



Bean variety trials in Scotland

2025 growing season

This project is in collaboration between
PGRO and Scottish Agronomy.
Partially funded by Innovative Farmers

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Objective

The Scotland Bean Variety Trial aims to identify bean varieties best suited to Scottish growing conditions and to increase confidence among growers and advisors in beans as a reliable and profitable break crop. The trial evaluates key winter and spring bean varieties across multiple farm environments to assess performance under differing climatic and agronomic conditions.

Background

Clubroot has increasingly challenged oilseed rape production in Scotland, reducing its reliability and profitability as a break crop. As a result, growers are seeking alternative options that avoid clubroot pressure while delivering similar rotational benefits. Winter beans are a promising candidate, but limited trial work has been conducted in Scotland to evaluate whether varieties can mature in time, withstand northern winters, and produce commercially viable yields.

Beans offer several agronomic advantages: they require no in-season nitrogen fertiliser, contribute residual nitrogen for subsequent crops, improve soil health, and reduce input costs. Increasing domestic bean production also provides opportunities to substitute imported protein sources in livestock feed, helping reduce the UK's carbon footprint. However, the Scottish industry currently lacks region-specific data to support variety choice and management decisions — a gap this trial seeks to address.

Method

Sites:

Scottish Agronomy coordinated five field trial locations across Scotland:

- Dundee
- North Berwick
- Inverness
- Kirkcaldy
- Kinross

Treatments:

Each site consisted of four bean varieties sown in unreplicated 2-ha strips (headlands excluded):

- Tundra
- Vincent
- Vespa
- Lynx (a spring variety included intentionally within the autumn sowing window)

Crop protection and management followed each farm's standard practice.

Assessments

Assessments were conducted randomly across the entire site for each variety.

1. Establishment
2. Winter hardiness
3. Yield

Tundra entries that survived winter were submitted to the Bean YEN (Yield Enhancement Network)

Results & Discussion

Despite successful emergence at Kinross and Dundee, all varieties at these two sites suffered complete winter kill. Their later drilling dates relative to other locations (Table 1) likely reduced establishment quality, leaving plants more vulnerable to seed rot, foot rot, or bird damage, and ultimately less resilient to harsh winter conditions. Geography also contributed to these losses: Kinross is situated further inland and is therefore exposed to colder winter temperatures, while the Dundee site sits at higher elevation, increasing the risk of frost. These geographical factors likely compounded the vulnerability of the crops.

Table 1. Drilling dates for all trial sites.

	N. Berwick	Kinross	Dundee	Kirkcaldy	Inverness
Drilling Date	26/10/2024	01/11/2024	07/11/2024	31/10/2024	14/11/2024

Based on the 2025 YEN model, the surviving winter bean sites demonstrated high yield potential (Figure 1).

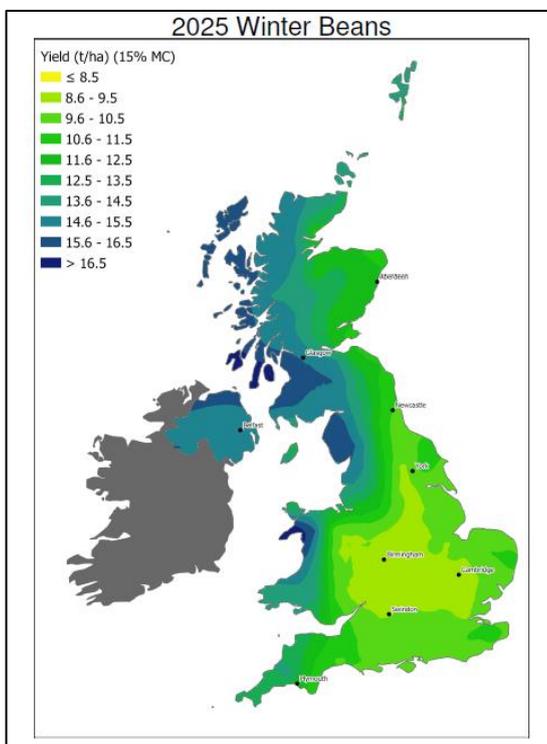


Figure 1. Modelled winter bean yield potential from 2025 Bean YEN dataset.

All three sites that overwintered produced yields above the 2025 YEN average (Figure 2). YEN yield potential model accounts for soil texture, climatic conditions and other factors. The UK average for measured yield potential is around 33%.

