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## About CERERE:

Through a balanced, multi-actor network of researchers and communities of practitioners, the project promotes innovation by producing and disseminating accessible end-user materials and training products for farmers, food manufacturers, consumers, researchers and policy makers.

# ADAPTATION OF HERITAGE WHEAT VARIETIES TO CREATE LOCAL 'LANDRACES' FOR ARTISANAL SOURDOUGH BREAD PRODUCTION IN WEST WALES.

## PROBLEM

The problem addressed here is how to obtain locally-adapted, heritage wheat. There are actually two problems: where to get locally-adapted seed and, how to guarantee its continued availability.

## SOLUTION

**Seed sources:** The solution was to produce a locally-adapted landrace using imported heritage cereal lines. The initial heritage wheats were sourced from Brittany and near Lyon in France using informal personal contacts. There were no certified seed lots. Before drilling, seed lots were mixed and sown together in the first year. Adapted lines "self-selected" and seeds produced were saved seed for the following year's crop. Over a period of 5-10 years, it is expected that the population will stabilise, becoming a locally-adapted "landrace".

**Agronomy:** The land is managed organically. In the June before wheat planting, a green manure is planted to increase fertility and suppress weeds. Plants grown include sweet clover, mustard, forage peas, buckwheat. The green manure is ploughed in September. The (winter) wheat crop drilled as soon as possible thereafter. Seed rate is adjusted according to seed germination percentage and drilling date but is quite high (200 kg/ha). Seeds are treated with vinegar and mustard powder (15g/kg seed) before planting. Alternative approaches and seed priming are being considered to reduce the cost of seed treatment.

**Harvesting:** Most of the crop is combine harvested in August. A small area is, however, hand harvested by volunteers from the community using traditional methods (i.e. with a sickle and stooking). The hand-harvested stooks are also threshed and winnowed by hand.

**Seed drying:** Seeds for the following year's crop are selected post-harvest from the bulk of grain. These seeds are dried to approximately 15% moisture (the grain samples will be dried to about 14% moisture). The higher seed moisture is to minimise loss of viability during hot air drying.

**Seed cleaning:** A Marot #5 cleaner was purchased in 2018 from France. Larger weed seeds (wild-oats and vetch) are removed efficiently and the wheat is separated into three size categories. The small/shrivelled and diseased grains are rejected and fed to chickens. The medium and large grains are retained for seed and grain.

## Outcomes

**Productivity** –Target wheat yields are about 2.4 tonnes/hectare valued at c. £400/t as heritage grain, c. £4/kg (£4000/t) as flour and perhaps twice that amount as bread. Approximately 10% of the crop is saved for planting the next crop.

For the community, over the three years that Torth y Tir has been running, yields have been sufficient to produce bread to satisfy local demand. A very high quality bread is produced locally at an affordable price.

For the farmer, the small-scale (3.4 hectare), traditional production system only approaches economic viability once value is added by producing flour and artisanal sourdough bread. Yields are very low by national standards even for organic farms, but control of the entire value chain and local distribution allows value to be added to the grain so that the overall process is just sufficient to produce a livelihood for the producers.

An increase in profit could occur if a smaller proportion of the crop could be saved as seed. It is, however, difficult to put a

value on a unique, locally-adapted, traditionally-selected landrace. One option being considered is to reduce seed rates on a spatially-variable basis so that parts of field with higher fertility and a lower weed burden could be planted at a lower seed rate. Another is that of seed priming to invigorate the seeds before planting, which might again give scope for reducing seed rates.

For the community, there is a price premium, but the bread has the unique selling points of being local, traceable, nutritious, safe and environmentally sustainable. Moreover, the involvement of the local community in the production process and links with local schools provide additional benefits to the community as well as raising awareness of the product.

## Practical recommendation

- Develop your own unique landrace (and use this as a unique selling point!): start with a wide range of germplasm. Be patient – it will take 5-10 years for the heritage wheats being grown to become adapted to your local agro-ecology.
- Remember “prevention is better than cure” - Adopt preventative practices to minimise pests, weeds and disease before they become a problem. Be especially careful when importing heritage varieties and seed populations in the first year. Examine and clean the seeds to remove obviously diseased grains and any weed seeds. Before planting, check germination and treat with mustard powder and vinegar to help control disease and pests. Keep on top of the weeds. Don't try to save money by failing to clean your saved seeds. Monitor your crop carefully to make sure you never introduce new weeds when drilling the crop.
- People respond positively to the idea of local produce. Seek to involve participation and ownership of your brand by the local community. Get volunteers to help with harvest. Have open days with samples.
- To make more than ‘pocket money’, you will need to focus on more than just grain – it won't be economic except perhaps on a large-scale. Torth y Tir's approach is to look at the whole process as an holistic farm system from 'seed to shop' in which value-is added to the grain by milling and baking and then marketing through local outlets and communities.

## Evaluation and sharing of the results

Use the comment section on the CERERE website to share your experiences with other farmers, processors, retailers, advisors and scientists. If you have any questions concerning this Practice Abstract, please contact the author by e-mail.



## Project partners

The University of Reading (*United Kingdom*),  
 The University of Florence (*Italy*),  
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 The University of Debreceni (*Hungary*).

## Further Information

<https://torthytir.co.uk/>

<https://communitysupportedagriculture.org.uk/csa/torth-y-tir/>

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