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# growing field peas

S. T. ALI-KHAN and R. C. ZIMMER  
Research Station, Morden, Manitoba

In Canada, field or dry peas, *Pisum sativum* L., are used mainly in the manufacture of soup. On a smaller scale, they are marketed in packets in whole or split form. Also, field peas are an important source of protein in animal nutrition.

Early in the 20th century the production of field peas was at its peak in Canada; approximately 3 million bu (82,000 metric tonnes) were produced, mainly in Ontario and Quebec. But in 1940, production started to decline and by 1950 only 652,000 bu (17,800 metric tonnes) were produced. Since 1945 Manitoba has been the major producer. The average area planted in field peas from 1957 to 1971 was approximately 66,000 acres (27,000 ha). In 1970, Canadians planted a record crop of 86,400 acres (35,000 ha), of which Manitoba had 52,000 acres (21,000 ha). In Manitoba, most of the crop is grown in the southern region from Portage la Prairie to the international border.

## Description

Peas belong to the legume family, Leguminosae, and are related to a number of other crops such as navy beans, soybeans, alfalfa, clovers, vetches, and several wild plants. Peas are annual plants that have angular-shaped twining, trailing stems. They have a taproot system. The nodules on the roots contain nitrogen-fixing bacteria that make atmospheric nitrogen available to the plant. Because of this property, peas are a valuable addition to crop rotation; they increase rather than deplete the nitrogen supply.

The flower is papilionaceous, which means that the five petals of the corolla are irregular in shape with one standard, two wings, and two keels. The petals vary from white to blue. Peas are naturally self-pollinated, and fertilization occurs before the flowers open. After fertilization, pods form, which contain various numbers of seeds depending on the variety of pea.

## **Adaptation**

Peas are well adapted to a cool climate. Hot weather, especially at the time of flowering, is harmful and causes blasting of the flowers. Well-drained clay loam soils are considered best for peas. Light sandy soils, which do not hold moisture, tend to produce lower yields. Good drainage is essential to minimize diseases such as root rot.

## **Rotations**

To avoid diseases, do not grow peas again on the same land for at least 5 years. To reduce weed problems, grow peas after summerfallow. Because of its nitrogen-fixing properties, the pea crop leaves the soil rich in nitrogen, which is beneficial to the succeeding crops, especially cereals.

## **Fertilizers**

Peas respond well to phosphate fertilizer and to potash. Most of the Manitoba soils contain enough potash. Nitrogen needs are usually met by nitrogen-fixing bacteria, but because the bacteria are not very active in early spring, it is helpful to add some nitrogen fertilizer to give your plants an early and better start. To determine fertilizer requirements, test your soil. It is considered that soils high in phosphate and potash tend to produce better cooking peas.

## **Seeding**

Cultivate your land in the spring to help warm up the soil. Level and firm the seedbed for uniform germination and maturity. Experiments at the Research Station, Morden, have shown that seeding in early May produces the best yields.

Use a regular grain drill for seeding peas. Sow the seeds in rows 6 in. (15 cm) apart and 2 to 3 in. (5 to 8 cm) deep. The seeding rate depends on seed size. Small-seeded varieties such as Trapper are sown at 2 bu/acre (135 kg/ha), whereas 3 bu/acre (200 kg/ha) are needed for the large-seeded varieties such as Century. Treat the seed with a recommended fungicide. When you grow peas for the first time, treat the seed with a recommended nodule-forming bacterium just before seeding.

## **Weed Control**

Because peas do not compete well with weeds, thorough weed control is essential. Several herbicides are available that control wild oats, foxtails, barnyard grass, and some broad-leafed weeds. Consult your agricultural representative for the correct material to use.



## Disease Control

To reduce loss caused by disease:

- Sow sound, clean, disease-free seeds of recommended varieties that have been treated with a fungicide.
- Follow sanitation measures to reduce the amount of pea refuse left on the soil after harvesting. Plow under any refuse not already destroyed.
- Locate new plantings as far away as possible from those of the previous year.
- Follow a crop rotation plan in which peas are not sown more than once every 5 years and in which peas do not follow flax, sugar beets, or other legumes.

Several diseases occur on field peas each year in Canada. They are caused by microorganisms (pathogens) such as fungi and bacteria and by viruses, which are too small to be seen through an ordinary microscope.

