



Field Beans - Crop Development, Agronomy Pointers



An excellent break crop with good margin potential

- Winter or Spring sown Field Beans (*Vicia faba*) are an excellent low cost leguminous break-crop option for Irish tillage farms that can leave a gross margin comparable to a high yielding cereal crop.
- Beans are a low-cost crop to grow with zero Nitrogen fertiliser requirements – they can typically fix 40 kg N per hectare N which is available for the next crop and so offer a good entry to first cereals.
- Beans are ideally suited to meeting the requirements of the new 2-crop or 3-crop rule under the CAP 2015 reforms. They also now qualify for the new protein-crop aid payment of up to €250/ha.
- Beans produce a high protein, high energy and GM-free feed which can be included in compound feeds for both ruminant and monogastric animals, offering users a great alternative to imported feeds such as Soya / distillers. The nutritional value of beans is 26-28% crude protein and a UFL of 1.01.

Yield Potential:

Crop yields can vary hugely between crop years which have been one of the major negative points raised by growers when referring to the bean crop. The national average yield of beans is approx. 5.5 tonnes per hectare / 2.2 tonnes per acre, but we know from trials that there is potential to grow up to 8.0 tonnes per hectare in Ireland. Goldcrop would be encouraging growers to **target a minimum yield of 6.25 tonnes per hectare / 2.5 tonnes per acre** on a consistent basis, and hopefully, with improvement in agronomy and variety development, we can raise the national average significantly in coming years.

Soil type / Crop Rotation:

Beans are deep rooting plants that do best on medium to heavy soils that don't suffer from summer drought. Beans can be sown in conjunction with OSR or beet in a crop rotation along with cereals, albeit the risk of disease infection will increase with a higher level of cruciferous crops in the mix. Goldcrop recommend to grow beans in rotation no less than 1 year in 5 to avoid issues with diseases such as Sclerotinia and Ascochyta.

Soil Fertility:

Lime Status: Beans like high pH (6.5 – 7.0), best to soil test prior to sowing and apply lime if necessary.

Macro Nutrient Requirements (kg/ha):

	Nitrogen	Phosphorus	Potash	Magnesium
Soil Index 1	0	50	100	40
Soil Index 2	0	40	60	20
Soil Index 3	0	20	40	0

Micro Nutrients:

These are essential in beans. Routine and multiple applications of **Manganese, Magnesium and Zinc** should be applied during the stem extension and flowering phases of plant growth.

Sowing Date:

Winter Beans are normally sown from mid-October onwards, with a latest safe sowing date similar to winter wheat - i.e. 1st week Feb down south, and a week later in the North East. Winter Beans tend to tiller more than spring beans, especially if sown early, and this tends to produce a large canopy of foliage which can lead to lodging pressure. Later sowing is preferred, but problems with establishment and crow damage must also be considered.

Spring beans can be sown ideally from early February onwards and no later than early April, otherwise harvest will run late and yields could fall back below 1.5 tonnes per acre. Seed rate is important, and always check the TSW of your seed lot before sowing to avoid wasting seed and running into potential problems with lodging / chocolate spot pressure from overly thick crops.

Seed Rate:

Winter Beans - Target plant stand is 22-25 plants/m² which is lower than spring beans due to the higher tillering capacity of winter types. Seeding rate depends on TSW and allowance for establishment losses. Typically, sowing 25-30 seeds per sq metre of TUNDRA or WIZARD.

Spring Beans - Target plant stand depends on sowing date - earlier sown crops will tiller more and grow taller, whereas later sown crops will need greater plant numbers to compensate to get pod numbers per sq metre to the optimum level. Typically (for all varieties), sowing 30 - 40 seeds per sq metre for early drilled crops, and 35 - 45 seeds per sq metre when drilling in late March / April.

It is important to sow beans deep (10cm +) to prevent crow damage, especially if planting in the months November - early March. Beans can also be direct drilled into stubble to greater depths using drilling machines such as the Claydon, Mizuri or Sumo.

Variety Choice:

See <http://www.goldcrop.ie/agriculture/recommended-lists> for full information on all commercial varieties available in Ireland and the UK. The principle varieties currently grown are;

Winter Beans - TUNDRA, WIZARD

Spring Beans - BOXER, FANFARE, FUEGO

Crop Protection

Weed Control

Beans are a very uncompetitive crop so it is essential to get the weed control correct.

