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UNDERUTILISED CROPS

AT FIRST GLANCE

What does DIVERSIFOOD mean by 'Underutilised Crops'? A series of innovation processes involving plants, farmers, processors and consumers beyond mainstream: challenges we are addressing to improve agriculture, market and diets, and their sustainability

Embedding crop diversity and networking for local high quality food systems

Last call for agricultural diversity?

Of a total of 250 000 identified plant species, 7 000 have been used in agriculture throughout human history. However, currently, 75% of the world's food comes from just 12 plant and 5 animal species, and 60% of total worldwide caloric input comes from just three plants: rice, wheat and maize (FAO, 1997). These numbers are alarming. In fact, utilisation of such a minimal diversity leads to excessive homogeneity and oversimplification of both farming and food systems, disrupting the ecological, biological and social drivers of sustainable, resilient and healthy agriculture and food.

A process-focused framework

DIVERSIFOOD is focusing on the bulk of the 7 000 forgotten plant species that fall into the category of Underutilised Crops. Our definition of Underutilised Crops, informed by two years of fieldwork and documentation across the DIVERSIFOOD consortium, needs to be tested over time and in different scenarios. The focus is not on the plants, but rather on the process to build opportunities across a wide range of neglected or unexplored resources.

An Underutilised Crop is:

A plant genetic resource ...

Be that either a species or a germplasm, or a genetic structure

... with limited current use ...

having been either forgotten or abandoned, or not yet explored

... and potential to diversify and improve ...

the focus is set on the advantages we expect

... cropping systems and supply chains ...

both cropping systems and supply chains are target of diversification to improve sustainability, resilience and health in the field, the market and the diet

... in a given context.

the reality, in geographic, historic, social, economic terms, in which the case for the underutilised crop is embedded.





The way forward

There are different categories of Underutilised Crops. After two years' working on several case studies, during the 2nd Annual Meeting in February 2017, the DIVERSIFOOD consortium held an exercise aimed at identifying and characterising three distinct challenges:

- introducing “outsider species”.

Growing Quinoa in Europe or Chickpeas in the United Kingdom: these examples and many others have in common the challenge of *shifting a cultivation areal*. This areal shift can either (i) cross a geographical discontinuity (e.g. Quinoa from South America to Europe) or (ii) extend the borders of cultivation areal (e.g. moving Chickpeas and Buckwheat northwards). In most cases, the primary interest can arise from professional or home growers/gardeners (Kell et al. 2013), and ‘outsider’ plants can be primarily grown, alongside food production, for ornamental purposes.



- reviving “old, forgotten species”.



The starting point is to understand *why* these species, e.g. old minor cereals, have been “forgotten”, and why has it been so easy to “forget” them. Although specific answers are related to specific cases, abandonment is generally an overall result of the Green Revolution, i.e. the widespread diffusion of high yielding varieties and related ‘technological packages’ starting from the post-World-War-2 period (Yapa, 1993). This has led to a **standardisation** of environments, cropping techniques, processing and supply chains, that most of these “abandoned” species do not fit into.

- reviving “neglected germplasm of common crops”.

A typical example is that of open-pollinated varieties (OPVs) of currently hybrid-dominated crops which went through the same process of abandonment as “forgotten species” during the Green Revolution, such as Maize, Tomatoes, Broccoli. Increasing use of OPVs would broaden the genetic diversity of these common crops aiming to specific, rather than wide, adaptation (Ceccarelli, 1994). Reviving these germplasms, as well as the old species addressed above, could help overcome agricultural standardisation, giving back marginal areas, artisanal processing and low-input farming significant chances of successful sustainable development.



Suggested readings

Ceccarelli S (1994) *Specific adaptation and breeding for marginal conditions*. Euphytica vol. 77, pp. 205–219

Food and Agriculture Organisation of the United Nations. The State of the World's Plant Genetic Resources for Food and Agriculture. Rome (IT) (1997). <ftp://ftp.fao.org/docrep/fao/meeting/015/w7324e.pdf>

Kell S, Rosenfeld A, Cunningham S, Dobbie S, Maxted N. *Benefits of Non-Traditional Crops Grown by Small-Scale Growers in the Midlands – Final Report of the “Sowing New Seeds” Project*. 2013, Garden Organic, Ryton, Coventry (UK). See also <http://www.gardenorganic.org.uk/sns-resources>

Yapa L (1993) *What are improved seeds? An epistemology of the Green Revolution*. Econ Geogr 69:254–273