



## Peas – Introduction

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Scientific name:	Pisum sativum L.
Family name:	Leguminosae
South African Common name:	Field peas, Ertjies (Afrikaans)

The pea is most commonly the small spherical seed or the seed-pod of the pod fruit *Pisum sativum*. Each pod contains several peas, which can be green or yellow. Botanically, pea pods are fruit, since they contain seeds and develop from the ovary of a (pea) flower.

### Peas: Testing the learning: Introduction

- Pea pods are a fruit? True/False

### Peas: Micro Jobbing: Introduction

- Register to grow crop.
- Tell us about your growing conditions.
  - What is the prevailing wind?
  - What are the normal temperatures during your growing program?
  - How many hours of daylight will you have during your growing period?
  - Is there pollution in the area?



## Peas – Description of the plant

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The field pea is an annual herb: bushy or climbing, glabrous, usually glaucous and stems are weak, round and slender. Field pea is either of indeterminate (climbing) type or determinate (bush or dwarf) type. Vines are often 1,52m long, but when grown alone, the field pea's weak stems prevent it from growing more than 0,61m tall.

### Roots

Pea roots can grow to a depth of 90 cm, however, over 75% of the root biomass is within 61 cm of the soil surface. Field pea is shallow rooted and therefore subject to drought on sandy soils. Owing to a relatively shallow and small root system, the crop is well modulated and high water use efficiency make field pea an excellent rotational crop with small grains, especially in arid areas where soil moisture conservation is critical.

### Stems

Field pea is an annual herbaceous plant and stems grow to a length of 1 m. The pea normally has a single stem but can branch from nodes below the first flower. The plant is very viney, with weak, small stems (though larger and more succulent than those of vetches) and requires supporting crops such as oat or rye in order to ascend. The plant is a climbing annual legume with weak, viney and relatively succulent stems.

### Leaves

There are two main types of field pea. One type has normal leaves and vine type lengths is 1,82 m, the second type is the semi-leafless type that has modified leaflets reduced to tendrils, resulting in shorter vine lengths of 1,21 m. A leaf consists of one to three pairs of leaflets with a terminal, branched tendril. Leaves are pale green with a whitish bloom on the surface. As pea leaves and stems mature, they turn to get tough and stringy; at maturity, the plant is a prostrate vine.

### Flowers

Flowers are borne on racemes arising in the axils of the leaves which are mostly self-pollinated. In most varieties, the blossoms are reddish-purple or white. Hot weather during flowering causes the flowers to burst which results in reduced seed set. Flowering usually begins at 32 to 55 days after planting and normally takes two to four weeks, depending on the flowering habit and weather during flowering.

Pea varieties have indeterminate or determinate flowering habits. Indeterminate flowering varieties will flower for long periods and ripening can be prolonged under cool, wet conditions. Indeterminate varieties are later in maturity, ranging from 90 to 100 days. Determinate varieties will flower for a set period and ripen with earlier maturity of 80 to 90 days. Indeterminate varieties are more likely to compensate for periods of hot, dry weather and are more adapted to arid regions. Determinate semi-leafless varieties that have good harvestability are more adapted to the wetter regions. Flowers of field pea attract bees.

### Growing season

Field pea grows in the winter where the climate is mild or in the spring where the winters are too severe for growth. The plant requires cool, moist growing conditions and can withstand heavy frost; however, it succumbs quickly to heat, especially if combined with humidity. Cold resistance is due to winter dormancy. In order to extend pea the growing season one has to harvest and eat some of the young pea shoots and tendrils.