Some of the pathogens that cause disease on peas are seed-borne, or present in the soil, or both. Once established, some diseases persist in the soil for a number of years. Use crop rotation and sanitation measures to control these soil-established diseases. Most of the pathogens that cause disease on leaves and stems of peas persist on dead foliage. Remove and burn or plow down this plant debris to reduce infection early in the season. When good crop rotation practices are followed, plant debris decomposes between plantings of the same crop. With other diseases, for example root rot, crop rotation does not effectively control the various pathogenic fungi that may persist in the soil indefinitely.

Field peas are affected most often by leaf and stem diseases, wilting, and root rot.

*Leaf and stem diseases* — One of the most common leaf and stem diseases is caused by the fungus *Ascochyta*. This disease also infects the pods and consequently the three species of this fungus are seed-borne.

The most effective method of controlling the *Ascochyta* diseases is to grow resistant varieties. Century, the most commonly grown variety of field pea in Canada, has some tolerance for the various leaf and stem diseases. However, because only partial resistance has been developed, other control measures are necessary. Destroy as much pea refuse as possible at harvest. If this is not practical, deep plow the refuse to hasten decomposition. Follow a crop rotation in which peas are not planted more than once in 5 years. One species of *Ascochyta*

produces a windblown spore that is capable of being spread long distances. This species persists on dead foliage in or on soil for 3 years, or longer. Therefore, locate pea plantings as far away as possible from the previous year's fields.

The control measures for the *Ascochyta* diseases are effective also for other leaf and stem diseases of peas such as bacterial blight, septoria blight, and powdery mildew.

*Wilt* — When the plants show early symptoms such as yellowing of lower leaves and stunting and slight downward curling of leaf edges, they may be infected with wilt. Two species of this fungal pathogen, *Fusarium*, which infect peas, may persist in the soil for a very long time. For this reason, crop rotation is not an effective method of control. The most effective control method for this disease is to grow resistant varieties. Only the older varieties, Alaska and Arthur, are known to possess strong resistance. Century probably has some tolerance, because wilt does not seem to be a problem in Manitoba.

*Root rots* — Root rot of peas may be caused by several fungi such as *Fusarium*, *Pythium*, or *Rhizoctonia*. Plants may be infected at various stages of growth. When infection is severe, the roots may be almost completely destroyed and the plants can be pulled easily from the soil. To control this type of disease, do not plant peas more than once every 5 years or in rotation after flax, sugar beets, or other leguminous crops such as alfalfa or sweetclover.

*Other diseases* — Several virus diseases, rust, anthracnose, and downy mildew have been described on peas in Canada, but these diseases are rarely severe enough to cause a problem.

If you have a disease problem in your pea fields, consult your agricultural representative (or the nearest Research Station, Canada Department of Agriculture; provincial department of agriculture; or appropriate department at the nearest university). A specific diagnosis of your problem and appropriate control recommendations can be made.

The following table lists the main diseases of peas and their control measures.

## **Insect Control**

Aphids are commonly found on peas. Pea plants can support small populations of aphids with little injury. However, in hot weather aphids propagate quickly and damage the plants. Yellow patches in the fields are common when the aphid infestation is high. Check fields daily when the weather is hot and dry at flowering time. If damage appears likely, consult your agricultural representative for the latest recommended insecticide and its method of application.

## METHODS FOR CONTROLLING DISEASES IN PEAS

| Disease                        | Crop rotation | Sanitation | Disease-free seed | Resistant variety |
|--------------------------------|---------------|------------|-------------------|-------------------|
| <i>Ascochyta</i>               |               |            |                   |                   |
| <i>A. pinodella</i>            | +             | +          | +                 | -                 |
| <i>A. pinodes</i> <sup>1</sup> | +             | +          | +                 | -                 |
| <i>A. pisi</i>                 | +             | +          | +                 | +                 |
| Bacterial blight               | +             | +          | +                 | -                 |
| Powdery mildew                 | +             | +          | -                 | + <sup>2</sup>    |
| Root rot <sup>3</sup>          | +             | -          | -                 | -                 |
| Septoria blight                | +             | +          | -                 | -                 |
| Wilts                          | -             | -          | -                 | +                 |

Note: Plus (+) indicates the recommended control practices to follow.

Minus (-) indicates either that this is not a recommended control practice or that not enough is known to recommend it as a good control practice.

Treat all seed to prevent seed decay and damping-off.

<sup>1</sup> Because *A. pinodes* produces a windblown spore, new fields should be located as far away as possible from the previous year's plantings.

<sup>2</sup> Century appears to have some tolerance. Early planting will reduce the severity of this disease.

<sup>3</sup> To help control root rot, apply fertilizer, which will promote vigorous growth, and plant field peas in well-drained areas.

