



Slicing Cucumber Production

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Production Requirements

Cucumbers are a warm season crop and susceptible to frost damage. Low humidity is favorable to cucumber production because of lower incidences of fruit and foliar diseases. Extremely high temperatures may cause light green fruit color and bitterness in many cucumber varieties. Cucumbers will grow on almost any well-drained soil. Light, sandy loam soils are preferred for early production. A good slicing cucumber yield in Oklahoma is 300 bushels per acre, although much higher yields are possible.

Varieties

Varieties producing all female flowers (gynoecious types) produce fruit earlier and have more concentrated production. In experimental trials the following varieties have produced high yields of marketable fruit and have resistance or tolerance to common diseases. They all have the uniform green fruit color required in the marketplace.

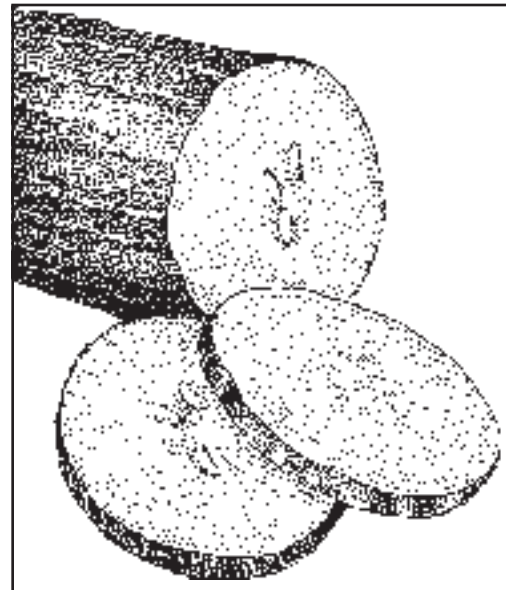
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| Burpee Hybrid | Comet A II |
| Dasher II | Marketmore 80 |
| Slice Master | Sprint 440 II |
| Victory | |

Soil pH and Fertilizer

Apply lime to maintain a soil pH between 5.5 and 6.8 if pH is low. On a lbs/A basis, cucumber plants absorb about 120N, 20P, and 115K from the soil. Based on OSU soil test results the following quantities of P₂O₅ and K₂O are recommended.

Phosphorus per acre

When test shows	0 to 19	20 to 39	40 to 69	70 to 99	100+
Add lbs P ₂ O ₅ /A	100	75	50	25	0



Potassium per acre

When test shows	0 to 99	100 to 149	150 to 199	200 to 249	250+
Add lbs K ₂ O	250	150	100	50	none

Nitrogen. Apply 50 lbs/A N with the P₂O₅ and K₂O fertilizer, as shown in the preceding table, in a preplant incorporated application. When vines begin to run, topdress with an additional 50 lbs/A N. On soils where severe leaching occurs, more N may be needed. Care should be taken not to apply too much N early in vine development as this will encourage vine growth and retard fruit set.

Spacing and Planting

Cucumbers are usually seeded in single rows at 1 to 2 pounds per acre at a depth of 1/2 to 1 inch. Row spacings vary from 3 to 6 feet. Final plant spacing should be 9 to 12 inches in the row on irrigated land and 15 to 18 inches on dry land. Plants should be thinned before the four-leaf stage if the stand is too thick. Cucumber seed will not germinate at soil temperatures below 60°F, and the most rapid germina-

tion occurs at 95°F, so delay planting until after the date of the last spring frost. Seedlings are very sensitive to chilling injury and will be stunted and leaves will become brittle and turn white under cold growing conditions.

Weed Control

Shallow mechanical cultivation and hand hoeing are needed to control weeds before plants have vined. Pruning roots and vines with cultivating equipment slows cucumber development and reduces yield. Cucumber roots often spread horizontally faster than the vines and many roots are very shallow. A limited number of pre-emergence herbicides are available that will control germinating broadleaf weeds and grasses in seeded and transplanted cucumbers if used properly. Chemicals are economical when used in narrow band applications over the planted row. Other chemicals can be used as a layby application between the rows before vines begin to run. Consult the most recent revision of OSU Extension Fact No. 6008 *Weed Control in Vegetables* or the latest edition of OSU Extension Circular E-832 *OSU Extension Agent's Handbook of Insect, Plant Disease, and Weed Control*.

