ORGANIC FIELD PEAS

Production Guidelines

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.[1]

Salinity

Peas are more sensitive to salinity than soybeans. Plant peas in soil with soluble salt levels < 1.7 mmho/cm.[2]

Field History

Crop rotation is important for maximizing yield. Field peas should follow dissimilar crops, like cereals or oilseeds. Peas generally yield highest when grown after winter/spring wheat or barley.[3] Ensure at least four years between field peas or other pulse crops to help reduce disease problems, particularly root rots.

Field peas are poor competitors with weeds. Select fields where good control of aggressive perennial weeds, like Canada thistle and quack grass, has been achieved.

SEEDING

Seeding Date and Soil Temperature

Seed peas from late April to mid May. Field peas are very tolerant of cool soil temperatures and will germinate and emerge at lower temperatures than warm-season crops like soybeans or corn. Peas are more tolerant to spring frost than other crops because pea cotyledons remain underground. If frost injury does occur, new shoots will emerge from axillary buds protected under the soil surface. Later seeding may be necessary if pre-plant tillage for weed control is used. However, avoid planting in late May or early June. Late seeding can result in > 20% yield loss due to flower blasting during hot weather.[4]

Target Plant Stand and Seeding Rate

Target 120 live plants/m².[5] 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%, meaning 140 seeds/m² would be required to obtain 120 live plants/m².

Seeding Depth

Rapid and even emergence of field peas is important for maximizing yield. Prepare a firm seedbed and ensure good seed to soil contact when planting. Seed peas 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 2nd–3rd true 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 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 fixation. Consider double-inoculating (e.g., liquid on-seed plus granular in-furrow) 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 true node stages.

Fertility

Peas can, on average, biologically fix 55–80% of their N requirement, making the use of soil amendments to increase soil N supply unnecessary. Soils with high N levels (> 50 lbs/ac) can inhibit N fixation and increase crop lodging. Ensure fields are adequately supplied with P and K before growing peas. Since P is often yield-limiting, composted manure or other nutrient sources approved for organic production may be required.

AVERAGE FIELD PEA NUTRIENT REMOVAL RATES

Nutrient	Removal	
	lbs/bu	lbs/ac*
Nitrogen (N)	2.3	117
Phosphorus (P_2O_5)	0.69	34.5
Potassium (K_2O)	0.71	35.5
Sulphur (S)	0.13	6.50

*Based on 50 bu/ac field pea crop

PEST MANAGEMENT

Weeds

Yield loss in peas can be as high as 80% in the absence of effective weed control. There are several options for timing and method of mechanical weed control. Multiple passes are usually necessary to obtain acceptable weed control.[6]

Pre-plant: A variety of tillage tools can be used once or multiple times before planting to control early-emerging weeds. Depending on soil moisture conditions, such operations can dry soils to seed depth, leading to delayed and uneven emergence that will reduce crop competitiveness with weeds.

Pre-emergent: Before crop emergence, a rotary hoe or flex tine harrow can be effective at controlling small-seeded annual weeds

Post-emergent weed control using a combination of harrowing and cultivation (left) and a flex tine harrow (right).


Photo: David Rourke


Photo: Jason Peters

continued

such as green foxtail and wild mustard. Inspect fields to ensure weeds are at the "white thread" stage as this will maximize performance of either implement. The rotary hoe is most effective on dry soil surfaces and on warm, windy days with sunny conditions. With flex tine harrows, ensure that weeds are either uprooted or buried.

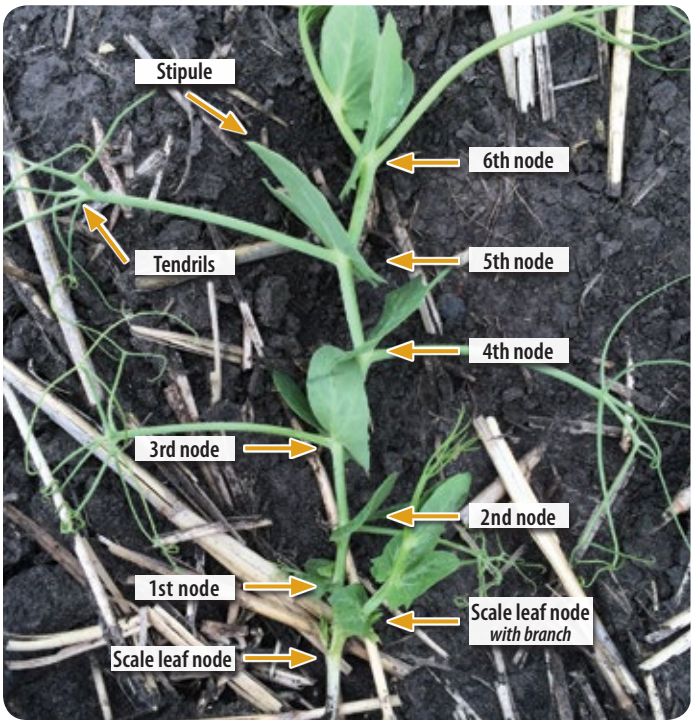
Post-emergent: The rotary hoe has a narrow post-emergence window. Effective weed control is achieved until the first leaf stage in grassy weeds and the cotyledon stage in broadleaf weeds.