## Harvesting

Harvest peas only when they are mature and hard in the pod. To avoid excessive shelling, cut the crop in the early morning or evening, when the plants contain more moisture. The crop can be combined either at the same time as or after swathing. Because pea swaths are light and can be easily tangled by winds, it is best to swath in calm weather.

Harvesting attachments, such as pea guards or pickup fingers, are available to help lift the pea vines before they are cut. The pickup fingers should barely touch the ground and, when crops are very heavy, may be placed 2 or 3 in. (5 to 8 cm) above the ground.

When you are combining or threshing field peas, feed the crop steadily into the combine and reduce the cylinder speed to 500–600 rpm to prevent splitting the peas. If the peas are very dry, lower or remove the concaves to avoid splitting.

If the crop is weedy, cut smaller swaths to help prevent the seed of immature weeds from plugging the combine. If immature weed seeds or other damp material gets mixed with the threshed peas, clean them promptly to avoid heating in the bin. Different sizes of screens are used for cleaning, depending upon seed size, varieties, and condition of harvested crop. Usually screens with round holes 18/64 to 24/64 in. (7.1 to 9.5 mm) are used on the top of a cleaner.



## Marketing

Most farmers deliver the crop as it comes from the combine. Elevators handling peas are well equipped to clean, grade, and remove trash and broken or split peas before the crop is shipped to the market. Approximately half of the Canadian crop is exported as whole peas and a quarter as split peas.

## Varieties

Most field peas grown in Canada are used for making soup. The yellow-seeded varieties are preferred for this purpose. Century is the most commonly grown variety in Canada. It is a yellow large-seeded (235 g/1,000 seeds) variety with high yielding ability and good cooking quality. It was licensed in 1960 and is grown on 90% of the pea acreage in Canada.

A yellow small-seeded (135 g/1,000 seeds) variety, Trapper, was licensed in 1971 to replace Chancellor. Trapper is higher yielding than Chancellor, has good cooking quality, but generally yields lower than Century. However, in some years, it has yielded as much as Century. Trapper contains more protein than Century and is suitable for livestock feed.

Green or blue peas are grown commercially in very limited amounts. Delwiche Scotch Green and Rondo are grown in some areas near Portage la Prairie and Brandon, Man.; however, these varieties are not licensed in Canada. As a result of hot and dry weather, green peas tend to lose their green color from the cotyledons. Consequently they look bleached and unattractive. Alaska peas were tested in Manitoba, but they yielded poorly and were susceptible to disease; this variety is not recommended.



## METRIC EQUIVALENTS

### LENGTH

|                 |                        |
|-----------------|------------------------|
| inch = 2.54 cm  | millimetre = 0.039 in. |
| foot = 0.3048 m | centimetre = 0.394 in. |
| yard = 0.914 m  | decimetre = 3.937 in.  |
| mile = 1.609 km | metre = 3.28 ft        |
|                 | kilometre = 0.621 mile |

### AREA

|                                     |                                 |
|-------------------------------------|---------------------------------|
| square inch = 6.452 cm <sup>2</sup> | cm <sup>2</sup> = 0.155 sq in.  |
| square foot = 0.093 m <sup>2</sup>  | m <sup>2</sup> = 1.196 sq yd    |
| square yard = 0.836 m <sup>2</sup>  | km <sup>2</sup> = 0.386 sq mile |
| square mile = 2.59 km <sup>2</sup>  | ha = 2.471 acres                |
| acre = 0.405 ha                     |                                 |

### VOLUME (dry)

|                                     |                                |
|-------------------------------------|--------------------------------|
| cubic inch = 16.387 cm <sup>3</sup> | cm <sup>3</sup> = 0.061 cu in. |
| cubic foot = 0.028 m <sup>3</sup>   | m <sup>3</sup> = 31.338 cu ft  |
| cubic yard = 0.765 m <sup>3</sup>   | hectolitre = 2.8 bu            |
| bushel = 36.368 litres              | m <sup>3</sup> = 1.308 cu yd   |
| board foot = 0.0024 m <sup>3</sup>  |                                |

