

## FIELD SELECTION

### Moisture

Peas thrive in relatively dry soil conditions and are susceptible to root rot in wet soils. Choose fields with well-drained, coarse-textured soils that are not prone to compaction or waterlogging. Under optimum soil moisture conditions, peas will use 12–15 inches of water.<sup>1</sup>

### Salinity

Peas are more tolerant to salinity than dry beans but more sensitive than soybeans. Plant peas in soil with soluble salts < 1.7 mmho/cm.<sup>2</sup>

### Herbicide Carryover

Residual herbicides that have re-cropping restrictions for peas the year following application include atrazine, clopyralid, flucarbazone, imazamethabenz and ethametsulfuron.

## SEEDING

### Seeding Date

Seed peas from late April to early May. Peas are more tolerant to spring frost than other crops because of hypogeal emergence, where pea cotyledons remain underground. If frost injury does occur, new shoots will emerge from axillary buds that are protected under the soil surface.

### Soil Temperature

Unlike soybeans, peas are very tolerant to cool soil temperatures. Cooler soil caused by surface residue in no-till systems will not be detrimental, but the mulch can trap excess moisture. Peas generally yield highest when grown after winter/spring wheat or barley.<sup>3</sup>

### Target Plant Stand and Seeding Rate

Target 80–90 live plants/m<sup>2</sup>. Adjust the seeding rate (lbs/ac) to account for expected seedling survival and seed weight, which varies considerably among market class, variety and seed lot. Typical seedling survival for peas is 85%.

### Seeding Depth

Seed peas at 1.5–2 inches deep, ensuring they are planted into moisture.

### Rolling

Land rolling should be done to improve harvestability and reduce earth tag, even on soil without stones. Rolling can be done immediately after seeding or post-emergence up to the 5th node stage. If rolling post-emergence, roll during the warmest part of the day. Avoid rolling as the crop is emerging, just after emergence or if the crop is stressed due to herbicide or frost.

## CROP NUTRITION

### Inoculant

Inoculate peas with *Rhizobium leguminosarum* bacteria, even on fields with a history of peas, to facilitate root nodule development and biological nitrogen (N) fixation. Consider double inoculating fields with no history of peas or using a granular inoculant when seeding conditions are unfavourable (drought, excess moisture or acidic soils). Check nodulation at the 6–9th node stage. Rescue N applications should be applied during the 9–12th node stage should nodulation failure have occurred.



Pea nodules branch as they develop and are more oval-shaped compared to soybean nodules.

### Fertility

Peas can, on average, biologically fix 55% of their N requirement so N fertilizer is generally not required. N rates (<15 lbs N/ac) commonly applied with starter fertilizer blends may improve early growth before nodules begin fixing N, particularly on cold soils with low soil N reserves. However, higher N rates can inhibit nodule development and N fixation.

Starter phosphorus (P) fertilizer has been shown to increase pea yields even on high P soils.<sup>4</sup> Maximum seed-row safe rates are 20 lbs P<sub>2</sub>O<sub>5</sub>/ac with seed bed utilization (SBU) >15%. P fertilizer should be placed away from the seed-row with lower SBU. Potassium and sulphur fertilizers, necessary only on low testing soils, should be applied away from the seed-row as they cause more seed toxicity than P fertilizer.

TABLE 1. AVERAGE FIELD PEA NUTRIENT REMOVAL RATES

NUTRIENT	REMOVAL	
	lbs/bu	lbs/ac*
Nitrogen (N)	2.3	117
Phosphorus (P <sub>2</sub> O <sub>5</sub> )	0.69	34.5
Potassium (K <sub>2</sub> O)	0.71	35.5
Sulphur (S)	0.13	6.50

\*Based on 50 bu/ac field pea crop

## PEST MANAGEMENT

### Insects

Consider an insecticide seed treatment in fields with a history of wireworms. Pea leaf weevil, which also feeds on seedlings and can be controlled with seed treatment, has not yet been identified in Manitoba but has been found in western regions bordering Manitoba. Cutworms will not be controlled by seed treatment and peas can re-grow if seedlings are clipped.



Pea aphids tend to feed on the youngest leaf tissue. Unfold the clam leaf (newest stipule) to check for aphids.

Pea aphids can be a sporadic pest in Manitoba. Scout for pea aphids at early flower. At four locations per field, check five plant tips (top 8 inches), or conduct 10 sweeps with a sweep net. If the economic threshold is reached (2–3 aphids/plant tip or 90–120 aphids/sweep<sup>6</sup>), apply foliar insecticide at first pod to protect plants from feeding during pod formation and elongation.

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## Weeds

Avoid fields with known infestations of perennial, biennial and/or Group 2 resistant weeds such as cleavers, kochia, wild mustard and smartweed. Pre-emergent herbicide (PEH) is recommended, as peas are relatively poor competitors, especially early in the growing season. Yield can be reduced up to 25% by delaying weed control until four weeks after emergence.<sup>5</sup> PEH options can provide excellent control of Group 2 resistant broadleaf weeds, which have limited in-crop control options (Table 2). Most broadleaf in-crop products perform best at the 2nd to 6th above-ground node stage and late application may result in crop injury and yield loss.