### Peas: Testing the learning: Introduction

- Pea pods are a fruit? True/False

### Peas: Micro Jobbing: Introduction

- Show us by taking a photo of which varietal of peas seeds you are planting



## Peas – Climatic Requirements

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### Temperature

- It is an annual, cool season pulse crop and therefore well-adapted to cool, semi-arid climates.
- The seeds germinate well at a soil temperature of 4,5 °C, but optimal temperatures for germination ranges from 12 °C to 24 °C.
- Temperatures above 27 °C decrease the growing period and adversely affect pollination.
- During limited rainfall (in spring) the plants can still perform well with the aid of the available moisture during pod filling and ripening.
- Field pea is intolerant to drought, which can have adverse effect if it occurs at flowering stage.
- During flowering, extremely hot weather or drought stress can reduce seed and pod set dramatically.
- Higher temperatures may accelerate germination but increase seedling susceptibility to soil-borne pathogens.

### Rainfall

Field pea crops prefer optimal rainfall ranging from 600 mm to 1000 mm per annum.

### Soil requirements

- Field peas are adapted to a wide range of soils, from light sandy loams to heavy clays but intolerant to waterlogged conditions.
- They do not tolerate water saturated or salt affected soils.
- Under these conditions, the plants may die off after 24 or 48 hours.
- The crop is best adapted to clay soils with a pH ranging from 6,0 to 7,0 and alluvial bottom areas and requires well-drained soil with an optimum pH ranging from 5,5 to 6,8.
- The seeds grow best when planted in a seedbed with a minimum volume of residue on the soil surface.

### Peas: Testing the learning: Climatic requirements

- Tell us a little about your normal climate conditions:
  - Average temperate
  - Average Rainfall

### Peas: Micro Jobbing: Climatic requirements

- Have you grown this crop before?
- Take a photo of your crop every Tuesday.



## Peas – Soil Preparation

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Avoid seedbeds with large clods and do not work the soil too fine, or subsequent soil crusting following rains could cause emergence problems. The plant can be grown in a no-till or conservation-till cropping system.

Avoid excessive tillage in spring to prevent drying out of the seedbed. Ploughing is recommended and this assists in weed control and in warming the soil. In order to obtain good soil contact with the seed, seedbeds should be firm and well worked.

The soil must be well drained as green peas are very sensitive to waterlogged conditions. Make sure that the water table of the underground water is not closer to the surface than 800 mm. As with any crop, a loamy well drained soil is the best.

Do NOT plant peas in the same place more than once in every four years.

### Peas: Testing the learning: Soil Preparation

- Peas are not to be planted in the same place more than once in every 4 years. True/False
- Prior to planting remove weeds. True/False

### Peas: Micro Jobbing: Soil Requirement

- Tell us about your growing conditions.
  - Have you removed all weeds, take a photo of your land before planting.
  - Are you going any other crops? If you are growing other crops please name the crops
    - \_\_\_\_\_
    - \_\_\_\_\_
    - \_\_\_\_\_



## Peas – Planting

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- Planting starts from April to mid-May to avoid unfavourable seeding conditions. Late seeding will negatively affect flowering.
- The row spacing should be 15 to 30 cm at a seeding depth of about 2 cm to 5 cm.
- Seeding rate depends on the variety selected, but an average of nine plants per square metre is suitable or 75 to 100 kg/ha.
- Seeds must be placed deeply to reach available moisture in non-irrigated soils and shallowly in irrigated soils if autumn rains have started.
- Emergence normally takes 10 to 14 days.
- Field pea is a winter and spring annual crop with a maturity of 95 to 100 days.
- Field pea requires the same length of the growing season as wheat and is normally harvested in August.
- On average, it requires 60 days from planting until bloom, and 100 days to mature the dry seed. In temperate climates, where winters are severe, the crop is usually planted in the spring.
- Where there are little or no frosts, planting occurs in the late fall and early winter.
- Seed field pea with a grain drill 2,5cm to 6,5cm deep in rows six to seven cm apart. Care must be taken to properly adjust the grain drill to prevent cracking the seed (cracked seed will not germinate).
- Field pea is not a strong competitor, therefore, poor germination or sowing at less than recommended rates may result in severe weed problems.