1. Broadleaved Weeds
- **For Pre-emergence application:** **Nirvana** 4.5 l/ha or **Stallion** 3.0 l/ha There is also an off-label approval for **Stomp Aqua** which can be used up to 2.2 l/ha.
2. Broadleaved Weeds
- **For Post-emergence application:** **Basagran SG** is the only product for post-emergence BLW control in beans. Results from such treatments can be variable / unreliable so it's best to prioritise pre-emergence control options. If applying, make sure to add oil / adjuvant to the mix (e.g. **Squadron**, **Fortune**, **Toil** etc).
3. Grass Weeds - **Apply early Post-Emergence** Consider graminicide options such as **Falcon**, **Fusilade Max** or **Stratos Ultra**

Disease Control

Disease control options are limited and focus on prevention rather than cure. Advice is to start the programmes before disease gets established i.e. before first bud. The main diseases of beans are;

Chocolate Spot: - This is the most widespread and damaging disease of beans grown in Ireland. Symptoms appear as reddish-brown spots, which eventually enlarge to give a more damaging aggressive phase in cool, wet or damp weather. Winter beans are more likely to suffer yield losses, especially where the plant population is high and the crop becomes tall. Early fungicide treatment is essential if the crop shows symptoms at first bud or early flower. Products like **Signum** (boscalid + pyraclostrobin), **Folicur** (tebuconazole), **Amistar** (azoxystrobin) and **Rover 500** (chlorothalonil) are the most effective products available to control the disease.

Downy Mildew: Attacks the youngest leaves of the plant and can cause significant yield loss particularly in wet seasons. Mildew is prevalent on spring beans, where it causes greyish-brown, felty growth on the under-surface of the leaves. Some varieties have better resistance to the disease and 1 - 9 ratings are given on the PGRO Rec List. **Basfoliar Activ** (potassium phosphite + nutrients) is very a useful, low cost product at helping to prevent downy mildew infection pre-flowering. Other products available include **Dithane** (mancozeb) and **Ridomil Gold** (metalaxyl-M + mancozeb). All can be mixed with another foliar fungicide, especially on the more susceptible varieties if conditions are suitable for infection.

Rust: Attacks the leaves in periods of warm, dry weather, typically characterised by numerous reddish-brown pustules on the leaves. It is more serious on spring beans and, all varieties are susceptible. Most damage occurs if infection begins during flowering and pod set. Fungicides such as **Folicur** (tebuconazole), **Amistar** (azoxystrobin), **Rover 500** (chlorothalonil) and **Signum** (boscalid + pyraclostrobin) may improve yield in either winter or spring beans, but treatment is unlikely to be worthwhile if infection begins when pod fill is complete and the crop is beginning to senesce.

Pest Control

Bean Stem Nematode: The BSN is very harmful to bean crops and can reduce yields significantly if crops are infected. The pest is both seed borne and soil borne and can live in the soil for many years in between crops. Goldcrop recommend that all fields intended for beans should be sampled prior to sowing to check for the presence of BSN. Equally, growers should only use certified seed that is guaranteed / tested free of BSN to ensure that 'clean' land is not infected by 'unclean' seed.

Birds: Crows and pheasants can be troublesome in the emerging crop. Deep sowing, below 8cm is important. Use bird scarers and shooting to prevent crop damage / loss.

Bean Weevil: The pest can cause damage to spring beans if large numbers appear when plants are small. Leaves of attacked plants show characteristic 'U' shaped notches around the edges, but the main damage occurs as a result of the larvae feeding on the root nodules. Sprays may be applied at the first sign of leaf damage and repeated after 7 - 10 days. Control adults with a contact insecticide such as **Decis** (deltamethrin) or **Dimethoate** at the first sign of damage.

Black Bean Aphid: Black bean aphid can be very damaging to field beans if colonies develop just prior to flowering. Spring-sown crops are usually more likely to suffer damaging attacks than winter beans. As well as forming dense, smothering colonies on the upper part of the stem, these and the less obvious pea aphid are able to transmit several viruses which add to the yield loss. Aphids can be controlled using Aphox (pirimicarb) as soon as 5% of the plants have been colonised. Care must be taken if using other insecticides, especially when flowers are present on the crop, as there is a serious risk to bees.

Harvesting

Harvesting typically takes place in September or October, depending on the sowing date, summer weather conditions and whether a winter or spring variety is grown. Early maturing varieties are best to ensure a timely harvest.

Bean pods blacken and seed becomes dry and hard first, but stems usually remain green for longer. Bean leaves usually fall during ripening and a desiccant has little effect on stems, so weed-free crops are not normally desiccated. If the crop is very weedy or has a few small late-set pods which are still green, a desiccant can aid harvesting. It should be applied when at least 90% of pods are dry and black and most seed is dry. Reglone (diquat) is usually the product of choice although various glyphosate products (e.g. Roundup, Gallup etc) can also be used.