TABLE 2. HERBICIDE OPTIONS FOR FIELD PEAS\*

HERBICIDE GROUP	ACTIVE INGREDIENT	TRADE NAME
<b>Pre-emergent herbicide options</b>		
2	Tribenuron	Express SG, Spike, Nuance, Mpower X, Inferno WDG
3	Ethalfuralin	Edge
	Trifluralin	Treflan Liquid, Treflan MicroActiv, Rival, Bonanza
4	MCPA Ester	GoldWing
8	Triallate	Treflan Liquid, Treflan MicroActiv, Rival, Bonanza
9	Glyphosate	–
11	Amitrole	Amitrol 240
14	Carfentrazone	Aim, Authority Charge, CleanStart
	Flumioxazin	Valtera
	Pyraflufen-ethyl	GoldWing
	Saflufenacil	Heat WG, Heat LQ
	Sulfentrazone	Authority, Authority Charge, Authority Supreme
<b>In-crop herbicide options</b>		
1	Clethodim	Select, Centrurion, Arrow, Shaow RTM, Patron 240 EC, Antler, MPower Independence
	Quizalofop	Assure II, Yuma GL, Contender
	Sethoxydim	Poast Ultra, Odyssey Ultra, Odyssey Ultra NXT
2	Imazemox	Odyssey, Odyssey Ultra, Odyssey NXT, Viper ADV
	Imazethapyr	Pursuit 240, MPower Kamikaze, Phantom, Gladiator, MultiStar, Duet, Odyssey, Odyssey Ultra, Odyssey NXT
4	MCPA	–
	MCPB/MCPA	Clovitox Plus, Tropotox Plus, Topside
5	Metribuzin	Sencor Solupak 75 DF, Sencor 75 DF, Squadron, TriCor 75 DF, Buzzin 70 WDG, Metrix SC
6	Bentazon	Basagran, Basagran Forté, Viper ADV, Benta Super

\*Consult the Manitoba Agriculture Guide to Field Crop Protection and product label for details.

## Diseases

A minimum of four years between pea crops is recommended to minimize yield-limiting disease. Fields diagnosed with *Aphanomyces euteiches* should be cropped to peas only once every seven to eight years to reduce inoculum levels in soil.

To protect seedlings from common root rots such as *Fusarium oxysporum*, *F. avenaceum* and *A. euteiches*, use a fungicide seed treatment when planting peas in short rotations, or when soil conditions are cool, wet or compacted. Seed treatment will only provide effective disease control for up to three weeks after seeding, and neither seed treatment nor foliar fungicide will control mid-season infection of *A. euteiches*.

Mycosphaerella blight (*Ascochyta pinodes*) is the most prevalent and economically important foliar disease in Manitoba field peas. Symptoms include purplish leaf, stem and pod lesions that start as irregular flecks and may develop circular, concentric rings. It is often confused with bacterial blight, however the main source of inoculum is crop residue, not contaminated seed. Cool, wet weather and short rotations favour disease development.

Begin scouting at the 10th node stage and use the *Fungicide Decision Worksheet for Managing Mycosphaerella Blight in Field Peas* to determine your risk of yield loss due to Mycosphaerella. The first foliar fungicide application should occur at early flower. If infection continues to spread up the canopy and moist conditions persist, a second application can be made 10–14 days later using a different fungicide group.

Sclerotinia and downy mildew are found less frequently in field peas and symptoms are seldom severe. All pea varieties are bred with resistance to powdery mildew.

## HARVEST

Peas are ready to desiccate or swath when most pods (75–80%) are yellow/golden brown, seeds in the bottom pods become detached and rattle in the pod and overall seed moisture is <30%. Harvest can commence in 3–10 days post-desiccation, depending on the product chosen, weather and crop stage. Several active ingredients are registered as pre-harvest aids and desiccants for field peas, including carfentrazone, diquat, glyphosate, saflufenacil and flumioxazine. Some of these actives may restrict export to key markets. Visit [keepingitclean.ca](http://keepingitclean.ca) for up-to-date maximum residue limit advisories and consult your grain buyer before selecting a product. Harvest peas once average seed moisture is <20%. Combining in the humid parts of the day can reduce shatter loss, but tougher plant material may not feed as well. Matching the pick-up header or reel speed to ground speed will also reduce shatter.

## References

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- Franzen, D. 2013. Managing saline soils in North Dakota. NDSU Extension Service. [ag.ndsu.edu](http://ag.ndsu.edu)
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- Johnston A. M. and F. C. Stevenson, 2001. Field pea response to seeding depth and P fertilization. *Can. J. Plant Sci.* 81:573–575.

<sup>5</sup> Harker, K. N., R. E. Blackshaw and G. W. Clayton. 2001. Timing weed removal in field pea (*Pisum sativum*). *Weed Tech.* 15:277–283.

<sup>6</sup> Maiteki, G.A. and R.J. Lamb. 1987. Sequential decision plan for control of pea aphid, *Acyrtosiphon pisum* (Homoptera: Aphididae), on field peas in Manitoba. *J. Econ. Entomol.* 80:605–607.