

GREEN PEAS

CLIMATE

Peas are a cool-season crop. The plants can withstand fairly cold conditions, but the flowers and young pods are sensitive to even relatively light frosts. Optimum monthly mean temperatures for growth are between 15°C and 18°C, with mean minimums of over 7°C and mean maximums under 24°C. Growth ceases below 5°C. Hot conditions cause poor fruit set and favour the onset of various diseases.

SOILS

Cool, well-drained, medium to heavy loam soils are preferred, but the crop can be successfully grown on a wide range of soil types. Ideally the soils should be well-drained to a depth of at least 500 mm. Soils which crust badly should be avoided.

CULTIVARS

For processing, popular cultivars include Cape Freezer, Combi, Dark Skinned Perfection, Greenfeast, Puget.

Greenfeast, Kelvedon Wonder and Onward are the main fresh garden peas. Only the young, tender seeds are eaten.

Edible podded peas (mange tout): Oregon Sugar Pod II is sometimes grown for its edible pods, and is harvested when the pods are fully sized, but before the young seeds start swelling (snow peas). Sugar Daddy is also grown for its edible pod, but is harvested when the seeds have swollen (sugar peas).

PLANT SPACING AND POPULATIONS

Factory crops (for freezing, canning or dehydration), are generally drilled in rows drawn about 200 mm apart. In wet, humid areas the aim is generally to achieve a population of 35 to 45 plants/m². In drier areas, under irrigation, a density of 50 to 60 plants/m² is used and, under ideal conditions, where diseases are not a serious problem, a population of up to about 100 plants/m² gives best results for a once-over harvest.

For the fresh market, where access for successive picking is required, rows are generally about 600 mm apart. However, it is preferable to plant two rows, spaced 200 mm apart, with 600 mm wide access paths between sets of double rows. Seeds are planted about 50 mm apart in the rows. This will give about 33 seeds/m² for single rows, and 50 seeds/m² for double rows. Under poor to average conditions, only 50% to 70% of these seeds will produce bearing plants, with 65 % to 90 % under good growing conditions.

SOIL PREPARATION AND PLANTING

The soil surface need not be worked to a very fine tilth, but cloddy soil is not suitable. The seed is planted directly into the land to a depth of not more than 30 mm on heavy soils or 70 mm on light sandy soils. Shallower planting is preferred if the top soil can be kept sufficiently moist for germination. Depending on seed size and the spacing adopted, between 50 kg and 150 kg of seed is required to plant one hectare.

TIME OF PLANTING

Pea seed may take more than a month to emerge when soil temperatures are only 5°C, about two weeks at 10°C, and 5 to 10 days at temperatures between 20°C and 30°C. However, planting times are largely determined by two factors, viz poor plant performance under high temperature conditions, and the sensitivity of flowers and pods, especially the young pods, to frost damage. The planting time selected should therefore be such that most of the growth occurs during suitably cool weather, but that flowering starts after the danger of frost damage has passed.

In cold areas which experience late frosts, planting in July is usually best.

In most other areas, planting is done from May to June.

In a few selected areas, with cool autumns, winters and early summers, and which experience only light or no frosts, planting may stretch from March to July.

In many areas, the earliest plantings may be at risk from frosts, should these occur, and the later plantings may bear poorly due to heat, but also because of a greater incidence of powdery mildew, which is more prevalent during the hotter, dry weather in spring or early summer.

FERTILIZER REQUIREMENTS AND INOCULATION

The green pea is sensitive to soil acidity. Adequate liming of acid soils is essential for good growth. Peas do not have a particularly high demand for nutrients. Soil deficiencies of phosphorus and potassium need to be corrected before planting. On soils of average fertility, pre-plant dressings of 300 kg to 400 kg of 2:3:4(30) per hectare will generally be adequate. A light top-dressing of 50 kg to 100 kg LAN per hectare may be advisable on some soils.

Should the seed be adequately inoculated with *Rhizobium* bacteria at planting, no nitrogen-containing fertilizer need be supplied to the crop.

IRRIGATION

The soil should be wet to a depth of about 450 mm at planting. Provided that the surface layer of soil remains sufficiently moist to allow for plant emergence, the soil may be allowed to dry out appreciably before any follow-up irrigation. This practice allows the development of a strong root system, and reduces vine length (which may influence the incidence of some diseases), but does not normally reduce the yield. Under average autumn/winter conditions, irrigation may be delayed for about 5 weeks on sandy soils, and about 8 weeks on heavy soils. However, the plants should not be allowed to show any obvious drought stress during this period. At the commencement of flowering (first open flowers) a good irrigation is essential for high yields. Most growers then keep the soil moist until harvest. However, disease incidence may be reduced if little or no irrigation is applied during petal fall. Irrigation is again vital at pod swell. No drought stress should be allowed from flowering onwards.

