

Xbeet[®] enrich¹⁰⁰



Product Information Pack



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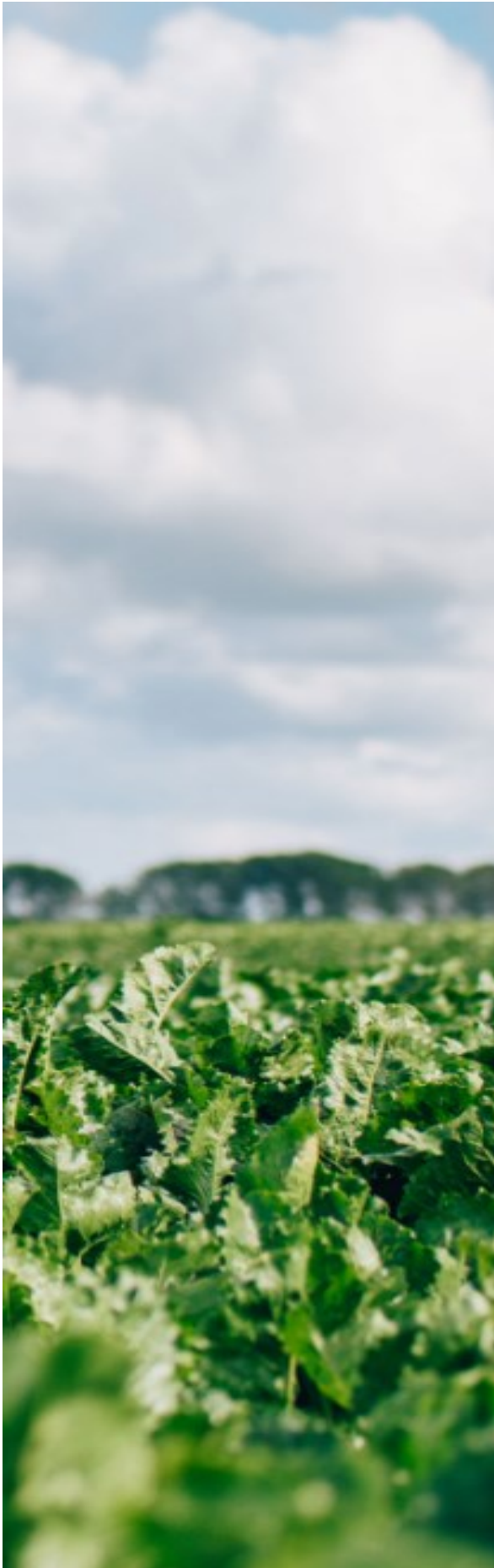
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Supporting Generations of UK Sugar Beet Growers...

Germain's has been supporting generations of UK Growers to achieve higher yields for many years. From the introduction of pelleting technology in the 60s to industry-leading priming technologies in early 2000s, we have continued to listen to the needs of UK growers to further maximise the potential of our Sugar Beet seed technologies.

We have been successfully running field trials in partnership with the BBRO, Armstrong Fisher and UK growers. All trials have been done across main growing areas of UK Sugar Beet and covered number of different soil types. These trials have shown a strong candidate for the next UK product: **Xbeet® enrich¹⁰⁰**. We are pleased to be able to share the following information in this pack with you.



About Xbeet® enrich¹⁰⁰

Xbeet® enrich¹⁰⁰ is a combination of a new pellet and elicitor treatment that promotes stronger plants, leading to greater yield potential.

What is an elicitor?

Naturally derived elicitors set off chain reactions that trigger different responses to not only pathogenic fungi and bacteria but also abiotic stresses such as drought, heat and cold.

These reactions improve stress tolerance, crop establishment, growth and ultimately the yield of the Sugar Beet.

