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Leek

Leek is a non-bulb forming member of the onion family and is grown for its blanched stem and leaves. It is eaten raw alone or mixed in salads and cooked as flavouring in soups and stews. It is not grown in India on commercial scale but is a favourite vegetable in a kitchen garden. The climatic and soil requirements are the same as those for onion. The present chapter will make the students understand with its importance, production technology, seed production practices and plant protection measures.

BOTANICAL NAME	*Allium ampeloprasum var. porrum L.* *Syn. Allium porrum L*
CHROMOSOME NUMBER	2n=2x=32
COMMON NAME	Leek
FAMILY	Alliaceae

INTRODUCTION

- Leek is a non bulb forming tetraploid plant of onion family.
- Except large size it looks like green onion.
- Its cultivation is not commercial in India and grown only in kitchen garden.
- Leek is cultivated for blanched stems and leaves.
- It is a biennial plant, consumed as salad and used in flavouring the soups.

ORIGIN

- The *Allium* species are not evenly distributed with in the northern hemisphere, since most of them occur in old world.
- Leek is thought to have been derived from the sand leek (A. ameloprassum) which grows wild in southern Europe, North Africa and the Middle East.

NUTRITIVE VALUE (per 100 g of edible portion)

Energy (kcal)	77	Vitamin-A(IU)	30

Moisture (g)	78.9	Thiamine(mg)	0.23
Protein (g)	1.8	Calcium(mg)	50
Fat (g)	0.1	Iron(mg)	2.3
Carbohydrates(g)	17.2		

ADAPTABILITY

- Leeks grow best in a cool to moderate climate.
- The Willamette Valley and Oregon Coast are ideal.
- They can be grown all the year round.

SOIL

- A well aerated soil with both good drainage and good moisture retention capacity with a pH of 6.5-7 is best, which should not be subjected to flooding at any time.
- Deep ploughing is recommended so that a longer shaft can be developed.
- They can be grown successfully on mineral soils but in heavy clay soils, harvesting should be held up and the removal of surplus soil from roots may require more labour.

VARIETIES

Main fall varieties (August to October):

- American Flag, Jolant, Kilima, King Richard, Primor.

Late fall - winter (October to December):

- Derrrick, Electra, Goldina, Goliath, Kilima, Tivi, Wintereuzen.

Overwinter (spring harvest):

- Carina, Conqueror (moderate bulbing), Eskimo and Siberia.

These varieties mature in 80-120 days.

Characteristics of few varieties is given here under

PPL-1

- It is a selection from exotic germplasm.
- The whole plant is consumed.
- Leaves light green, swollen stem and do not form bulb.
- Ready in 150-160 days and good replacement for green onion.

Palam Paushtik:

- An alternative of green onion, suitable for salad, soup and cooking.
- Matures in about 140-150 days with average yield of 300-350q/ha.

SOWING TIME

- August – October is the ideal time of sowing in plains and seedlings are planted when they are 15cm height. In hills, it is sown in March-April.
- Leek withstands heat and cold better than onions.
- Temperature is more important than day length in seed stalk development.
- It thrives well in higher altitude.
- Seeds are produced in India at higher altitude.

SEED AND SEED TREATMENT

- About 5-7 kg of leek seeds is required to be sown per hectare, but leeks are not commonly direct seeded.
- Use treated high quality seed for transplant production.
- Leek seed, like other *Alliums* has very limited useful viability (less than 2 years) unless stored under ideal conditions.

Seeding and Transplanting

- Direct field seeding is possible but not recommended due to the lack of registered herbicides and length of time needed to harvest from direct-seeded plantings (8-12 months or longer).
- Leeks are normally transplanted.
- They should be seeded under protection early in the season (February to March) or in outdoor seedbeds (April to May).
- Leeks for harvesting in August-September should be sown from mid-February to mid-March.
- For harvesting in early winter sow the crop from mid-March to mid-April.
- For spring harvest, seed may be sown from April to mid-May.
- The right varieties (above) must be used for each harvest season.
- At transplanting, leek seedlings should be placed in furrows 15 cm deep.
- Furrows are filled in during cultivation and as the plants develop, the rows should be hilled up.
- Leeks should have a white shaft that reaches almost to the base of the leaves.
- Care must be taken not to allow soil between leaves as it will penetrate the shaft.
- Another method of transplanting is to drop each seedling into an individual hole, 15 cm deep, pressed into the ground.
- This procedure eliminates the need for filling of furrows but ridging should still be done.
- Seedlings are spaced at a spacing of 40 x 10 cm.

