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GROWING GREENHOUSE VEGETABLES
CUCUMBERS

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A. G. B. Bouquet

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GROWING GREENHOUSE VEGETABLES - CUCUMBERS

A. G. B. Bouquet
 Horticulturist (Vegetable Crops)

Cucumbers are grown in considerable quantities in vegetable greenhouses throughout the United States and the plants and fruits reach their highest development when grown under glass. In contrast with tomatoes, discussed in Extension Circular 308 of Oregon State College, cucumbers reach maturity at a considerably shorter time, being ready for harvest in from 60 to 75 days from the sowing of seed.

A number of commercial greenhouses in Oregon produce cucumbers during the spring and early summer months.

Types of Greenhouses for Cucumbers. In view of the fact that cucumber vines grow to a height of 7 feet or more, it is desirable that the greenhouse for cucumbers be of standard height and width, having sufficient height at the eaves so that the planting may extend from one side of the greenhouse to the other. As in the case of tomatoes cucumbers are more easily cared for when grown in ground beds than in benches. As a matter of fact they are planted almost universally on the soil level of the greenhouse unless produced in rotation with some flowering crops which are grown on benches. In former years when the plants were trained in the "A" fashion, narrower, lower houses were used for cucumber growing but these have now passed out and the plants are now almost universally grown by the upright method in greenhouses of standard construction.

Seasons of Growing the Crop. Weather conditions for growing a spring and summer crop of cucumbers are decidedly more favorable than those prevailing for a fall and winter crop, for cucumbers in general do not thrive well during the short days of the late fall and mid-winter. The plants demand long daylight hours with plenty of sunshine for their best development and heaviest production of fruit. As a consequence, cucumbers are usually produced as a spring and early summer crop in the rotation of vegetable crops under glass. They are seldom produced for a fall crop. In most greenhouses tomatoes follow the spring and summer crop of cucumbers, the plants being set in the beds sometime in August.

Varieties and Seed. There are not many known main varieties of cucumbers for growing in greenhouses. As a general rule, hothouse cucumber growers have their own strains of seed which they have selected from year to year, choosing the type of cucumber that they desire for their particular market and saving a few of the best types of fruit from healthy, productive plants as the crop is growing in the greenhouses.

The preference of the market will determine the length and type of the cucumber which is selected. In general, the length of the fruit is an important factor and varieties will be grown accordingly. It is necessary to use specially selected seed in view of the fact that the hothouse cucumber is an extra-fancy article and seed of ordinary cucumber strains will not usually be of sufficiently select breeding to produce a crop of fancy hothouse cucumbers.

As a general rule, the fruit of a hothouse cucumber will vary from 7 to 9 inches in length. A variety of medium length is Abundance or Davis Perfect; of still greater length is a strain known as Irondequoit or Deltus. The English type of hothouse cucumber, such as Telegraph, is about 20 inches or so in length but these are seldom popular on the market.

Plant Growing. Cucumber plants are subject to damping-off during the late winter when the days are still cloudy and there is considerable humidity in the greenhouse. It is advisable, therefore, to use sterilized soil in the seedbed. There are several ways of treating soil for this purpose, and these methods are discussed in Oregon State College Extension Circular 418 on Greenhouse Management. It is important to do this work sufficiently early before seeding so that there is no delay in getting the plants started. This is particularly true if formaldehyde is used to treat the soil as this material must be thoroughly dissipated and the soil well aired before seeding.

A good composted soil mixture should be used in growing plants with enough sand and leaf mold in the mixture to give it good physical character and enough good garden soil to provide body and plant food. Growers sometimes add a 4-inch potful of bonemeal or some complete fertilizer to a wheelbarrow load or approximately $2\frac{1}{2}$ bushels of soil.

Cucumber plants are apt to grow long and spindling during the short days of January and February unless they are well grown. For this reason it is not wise to sow the seed too early in the spring. If hothouse tomatoes are to be sold about the 15th of March it would be necessary to start the plants about 75 days before that time.

Plants are quickly grown from seed to the time of setting them in the beds, usually four weeks or so elapsing between those operations, depending upon the time of year when the plants are grown.

There are two ways of growing plants (1) sowing seeds in beds or benches and transplanting to individual containers in about 7 to 9 days; these containers consist of clay pots or veneer bands of 3 to 4 inches in diameter, (2) berry hallocks are useful containers; transplanting is done when the plants have their first true leaves. An alternate method of growing plants is to sow a few seeds directly in the soil in the individual containers and later thin to one plant.

The night temperature for growing young plants should be about 65° F. and the house should be well ventilated during the day with a temperature of about 10° to 15° higher than that prevailing at night.

Soil Types and Fertilization. Cucumber soil should have a high organic matter content and be rich in fertility. In contrast with the tomato which may produce an excessive foliage growth if the soil contains considerable nitrogen, cucumbers delight in a soil that is well supplied with manure, and under these conditions will produce a large number of fancy cucumbers per plant. A good grade of loam soil, well enriched, makes a suitable soil for growing cucumbers. Under most circumstances a greenhouse is constructed over a certain type of soil which cannot be changed with the exception of adding organic matter and fertilizer to it; consequently, soil changing is not a general practice in growing cucumbers under glass.

It is customary to have a mulch of manure on the soil surface between the cucumber rows after the plants become well established. Such a mulch will provide additional fertility, help to hold soil moisture, and make a suitable place for workers to walk in trimming the vines and harvesting the fruit. This program of mulching will usually provide for an ample supply of fertilizing material with often necessary additional use of commercial fertilizer, but in some instances a complete fertilizer may be applied after the first fruits have started to be harvested in order that proper vine growth and fruit production may be maintained.