Key Benefits

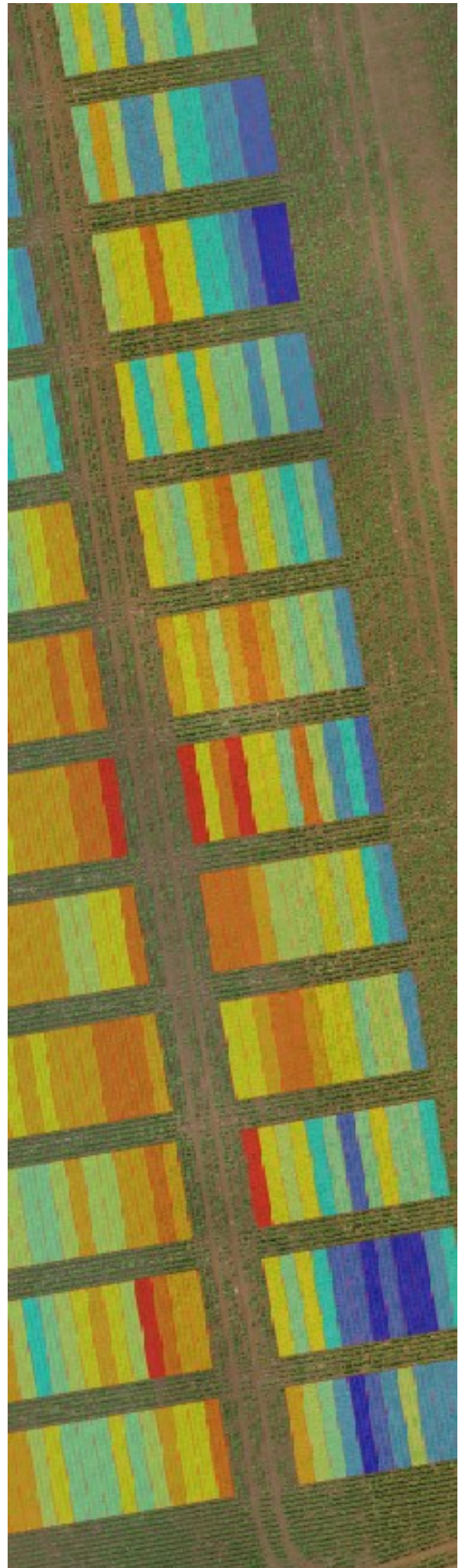
- Faster emergence in UK field conditions
- Greater leaf coverage
- Improved uniformity
- Stronger plants leading to increased yield potential

Small Plot Trial Protocol

The following emergence, leaf area and yield data has been collected from our **Small Plot Trials**.

Small Plot Trial Objectives:

- 🌱 To measure the emergence and yield of potential new sugar beet seed treatments
- 🌱 3 different fields spread across the UK sugar beet growing area
- 🌱 To demonstrate the benefits of the treatments for the UK industry



Experimental Protocol & Design

Design	Small plot randomised blocks
Sites	3 sites ideally representing different areas and/or soil types used for growing sugar beet in the UK
Number of blocks	3 (different varieties)
Number of reps	6 reps (ideally all the samples within the rep are positioned side by side, not stacked)
Plot size	3 rows 7.5m in length
Plant spacing	50cm between the rows, 17.3cm in the rows
Randomisation	Each replicate is randomized separately. Each treatment has the same probability of being assigned to a given experimental unit within a replicate. Each treatment must appear once per replicate
The main requirements for the trial location	Experimental plots should be flat, not sloping All treatment variants are sown during same day Away from trees, headlands Sowing by same drill for all treatment variants; Same depth and seeding rate
Agronomy	All plots should be treated equally with the standard agronomic practice of fertilisation and fungicide/insecticide/ herbicide sprays for that location and year. Trials should not be irrigated
Harvest	Carry out a harvesting, using a mechanical plot harvester



Data Required

1	Site locations Detailed position of trial in each field
2	Emergence counts at 25%, 50%, 75% and Final population
3	Harvest data: date, Plot weight(dirty), Clean weight, Yield (t/ha), Sugar content, Adjusted yield (t/ha), quality (Na, K, AN)
4	Climatic data (air and soil temperature and rain fall) daily averages for temp and daily sums rain fall





Enhanced Yield

Xbeet® enrich¹⁰⁰ demonstrated an average increase in yield of **1.3%**.

