% Rotenone dust, and can be safely used on all garden crops. Even lettuce can be safely eaten after rinsing with water.

Plant disease-resistant varieties and follow directions given in the references for seed treatment to control seed borne diseases.*

Disease Control

Bordeaux mixture will protect garden crops from diseases during the growing season. Plants transplanted to the garden should be sprayed the day they are transplanted and every ten to fourteen days during the growing season.

Bordeaux mixture can be obtained ready to add to water for spraying. Directions are on the package as to how much to use per gallon of water. Use the amounts given for a standard strength solution.

Part VI Harvesting and Storing

Summer Use

Many vegetables must be harvested at definite times if the most value is to be received from them.

Summer squash is best when the fruit is very immature.

Lima beans are used like peas when they are green and tender, or as dry beans.

Beets, turnips, and radishes are best when they are young and tender.

Beans, Sweet corn and peas need frequent picking.

Broccoli should be used before the green buds burst into flower.

Spinach goes to seed in hot weather.

Young leaves of swiss chard are best. Keep old leaves cut back.

Canning, Freezing, and Storage

Vegetables to be processed or stored must be handled carefully, to prevent cuts and bruises. Those that are to be frozen must be picked younger or less mature than you would for canning. For a garden exhibit at Fair time, the vegetables you are going to show canned must be in pint jars.*

Part VII Preparing Your Garden Exhibit

In preparing your vegetables for exhibit at fairs, you should remember that the judge will consider the following points:

1. The judging of a vegetable exhibit is generally based on the readiness of the products for immediate use.

2. Condition is very important. It includes such points as freedom from disease, insect work and mechanical injury and defects. A cabbage badly riddled by the cabbage worm, for example, is not a good exhibit. Neither are potatoes badly covered with scab or rhizoctonia, or pierced by the digging tool. Vegetable exhibits should contain specimens practically perfect from a physical standpoint. All vegetables should be clean.

3. It is a common idea that the large specimens draw the prizes. That is not the case. The average-sized specimen is usually most desirable and ranks the highest. Toughness or poor flavor lower quality. Very small vegetables should be avoided.

4. Uniformity, a point which applies to exhibits that include more than one speci-

* References: Pages 7 - 10, E. C. 1274, "Garden Vegetables" USDA Home & Garden Bulletin No. 46, "Insects and Diseases of Vegetables in the Home Garden"

* Reference: Farmers Bulletin No. 1939, "Home Storage of Vegetables and Fruits"

men, is particularly important. Uniformity largely determines the appearance of the exhibit. Even though you do not know too much about showing vegetables at fairs, you can make a good exhibit if all the specimens are as nearly alike as it is possible to have them. If you cannot get all carrots, beets, etc., in an exhibit as good as the best you found in your garden, then do not use the best one.

5. Carefully read and follow the instructions and rules in the Fair Premium List.

Part VIII Record Book

To get a true picture of your garden project, accurate records must be kept,

not only of expenditures but also the amounts of the various vegetables you harvest. For example: Radishes - when you harvest radishes for a meal at home, determine how many bunches (like you find in stores) you have and write them down on a list kept for this purpose. Then, when all the radishes have been harvested, the total number of bunches can be entered in your record book - a price per bunch assigned and total value of the radish crop determined. The same procedure is used for each kind of vegetable you raised.

Take a picture of your garden at planting time and also at harvest time and place them in the space allotted in your record book. A picture is one of the best ways of telling about your garden.

PLAN FOR VEGETABLE GARDEN—100x150 Ft.

Permanent vegetables	Asparagus				
	Herbs	Rhubarb	Horse radish	Winter onions	
	Parsley	Salsify	Parsnips		
Plant April 1-15	Lettuce	Spinach	Radishes	Follow with beans	
	Carrots	Beets	Kohlrabi		
	Turnips	Early cabbage	Swiss Chard		
	Early cauliflower	Early peas	Late peas		
		Early potatoes			
		Onions (field-sown or sets)			
		Onions			
		Late cabbage			
Plant May 1-15	Beets	Peas	Carrots	Kohlrabi	
		Sweet corn			
		Sweet corn			
		Wax beans			
		Green beans	Midseason cabbage		
Transplant May 15-31	Eggplant	Tomatoes	Sweet peppers	Cucumber	
	Kohlrabi		Rutabagas		
Plant July 15-Aug. 1	Turnips				
	Carrots	Celery	Beets		
		Sweet corn			
		Sweet corn	Watermelons in corn		
		Sweet corn			
Plant June 15		Sweet corn			
	Summer squash	Winter squash	Muskmelons		