

Alternative crop factsheet: Ancient cereals

OPPORTUNITIES FOR ANCIENT CEREAL PRODUCTION

There has been increasing interest in recent years in alternative and ancient cereals, as consumer trends show more interest in the provenance and health qualities of food.

A key factor behind this is the rising demand for low gluten cereals or those experienced as more digestible for people with gluten intolerances, spelt, einkorn and emmer, though still containing gluten, are often considered to be more palatable by people with intolerances, and buckwheat, like oats, is gluten-free, providing there is no contamination in processing.

Many ancient cereals tend to be favoured for higher protein, fibre and taste, both by consumers and by artisan bakers, and offer an interesting challenge for bakers in adapting conventional baking methods to the variation of characteristics of flours from ancient cereals. The rise in popularity in sourdough has assisted the use of ancient cereals in allowing the process to be more adaptable to different flours than

the Chorleywood method, and research has linked sourdough fermenting also to better digestibility of bread.

The market for alternative cereals in the UK is a niche one, but growing, with the number of millers and bakers continuing to increase, consumers taking more interest in locally and hand produced foods, and online sales making such products more accessible.

Nevertheless, growing for a contract and discussing requirements with millers is recommended for producers of alternative cereals to minimise risk, due to the small size of the markets, and the proportionally larger fluctuations in market demand. Likewise, there is no established market for feed-grade minor cereals, as it is not economical to grow a higher-value cereal specifically for feed. Cereal that doesn't meet food grade can be used for low-value feed or AD plants (e.g. rye), but with a significant drop in price.

GROSS MARGINS

These gross margins are based on an estimate of a 5.5 t/ha yield. Yield will vary between ancient cereals, and organic crops will have lower yields. Price per tonne grain also varies considerably due to much smaller markets, and changes in consumer demand having correspondingly larger impacts on price. For example, in 2014 the price of spelt rose from £500/t to £1600/t due to an increase in demand.

Data source: Agricultural Budgeting Costing Book, 2019, and SAC Consulting

	/ha
Yield (t/ha)	5.5
Price per tonne	£ 500
Output	£ 2,750
Seed	£ 150
Fertiliser	£ 110
Crop protection	£ 120
Sundries	£ 15
Variable costs	£ 395
Gross margin	£ 2,355

Establishment costs:

- Seed costs tend to be higher than conventional cereal varieties, especially for organic seed. Some seeds may have to be sourced from further afield or abroad, with additional delivery fees.

PROCESSING AND SUPPLY CHAINS

- Transport and processing costs tend to be a main challenge for smaller quantities of cereals, as it requires separate processing, setting up of the equipment, and a loss factor for cleaning machinery between batches. Finding a miller who can and is willing to take a small batch of alternative grain is essential, ideally before growing, as well as checking that the characteristics of the variety is suitable for the end product (e.g. protein and starch contents) as there are strict quality requirements.



- Milling usually must go through smaller scale mills due to the much smaller quantities, and negotiating milling of much smaller batches can be challenging. In the case of gluten free cereals such as buckwheat, separate milling facilities may be required to ensure no cross contamination with gluten products.
- Ancient grains are sought after by artisanal bakers for their broader range of characteristics and flavours, and require adaptation and skill to bake with. Some ancient cereals also lend themselves better to sourdough methods rather than conventional Chorleywood baking, so artisanal baking would be a key market. There is also potential for pastas, noodles, crackers and biscuits made from ancient cereals.
- Adaptation to different characteristics of grain flours can be challenging if working with mainstream millers, bakers and processors – much trial and error may be needed to establish a product that meets the standard of more conventional varieties.
- Small scale milling is available, and don't have to rely on traditional stoneground methods which can be said to heat the flour and reduce quality. The Zentrofan mill is an example of a small scale, high tech mill, which allows for adaptability of the process and maintenance of the highest quality of flour.
- There is potential for high-fibre feed, biofuel or bedding from spelt, but processing costs are currently a barrier to developing these markets.

Ancient cereals tend to have lower yields than conventional modern varieties, whose yields have been optimised through breeding, but attract a premium market price.

CROP ESTABLISHMENT AND PRODUCTION

LAND AND CLIMATE REQUIREMENTS

Spelt is an ancient variety of winter wheat that is tolerant of poor soils and cold winters. There is very little documented advice on growing ancient cereals, although the UK Grain Lab is an established group of producers around the UK who support each other and offer advice. Generally, most ancient cereals can be treated like heritage wheat, so it is advised to reduce seeding and nitrogen rates to avoid lodging.

TYPES AND VARIETIES

The most common types of ancient grains that can be grown in the UK are spelt, heritage wheat, einkorn and emmer, although buckwheat, rye(?), triticale, quinoa. More exotic grains like amaranth, teff, millet, sorghum and kamut are also ancient cereals, but not grown in the UK.

CROPPING SYSTEMS

Ancient cereals can be grown as a normal part of an arable rotation in place of other cereal crops. Spelt and einkorn are recommended for winter sowing, emmer and rye can be sown as a winter or spring crop, and buckwheat as a spring crop.

They are well-suited to low-input systems as weed cover tends to be good providing quick early establishment.

MACHINERY

Ancient cereals can be cultivated with usual arable machinery. Specialist machinery however may be required for dehulling of some crops such as spelt and buckwheat, as hulls are harder than conventional crops

TIMINGS

The optimum timing of harvest is especially important for alternative cereals; as niche products there is often a more uncertain and lower value feed market, so crops that don't meet food grade see a larger drop in price, and relative to higher establishment costs. In particular, spelt, einkorn and emmer can take a little rain, but the premium value drops significantly if the Hagberg FN falls below 200.

Further information

- Crop management for underutilised and minor grains. A factsheet produced by the Organic Research Centre.
- Bangor University's Centre for Alternative Land Use Factsheets. Available online.
- UK Grain Lab. <https://www.ukgrainlab.com/>

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