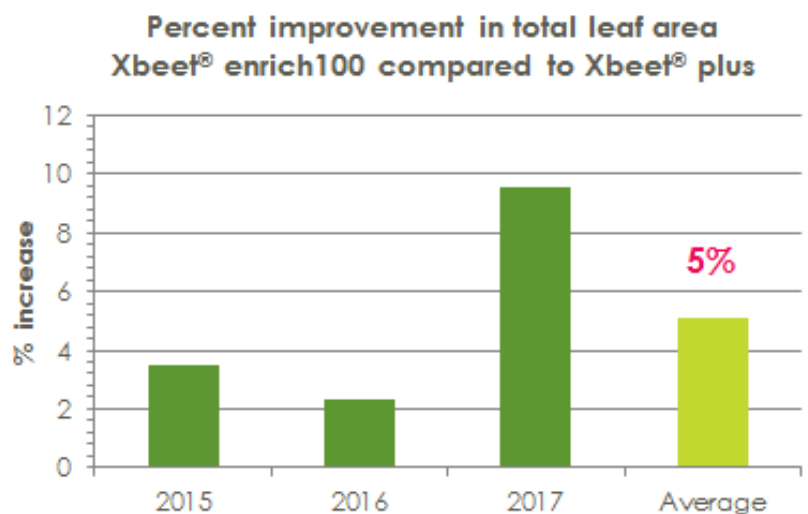
These trials were completed over 3 years on 13 UK trial sites across 6 varieties.

Data independently analysed by NIAB. Difference significant at 95% confidence level.

Greater Leaf Coverage

Leaf area is measured using our unique image capturing program to analyse the average leaf area of plots and monitor early plant development.

Xbeet® enrich¹⁰⁰ demonstrated a greater leaf area of **5%** relative to Xbeet® plus.



Faster Emergence

Xbeet® enrich¹⁰⁰ demonstrated faster emergence of 9.6% relative to Xbeet® plus over 3 years of trials.

