

LEAF LETTUCE



Presented by



WIFSS
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LEAF LETTUCE



This production summary provides an overview of leaf lettuce growing, harvesting, and post harvesting practices. There are some common practices that many large commercial growers use when producing leaf lettuce, and though there are variations in these practices, having an understanding of the most common methods used will be helpful when carrying out regulatory activities.

By the end of this summary, you will be able to:

1. Describe the differences among varieties of commercially produced leaf lettuce.
2. List the top leaf lettuce producing regions in the U.S.
3. Identify the most common farming practices used in the production of leaf lettuce.
4. Describe farming practices used in different growing regions.

INTRODUCTION

Unlike head lettuce, leaf lettuce leaves branch from a single stalk in a loose bunch rather than forming a tight head. There are several types of lettuce that will form a tight head if allowed to mature, but when they are harvested before they are completely mature, they are often referred to as leaf lettuce. Familiar examples of leaf lettuce include Romaine, red and green leaf lettuce, and butterhead varieties like Boston or Bibb lettuce.

Nearly all commercially produced leaf lettuce in the United States comes from California and Arizona (Fig 1). This equates to over 12 billion pounds of leaf lettuce each year! Leaf lettuce is grown in the coastal areas of Salinas, Watsonville, and Santa Maria. In the spring and fall, production also occurs for a short time in the San Joaquin Valley, and in the winter production occurs in Yuma, Arizona.

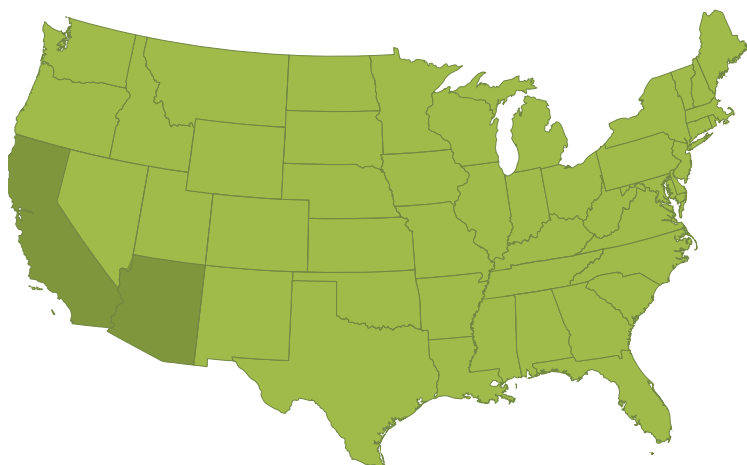


Fig 1 - Top Leaf Lettuce Producing States in the US



GROWING

Lettuce, in general, is a crop with distinct temperature requirements. Leaf lettuce is considered a cool-season crop. Optimal growing temperatures range between 73°F during the day and 45°F at night.

Frost can damage the outer leaves of mature plants which can lead to plant decay. Leaf lettuce grows best in silt loams and sandy soils. These types of soils provide better drainage during cold weather and warm up more readily during the day, which is especially important in cooler times of the growing season.

Prior to planting, the soil is typically amended to loosen clods and to improve overall quality of the soil for root development. There are a number of different implements pulled by tractors to prepare a field for cultivation. Some are used to spread soil amendments, others to loosen and aerate the soil, and still others to form uniform and parallel raised beds. Lettuce beds may vary in width from 18 to 40 inches.



The lettuce beds are separated by furrows wide enough to accommodate workers, irrigation pipes, and tractor tires. Many commercial growers pre-irrigate fields in preparation for planting. Water is applied using overhead sprinklers after the beds are formed. Most leaf lettuce is planted using pelleted seed and a precision planter. A small percentage is planted using transplanted seedlings that were started in a greenhouse. Growers often thin the density of growing plants leaving approximately 6 to 12 inches between plants to allow the plants to grow and expand. Thinning reduces plant disease caused by overcrowding.

