



FACULTY OF AGRICULTURAL SCIENCES AND ALLIED INDUSTRIES

SPINACH BEET OR INDIAN PALAK

TYPES OF SPINACH: There are two types of spinach.

1. Desi or common palak (Spinach beet or beet leaf or beet leaf spinach or Indian Palak or Desi Palak).
2. Vilayati palak or English Spinach (spinach)

DIFFERENCE BETWEEN SPINACH BEET AND SPINACH

Sr.No.	Spinach Beet	Spinach
1.	Botanical name is <i>Beta vulgaris var. bengalensis</i> Hort	Botanical name is <i>Spinacea oleracea</i> L
2.	Chromosome number 2n=18	Chromosome number 2n=12
3.	Leaves with margins	Leaves with lobed leaf margin
4.	Produce hermaphrodite flowers	Produce staminate, pistilate and hermaphrodite flowers
5.	Tolerates high temperature and grow well in hot weather	Purely a cool season crop and can not tolerate high temperature. In warm weather and long days it quickly tend to flower

SPINACH BEET

BOTANICAL NAME	<i>Beta vulgaris L. var. bengalensis Roxb</i>
CHROMOSOME NUMBER	2n=2x=18
FAMILY	Chenopodiaceae
COMMON NAME	Palak, Saag, Indian Spinach, Indian Palak, Desi Palak

USES

- Rich source of vitamin A as compared to spinach and carrot
- Also contains high quantity of ascorbic acid and iron
- 100g of leaves supply as much essential amino acids as 100g of any non vegetarian food like meat and fish
- Its succulent leaves and stems forms a nutritious dish after cooking
- The herbaceous parts are mildly laxative besides other medicinal values.

ORIGIN AND HISTORY

- The spinach is probably native of Indo-Chinese region.
- Spinach is a nutritive leafy vegetable.
- It is rich in vitamins and minerals.
- The Romans used it as feed for animal and man.
- In Germany, it was first described in 1557, where it is referred as Roman beet.
- The crop was introduced in USA in 1800.
- It has some medicinal properties also, the herbaceous parts of palak are mildly laxative, beside other medicinal values and it is a leafy vegetable which is highly suitable for hydroponics.

NUTRITIVE VALUE (per 100 g of edible portion)

Energy (kcal)	46	Thiamin (mg)	0.26
Moisture (%)	86.4	Riboflavin (mg)	0.56
Protein (g)	3.4	Niacin (mg)	3.3

Fat (g)	0.8	Ascorbic acid (mg)	70
Carbohydrate (g)	6.5	Ca (mg)	380
Vitamin-A (IU)	5862	P (mg)	30

CLIMATIC REQUIREMENTS

- Spinach beet is a cool season crop.
- It can withstand frost better than other vegetable crops.
- High temperature, especially long day cause bolting, thus reduces its market value.
- Higher yields are obtained under short day and mild temperature.
- Succulence and tenderness of leaves are increased under high atmospheric humidity.
- Can be grown throughout the year under mild temperature conditions.

SOIL CONDITIONS

- Spinach beet can be grown on a wide range of soils.
- It thrives best in well drained loamy soil.
- pH should be in the range of 6-6.5.
- Low soil pH is harmful for growth and development of crop.

VARIETIES /HYBRIDS

On the basis of pigmentation of midrib and leaf veins, palak cultivars can be divided into two groups:

1. Reddish midrib and leaf veins.
2. Green midrib and leaf veins.

AllGreen:

- This is an early variety suitable for growing in September.
- Leaves are green, uniform, tender with entire leaf margins.
- Plant produces seed stalks in 75days after sowing.
- Average yield is 125q/ha of green leaves.

ArkaAnupama:

- It has been developed through hybridization of IHR-10 and IHR-8 followed by pedigree method of selection and released from IHR, Bangalore.
- Leaves are medium large, dark green, wrinkled and attractive.
- It is late bolting variety and regenerates at fast rate.
- Leaves are ready for first harvesting in 30 days after sowing.
- It gives about 410 q/ha fresh green leaves in four cuttings.

BanerjeeGaint:

- It is very popular variety developed in West Bengal through hybridization between Local Palak x Sugar beet.
- It produces large thick and succulent leaves with very succulent stem and fleshy roots.
- It yields 150-200q/ha of green leaves.

JobnerGreen:

- Evolved through spontaneous mutation and selection made from a local collection (5-5).
- Leaves are long, thick, and succulent with strong flavour.
- Can be successfully grown on alkaline soils having pH of 7.0-10.5.
- It produces tender leaves and strong flavour having entire margin.
- Taste is comparable to cultivar All Green.
- Prolific yielder with average yield of 300q/ha.

