

Pulses in rotation with canola: Quick comparison						
Crop	Soybeans	Peas	Lentils	Chickpeas	Fababeans	Edible beans
Ideal growing conditions/locations	They can handle a wide range of soil types, including heavier soils. With longer seasons, yields and profits are often higher. Select varieties based on region/growing season length to ensure they reach maturity before fall frost. Excess moisture, high soil carbonates and/or salinity will aggravate iron deficiency chlorosis.	Dark Brown and Black soil zones are ideal. Peas are somewhat drought tolerant, but do not tolerate salinity, and low pH can inhibit nodulation. Lighter textured, well drained soil are ideal for reducing risk of root rot.	Lentils are well suited to Brown and Dark Brown soil zones, but can grow well in Black soils in moderate-moisture years (6-10" through the season). Lentils are short, shallow-rooted and somewhat resistant to high temperature and drought.	Chickpeas are best adapted to the Brown and Dark Brown soil zones, and not to heavy, clay soils. Chickpeas are heat tolerant and prefer warm days and nights and moderate moisture (6-10" per growing season.)	Fababeans are best suited to moist areas and well-drained loam or clay soils of pH 6.5 to 9.0.	Edible beans, in general, work well in the Black Soil Zone and a wide range of soil types. They are best suited to flat, well-drained land that is relatively stone-free.
Potential risks	Not having the season length for a break-even yield. Even with shorter-season varieties, this can be a challenge in some parts of the Prairies. Soybeans remove a lot of P and K. Soybeans, like all pulses, will also host sclerotinia. Volunteer canola is the most abundant weed in soybeans and therefore glyphosate will require an effective tank mix partner to control RR canola.	Peas don't emerge well in wet conditions and wet summers can result in high levels of disease. Aphanomyces and root rots are major disease threats. Pea leaf weevil requires insecticide seed treatment in areas affected by this pest. Harvesting the tangled crop can be slow, especially if the crop is uneven and desiccation was not used. Mature pea crops are also susceptible to wind losses. Market access issues, such as India's high tariff, can impact market opportunities.	Lentils are a short crop, which can cause harvest challenges. It leaves very little residue to hold soil. It does not compete well with weeds. Aphanomyces and root rots are major disease threats. Market access issues, such as India's high tariff, can impact market opportunities. Earth tag and down-grading due to off colour.	Chickpeas are a long-season crop and early frost can reduce yield and quality. Chickpeas are susceptible to ascochyta blight, an aggressive disease that can require multiple fungicide applications. Chickpeas are not competitive with weeds, and has fewer in-crop options than other pulses.	They are a long-season crop, so have to be seeded early and will still often be the last crop harvested. This does increase yield and quality risk with a September frost and delayed harvest. Pea leaf weevil requires insecticide seed treatment in areas affected by this pest, Lygus bug damage may downgrade crop out of human edible market. Fababeans have limited domestic and export markets at this time, so marketing a big crop could be a challenge.	Weed competition is low and herbicide options are limited, as with most pulses. Diseases, especially white mould (sclerotinia), can be costly in moist conditions, so fungicide is often required.
Potential rewards (when grown in rotation with canola)	Soybeans can fix a lot of their own N, so can help reduce whole-rotation N costs (but leave very little for following crops.) RR soybeans solve the potential weed management issue with pulses, especially with Group-2 resistant weeds, but will require tank mixing to manage glyphosate-resistant canola volunteers.	Peas generally leave behind more N than lentils, but that depends on yield. N credit from pea stubble is 0.5 to 1 lb./ac. of N for every bu./ac. of peas harvested. Peas often require minimal inputs, and may provide an N credit for the following crop.	Lentils can grow well through residue. Lentils are shallow rooted, so can leave more water for other crops in the rotation. Lentils may provide an N credit.	Chickpeas are shallow rooted, so can leave more water for other crops in the rotation.	Fababeans are better suited to the more typical canola growing regions - high moisture, cooler areas. Fababeans can work in areas where peas tend to get more disease problems. Fababeans are excellent N-fixers, better than other pulse crops, and may provide an N credit for the following crop. Fababeans seem to be less susceptible to disease. Fababeans are tall so often show better weed competition than other pulse crops.	Edible beans may not provide much of an advantage over other pulse crops. They will often result in an N neutral or N-deficit situation.