It takes 65 to 80 days for midsummer plantings to mature, and as long as 130 days for late-fall and winter plantings. In order to supply lettuce all year long, lettuce is planted in different growing regions which results in a staggered harvest schedule. Irrigation practices vary depending on the growing region and individual grower preferences. Many California growing regions use ground water, whereas growers in Arizona use surface water brought in from the Colorado River through irrigation canals. Nearly all seeded and transplanted leaf lettuce fields are sprinkler irrigated every two to three days until seedlings emerge regardless of the growing region.

After the plants are established, the crop is irrigated less frequently until thinning occurs. A number of irrigation practices may be employed for the remainder of the growing season. In some California regions, growers continue to use sprinklers throughout the growing season; others switch to furrow irrigation. Furrow irrigation is most common in the desert regions of California and Arizona. The practice of surface-placed drip irrigation is gaining in popularity in many leaf lettuce growing regions in California. Drip irrigation has the potential to deliver water more uniformly than sprinkler or furrow irrigation methods and also saves water and reduces run-off.

Regardless of the watering method and growing region, most of the irrigation water is applied during the 30 days prior to harvest. Commercial growers use chemical fertilizers or properly composted organic materials to provide nutrients to growing plants. Fertilizers can be added by injection into the soil, through the irrigation system, or added as a side dressing in the furrow that is distributed when it rains or during irrigation. Weeds and insects can be a problem for lettuce growers. Several commercial herbicides and pesticides are available for use on leaf lettuce. These chemicals can be applied with tractors fitted with sprayers or injected into the irrigation system. Growers use traps and bait stations to control rodents around lettuce fields.

HARVESTING

Preparing fields for harvest involves applying the final irrigation and removing irrigation equipment. Drip lines are removed prior to harvesting and reused for subsequent plantings.

Immediately prior to harvesting, food safety checks are conducted by the grower's field managers or staff to look for food safety issues that could lead to potential contamination of the leaf lettuce. Signs of animal intrusion, pooling water, and foreign debris may cause an area of a field to be flagged as non-harvestable.

All types of lettuce, including leaf lettuce, are harvested by hand in the field and are not washed. Leaf lettuce is harvested using a special long bladed knife with an angled cutting edge. The outer leaves of most leaf lettuces are removed in the field before they are placed in cartons. Romaine hearts are often packed individually in sealed packages.





HOLDING

Following field packing, cartons are loaded onto trucks for transport to cooling operations where field heat is quickly removed, preserving the delicate leaves and extending shelf life. Ideally, lettuce is cooled within four hours after harvesting.

Leaf lettuce varieties are typically vacuum cooled or hydrocooled, but forced-air cooling may also be used. If the lettuce is vacuum cooled, it is placed in a vacuum chamber. The reduced pressure around the product causes water on the product surface to evaporate lowering the surface temperature of the product.

If the product is hydro-cooled, cool water is sprayed over the product, or the product is immersed in cool water. If the product is cooled by forced air, the stacked cartons of leaf lettuce are placed inside a refrigerated room against a large fan and covered with a plastic tarp. The fan rapidly draws the refrigerated air through the openings in the cartons, quickly dropping the temperature of the product.

Ethylene is a naturally occurring hydrocarbon gas emitted by fruits as they ripen. Lettuce will brown and decay in the presence of this gas and should therefore be stored in a controlled environment that is free from ethylene. Lettuce has a high water content, so it is important to maintain a high relative humidity in the storage environment. 98 to 100% is optimal. The ideal temperature for storing or holding leaf lettuce is 32 to 34°F. Boxes of harvested lettuce may be held in large refrigerated rooms before being shipped to market on temperature controlled trucks.

CONCLUSION

Having a basic understanding of the way leaf lettuce is grown, harvested, and cooled will provide the basic background information that will be helpful to regulators when completing inspections or investigations in the field.

The agricultural practices described in this production summary are common on most large commercial farms like those found in major leaf lettuce producing regions in the United States. There are undoubtedly variations in these practices depending on the region, operation size, and individual grower preferences. This is especially true of farms outside of the U.S.

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