As runners are being formed, cultivate each row in the direction that vines are to be trained. Always cultivating in the same direction keeps the vines in the row, produces a narrow row, and reduces vine injury when workers harvest the crop.

Field Scouting for Plant and Pest Development

Fields should be scouted at minimum once per week after planting by walking across the entire field in a V-shape or X-shape pattern and recording plant development, and weed and insect occurrence and numbers. Results of surveys will be needed to make decisions regarding projection of harvest date, need to bring in honeybees for pollination, and pest control inputs.

If known, scout for diseases in areas of a field in which diseases tend to appear first. Otherwise, use the V-shape or X-shape sampling pattern outlined for insects. Some foliar diseases will appear where air circulation is reduced and leaves remain wet, such as in low areas and along borders sheltered by trees. Foliar diseases typically appear first on crown leaves close to the base of the main stem. Shaded crown leaves often senesce and could be mistaken for disease. Root diseases tend to appear where soil remains wettest, such as in low areas and in heavier soils.

Insects

Fields previously in sod or having heavy infestations of weeds in the prior year should be treated with a soil-applied insecticide at planting to control soil insect pests including cutworms. Small seedlings are extremely susceptible to feeding damage from adult striped and spotted cucumber beetles and may need to be treated with a foliar applied insecticide to prevent complete defoliation and/or infection by bacterial wilt which is transmitted by cucumber beetles. Squash bugs must be controlled early in the growing season and can best be located by examining the underside of leaves for eggs which are laid in groups. Aphids and mites can cause dam-

age to leaves and leave deposits on fruit, reducing marketable yield. Low numbers can be tolerated throughout most of the season and scouting results will indicate whether populations are increasing and should be controlled.

Good fruit set and development for cucumbers are dependent upon insects, primarily honeybees, to pollinate the female flowers. Flowers are receptive to pollination for a matter of hours on the day they open. Flowers should be examined to determine activity of honeybees. If fewer than one bee per ten flowers is noted during the morning hours, the producer should bring bee hives into the field to ensure adequate pollination.

Diseases

Cucumber is susceptible to several diseases that attack the roots, foliage, and fruit. The most common diseases in Oklahoma have been anthracnose, angular leaf spot, downy mildew, bacterial wilt, powdery mildew, and virus diseases. Gummy stem blight, damping-off, and root-knot nematodes also have been problems. Consult OSU Extension Circular E-853 *Cucurbit Production and Pest Management* or E-929 *Guide for Identification and Management of Diseases to Cucurbit Vegetable Crops* to help identify these diseases.

Disease control is essential in the production of high quality slicing cucumbers. A preventive program that combines the use of cultural practices, genetic resistance, and chemical control as needed usually provides the best results.

Cultural practices are useful for limiting the establishment, spread, and survival of pathogens that cause cucumber diseases. Many of the fungal, bacterial, and nematode pathogens survive in old crop debris and in soil. Fields should be rotated with non-cucurbit crops for at least three years to reduce pathogen levels. Grass crops are ideal for rotations where nematodes are a problem. Select well-drained soils to minimize damping-off, root rots, and fruit rots. Late plantings should not be situated nearby and downwind of early planted cucurbit fields where foliar or virus diseases already exist. Avoid the movement of contaminated soil or plant debris into clean fields on workers or equipment. Diseases such as anthracnose, angular leaf spot, and gummy stem blight are known to be carried on seed. This can lead to the introduction of diseases into clean fields. Purchase seed from reputable sources and apply a fungicide seed treatment prior to planting. Most foliar diseases are spread by water-splash or are favored by long periods of leaf wetness. Utilize drip irrigation or avoid frequent sprinkler irrigation with small amounts of water. Finally, use tillage practices soon after harvest that promote the rapid decomposition of old vines and fruit.

