Faba Bean Production Guidelines

Faba beans are an attractive alternative pulse crop option because they are excellent nitrogen (N) fixers, resistant to Aphanomyces and well adapted to cool, moist growing conditions.

Markets for faba beans are expanding in western Canada, as this crop is rich in protein. Domestic processing has been expanding, allowing select varieties of faba beans to enter markets as a protein and flour ingredient. Faba beans are becoming a more common cover crop option and animal feed markets are expanding for low-tannin varieties.

FIELD SELECTION

Moisture

Faba beans have a high moisture requirement, needing at least 10 inches (254 mm) of water over the growing season. If available, faba beans will use more than 15 inches of water. Choose fields that have good water-holding capacity with medium to heavy textures. Fabas grow well on loam or clay soils with a pH of 6.5–9.0.

Salinity

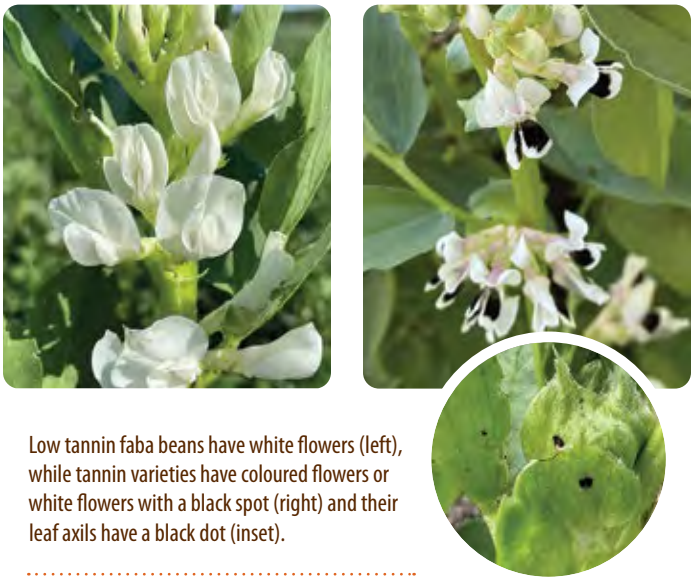
Faba beans are less tolerant to salinity than soybeans. Select fields with soluble salt levels less than 0.75 mmho/cm.[1] At 1.75 mmho/cm, 25% yield loss may be expected.

Crop Rotation

Similar to peas, faba beans are sensitive to damage from select soil residual herbicides like atrazine, clopyralid, fluroxypyr and ethametsulfuron. Refer to the *Guide to Crop Protection* for a full list of re-cropping intervals.

VARIETY SELECTION

Varieties fall into two categories – coloured flower (tannin) or white flower (low tannin). Tannin varieties have tan seed coats, white flowers with large black spots and a black spot on the leaf axils. They are grown for human consumption markets. Low tannin varieties have a light grey seed coat and white flowers and are grown mainly for the livestock feed industry.



Low tannin faba beans have white flowers (left), while tannin varieties have coloured flowers or white flowers with a black spot (right) and their leaf axils have a black dot (inset).

The faba bean industry is transitioning to low vicine/convicine (LVC) varieties. Vicine/convicine are anti-nutritional compounds that can cause rapid onset anemia in a small percentage of people. Including this LVC trait widely expands market opportunities for faba beans and is a required component of all new varieties.

Pollinators play a large role in faba bean production, and cross-pollination can occur in neighbouring fields. Ensure at least one kilometre between tannin and low tannin varieties and vicine/convicine-containing varieties and LVC varieties. Testing is often required to verify the integrity of LVC status of harvested faba beans.

Faba beans require 100–130 frost-free days from planting to maturity, depending on variety. Most varieties mature in 105–110 days. See MPSG's *Pulse and Soybean Variety Guide* or *Seed Manitoba* for faba bean variety data such as days to maturity and yield.

SEEDING

Residue Management

Faba beans are commonly grown following cereals and can be successfully grown in conventional, minimum or no-till systems, provided the previous crop residue is standing or well distributed.