### Peas: Testing the learning: Planting

- Plant the seeds about 2.5cm to 6,5cm deep, rows 6cm to 7cm apart. True/False
- Do you have anyone helping you grow your crops? Yes/No

### Peas: Micro Jobbing: Planting

- Take a photo of your crop after planting your crop
- If you have a team helping you with your farm, that a photo of the team



## Peas – Fertilisation and Irrigation

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### FERTILISATION

The type of fertiliser to be used is determined by soil test results. It is of utmost importance to inoculate field peas with *Rhizobium leguminosarum* to enhance growth. Field peas require relatively large quantities of potassium and phosphorus for nitrogen fixation and promotion of earlier maturity. Fertilisers should be applied in spring just prior to planting through broadcasting or band placed with the seeds. Avoid direct contact between seeds and fertilisers because germinating field peas are extremely sensitive to salt concentrations. The crop is considered as one of the highest nitrogen fixing crops, therefore, the plants do not require much added nitrogen. Heavy application of nitrogen increases costs without raising yield.

### IRRIGATION

The water requirement of peas is comparatively low. Pre-sowing irrigation is essential for proper germination if the soil is dry. The frequency of irrigation depends on the type of soil and winter showers. Generally two to three irrigation intervals are required. Soil moisture deficit reduces growth and hampers nodulation. Frequent irrigation should always be avoided (as excess moisture results in yellowing of the crop, reducing the yield) but the crop must be provided with irrigation at the pod-filling stage and when frost is expected during the growth period. Furrow irrigation is generally used for irrigating peas but the sprinkler irrigation method is better. Moisture stress conditions during flowering and subsequent pod-filling stage severely limits the yield and the quality of the pods.



### Peas: Testing the learning: Fertilisation and Irrigation

- Has your soil been tested? Yes/No
- Fertilisers should be applied in spring just prior to planting. True/False

### Peas: Micro Jobbing: Fertilisation and Irrigation

- Do you have access to other water?
- Show us how you will get the water to your crops.
  - Take a picture.
- Have you use fertiliser or compost? Yes/No
- If you have used fertiliser or compost, please take a photo of the product



## Peas – Weed control

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- Weeds should be rigorously controlled.
- The critical period of weed competition is 3 to 8 weeks after emergence.
- The pea crop severely suffers because of weed growth at the early stages. This may be the result of wider spacing given for hand picking of green pods or for slow growth of pea during the early stage.
- Later the crop smothers the weed growth by covering the ground.
- Generally 2 to 3 weedings are necessary to keep the field free from weeds.
- Manual weeding is better than mechanical weeding as it may damage the root system.
- Weeding at later stages is avoided as it may also damage the crop by trampling and mechanical breakage of tender and succulent stems and branches.
- Weeds can be controlled by hand weeding where labour is cheap, whereas chemical weed control is more practical in large-scale production.
- Early land preparation can encourage weed seeds to germinate so that they can be destroyed in subsequent cultivation.



### Chemical weed control

Registered herbicides could be used before planting for controlling annual grasses and many broadleaved weeds, pre-emergence herbicides should be sprayed after planting before field pea and weed emergence and post-emergence herbicides should be applied when annual broadleaves are small and actively growing, but only after three pairs of pea leaves (usually four nodes) are present.

### Peas: Testing the learning: Weed Control

- Weeding is critical between the 3<sup>rd</sup> and 8<sup>th</sup> week after emergence. True/False

### Peas: Micro Jobbing: Weed Control

- Relook at the plan with your agent and plan for chemicals.
  - This plan must include which of the chemical or herbicide you will use and when.
- Take a photo of the weeds growing in crops.