The use of disease-resistant varieties is an economical means of controlling diseases. In slicing cucumber, excellent resistance is available to most of the important diseases and variety selection should be the primary method of disease control. Several varieties are resistant to angular leaf spot, anthracnose, downy mildew, powdery mildew, scab, and one or more virus diseases. Consult OSU Extension Circular E-853 *Cucurbit Production and Pest Management* for a listing of locally adapted varieties with disease resistance.

Given proper cultivar selection, foliar disease management with fungicides should not be necessary unless gummy stem blight becomes a problem. Fields should be monitored at least weekly for early disease detection. A spray program

should be initiated shortly after the first appearance of gummy stem blight. A 14-day schedule is adequate. Management of bacterial wilt may require the use of insecticide to control cucumber beetles which spread the disease. Consult OSU Extension Circular E-832 OSU *Extension Agent's Handbook of Insect, Plant Disease, and Weed Control* for a listing of fungicides approved for use on cucumbers.

Pesticide Applications

Insecticide applications should be made only when necessary as determined using results of field surveys. For control of diseases, fungicides are most effective when applied before disease begins to increase. The potential for very rapid increase is greatest shortly before harvest when the canopy is most dense or anytime during rainy periods. Insecticides and fungicides should be selected based on proven effectiveness. Ground applications should be applied in a minimum spray volume of 20 gallons per acre at 40 psi pressure to ensure adequate canopy penetration and foliar coverage. Aerial application should be applied in a minimum volume of 5 gallons per acre. Chemigation is an effective method of applying some fungicides.

Bee hives maintained near fields for pollination must be protected from spray drift by removing the hives or covering them. Additionally, the bees working the fields must be protected by using insecticides with a low toxicity to bees and by withholding applications until late in the day when bees are less active.

Irrigation

Irrigate with moderate amounts of water since cucumbers root only 3 to 4 feet deep but have many shallow roots. Moisture stress during harvest can seriously reduce the yield of marketable fruit. When overhead irrigation is used, water should be applied early in the day so leaves can dry before nightfall to reduce the incidence of fruit-rotting and foliage diseases.

Harvesting

In normal seasons, the first picking can be made 45 to 60 days after planting. Generally, cucumbers are harvested every two or three days, but under ideal growing conditions, daily harvest may be needed to harvest a high percentage of fancy grade fruit. When picking, do not pull the cucumber from the vine. This may tear the fruit and damage the vine. When picked properly, the stem is pushed off the fruit with the thumb. Cucumbers must be fresh and crisp when received by the consumer. The market desires a uniform dark green cucumber that is well formed, straight, and of medium size. This requires frequent picking and careful handling and grading. Trellising will improve the quality and color of the cucumbers, but extra labor and supplies are required to construct and remove the trellis, and train the plants to grow onto the trellis. Allowing fruit to become too large on the vine will reduce quality and yield of the crop.

Post-Harvest Handling and Marketing

Cucumbers can be held 10 to 14 days at 50°F and 90 to 95% relative humidity. The fruits are very susceptible to shriveling so the relative humidity must be kept high. Below 50°F cucumbers are subject to chilling injury and at high temperatures they turn yellow. Do not store with fruits that produce ethylene such as ripe tomatoes, apples, or cantaloupes. Slicing cucumbers are usually waxed after washing and grading. This adds slightly to the cost of production, but improves appearance and is effective in preventing shrinkage and loss of freshness during storage, shipping, and marketing. Cucumbers are normally packed and sold in cartons or crates holding 50 to 55 pounds.

Related Extension Publications

- E-832 OSU Extension Agent's Handbook of Insect, Plant Disease, and Weed Control.
- E-853 Cucurbit Production and Pest Management.
- E-929 Guide for Identification and Management of Diseases of Cucurbit Vegetable Crops.

The Oklahoma Cooperative Extension Service

Bringing the University to You!

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Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

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