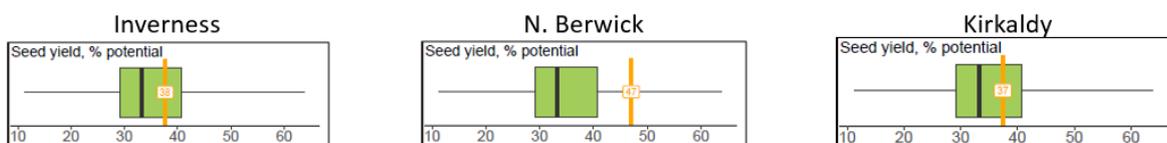


Figure 2. Measured yield potential of 3 sites compared with 2025 YEN average.

Yield variation among sites correlated strongly with drilling date (Figure 3).

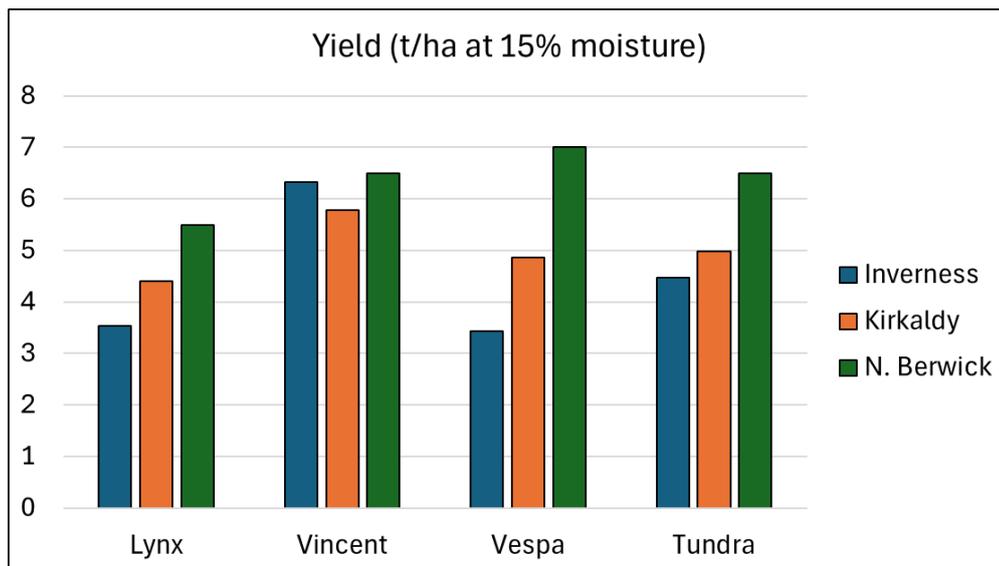


Figure 3. Site specific yield outcomes for each bean variety.

North Berwick — drilled earliest — achieved significantly higher average yields than other locations (Figure 4).

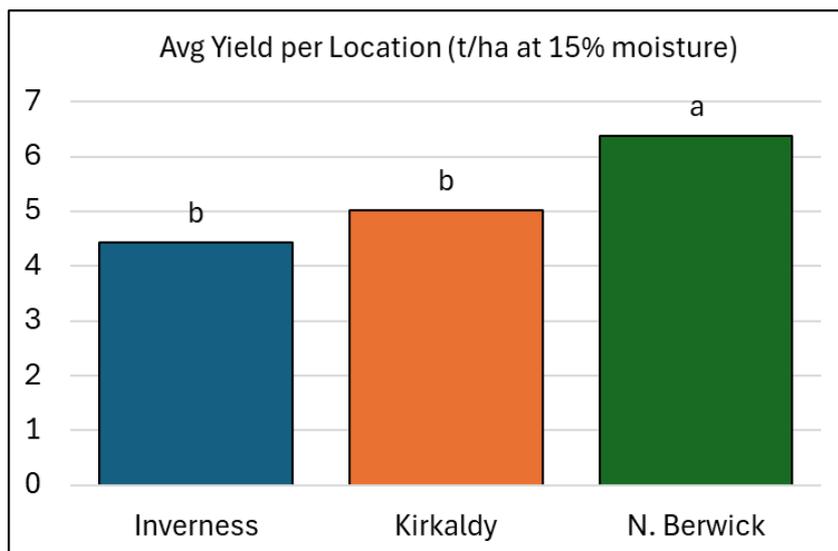


Figure 4. Location based yield averages (letters indicate significant differences at $p < 0.05$).