Specialized equipment required	Soybeans are often seeded with a row-crop planter, but they can be seeded with a drill in narrow rows. Rolling after seeding or post-emergence at the 1st trifoliolate stage (to reduce soil erosion from pulverized soil after seeding) is recommended in rocky fields. Combining is best done with a flex header as pods can be very low to the ground.	Peas work well when seeded with a drill. Rolling after seeding is recommended as crop is harvested right at ground level. Combining is best done with a flex header. If swathing, lifters and a pick up reel will help. Same with straight combining.	Lentils work well when seeded with a drill. Rolling after seeding is recommended as crop is harvested right at ground level. Combining is best done with a flex header.	Direct-seeding into tall (10-14") stubble is a good practice. Chickpeas work well when seeded with a drill. Rolling can help in rocky fields. Combining is best done with a flex header. Most chickpeas are straight-combined without desiccant.	Fababeans work well when seeded with a drill. Fababeans stand exceptionally well and pods are well off the ground, so a flex header may not be as important as it is for other pulses.	Can be direct seeded with regular drill, but Saskatchewan research shows higher yields when seeded with a planter in wider rows. Rolling after seeding is recommended as crop is harvested right at ground level. Edible beans can be undercut and windrowed or straight combined with a flex header.
Major inputs	Seed costs are high per acre, but like all pulses, fertilizer costs are much lower than for canola. In Manitoba, soybean input costs are lower than canola and yields are about the same. Therefore the breakeven price for soybeans is lower.	Inoculant is important, but with nodulation, peas can capture up to 80% of N needs from the air. Include seed treatment to manage early-season diseases. Multiple foliar fungicide applications are sometimes necessary to effectively prevent yield loss due to mycosphaerella blight.	Fungicide is often applied at least once per year. Aphid control may be required. Weed control, which should include pre-seed and pre-harvest as well as post-emergence. Use seed treatment and inoculant.	Ascochyta blight is an aggressive disease, and in moist season can be devastating to yield. Multiple fungicide applications may be required. Use seed treatment and inoculant.	Seeds are large so high seeding rates are required to hit target stands. Budget for \$50 per acre for seed, treatment and inoculant.	Seed, inoculant, seed treatment and fungicide are major input costs.
Canadian acres and production (2013-17 avg)	2013-17 averages for Canada are 5.69 million harvested acres and 6.43 million tonnes. 2017 results were 7.25 million acres and 7.72 million tonnes. Manitoba had 2.29 million acres and 2.25 million tonnes in 2017. Saskatchewan acres 4x higher in 2017 at 845,000. Most of the rest is in Ontario. USDA puts global soybean production at 341 million tonnes in 2017-18.	2013-17 averages for Canada are 3.84 million harvested acres and 3.98 million tonnes. 2017 results were 4.06 million acres and 4.11 million tonnes. Production in 2017 was evenly split between Saskatchewan and Alberta. FAOSTAT puts global pea production at just over 11 million tonnes per year. (avg of 2012 and 2013)	2013-17 averages for Canada are 3.92 million harvested acres and 2.51 million tonnes. 2017 results were 4.38 million acres and 2.59 million tonnes. Around 90% of acres and production is in Saskatchewan.	2013-17 averages for Canada are 143,000 harvested acres and 107,000 tonnes. 2017 results were 160,000 acres and 86,100 tonnes. This is all in Saskatchewan.	2014-17 averages for Canada are 71,500 acres and 85,800 tonnes. 2017 results were 93,000 acres and 99,800 tonnes. *The source, StatsCan, has no fababeans records for 2014.	2013-17 averages for Canada are 275,000 acres and 257,800 tonnes. 2017 results were 325,100 acres and 322,400 tonnes. Manitoba had 135,000 acres and 130,000 tonnes in 2017. Alberta 50,000 acres and 61,500 tonnes. Rest in Eastern Canada. FAOSTAT puts global bean (not soybean) production at around 23 million tonnes per year. (avg of 2012 and 2013)
Size of world export market/Canada's share	USDA put trade of soybeans (seed only) at 150 million tonnes in 2017-18. AAFC numbers for Canadian soybeans exports are 5.6 million estimated 2017-18. That has risen rapidly from 3.4 million in 2013-14.	FAOSTAT numbers for 2012 and 2013, the last available, show around 4 million tonnes per year in trade. AAFC numbers have Canadian pea exports at 2.65 million tonnes for 2012-13 and 2.78 for 2013-14. Canadian pea exports hit 3.9 million tonnes in 2016-17, then dropped back to 2.5 million in 2017-18.	According to AAFC stats, Canadian lentil exports rose steadily from 1.64 million tonnes in 2012-13 to 2.45 million in 2016-7, then fell back to 1.30 million in 2017-18.	Canadian chickpea exports ranged from 48,000 tonnes to 152,000 tonnes per year over the past five years. (AAFC)	Canadian fababeans exports were 2,500 tonnes in 2012-13 and rose to 25,100 tonnes in 2015-16. They fell back to 13,400 in 2016-17. (AAFC)	Canadian dry bean (edible bean) exports have been fairly consistent over the past five years, ranging from 297,000 to 337,000 tonnes. (AAFC)