

## KEYS TO PROFITABLE PEPPER PRODUCTION

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Green peppers are grown predominantly as a fresh market crop in the spring, summer and fall. In recent years there has been an increasing amount of both green and red bell peppers processed by canners and freezers. About 7,000 acres are grown annually with a value of \$8 to \$10 million.

### Areas of Production

The principal area of pepper production in Texas is in the Lower Rio Grande Valley, with scattered production in the San Antonio-Winter Garden, Trans-Pecos, and High Plains areas.

Green peppers for the spring market are seeded in late December with most active planting in January. In the Lower Rio Grande Valley, harvest begins during the latter part of May and peak movement is during June.

Planting for the fall crops begins in May in the High Plains area and continues into August in the Rio Grande Valley and the Trans-Pecos. Harvest begins in mid-August in the High Plains and continues through October. Trans-Pecos harvest begins in mid-October and continues until frost. Production usually is available from South Texas until December or until a killing frost occurs.

### Seasonal Movement

The spring harvest accounts for about 30 percent of the annual volume during April, May and June, all originating in the Rio Grande Valley. The San Antonio-Winter Garden area along with the Trans-Pecos and High Plains produces about 20 percent of the annual volume. This summer production is harvested beginning in late June moving West and North during July, August, September and October. Production then returns to the Lower Rio Grande Valley

fall crop which accounts for about 50 percent of annual production in Texas. The fall shipments begin in mid-October and last until Christmas depending on when the first frost occurs.

### Climatic Requirements

Peppers require about the same growing conditions as tomatoes and eggplant. Peppers succumb to a light frost and do poorly when temperatures are in the 40- to 60-degree range. The extreme summer heat in most areas of Texas is too high for fruit set to occur. Fruit that set at temperatures above 80 degrees usually are small or poorly shaped. Very little fruit set occurs at temperatures above 90 degrees. Best yields occur when temperatures range between 65 and 80 degrees during fruit setting.

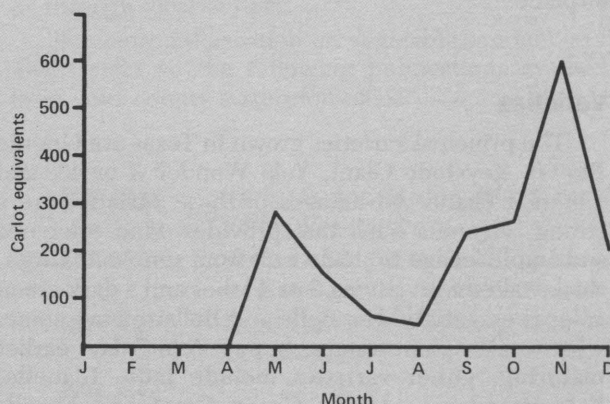


Figure 1. Green peppers — Texas seasonal shipments in carlot equivalents by months for 1975 (Source: Market News, USDA).

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## Soil Type

Peppers grow well on most Texas soils. A loam or sandy loam soil which holds moisture fairly well and has a liberal supply of organic matter is ideal. Light-textured soils which are conducive to earliness are especially desirable where the growing season is limited by frosts. Most peppers are presently grown in soils with a pH range of 7.1 to 8.3. Peppers are not overly sensitive to soil pH, but highly acid soil should be limed to bring them into the 5.5 to 7.0 range.

## Fertilizers

Peppers are one of the vegetable crops that respond very well to banding phosphate 2 to 3 inches below the seed at planting. On sandy soils, a balanced fertilizer such as 12-24-12 at 300 to 500 pounds per acre may be broadcast and disced in before making rows. Most High Plains soils contain high levels of potassium, therefore potassium fertilization is unnecessary. High plant populations, where two rows are grown on top of 40-inch beds, require additional sidedressings of a balanced fertilizer when plants are 6 to 8 inches tall. To maintain vigorous growth to promote continuous blooming and fruit sizing, two or three additional nitrogen sidedressings may be required during the growing season. A total fertilizer use on double row peppers may be as high as 250 units of nitrogen (N), 150 units of phosphorus ( $P_2O_5$ ), and 50 units of potash (K). Some growers use 3 or 4 applications of foliar feeding at 1 to 1½ quarts per acre beginning at first bloom. Foliar fertilizers usually contain the minor elements iron, zinc, manganese and magnesium, in addition to a low analysis of N, P and K. The amount of total nutrients applied per acre as foliar feeding is ridiculously low, but many successful growers feel it beneficial during bloom and early set. Foliar fertilizers are frequently applied with an insecticide or fungicide applied by ground rig or airplane.

## Varieties

The principal varieties grown in Texas are Grande Rio 66, Keystone Giant, Yolo Wonder A or 43, and Emerald Giant. Advantages of these varieties are a strong, vigorous bush that provides wind tolerance and ample foliage to shade fruit from sunburn. Large, thick-walled fruit having 3 or 4 lobes and a dark green color is essential. Miss Belle and Bellaire have somewhat weaker plant frames, but are 5 to 7 days earlier maturing. Other varieties include Jade, Idabelle, Yolo Wonder L, Lucky Green Giant and Florida Giant.

Hot pepper varieties include Jalepeno, Floral Gem, Hungarian Yellow Wax, Hot and Mild Cherry, Cayenne and Serrano.

## Seeding Rates

The Texas acreage of green peppers includes both direct seeded and transplanted fields. Peppers are direct seeded in fields at a seeding rate of about 2 pounds per acre. The plants are thinned by hand to a final in-the-row spacing of 12 to 14 inches. Belt seeders that drop 3 to 4 seeds in clumps at the desired intervals provide better seedling emergence and facilitate the thinning operation. Peppers are grown on top of flattened beds spaced 38 to 40 inches apart. Plants are grown in single lines on top of rows or in double lines spaced 10 to 12 inches apart on top of flattened beds. A small acreage is transplanted to produce earlier fruit for the retail trade.