Across varieties, all winter beans exceeded the UK national average from the 2025 Bean YEN dataset (Figure 5). This was true not only for measured yield but also seed yield, based on percentage of yield potential, which incorporates climatic conditions (Figure 2). The spring variety, Lynx, produced the lowest yield, as expected. It was included to determine whether it would mature earlier than the other varieties, potentially reducing the risk of a delayed harvest. Vincent achieved the highest overall yield, though not significantly greater than Vespa or Tundra, indicating several robust options for Scottish growers.

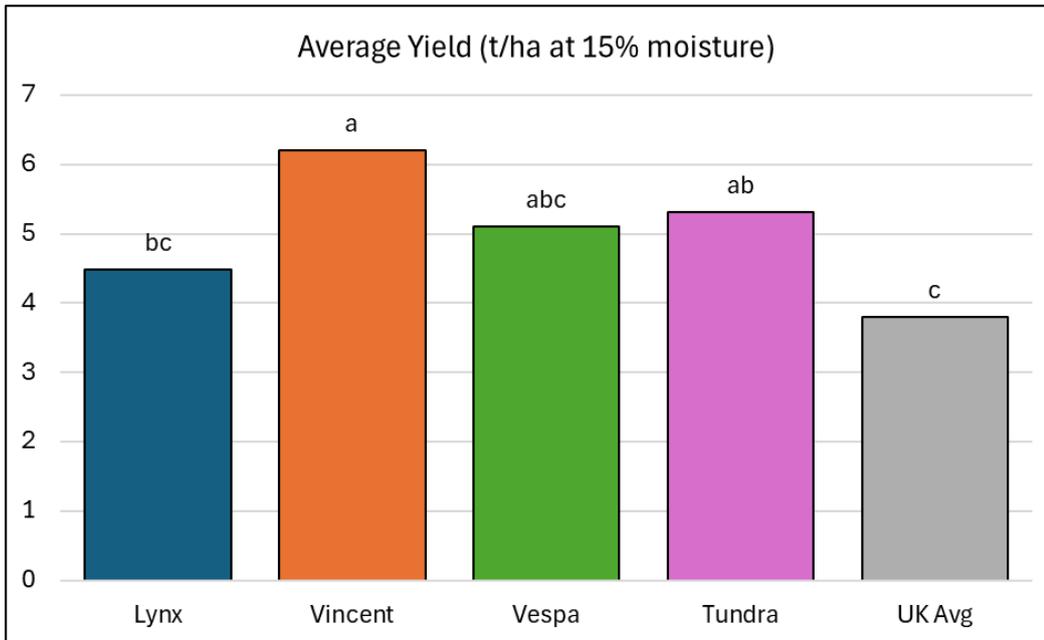


Figure 5. Average yield for each bean variety. (letters indicate significant differences at $p < 0.05$).

Conclusion

The first year of the Scotland Bean Variety Trial demonstrates that winter beans have strong potential as a viable and profitable break crop under Scottish growing conditions. Although two of the five sites experienced complete winter kill—likely influenced by later drilling and challenging winter conditions—the remaining sites produced yields that exceeded the 2025 Bean YEN national average on both yield (t/ha) and seed yield based on percentage of yield potential. Harvest date was not an issue, as all three sites had completed harvest by first week in September. This provides an encouraging indication that, when established well and managed appropriately, winter beans can perform consistently in northern climates.

Across the surviving sites, variation in yield outcomes was closely linked to drilling date and site-specific conditions. North Berwick, which had one of the earliest drilling dates, significantly outperformed the other locations, reinforcing the importance of timely sowing in achieving robust winter survival and maximising yield potential. Drilling conditions are one of the most important agronomic factors for beans. Achieving good seed-to-soil contact and avoiding compaction are essential. Historical YEN data shows that earlier drilling can lead to higher yields, but going too early increases the risk of frost damage and more severe chocolate spot. If soils become too wet to travel in late October to mid-November, it's far better to wait for conditions to improve rather than force the drilling date.

Variety performance also showed clear trends: all winter varieties out yielded the UK benchmark, while the spring variety (Lynx) performed lowest, as anticipated. Vincent delivered the highest yield overall, though not significantly greater than Vespa or Tundra, suggesting several strong options for Scottish growers.

Overall, the results from year one build confidence that winter beans can fit successfully into Scottish rotations. Establishment timing, winter resilience, and moisture availability during key growth stages remain critical factors. Continued multi-site evaluation in future seasons will help refine variety recommendations and management guidelines to support wider adoption of beans as a resilient break crop in Scotland.