Seeding Date

Plant faba beans in late April or early May to maximize yield. Faba beans are tolerant of cool soils and late spring frosts. Cotyledons of faba beans remain below ground, meaning they can regrow if above-ground damage like a killing frost occurs. The minimum temperature for faba bean germination is 3–5°C.

Hot temperatures during flowering can reduce seed set. Seeding early allows flowering to begin during cooler temperatures in June.

TARGET PLANT STAND AND SEEDING RATE

Target a living plant stand of 180,000 plants/ac (45 plants/m^2 or 4 plants/ft^2) and use narrow row widths.[2] There is wide variation in seed size among varieties and seed lots. Calculate seeding rates (seeds/ac) using thousand seed weight and expected seed survivability. Assess plant stand during early vegetative stages to inform future seeding rate decisions.

Some varieties have large seed sizes that require high seeding rates and may cause plugging issues during seeding. Plugging may occur at various points, such as the metering system, distribution system, blockage sensors and soil openers. Soil openers are the most common source of plugging.

Seeding Depth

Seed faba beans between 2–3 inches deep, placing seeds 0.5 inches into moisture. Faba beans can tolerate a deeper seed depth than soybeans since their cotyledons remain below ground.

Rolling

Faba beans are not typically rolled since plants remain upright and pod high above the ground. If rolling, roll before emergence since plant stems are stiffer than other pulses and may be damaged following emergence.

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TIPS TO AVOID FABA BEAN PLUGGING ISSUES IN AIR SEEDERS[3]	
1	Reduce planting speed to < 5 mph.
2	Use soil openers with large-diameter seed openings and minimal change in seed flow direction or tube shape.
3	Ensure the recommended metering roller or auger is installed for large seeds and high application rates.
4	Avoid sharp turns so that the inside end of the drill maintains forward speed with the toolbar engaged in the soil.
5	Ensure there are no tight radiuses or sags in distribution hoses.
6	Eliminate flow obstructions, like screws, in the distribution hoses.
7	Consider metering from multiple tanks to reduce the application rate demand on a single metering system of one tank.

CROP NUTRITION

Inoculant

Inoculate faba beans with *Rhizobium leguminosarum* bacteria to facilitate root nodule development and biological N fixation. Faba beans are excellent at fixing N, acquiring around 90% of their nitrogen requirements.[4] Single inoculation (one form or placement of inoculant) is often sufficient to support nodulation. Consider double inoculation if soils have been flooded recently or have no pea or faba history.

Fertility

Select fields with <50 lbs N/ac of residual nitrogen to facilitate nodule development. No additional N fertilizer is required.

Balance phosphorus (P) and potassium (K) removal with inputs throughout the crop rotation, maintaining soil test P levels of 10–20 ppm and K levels >100 ppm.

Faba beans are high P users and are more responsive to P fertilizer than peas or soybeans. Since fabas are seeded into cool soils, access to P early in the season will promote root development and early-season growth. The maximum safe rate of seed-placed P is 40 lbs P_2O_5/ac with 10–15% seedbed utilization (SBU) under good moisture conditions.[5] Calculate SBU by dividing seed spread behind the opener by row width (e.g., 9-inch rows with knife openers and 1-inch spread would have 11% SBU).

Potassium and sulphur are required for optimum yields on black and grey wooded soils and should be included based on soil test recommendations.[6]

AVERAGE FABA BEAN NUTRIENT REMOVAL RATES.[7]		
NUTRIENT	REMOVAL	
	lbs nutrient/bu seed	lbs/ac*
Nitrogen (N)	3.07	107
Phosphorus (P_2O_5)	0.74–1.22	26–43
Potassium (K_2O)	0.94	33
Sulphur (S)	0.13	5

*Based on a 35 bu/ac (2100 lb/ac) faba bean crop.

PEST MANAGEMENT

Insects

Monitor for pea leaf weevils, wireworms and cutworms from May to June. Insecticide seed treatments are available to protect against these three insect pests. Assess the need to use these products on a field-by-field basis. Foliar insecticide may be used to manage cutworm outbreaks but is not recommended for managing pea leaf weevils.