**This stage of planning and growing may not be necessary if you are using natural growing program. If you are not going to use chemicals, please tell us.**

### Using chemicals – Yes or No



## Peas – Pest/Insect and Disease Control

Lots of insects and animals love beans as much as you do, including:

PEST/INSECTS	DAMAGE	TREATMENT
Pea aphid	Causes injury by sucking plant sap which causes foliage and blossoms to wilt and shrivel. Aphids may be vectors for viral diseases. It is light green in colour.	Registered insecticides
Pod borers, loopers, army worms and alfafa caterpillars	Foliage feeders	Registered insecticides
Seed corn maggot	Feeds on sprouting seed or on seedlings	Coat the seed with an insecticidal seed treatment
Pea weevil	Larvae feed on the leaves	Use registered cultivars
Pea cyst eelworm	Stunted plants turn yellow and die off	Practice crop rotation

### Diseases

Controlling disease in field pea begins with crop rotation. Rotation with small grain/canola or lentil is also good in controlling diseases:

DISEASE	SYMPTOMS	IDEAL CONDITIONS	PREVENTION/TREATMENT
Seed rot	Seed is infested shortly after planting and seedlings fail to emerge	Cool weather	Application of registered fungicide
Fusarium root rot	Infections occur where the cotyledons are attached to the stem. Brownish-red discoloration of the vascular tissue. The root's vascular tissue may also be discoloured (reddish streaks).	Warm, dry soil conditions, excessive compaction and low soil fertility	Planting field pea in a four year rotation with other crops.  Use resistant cultivars
Ascochyta blight (Leaf and pod spot) seed borne	Purplish to black, streaky, and irregularly shaped lesions on the stem	Cool to moderate and humid conditions	Practice crop rotation.  Use resistant cultivars
Septoria blight (fungus)	Causes the leaves to appear yellowish and shrunken	Cool weather	Remove infected/diseased/dropped leaves
Bacterial blight	Produces water soaked lesions on all parts of the plant, which may	Highly humid conditions	Warm, dry weather reduces mildew growth





	appear creamy and slimy		
Pea mosaic (viral disease)	Stunting and mottling of leaves with streaks of yellowing on the stems. Early infection causes the plant to die off.	Highly humid conditions	Practice crop rotation Apply registered insecticides
Mycosphaerella foot rot (fungus)	Causes purple spots or lesions on the leaves, stems, flowers, pods and seeds. Infected leaves will prematurely die off, resulting in premature ripening of the plant. Lesions on pods can develop. Infected seed will be shrunken and discoloured.	Severe in wet weather	Use the disease free cultivars
Ascochyta foot rot (fungus)	Form blackish-purple lesions on the stem at the base of the plant. Severe infections will result in premature ripening, lodging, shriveled seed and reduced yields.	Survive on plant debris, and spores can survive for years on field pea stubble. Spores of both fungi can also be carried on the seed.	Planting disease-free seed
Aphanomyces root rot (fungus)	Black lesions on the roots, stunted plants and weak, plants turn yellow, shrivel and die off maturely.	Saturated soil for a long period of time	Minimising soil compaction. Planting oats as a pre crop
Sclerotinia stem rot (fungus)	White, frothy, fungal growth found on dead or decaying tissue. Cause premature ripening of the plant	Wet and cold conditions	Overturning the soil with a deep ploughing action before planting to bury the survival structures of the pathogens
Powdery mildew	Causes white powdery spot on the lower leaves and stems. Infected leaves stay green and leaves turn yellow.	Wet or heavy dew conditions. Late planting. The disease overwinters on plant residue.	Correct time of planting  Use of resistant varieties

### Peas: Testing the learning: Pest and Disease Control

- What is the most important two things I need to do every day?
  - *Walk around the crop*
  - *Pull out the weeds*
  - *Look for aphids (small bugs)*
  - *Ensure there is enough water.*
- How long does the crop take to grow?
- What will I use to spray the crop down?



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## Peas: Micro Jobbing: Pest and Disease Control

- Take a photo of your crop every Tuesday.
- Complete the job sheet every week.

Date	Task	Proof of task
Day 1	Prepare lands	
Day 2	Plant seed	
<b>Week 1</b>	How much water did the crop get this week?	
	Did you add fertiliser? If yes, how much.	
	Were there lots of weeds to take out?	
	Did you need to spray for pests? If yes, how much.	
	Did you need to spray for diseases? If yes, how much.	