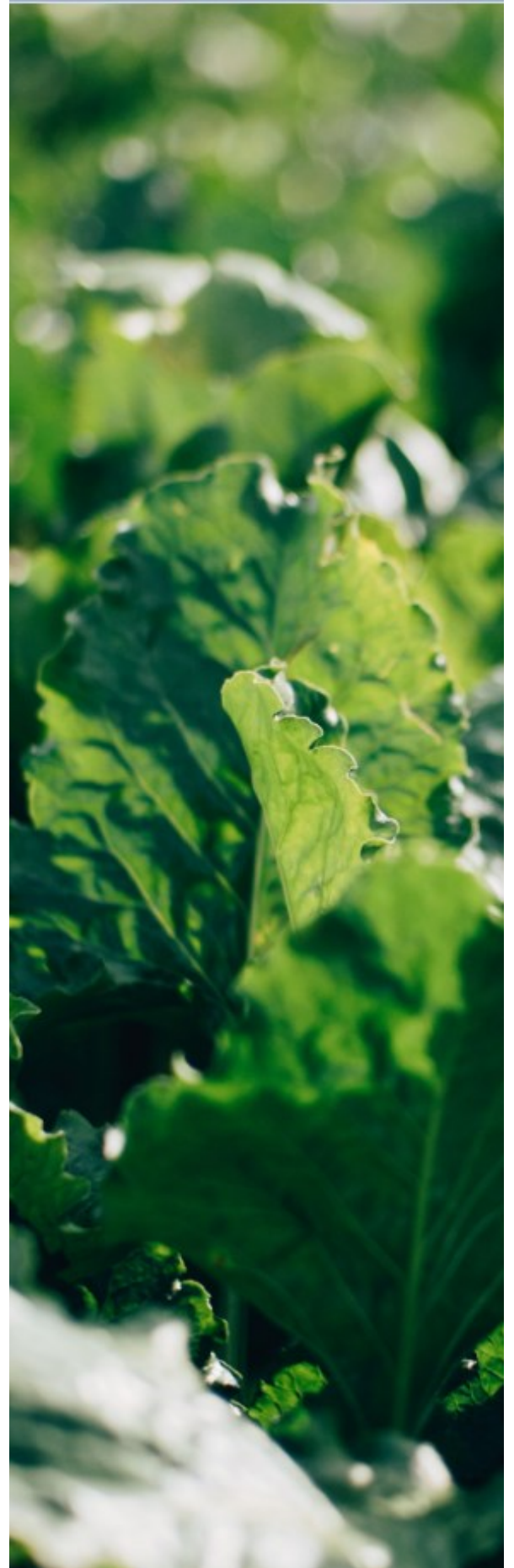
No Impact on Bolting

The propensity for the Sugar Beet crop to bolt is determined by:

1. The level of exposure to low temperature the seedling is exposed to around emergence
2. The genetics of the seed

Considerable work has been historically published by Brooms Barn and British Sugar, investigating the impact of priming on bolting (references 1,2,3,4,5 and 6). The conclusions state that there is no impact of priming on the bolting of Sugar Beet.

14 years of experience with primed Sugar Beet seed in Europe and North America has provided no evidence of an increase in bolting following carryover sowing of primed seed.





Strip Trial Protocol

Strip Trial Objectives:

In addition to the Small Plot Trials, Germains also conducts Strip Trials.

The purpose of the Strip Trials is to test the benefits of new seed treatments under conditions that are as close as possible to normal farming practice.

- Data collected over 2 years
- Trials consist of large strips across UK fields
- Seeds are planted with commercial drills and roots harvested with commercial harvester.

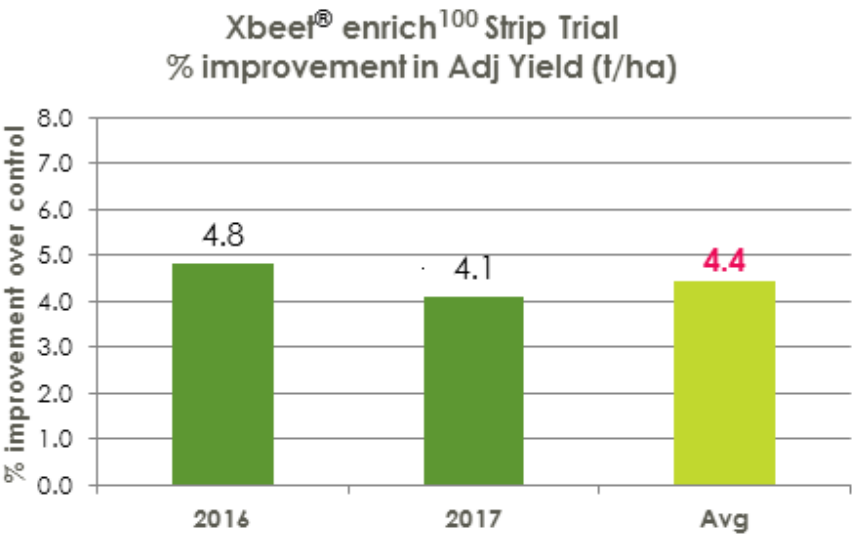
Experimental Protocol & Design

Design	Replicated strip trial
Sites	Sites chosen to represent different areas and/or soil types used for growing sugar beet in the UK
Number of reps	6 reps
Strip size	6 rows between 200-400m in length
Plant spacing	50cm between the rows, 17.3cm in the rows
Randomisation	Treatments within each rep should be randomised
The main requirements for the trial location	Experimental plots should be flat, not sloping All treatment variants are sown during same day Away from trees, headlands Sowing by same drill for all treatment variants; Same depth and seeding rate
Agronomy	All strips should be treated equally with the standard agronomic practice of fertilisation and fungicide/insecticide/herbicide sprays for that location and year. Trials should not be irrigated
Harvest	Carry out a harvesting, using a commercial 6 row harvester. Samples for yield (tare house) analysis should be taken from 5 locations in each strip, record number roots, weight, and length



