



Studies on Lettuce Cultivation

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Lettuce, *Lactuca sativa* L., is a cool-season, leafy vegetable that belongs to the Cicoreae tribe of the family Compositae. Lettuce is grown on all continents, but the greatest consumers and producers are the USA (91 000 hectares, of which 60 000 ha are in California) and Europe (total EEC area 80 000 ha). Large areas of lettuce are also grown in southeastern Australia, Japan, China, Israel, northern Mexico, Chile, Argentina, Brazil, and Peru. There are a number of features that make lettuce suitable for genetic studies. It has a relatively short life cycle, it is fully self-fertile with a high rate of natural self-pollination.

Lettuce is an excellent source vitamin A (21% DV) of vitamin K (97% DV) with high content of provitamin A compound, beta-carotene, in darker green lettuces, such as Romaine. Lettuce is also a good source (10%–19% DV) of folate and iron.

Botanical Description

Lettuce, *Lactuca sativa*, is a leafy herbaceous annual or biennial plant in the family Asteraceae grown for its leaves which are used as a salad green. The lettuce plant can vary greatly in size, shape and leaf type but generally, the leaves of the plant form a dense head or loose rosette. The stem of the plant is short, with larger leaves arranged at the bottom and becoming progressively smaller further up the stem. Leaves can be smooth or curly and are usually green or red in color. The lettuce plant can grow to a height of 30–100 cm (12–40 in) in height and is typically grown as an annual, harvested after only one growing season. Lettuce may be referred to as garden lettuce and is believed to originate from Asia Minor and the Middle East.

Origin

The lettuce has its predecessor in a wild species that grows in most of the tempered areas of the planet; therefore, its geographic origin is not clear. It is mainly cultivated in Asia, representing half of the world-wide production, followed by North America and Europe.

The lettuce was well-known by the Sumerian, Egyptian, Persian and Roman people. Its consumption diminished during the Middle Ages, but it was once again in fashion during the Renaissance. In the XVIth century, the Roman lettuce was introduced in France, from where it spread to England. Nowadays, it is consumed everywhere in the world.

Economic Significance

Lettuce is the second most valuable vegetable produced in the United States with farm-market receipts of over \$1.98 billion in 2005 (USDA 2005a). About 75% of all lettuce produced in the US is grown in California, and combined with Arizona these two states account for 96% of the total lettuce production (USDA 2005a). China produces almost one-half of the world's lettuce and at more than 11 million Mt their production is more than double that of the US

Post-Harvest Treatment

Post-harvest treatment is applied to vegetable either to maintain quality or to improve visual appeal. Wastage of vegetable by microorganism between harvest and consumption can be rapid and severe particularly in tropical areas where high temperature and high humidity favour rapid microbial growth. Post-harvest wastage of vegetable may be reduced by low and high temperatures, modified atmospheres, correct humidity, irradiations and good sanitation.

Post Harvest Storage

1. Harvest leaf lettuce by cutting the leaves from the plant when they reach 4 to 6 inches long. Continue to water the plants with 1 inch of water each week and the leaf lettuce will continue to produce fresh leaves. Harvest head lettuce varieties once the heads reach the full size for the variety. Head lettuce varieties won't continue to produce after harvest.
2. Place the unwashed lettuce in a plastic bag. Lay a paper towel over the top of the lettuce to help absorb any excess moisture during storage.
3. Store the lettuce near, but not below, 32 degrees Fahrenheit in the vegetable crisper drawer of the refrigerator. Lettuce retains its quality for approximately seven days.
4. Wash the lettuce immediately before use with cool water. Pat it dry with a towel or use a salad spinner to get rid of the extra water before using it.

Post Physiology And Disorder

Verticillium wilt primarily caused by *Verticillium dahliae* Kleb is a serious problem on lettuce in California and other crops globally. Since its first identification on lettuce near Watsonville in 1995, the disease has spread to other prime lettuce production regions of the Salinas Valley (Atallah et al. 2012; Subbarao et al. 1997), the salad capital of the United States.

Pathology and Control of Disease

Downy mildew is a fungus that can affect up to 80 percent of acreage once established. Mature leaves are often most affected by this disease. Lettuce develops a yellow area on the upper side of the leaves and a white or gray fluff on the underside.

Fungicides can be used to help manage downy mildew of lettuce. Fungicide treatments should be initiated when conditions are favorable for the disease but before symptoms develop on the plants. Treatments should continue as long as conditions remain favorable. Fungicides should be applied in high volumes of water and at high spray pressures to ensure adequate coverage of all plant surfaces.

References

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