

KEYS

TO PROFITABLE PRODUCTION

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KEYS TO PROFITABLE LETTUCE PRODUCTION

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Keys to Profitable Lettuce Production

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Areas of Production

Most of the lettuce is grown in South Texas, including the San Antonio-Winter Garden Area and the Lower Rio Grande Valley. These areas are defined as winter production which totals about 5,200 acres of Texas lettuce. The early fall lettuce is produced in the High Plains and consists of about 1,500 acres.

The three leading counties in acreage for winter marketed lettuce are Hidalgo, Starr and Zavala, while Deaf Smith and Castro counties lead in lettuce marketed in early fall.

Seasonal Movement

Planting in the High Plains begins the latter part of June and continues into August with most of the acreage seeded in July. Planting in South Texas begins the latter part of August in the Winter Garden Area and continues into October. In the Lower Rio Grande Valley, seeding begins in early September with most of the acreage planted in late September and early October. Crops for late season harvest are seeded in December and early January.

Limited supplies from the High Plains are available the last half of September, with most active harvest

occurring late September and the first half of October. Movement continues from the High Plains through early November or until harvest is terminated by freezing weather. Harvest begins in mid-November in the Winter Garden Area and the latter part of November in the Rio Grande Valley. The largest part of the crop is harvested from late December through February with late crops in the Winter Garden Area producing through May.

Climatic Requirements

Lettuce is a cool-season crop, preferring mean temperatures between 55° and 60° F. during the growing season. Warmer temperatures and longer days accelerate growth. High quality lettuce is producible only when the air and soil temperatures are moderately cool while the crop is maturing. High temperatures tend to cause loose heads, bitterness and some diseases. Early in its development, lettuce will tolerate considerable frost, but if severely frosted when nearly mature, it is more subject to slime. Bolting may occur if the lettuce plants are subjected to high temperatures during most of the growing season. The time required from seeding to harvest ranges from 60 to 120 days, depending on variety and climatic conditions.

Soil Types

Lettuce grows successfully on almost any type of soil that is well drained and fertile. For early fall crops subject to relatively high temperatures, clay loams or heavy soil types should be used. These soils have a greater water-holding capacity and generally are cooler than sandy soils. For early spring lettuce, use lighter soils that are well drained.

Land Preparation

Prepare the seedbed by plowing, discing and floating the land before listing up the furrows. Tillage should leave the soil mellow, free of large clods and trashy organic matter.

Fertilizing

The lettuce plant is a poor competitor for nutrients because of the limited root system. All phosphorous fertilizer should be banded 3 to 4 inches directly below the seed at planting. Apply 60 to 80 pounds of P_2O_5 per

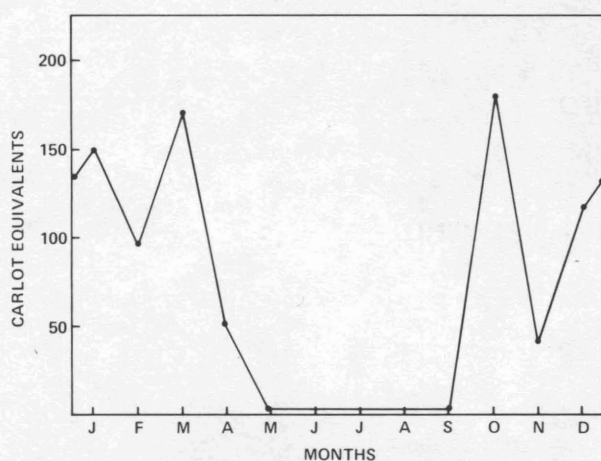


Fig. 1. Seasonal shipments of lettuce in carlot equivalents unloaded in 41 major U.S. cities by months, 1975.

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acre. Generally, 80 to 100 pounds of N are required to produce a good lettuce crop. Specific fertilizer requirements are based on the individual soil type, season and the previous crops grown on the land.

Varieties

Great Lakes 659, the predominant lettuce variety grown in Texas, is recognized for its ability to produce high yields of uniformly large firm heads under a variety of conditions. It is moderately slow bolting and resistant to tip burn; however, it is not resistant to downy mildew.

Valtemp, Valrio and Valverde were developed for southern Texas where downy mildew is a problem. Valtemp is an early season variety which heads well under warm conditions and also is resistant to downy mildew. Valverde is noted for its high quality, resistance to downy mildew and adaptability for late winter production. Some lettuce varieties and planting periods for different regions of Texas are given in Table 1.

Other types of lettuce are grown to some extent. Among these are butterhead — Bibb, Big Boston, Buttercrunch; romaine — Valmaine, which is mildew resistant; looseleaf — Black-seeded Simpson.

Table 1. Lettuce varieties and planting periods for different areas of Texas.

Area	Variety	Planting season
High Plains	Great Lakes 659, Valtemp	June-Aug.
Winter Garden	Great Lakes 659, Valtemp Valverde	Aug.-Oct. Dec.-Jan.
Rio Grande Valley	Great Lakes 659, Valtemp Valrio, Great Lakes 6238 Valverde	Sept.-early Oct. Oct. 15-Nov. 15 Nov. 15-Dec. 15

Planting

Lettuce is commonly grown on 40-inch beds. The seed is usually sown 1/8 to 1/4 inch deep in paired rows 14 to 16 inches apart on the bed which is usually 18 to 20 inches wide at the top. Approximately 2½ to 3½ pounds of seed per acre are required for warm season planting, while 1½ to 2 pounds give a satisfactory stand during cooler weather. The seedlings are thinned to stand 9 to 12 inches apart when they reach the two to three true leaf stage. A second thinning is necessary to eliminate doubles.