Distances of Planting. These vary with individual growers but the common distance of setting plants is about 18 inches between the plants in the row and about 60 inches between the rows. One large grower of cucumbers plants 12 rows of cucumbers in a 50-foot greenhouse. In setting the plants they should be taken out as carefully as possible from the containers in which they have been growing so that there is the least disturbance of the root system.

Training and Trimming. The same method of supporting the vines can be used as for tomatoes, namely, training to a single stem and running heavy twine from small stakes driven into the ground at the base of the plant to overhead wires which are secured to the frame of the greenhouse. In contrast with the tomato which grows up to the top of the twine the cucumber vines will do likewise and also spread over the top wires between the rows. One large grower has a network of wires 7 feet above the ground. These wires run lengthwise of the house every ten inches. Crosswise for holding up the lengthwise wires are every 12 feet. These cross wires are in turn supported by perpendicular wires running from the overhead cross braces to the cross wires.

Due to the extensive foliage growth of cucumber plants it is necessary to prune them systematically and rather severely. The usual plan is to allow as many cucumbers as will set on the axils of the main stem and also to allow one cucumber of each lateral that arises from the main stem. As soon as the lateral is sufficiently developed to show the location of the first fruit it is cut off just beyond this fruit. This first joint invariably bears a female blossom and cucumber but if the lateral does not bear at this joint several joints will have to grow before showing small pickles. The second, third and following laterals are treated in the same way as they develop, and this process is continued for the full length of the vine.

Pollination. In view of the fact that the cucumber plant bears both male and female blossoms, it is necessary that this pollen be economically carried from one kind of flower to the other by bees. Hives of bees, therefore, are put into the greenhouse when the vines begin to show their first male and female blossoms. There are usually four to six hives of bees in a 50 x 450 foot greenhouse. The bees must be properly cared for by having plenty of sweetened water which should be placed in a shallow tray in which is a piece of smooth board on which the bees may alight to feed on the syrup. This should be placed near the hives. For particular details concerning the handling of bees under these conditions, the Department of Entomology of Oregon State College may be consulted.

Maintenance. Greenhouses are usually carried at temperatures of 75° to 85° for cucumbers. Night temperatures of about 10° to 15° below those of the day. Warmer conditions are usually provided for a cucumber crop than for tomatoes.

For proper sanitation of the atmosphere of the greenhouse there should be proper ventilation and air circulation at all times except when the outside temperatures are unusually low. Plants should not be exposed to cold drafts and a slight amount of air should be permitted at night. The humidity for greenhouse cucumbers may be considerably higher than for tomatoes without fear of damage to the plants, but excessive heat, high humidity and little air circulation should be avoided as they are the forerunners of inducing development of disease.

The cucumber plant thrives on ample supplies of water and the soil should have a uniform and constant supply of soil moisture. In contrast with the tomato plant the wetting of the leaves of the cucumber plant is not considered a drawback and frequently the leaves are given a thorough drenching with a strong spray of cold water on the undersides to possibly assist in dislodging the red spider.

Harvesting, Grading and Packaging. Cucumbers must be cut and never pulled from the vines. While an experienced operator can readily tell when a fruit has reached the proper size to be taken, a less experienced worker may be helped by having a ring of a specified diameter with which to determine the desirable diameter of a fruit to be harvested. Cucumbers grow avidly during periods of warm weather and consequently the size must be observed so that the fruit does not get too large before being taken.

Growers commonly make five different grades which will vary in length, smoothness, uniformity of shape and color. Extra-fancy fruits run from $2\frac{1}{2}$ to 3 dozen per box; fancy, 3 to $3\frac{1}{2}$ dozen; choice, $3\frac{1}{2}$ to 4 dozen; and standard, 4 to $4\frac{1}{2}$ dozen. These grades will be determined largely by the type of cucumber which is being grown.

A package suitable for carrying greenhouse cucumbers is one having inside dimensions of $7 \times 11\frac{1}{2} \times 18\frac{1}{2}$ inches. Such a box when filled would weigh approximately 36 to 38 pounds.

Yields and Values. The number of cucumbers produced by a single plant varies largely according to different factors such as time of year at which the crop is grown, the vigor of the plants and the freedom of the crop as a whole from disease. It is not uncommon for good plants to bear from 2 to $2\frac{1}{2}$ dozen fruits per vine and in some cases this may be extended to 32 to 36 fruits actually harvested. In one northwestern greenhouse, 11,466 dozen were taken from one crop of cucumbers grown in a greenhouse 50 x 450 feet. This yield is at the rate of about 32 fruits per plant.

Values vary according to the time of the year in which the crop is sold and the usual influence of supply and demand. Prices may vary from 85 to 90 cents up to \$2.00 or more per dozen for first-grade cucumbers. An average for an entire crop will probably be in the range of \$1.25 to \$1.50 per dozen. At the present time cucumber values are made per pound, the price in mid-March being at the rate of 25 cents per pound and in mid-April about 21 cents per pound, wholesale.

Additional literature in regard to the growing of greenhouse cucumbers may be obtained by writing the Superintendent of Documents, Washington, D. C., requesting Farmers' Bulletin No. 1320, for which a fee of 5 cents is required.

Oregon State College Extension Circular 418 on "Greenhouse Management" may also be of interest to the reader of this circular.