

HEAD LETTUCE



Presented by



WIFSS
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HEAD LETTUCE



This production summary provides an overview of head lettuce growing, harvesting, and post harvesting practices. There are some common practices that many large commercial growers use when producing head 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 head lettuce.
2. List the top head lettuce producing regions in the U.S.
3. Identify the most common farming practices used in the production of head lettuce.
4. Describe farming practices used in different growing regions.

INTRODUCTION

Head or crisp-head lettuce are varieties in which the leaves grow in a dense rosette. The most well-known head type of lettuce is 'iceberg', but butterhead, also known as Boston or Bibb, is common as well. Head lettuce varieties are planted according to market demand and according to the historical success of different varieties in specific growing regions or during certain times of the year.

Nearly all commercially produced head lettuce in the United States comes from California and Arizona (Fig 1). This equates to over 40 billion pounds of lettuce each year! Head lettuce is primarily 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.

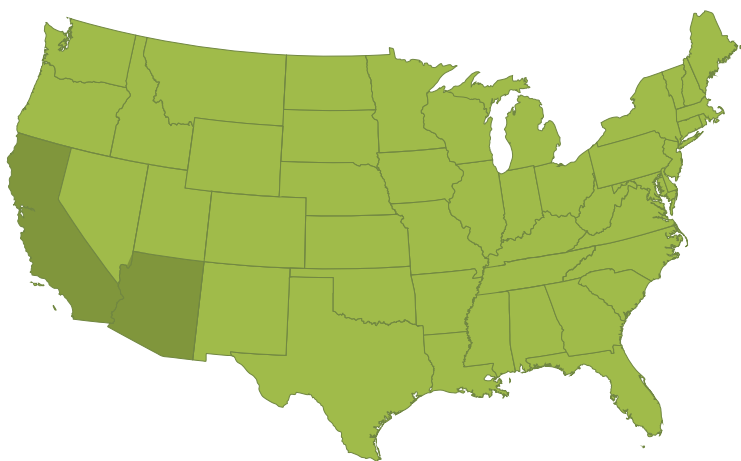


Fig 1 - Top Head Lettuce Producing States in the US



GROWING

Lettuce is a crop with distinct temperature requirements. Optimal growing temperatures are 73°F during the day and 45°F at night. Frost can damage the outer leaves of mature plants, leading to decay during the handling and storage processes. Head lettuce grows best in silt loams and sandy soils. These types of soils provide good drainage. They also warm up readily during the day, which is especially important during cooler parts 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 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.



Pre-irrigation is applied to fields after beds are formed in preparation for planting. Most head lettuce is planted using a pelleted seed with a precision planter pulled behind a tractor. A small percentage of head lettuce is grown using transplants from greenhouses.

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. Planting to harvest takes 65 to 80 days for midsummer plantings, and as long as 130 days for late-fall or 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. In most growing regions, crops are irrigated with overhead sprinklers every two to three days until the seedlings emerge. After the plants are established, the crop is irrigated less frequently.

A number of irrigation practices may be employed for the remainder of the growing season. For example, furrow irrigation is commonly used in the desert growing regions of Arizona and California. In other areas, overhead sprinkler irrigation may be employed throughout the entire growing period. Drip irrigation is a water saving method used to conserve water reduce field run-off. Drip irrigation allows producers to directly water the plant roots during the phase of rapid vegetative growth. Drip irrigation reduces water usage and the leaching and run-off of nitrogen fertilizer from the soil. Regardless of which

irrigation practice is used, the majority of water is applied during the last 30 days before 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 which 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 head 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.



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

Head lettuce may be harvested mechanically or by hand, and is not washed. Head lettuce is harvested using a special long bladed knife with an angled cutting edge. Blades are frequently placed in buckets of sanitizing solution throughout the day.





If the heads are being packed for sale directly to the consumer, the outer ‘wrapper’ leaves are trimmed and the heads are inserted in a plastic bag by the cutter and then placed on a table where the packer seals the plastic bag and places the heads in a carton. Head lettuce is frequently field-packed into cartons for shipping. If the heads are going on for further processing, say for mixed salad, the lettuce heads may be cored in the field or stacked in bins for transport to a packinghouse where they are cored, trimmed, washed, and precut into various sizes for market.

The packed cartons are stacked on a flatbed trailer in the field until they can be taken to a warehouse cool room. Lettuce is highly perishable and is cooled as soon as possible after harvest. Some warehouses use forced air cooling or hydro-cooling, while others may employ vacuum or evaporative cooling to rapidly cool harvested lettuce.

HOLDING

If the product is cooled by forced-air, the stacked cartons of head 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. If the product is hydro-cooled, cool water is sprayed over the product as it travels through a tunnel, or the product is immersed in cool water which rapidly reduces the temperature of the product. If the lettuce is vacuum cooled, it is placed in a closed vacuum chamber. The reduced pressure around the product causes water on the product surface to evaporate lowering the surface 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 where 98 to 100% is optimal. The ideal temperature for storing or holding 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 head lettuce are 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 head 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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