HS-23:

- It is quick growing and heavy yielding cultivar, gives first cutting in 30 days after sowing and a total of 6-8 cuttings at 15 days intervals.
- Evolved through mass selection
- Leaves are long, dark, thick and succulent

PusaJyoti:

- It gives 6-8 cuttings and yields 290q/ha.
- It is a polyploid, evolved through selection among colchicine treated progenies of All Green.
- It is a giant leaved type with succulent and crisp leaves.
- It yields 490q/ha with 6-7 cuttings.
- It is rich in K, Ca, Na, Fe, and ascorbic acid and can be grown throughout the year.

PalakNo.51-16:

- It produces green leaves, gives several cuttings and yields about 160q/ha.
- Released by the Maharashtra State Department Of Agriculture.
- It is a late bolting cultivar.

PusaPalak:

- It produces uniform green leaves without any purple pigmentation.
- Developed by hybridization between Swiss Chard x Local Palak
- It is a late bolting cultivar.

Ooty-1:

- It is tasty green leafy vegetable.
- It yields 150q/ha of leaves.
- Leaves are rich in vitamins.
- It also contains higher carotene content.
- It can be grown throughout the year and can withstand frost.

PusaHarit:

- Suitable for cultivation in the hills throughout the year,
- Plants are upright, vigorous growing with uniformly thick green, slightly crinkled and giant sized leaves,
- Heavy yielder with remarkable ability for rejuvenation.
- It has late bolting habit and wide range of adaptability to varying climates,
- Average yield 150-200q/ha.

PunjabGreen:

- Foliage is shining dark green, thick, long, sweet, succulent and free from sourness.
- There is light purple pigment on the stem.
- Slow bolter and has low oxalic acid content which is a desirable character in greens.
- Average yield is 315q/ha.

PunjabSelection:

- Leaves are light green, long, thin, narrow and smooth with slightly sour taste.
- Stem is covered with purple pigment.
- It yields 275 q/ha green leaves.

PantComposite-1:

- It is released from GBPUAT, Pantnagar.
- It is a heavy yielder and tolerant to *Cercospora* leaf spot.

PusaBharati:

- Leaves are long, succulent and flavoured.
- It yields 500q of green leaves per hectare.

SOWINGTIME

- In plains of India, it can be grown 3 times in a year i.e. early spring, in the beginning of rainy season and as main crop during Sept. - Nov.
- It can be grown throughout the year in places where mild climate exist.
- In hills, it is generally sown in March-May

SEEDRATE

- Summer crop : 25-30 kg/ha
- Winter crop : 10-15kg/ha
- Seeds are soaked in water overnight before sowing to improve germination

SPACING

- Keep planting distance of 25-30cm between rows and plants should be spaced at 5-10cm after thinning.

NUTRIENTMANAGEMENT

- For good crop, add 250-300q/ha of Farm Yard Manure per hectare and mix it well during field preparation.
- Besides Farm Yard Manure, 80-100kg nitrogen, 60 kg phosphorus and 60kg potash should be applied per hectare in the form of inorganic fertilizers.
- The entire quantities of P and K along with one fourth quantity of nitrogen are applied at the time of planting.
- The remaining amount of nitrogen is top dressed into three split doses each @ 20-25kg/ha after each cutting.

USEOFPLANTGROWTHREGULATORS

- In Spinach beet, application of GA at 10ml/L in combination with 1 per cent urea has been reported to give higher yield.

IRRIGATION

- There should be sufficient soil moisture for proper seed germination and growth.
- If soil moisture is not sufficient at the time of sowing, pre sowing irrigation is advisable.
- Irrigation should be done after sowing.
- In summers, water is applied at 4-5 days interval and in winters at 8-10 days interval.

- However, the rainy season crop does not require any irrigation except during the long dry spell.

INTERCULTURAL PRACTICES

- Thinning is essential which should be done to provide proper space for accommodation and development of large uniform plants.
- Shallow hoeing is essential because the spinach beet plant cannot compete well with the weeds.
- To keep away the weeds from the field and to loosen the soil for proper aeration, 2-3 hoeings cum weedings are required.
- Application of Pyrazone @ 2.4-2.8 kg/ha as pre-emergence application is also found effective
- Harvesting is made more difficult where weeds are present.
- Avoid weedicides for controlling weeds in palak.

HARVESTING

- Spinach beet leaves become ready for harvesting in 25-30 days after sowing, the leaves are cut with the help of a sharp knife/sickle.
- The successive cuttings may be done at 15-20 days interval. In 4-6 cuttings, the crop is over.
- Winter crop gives more cutting than spring-summer crop.
- Varieties of broad leaves are usually high yielding than those of a short leaved.
- The yield and quality of leaves are affected adversely, if harvesting is not done at regular intervals.
- Palak is highly perishable vegetable, so immediately after harvesting, it should be sent to the market.
- The attractive appearance of leaves and their turgidity is lost within 24 hours of harvesting along with rotting of leaves.
- Palak cannot be stored at room temperature, but at low temperature (0°C) with high relative humidity (90-95 per cent) leaves can be stored for about 10 to 14 days.

YIELD

- On an average, green leaves yield varies from 100-150 q/ha (winter) and 80-100 q/ha (Spring-summer).