Weed Control

A preplant application of 4 to 6 pounds per acre of Prefar incorporated 1 to 2 inches deep, or 2 to 4 pounds per acre of Vegadex incorporated ¼ to ½ inch deep assures early control of weeds. Balan can be incorporated before seeding at ¾ to 1½ pounds per acre. Prefar gives better control of pigweed when used as a

preemerge surface application at 2 to 4 pounds per acre.

Kerb 50-W may be used at 2 to 4 pounds per acre as a surface application or 3 to 4 pounds per acre as a preplant incorporated treatment for control of susceptible annual grasses and broadleaf weeds. Use the lower rates on sandy soils and higher rates on silty clay or clay soils. Do not use more than 3 pounds per acre on endive or escarole. Lettuce is tolerant to post-emergent treatments of Kerb. Applications can be made at or before thinning, but preferably pre-emergent to weeds. All of these herbicides should be applied in 30 to 40 gallons of water per acre. Read the label for specific weeds that each material will control.

Irrigation

For the initial irrigation, apply enough water to thoroughly wet the soil surface by capillary action. Do not permit the surface soil to dry before emergence. Crusting-over of the soil surface will result if free water is permitted to cover the top of the seed bed. A consistently high level of soil moisture is required for optimum growth and high quality. Excessive soil moisture can be harmful at two stages in the growth cycle. The first stage is when excess moisture may cause a shallow and limited root system. The second stage is just before maturity when excess moisture may cause a too rapid growth rate with soft or puffy heads resulting.

Disease Control

Lettuce diseases are caused by viruses, fungi, nematodes and bacteria. Also, physiological problems are often encountered and these diseases can damage lettuce severely in the field or in transit. Their control is necessary to insure a healthy, profitable crop.

Among the most common virus diseases, with their vector in parentheses, are mosaic (aphids), aster yellows (leafhoppers), spotted wilt (thrips), and big vein (probably a soil fungus). Virus diseases are best controlled by using clean, certified seed, by eliminating weed hosts around the field, by crop rotation and by controlling insect vectors.

The most important fungal diseases are downy mildew, sclerotinia drop, damping-off and occasionally powdery mildew. Some varieties are resistant to many of these diseases and the availability of resistant varieties should be investigated. In addition, a preventive fungicide program using maneb, zineb or basic copper sulfate should be practiced. Sclerotinia drop can be controlled by crop rotation, by avoiding overwatering and by fungicide applications (Botran.) Damping-off is a disease of small seedlings; it is best controlled by treating seeds with a fungicide; crop rotation also helps. Powdery mildew is best controlled with applications of sulfur dust.

Nematodes have been found causing damage to lettuce in the Rio Grande Valley. If nematodes are

suspected, soil samples should be collected and sent to a laboratory for analysis. Contact your county Extension agent. If parasitic nematodes are found in sufficient numbers, fields should be fumigated before planting.

Tip-burn, a non-parasitic disease caused by bright warm days following cool damp weather, is best avoided by using resistant varieties, if adapted to the area. Soft-rot decay (slime mold) and other transit diseases can be eliminated by careful handling and rapid fieldheat removal during harvesting and packing, and by proper cooling and ventilation of transport units.

Insect Control

The primary insects damaging to lettuce are cabbage loopers, cutworms, aphids, corn earworms, grasshoppers, tobacco budworms, armyworms, crickets, and leafhoppers. Aphids, leafhoppers, and grasshoppers can be controlled with periodic applications of parathion on head lettuce. Cabbage loopers and imported cabbageworms can be controlled with *Bacillus thuringiensis* (Thuricide, Biotrol or Dipel) at the rate specified by the manufacturer's label. *Bacillus thuringiensis* is a slow killer, but the worms stop feeding on contact and are prevented from pupating and webbing soon after ingesting this bacteria. Corn earworms can be controlled with Sevin and cabbage loopers can be controlled with Lannate. For specific rates and time of application limitations, READ THE LABEL or consult MP-675, *Texas Guide for Controlling Insects on Commercial Vegetable Crops*, which is available from the county Extension office.

Harvesting and Handling

The first harvest usually occurs when at least 25 percent of the heads are firm. When the market is high, it may pay to begin earlier. Damage to wrapper leaves can be reduced to a minimum by harvesting after noon or when the leaves are less turgid. Firm

heads are cut with long knives, trimmed to remove excess wrapper leaves, graded by size and packed in cardboard cartons holding 18, 24 or 30 heads and weighing approximately 40 pounds. The bottom layer is arranged with butts down and the top layer with butts up.

The cartons are loaded on pallets and hauled to the vacuum cooler. After cooling, cartons are loaded into precooled refrigerated cars or trucks or into refrigerated storage for holding.

High quality lettuce can be stored 3 to 4 weeks at 32 degrees F. and high humidity if cooled properly soon after harvest.

Lettuce also can be hauled directly from the field to local markets where it can be placed directly into refrigerated storage.

Marketing

Lettuce is sold by the carton at prevailing prices and moved to distant markets in refrigerated railroad cars and trucks. A carlot of lettuce usually consists of eight hundred 35- to 40-pound cartons. Maintaining high standards of quality is essential to promote buyer confidence in Texas lettuce. Recent figures show that 60 percent of the total f.o.b. cost is made up of harvesting, packing and selling; while less than 40 percent is comprised of production costs including land and overhead.

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

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

Acknowledgment

The authors acknowledge the contributions to this publication by Dr. Jose Amador, Extension area plant pathologist, Weslaco.

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Cooperative Extension Work in Agriculture and Home Economics, The Texas A&M University System and the United States Department of Agriculture cooperating. Distributed in furtherance of the Acts of Congress of May 8, 1914, as amended, and June 30, 1914.
10M—11-76, Revision