*The above needs to pop up every Tuesday for the full growing cycle of 20 weeks*



## Peas – Harvesting Process

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Harvesting period: 58 to 74 days, depending on variety and growing conditions (soil, temperature, and moisture).

### Garden peas

1. Pick garden peas when pods are round and full.
2. When the pea pods are swollen (appear round) they are ready to be picked.
3. Pick a few pods every day or two near harvest time to determine when the peas are at the proper stage for eating.
4. Peas are of the best quality when they are fully expanded but immature, before they become hard and starchy.
5. The last harvest (usually the third) is made about one week after the first.
6. Pulling the entire plant for the last harvest makes picking easier.
7. The smooth-seeded varieties tend to have more starch than the wrinkled seeded varieties.
8. The wrinkled-seeded varieties are generally sweeter and usually preferred for home use.
9. The smooth-seeded types are used more often to produce ripe seeds that are used like dry beans and to make split-pea soup.
10. Snap peas have been developed from garden peas to have low-fibre pods that can be snapped and eaten along with the immature peas inside.
11. Snow peas are meant to be harvested as flat, tender pods before the peas inside develop at all.

### Peas: Testing the learning: Harvesting

- Can I hand harvest peas? Yes/No
- Harvesting period is between 58days to 74 days. True/False

### Peas: Micro Jobbing: Harvesting

- When your crop is ready for harvesting, take a photo of the crop before harvesting.



Peas – Production Schedule

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Soil sampling	■											■
Soil preparation		■										
Planting				■	■							
Fertilisation				■	■							
Irrigation				■	■	■	■	■				
Pest control				■	■	■	■	■	■	■	■	■
Disease control				■	■	■	■	■	■	■	■	■
Weed control				■	■	■	■	■	■	■	■	■
Harvesting									■	■		
Marketing	■	■							■	■	■	■

**Peas: Testing the learning: Production schedule**

- Do you have a copy of the production schedule? Yes/No

**Peas: Micro Jobbing: Production schedule**

- Take a photo of your log of production schedule



## Peas – FAQ

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1. How long will peas produce?

- a. 2 to 3 months

If you allow the first dozen or two pods to mature and develop seeds, that may exhaust the plant and become your entire harvest; whereas, if you harvest all pods when young, a pea plant may continue to produce consistently for 2 to 3 months or longer.

2. What season do peas grow in?

- a. Sow directly into the soil from mid spring onwards. Some varieties can be planted year round. Sow in batches for a continuous supply.

3. What does peas need to grow?

- a. Peas like rich, well-drained soil. They benefit from a little nitrogen fertilizer at planting time, because it takes several weeks before the root nodules are able to produce nitrogen. Peas are rarely bothered by insects or disease and are usually ready to eat about three weeks after they start to flower.

4. Do peas need full sun?

- a. Peas

They need some sun (about four to five hours per day) to produce flowers and pods, but they tend to fade out as the temperature warms. Planting them in a cool shady spot will lengthen your growing season.

5. Why won't my peas grow?

- a. Any number of poor growing conditions can also attribute to garden peas not producing. Cold, wet springs or hot, dry weather can impede the development of root nodules and inhibit nitrogen fixing. Planting peas too late in the season can cause the plants to turn yellow and die before setting pods.

6. Do pea plants die after harvest?

- a. Harvest sooner, as soon as peas fill out but are still tender and succulent. Pods left on the vines too long will become hard and woody. Plants stop producing pods; leaves turn yellow, then brown, and die.

7. Can I grow peas in winter?

- a. Sow peas between March and early July. For earlier crops that are ready from May onwards, sow in autumn or late winter (bear in mind you may experience losses from cold weather or mice). ... Alternatively, start plants indoors in autumn to avoid seeds being eaten by pests.