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Scientific Cultivation of Pea

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Introduction:

Pea (*Pisum sativum* L.) is the famous plant in which the crop is cultivated for its tender and immature pods to use as vegetable and mature dry pods to use as a pulse .In both cases, seeds can be separated and used as vegetable or pulse Peas are highly nutritive and contain high content of digestible protein (7.2 g / 100g), Carbohydrate (15.8 g), Vitamin-C (9mg), phosphorus (139 mg) and minerals.Tender seeds can be also used in soups. Canned, frozen and dehydrated peas are very common for use during off-season.

Origin

Pea originated from Central Asia and cultivated garden pea is not seen in wild state and it might have been originated from wild field pea or other related species.

Botany

Pea is a diploid with 2n=14. Field pea belong to *Pisum arvense* and the garden pea belong to *P. sativum*. Pea is a herbaceous annual plant with tap root system, and upright slender stem. Usually single leaves are pinnately compound with the rachis terminating in a single or branched tendril with large stipules at base of leaf and Inflorescence is a raceme arising from axils of leaves and individual flowers are typical papilionaceous ,.Gynoecium is monocarpellary with ovules (up to 13) alternately attached to placenta and pods are straight or curved with smooth or wrinkled.

Varieties

Pea cultivars can be grown in different parts of the world exhibit wide variation such as height of stem,branching, pod size, seeds per pod, shelling percentage, smoothness of seeds (smooth wrinkled) and can be used for good cultivation of pea as different varieties such as Arka Ajit,UN 53-6,Arkel, Bonneville, Sylvia, Lincoln, Kashi Nandini, KashiShakthi, Matar Ageta6, Matar 2, Matar-3, Early December, Jawahar Matar-4, Harbhajan, Pant Uphar, PanSabji etc.

Climate and soil

Pea is typically a cool season crop and thrives well in cool weather. Optimum temperature for seed germination is 22oC and early stage of crop is tolerant to frost.

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But flowering and fruit development are adversely affected by frost and crop prefers well drained, loose and friable loamy soil for early crop and clayey soil for high yield. Ideal pH is 6.0-7.5 and it grows under alkaline soil. If soil is acidic, liming is recommended.

Sowing time, spacing and seed rate

In plains of North India, pea is sown from beginning of October to middle of November when crop is sown after 4th December. Crop sown in September will be susceptible to wilt disease. In hills, pea is sown in March for summer crop and in May for autumn crop Soil is prepared to a fine tilth by disc ploughing followed by one or two harrowing. Seeds are sown in flat or raised beds by broadcasting or by dibbling at 2.5-5.0 cm depth. Early varieties are sown at a closer spacing of 30 x 5-10 cm and the seed rates is 100-120 kg/ha. Mid season and late varieties are sown at wider spacing of 45 x 10 cm. Late varieties are sown on either edge of raised beds which are 120-150 cm wide with furrows in between. Seed rate for late varieties is 80-90 kg/ha. Overnight soaking of seeds in water or GA 3 (10 ppm) improves germination.

Manure and fertilizers

A crop yielding 4-5 tonnes of green peas removes 55 kg N, 20 kg P2O5 and 40 kg K2O. High does of N have adverse effect on nodule formation and N fixation. N at 25 kg/ha is sufficient to stimulate early growth of pea. Phosphatic fertilizer increases yield and quality by increasing N fixation and nodule formation. Potassium fertilizers also increase N fixation ability of plants and yield. In addition to 10 tonnes of farmyard manure, a fertilizer dose of 25 kg N, 70 kg P2O5 and 50 kg K2O are recommended for one hectare and the entire dose is drilled at the time of sowing seeds. If fertilizers are coming in contact with seeds, there will be severe injury to seeds. Fertilizer should be applied in bands at 7-8 cm away and 2.5 cm deeper from seeds. Application of sodium molybdate @ 40 kg/ha either as per or post emergence spray is reported to increase yield and collar rot resistance in peas.

Irrigation

Irrigation can apply on 10-15 days intervals for pea and flowering, fruit set and grain filling periods are critical stages and care should be taken to irrigate crop at these stags. Four irrigations at pre-bloom, pod set and fruit picking stages are recommended for variety Bonneville under Bangalore conditions.

Weed control

Different chemicals can use for weed control of pea but lasso (alachlor) @ 0.75 kg a.i. or tribunal @ 1.5 kg a.i./ha or pendemethalin 0.5 kg a.i. / ha as pre emergence spray along with one hand weeding at 25-45 days after sowing is very effective for weed control.

Inter-culture

When pea plants attained about 15 cm high, tall varieties should be stacked with wooden sticks or twigs for trailing. A single row of stakes fixed in middle of raised bed will support both rows of plants in each bed. Earthing up and hoeing is also important operations in peas and helps in root development and growth of plants. This is usually done after weeding and fertilizer application.

Harvesting

When tender peas with high sugar content fetch premium price in market, care should be taken to harvest pods at correct maturity. During maturity, sugar content decreases and polysaccharides and insoluble nitrogen compounds like protein increases. Calcium migrates to seed coat and becomes tougher during ripening.Toughness of seeds is determined using Tendrometer Usually 3-4 harvests at 10 days intervals are possible.

Yield

Green pod yield varies with duration of variety and is 2.5-4.0 t/ha for early varieties, 6.0-7.5 t/ha for mid season varieties and 8.0 10.0 t/ha for late varieties. Shelling percentage ranges from 35-50. Seed yield varies from 2.0 to 2.5 t/ha.

Storage

Peas after harvesting are packed in gunny bags or crates. Fresh unshelled peas can be stored for two weeks at 10oC and 90-95% RH.

Insect

Stem fly, pea aphid, leaf miner and pod borer are major pests and these insects are controlled by different insecticide such as Phorat10G 8-10kg/ha or Dimethoate 30EC@1.2-2ml or Spinosad45EC@0.5-0.6 ml/litre water

Diseases

Wilt, root-rot, powdery mildew, rust, *Ascochyta* blight and pod rot are major diseases of pea and these diseases are controlled by different fungicide such as Thiram or Captan or Dithane M-45@2g/kg seed treatment before sowing or to apply of crop rotation or resistant varieties.