## Irrigation

Adequate moisture is essential for production of peppers in Texas. Most of the Texas pepper production is grown under irrigation. The number and frequency of irrigations depends on soil type, humidity and prevailing temperatures. Generally, the pepper crop requires 24 to 30 acre inches of water during the growing season, applied in six to twelve irrigations.

Most of the peppers grown in Texas are furrow irrigated. Adequate soil moisture for optimum growth should be maintained since shedding of flowers and young fruit occurs during soil moisture stress. Peppers are slow to recover from anything that slows the growth of the plants.

## Cultivation

As soon as the young plants become established in the field, cultivate shallow. Deep cultivation results in root pruning as well as loss of soil moisture. Avoid damaging the plants during cultivation. Peppers are extremely brittle and subject to damage.

## Weed Control

Apply Prefar at a rate of 4 to 6 pounds of active ingredient per acre as a preplant or preemergent treatment to a well prepared seedbed. Prefar applied as a spray to the soil surface of shaped beds and incorporated 2 to 3 inches deep with a power-rotovator results in satisfactory control of most weeds and grasses from seed. When Prefar is applied to the soil surface without incorporation, it must be moved in the soil surface by irrigation or rainfall within 24 to 48 hours.

Dacthal or Treflan applications after transplanting but before the weeds emerge, are also suggested. Dacthal may be applied to the crop at the rate of 6 to 12 pounds active ingredient per acre. It also can be applied as a postemergent treatment directly over the top of pepper plants but before weed emerge. Apply



Treflan only as a post-transplanting or post-thinning operation at the rate of ½- to ¾-pound active ingredient per acre and incorporate 1 to 2 inches into the soil.

Apply lower rates of herbicides on light sandy soils and higher rates on heavy clay-loam or clay soils.

### Insect Control

The major insect pests of peppers in Texas are leafminers, cutworms, aphids, spider mites, flea beetles, pepper weevils and fruitworms. These insects can be controlled by timely applications of FDA approved insecticides. Cygon, Diazinon or Parathion controls leafminers and common aphids. Sevin or Toxaphene controls flea beetles and fruitworms. Cutworms are controlled with Dylox, while spider mites are controlled with Kelthane.

See MP-675, "*Texas Guide for Controlling Insects on Commercial Vegetable Crops*" for information and recommendations concerning specific rates and timing of applications. *Read and follow the label directions before applying any pesticide.*

### Diseases and Control

Several diseases are known to attack peppers that reduce yields and increase cost of production. Control should be based on the use of a combination of practices that will minimize the chances of these diseases from becoming established. Once diseases are prevalent, they are difficult, if not impossible, to control. *Bacterial spot* causes severe damage to sweet peppers, but is not a serious problem of hot peppers. It will also attack tomatoes. The bacterium is seed-borne. For control, use disease-free seed and spray regularly with a combination of a copper fungicide and an antibiotic such as streptomycin.

A number of *mosaic disease viruses* infect peppers and can cause severe losses. Mottling, distortion of leaves and stunting, all symptoms of virus diseases, are usually worse when a combination of more than one virus occurs in the plants. Weeds that can harbor the viruses should be removed in and around the fields, insects that can spread the disease should be controlled, and if possible, peppers should not be planted next to tomatoes, cucumbers, cantaloupes, or commercial sunflower fields. *Phytophthora blight* is soil-borne and sometimes can be very destructive, particularly during very wet weather. The fungus infects both stem and fruit, girdling the plant at the soil line and causing a sudden wilt. Several plants may be killed along a single row due to the fungus spores being carried by irrigation water. No effective control measures have been developed.

*Nematodes* are microscopic worms that live in the soil and feed on roots. Only root knot nematode symp-

toms can be detected by the naked eye. A soil examination is needed to detect other types that may be present. Rotating fields and fumigating with a nematocide prior to planting reduces damage. *Damping-off* is another soil-borne disease that can rot the seed or kill the young seedlings before or after emergence, especially in very moist soils. Control is obtained by using treated seed and rotating fields to avoid build-up of diseases in the soil.

### Harvesting and Packing

Peppers normally are harvested when they are about full size and before they turn red or yellow. Quality peppers are firm to feel, have thick walls, and should have a dark green color. The peppers are picked in field baskets and hauled to the shed for grading and packing. Peppers are graded into classes such as U.S. Fancy, U.S. No. 1, and U.S. No. 2, according to characteristics, such as firmness, shape, size, color, insect injury, sunburn, diseases and mechanical injury.

During the packing and grading process, take extreme care to avoid skin breaks and bruising the fruit. Injuries may result in the development of rots during transit or storage. A water bath with 500 ppm of chlorine at 128 degrees F. after grading, and before waxing helps to control intransit fruit rots. Most peppers are sprayed with a wax emulsion before packing.

Various kinds of containers ranging from wooden crates to paper cartons are used for packing purposes. The shipping container should be rigid enough to protect the fruit during the transit period.

### Marketing

Texas grown peppers are sold mainly f.o.b. the shipping at the prevailing market prices. A small portion of the production is sold directly to chain stores or through local outlets.

For more information on vegetable production in Texas refer to the following publications available from your county Extension office.

MP-1244	<i>Budgets for Major Rio Grande Valley Vegetables</i>
MP-675	<i>Texas Guide for Controlling Insects on Commercial Vegetable Crops</i>
MP-902	<i>Texas Guide for Reducing Vegetable Disease Losses</i>
Part III of MP-1061	<i>Suggestions for Weed Control with Chemicals in Horticultural Crops</i>

*The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.*

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