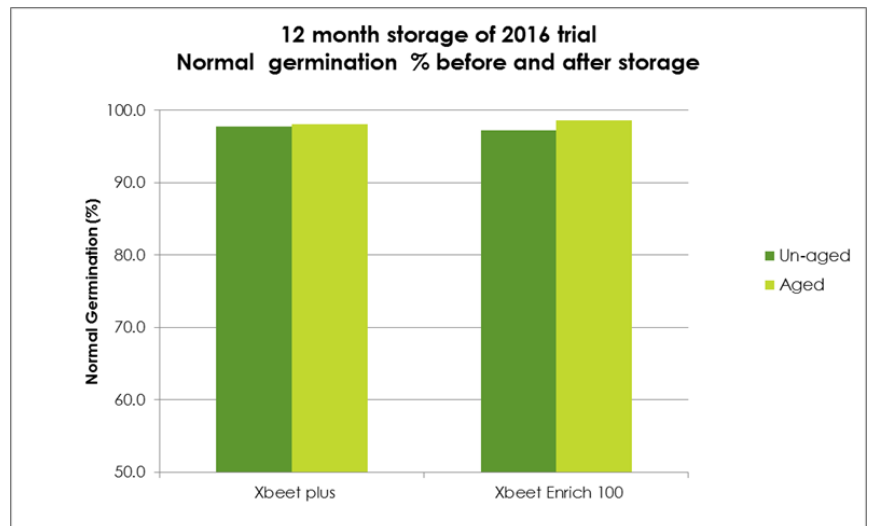
Yield Results

Two years of Strip Trial data demonstrates that Xbeet® enrich¹⁰⁰ achieved an average of **4.4%** increase in adjusted yield relative to Xbeet® plus.

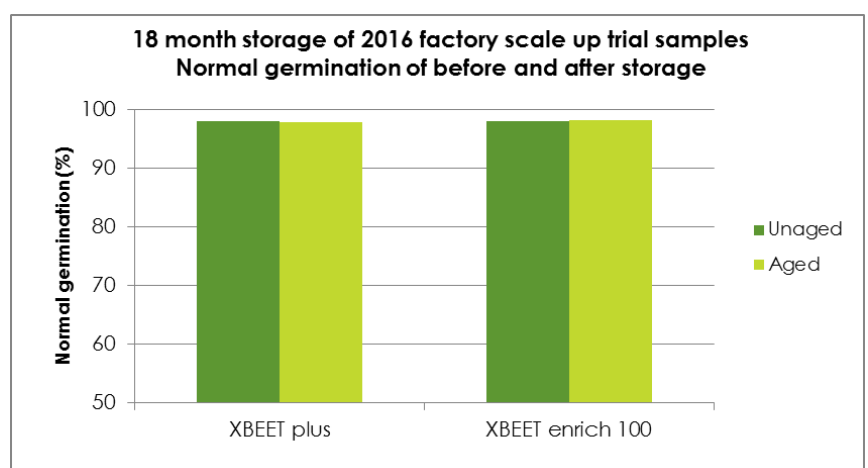


Storage Data

12 month storage tests of trial samples (average of 3 varieties), highlighting no drop in germination.



18 month storage tests of trial samples (average of two varieties). These factory produced samples show no drop in normal germination after 18 months storage of Xbeet® enrich¹⁰⁰.



All samples have been stored under controlled conditions in the R&D seed store at 15°C and 40-50%RH

References

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2. Jarvis, P. J. Patchett, M. R. **The effect of seed advancement treatment on the yield, quality and bolting susceptibility of the sugar beet crop.** (1998) *Aspects of Applied Biology*, 52:39-44
3. Durrant, M. J. Mash, S. J. **Effects of seed advancement and sowing date on establishment, bolting and yield of sugarbeet.** (1993) *Journal of Agricultural Science*, 121 (3):333-341
4. Durrant, M. J. Mash, S. J. **Sugar-beet seed treatments and early sowing.** (1990) *Seed Science and Technology*, 18(3): 839-850.
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6. Durrant, M. J. Jaggard, K. **Sugar-beet seed advancement to increase establishment and decrease bolting.** (1988) *Journal of Agricultural Science*, 110(2):367-374

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