WEED CONTROL

The use of herbicides is almost essential where close spacings are used, as is the case for most crops for processing.

For annual broadleaved weed control in pea crops, terbutryn (Igran 500 or Terbutryn) is applied just after the crop has been sown, followed by a light overhead irrigation. Bendioxide (Basagran) or MCPB (Tropotox) are used as post-emergent broad-leaved herbicides, or prometryn (Gesagard 500) at an early post-emergent stage of growth of the pea crop.

For control of annual and some perennial grasses, fluazifop-P-butyl (Grasses or Fusilade Super) is applied at early post-emergence, the dosage rate used being dependent on the grass to be controlled and its growth stage. Other post-emergent registered herbicides, which are applied up to the six-leaf stage of the pea crop for control of grasses, are haloxyfop-R methyl ester (Gallant Super and Verdict Super) and propaquizafop (Agil 100).

PESTS

The most destructive of pea pests is the American bollworm, which feeds on the pods. A full cover insecticide should be sprayed as soon as the larvae are noticed, and repeated after a fortnight. A number of chemicals are registered for use, including pyrethroids, which are also registered for control of the lesser armyworm; a characteristic of the latter pest is the spinning together of leaves of the growing tips of plants. Aphids and leaf miners should also be controlled by chemicals when they threaten to become a problem. Root knot nematodes may cause root damage in warmer soils; fenamiphos (Nemacur) may be used in early plantings of peas if the soil is known to be infested.

DISEASES

The most commonly encountered pea disease is powdery mildew, which manifests itself as white powdery areas on the upper surfaces of leaves, and on stems and pods. Severe mildew is very harmful to pod appearance and pea yield. Warm, dry areas, and cool nights with dew, favour disease progress. Powdery mildew is hardly seen if cool wet conditions prevail, including frequent overhead irrigation. However, abundant moisture in the crop favours downy mildew development. Ascochyta blight is caused by one or more of several closely related fungi, which can infect all surfaces of the pea plant. Symptoms range from irregular flecks to light brown lesions with darker edges, often showing concentric lesions. Blight can develop quickly in the crop during cool wet conditions, when the crop can be decimated.

Fusarium root rot could be a problem, although use of resistant cultivars is a possible control measure. White mould (or Sclerotinia rot) will occur if the fungus is present in the soil and foliage has dense, leafy growth. Bacterial diseases are usually of little concern because pea seed is produced in dry areas where conditions do not favour infection, and inspections identify problems. Virus diseases of peas are generally not production-limiting factors. Most are transmitted by aphid vectors, which can be controlled by aphicides. Use of virus-free seed and cultivars which have resistance to the main pea viruses have reduced the incidence of these problems to the point where the grower is unaware of the danger from such diseases.

Disease threats for the grower are diminished with the production of seed in dry areas, and with fungicide treatment of seed before its purchase. A good crop rotation programme may be necessary. Ascochyta blight can be controlled by a preventative spray programme commencing at the flowering stage; in wet weather the young crop should be protected from downy mildew. A number of contact and systemic fungicides are registered for powdery mildew control, but many are only sold in packings that could be used by commercial growers. For home garden use, several registered fungicides can be purchased in the garden section of stores, including sulphur, which is one of the oldest fungicides known to man.

LENGTH OF CROP

Crops grown under cool conditions will generally be ready for harvest within 110 to 120 days, but may be as quick as 70 to 90 days, under warmer growing conditions. Factory crops are usually stripped in a once-over harvest, whereas crops for the fresh market are generally harvested over a three-week period.

YIELDS

Factory crop yields vary from a conservative 1.5 tons to a good yield of over 5 tons of shelled peas per hectare. Average yields are 2.5 to 3.5 tons per hectare. For the fresh market, yields of peas in pods vary from 3 tons to 10 tons per hectare, or an average of 5 or 6 tons of pods per hectare. Edible podded peas will normally yield 3 to 5 tons of pods per hectare.

HARVESTING AND MARKETING

Factory crops are normally mechanically harvested at a stage when much of the crop has reached the edible maturity, but before the first berries become hard and starchy. The timing of harvest is critical. For the fresh market, pods are individually harvested by hand when the berries are well- developed, but still tender, sweet and succulent. Successive harvesting is required to gather the crop. Labour requirements for picking are high.

The sugars in the berries are converted to starch fairly quickly, especially when exposed to high temperatures, so rapid marketing is essential.

Pods are usually marketed in green mesh pockets similar to those used for green beans. Cartons and other containers are sometimes used. Sugar peas and mange tout are usually sold in smaller prepacks.

Table 25.

Total tonnages sold on Durban National Market per year from 1993 to 1997, and mean annual prices (R per ton obtained).

	1993	1994	1995	1996	1997
Tons sold p.a.	263	318	219	281	189
Ave. R/ton	1628	1870	1786	1862	2104