Flex tine harrows can be used up to the 5th true node stage in peas. Adjusting tine angle can improve weed removal while minimizing crop damage. Tines adjusted 45% backwards to the direction of travel perform well.

Inter-row cultivation can be used from the 5–10th true node stages in peas and requires mechanical or electronically-guided equipment to prevent crop damage, particularly with narrow row spacings. It is effective at controlling large weeds between crop rows, but provides little control of weeds located within crop rows.

Post-emergent mechanical weed control should occur during the heat of the day when plants are less turgid. Inspect the job after an initial pass to ensure weeds are controlled and crop damage is minimized.

FIELD PEA STAGING This semi-leafless pea cultivar is at the 6th (true leaf) node stage. Stipules, which resemble elephant ears, are true leaves at the base of each node along the main stem. Scale leaf nodes may be above or below ground and are not counted when assessing pea node stages.



INSECTS AND DISEASES

Wireworms, cutworms and pea leaf weevil can cause seedling damage in peas. Reduced crop emergence is common if wireworms and cutworms are present. Pea leaf weevil root feeding reduces crop vigour and makes the crop more susceptible to root diseases. Pea aphids are a sporadic pest in Manitoba. Yield loss results from aphid feeding during pod formation and elongation.

To reduce seedling losses from root rots, employ production practices that contribute to rapid emergence and growth of seedlings. Mycosphaerella blight is the most prevalent and economically important foliar disease in Manitoba field peas. Cool, wet weather and short rotations favour disease development. Sclerotinia and downy mildew are found less frequently in field peas and symptoms are seldom severe. All yellow pea varieties registered in Canada are resistant to powdery mildew. Further information on pests can be found at manitobapulse.ca.

HARVEST

Swathing can be used to hasten the dry down of both weeds and the crop. Field peas are ready to swath when most pods (75–80%) are yellow to golden brown, seeds in the bottom pods become detached and rattle in the pod, and overall seed moisture is < 30%. Another option is to swath 3–4 days before combining to allow any green plants to dry down enough to go though the combine. Swathers are usually equipped with a pick up reel and vine lifters to handle lodged peas. Swathing can be risky as pea swaths are easily blown around by strong winds.

Peas are ready to harvest once average seed moisture is < 20%. If peas are harvested at 20% seed moisture, aerate to 15–16% moisture and 15°C to ensure quality and safe storage. Field peas can be swathed or straight cut when harvest-ready, but this is rarely an option due to green weeds and uneven maturity. With swathing, the combine should follow immediately behind to prevent pod shatter and keep swaths from blowing around. Combining during 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

[1] McKenzie, R. and S. Woods. 2011. Crop water use and requirements. Government of Alberta, Agri-Facts.

[2] Franzen, D. 2013. Managing saline soils in North Dakota. NDSU Extension Service. ag.ndsu.edu.

[3] MASC. Relative stubble yield response (2010-2015). https://www.masc.mb.ca/masc.nsf/ mmpp_crop_rotations.html.

[4] MASC. 2010 - 2019: Seeding date vs. average yield response. https://www.masc.mb.ca/masc.nsf/ mmpp_seeding_dates.html.

[5] Baird, J.M., Walley, F.L. and Shirtliffe, S.J. 2009. Optimal seeding rate for organic production of field peas in the northern Great Plains. Can. J. Plant Sci. 89: 455-464.

[6] Stanley, K. 2019. Weed management in organic pea production. Presentation at Organic Pea Production Meeting. University of Manitoba.

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