Scout for pea aphids from the end of July to mid-August. Aphids often hide under the leaves and cluster in areas of new growth. The economic threshold for pea aphids in faba beans is 34–50 aphids/main stem and provides a seven-day lead time before aphid populations reach the economic injury level of 96–142 aphids/main stem.[8]

Pollinators are important to faba bean yield and should be considered when making insecticide spray decisions. Use practices and products that minimize the impact to pollinators.

Lygus bugs do not generally limit yield, but they are a concern for seed quality and grading. They pierce pods, leaving behind dark sunken areas on the seed from enzymes in their saliva. Fabas require less than 1% perforated damage to be graded No. 1 Canada.

Monitor fields during pod development for lygus until seeds in the pod become firm. Starting at early podding, visit five locations conducting 10–25 sweeps during the warm, sunny part of the day when lygus are most active. Count adult and late instar nymphs (nymphs have five black dots on their backs). Economic thresholds are not established for faba beans, but preliminary research suggests a low

Lygus bugs pierce pods, leaving behind dark sunken areas from enzymes in their saliva. While not yield-limiting, this causes concerns for quality and grading.

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threshold – as few as five lygus per 10 sweeps during early pod stages. Research to mitigate lygus bug damage in faba beans is ongoing at the University of Saskatchewan.[9]

Weeds

Avoid fields with known infestations of perennial, biennial and/or Group 2-resistant weeds like kochia or wild oats. The critical weed-free period for faba beans is between V2 and V7 (2–7 true leaves).[10] In-crop herbicide options are limited, relying on groups 1, 2 and 6 (bentazon). Refer to the *Guide to Crop Protection* for a full list of product options.

Maximize crop competitiveness by utilizing narrow row widths, early seeding dates, adequate seeding rates and appropriate fertility. Layer herbicides using a pre-emergent option with residual activity and timely post-emergent applications to target weeds while they are small.

Diseases

Faba beans are resistant to *Aphanomyces euteiches* making them an attractive alternative pulse crop option in fields with this root disease.

Faba beans are susceptible to the root rot complex, including *Fusarium* spp., *Pythium* spp. and *Rhizoctonia solani*. Fungicide seed treatments can offer protection from these diseases up to three weeks after planting. Consider fungicide seed treatments when planting in short rotations or when soil conditions are cool and saturated.

Scout for foliar and stem diseases from July to early September. The main yield-limiting disease of concern is chocolate spot (*Botrytis cinerea* or *B. fabae*) when weather conditions are conducive for its development (warm 15–20°C temperatures and humid conditions >70% around flowering). Stemphylium blight and Alternaria leaf spot are the most common foliar diseases in faba beans and their impact on yield is poorly understood.[11]

Several fungicides are registered for use on faba beans, however, very few are registered with activity on chocolate spot and even fewer have Stemphylium blight on the label. This is partly due to low faba bean acreage and the fact that these are also relatively new diseases.[12]

HARVEST

Direct harvest (straight cutting) is most common since faba beans are upright with strong, hollow stems that pod well off the ground. Swathing is not recommended since faba swaths may be difficult to pick up and do not dry down well following rain.

Desiccation is common to advance maturity and manage green stem material. The target for desiccation timing is when at least 80% of the field has reached R8 (full maturity) and seeds have dried down to <30% moisture in the least mature parts of the field. At this stage, stems are green to brown, 80% of pods are yellow to brown and 80-90% of leaves have dropped.

Faba beans are ready for harvest at 18–20% seed moisture, around 7–10 days after desiccation. Aeration following harvest is common to bring the beans down to the safe storage moisture of 16%. Faba beans often respire or sweat after storage, so monitor grain inside the bin for moisture build-up or spoilage.

At desiccation timing, the hilum on seeds from the uppermost pods (L) will be the same colour as mature seeds on the bottom of the plant (R).

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