### VOLUME (liquid)

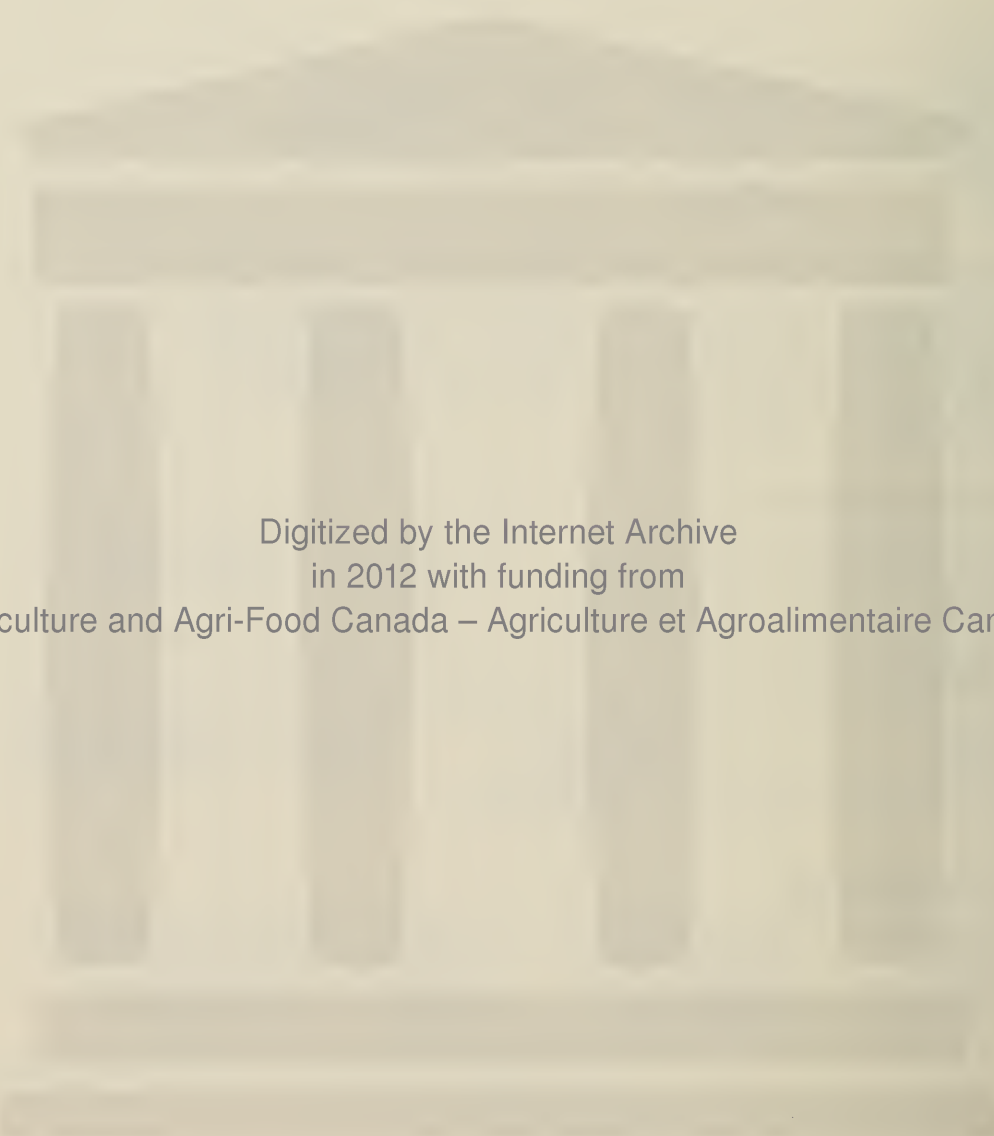
|                               |                         |
|-------------------------------|-------------------------|
| fluid ounce (Imp) = 28.412 ml | litre = 35.2 fluid oz   |
| pint = 0.568 litre            | hectolitre = 26.418 gal |
| gallon = 4.546 litres         |                         |

### WEIGHT

|                                 |                          |
|---------------------------------|--------------------------|
| ounce = 28.349 g                | gram = 0.035 oz avdp     |
| pound = 453.592 g               | kilogram = 2.205 lb avdp |
| hundredweight (Imp) = 45.359 kg | tonne = 1.102 short ton  |
| ton = 0.907 tonne               |                          |

### PROPORTION

|   |   |
|---|---|
| 1 gal/acre = 11.232 litres/ha           | 1 litre/ha = 14.24 fluid oz/acre        |
| 1 lb/acre = 1.120 kg/ha                 | 1 kg/ha = 14.5 oz avdp/acre             |
| 1 lb/sq in. = 0.0702 kg/cm <sup>2</sup> | 1 kg/cm <sup>2</sup> = 14.227 lb/sq in. |
| 1 bu/acre = 0.898 hl/ha                 | 1 hl/ha = 1.112 bu/acre                 |



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