NUTRITIONAL REQUIREMENTS

- A soil test is necessary to determine phosphate and potash requirement.
- Apply 200-250q well rotten Farm Yard Manure or compost along with 80-100kg N, 60 kg P_2O_5 and 80 kg k_2O/ha.
- Entire quantity of FYM, P_2O_5, k_2O and half N should be thoroughly mixed in the soil at the time of planting. Remaining N is side dressed one month after.

USE OF GROWTH REGULATORS

For proper growth and development

- Ethephon @ 50mg/l as foliar spray should be applied 20-25 days after sowing.
- NAA @50mg/l should be applied at 60 and 90 days after planting.

IRRIGATION

- Irrigate uniformly to maintain vigorous, uniform growth and tender stalks.
- A total of 12-15 inches of water may be required depending on planting date, seasonal variation and variety.
- Soil type does not affect the amount of total water needed, but does decide frequency of water application.
- Lighter soils need more frequent water applications, but less water applied per application.

WEED CONTROL

- Same as that of onion.

BLANCHING

- Blanching is important in leek cultivation.
- It is done by covering the plants to a certain height so as to bleach them, which improves the quality of the crop.
- For this purpose, plants are put in up to their center leaves in trenches or pits which are heavily manured and to earth up soil as they grow.
- Care should be taken not to earth up soil too early when the plants are young.

HARVESTING AND HANDLING

- Leeks do not bulb or go dormant in the fall but continue to grow slowly.
- The time of harvest is, therefore, very flexible, depending on the time of planting, market conditions and variety of leek planted.
- Small leeks can be sold starting in early August and varieties that have frost tolerance may be harvested throughout the fall and winter months.
- Machine harvest of leeks is now possible, but most leeks are lifted or dug by machine and then harvested, cleaned and packed by hand.
- Single or multiple row harvesters can be used effectively.

YIELD

- Leek yields approximately 925q green bulbs per hectare.

STORAGE

- Store leek seed at $0^{o}C$ and 95 to 100 per cent relative humidity.
- Leeks, if properly handled, should be kept satisfactorily for 2 to 3 months at $0^{o}C$.
- Leeks should be cooled promptly after harvest to near $0^{o}C$ by hydro cooling, crushed ice or vacuum cooling and they should be kept at this temperature with high relative humidity throughout storage.
- Yellowing and decay develop rapidly at warmer storage temperatures.
- High relative humidity is essential to prevent wilting.
- The use of polyethylene film crate liners and of crushed ice can aid in preventing moisture loss.
- Good refrigeration will retard the elongation and curvature that develops in leeks at $10^{o}C$ or $21.1^{o}C$.
- Respiration or heat evolution of leeks is about eight times faster at $21.1^{o}C$ than at $0^{o}C$.
- Storage for 4-5 months at $0^{o}C$ is possible by using a controlled atmosphere (CA), although there will be some loss in quality.
- The best CA contains from 1-3 per cent oxygen and from 5-10 per cent carbon dioxide.
- This CA retards yellowing and decay.
- Atmospheres containing 15-20 per cent carbon dioxide cause tissue injury.
- Cultivar, pre harvest and post harvest conditions, degree of trimming and method of packing will all influence the storage life of leeks.

PACKAGING

- Leeks are commonly trimmed to 12 inch length, bunched depending on diameter and often placed in polyethylene film bags.
- They are usually packaged in 5 kg cartons or wire bound crates, holding 10 film bags, each 500 g
- Other crates may be packaged with 18-24 bunches with a net weight up to 15 kg.

DISEASES

- Diseases of leek are same as that of onion