The history of the earth and the soil

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Millers can exercise great power and wisdom in their choice of crop feedstock to promote positive change in developing countries. These crop feedstock choices influence the soil that feeds us all, together with the seabed, sea and lakes, which are hugely influenced by the choice of crops we grow on land and how we grow them. A negative example of these effects on the sea is the fertiliser run off into the Gulf of Mexico resultant from crop farming activities.

Also in terms of modern farming of crops the soil has more recently been considered a growing medium – however it is absolutely no such thing! The soil is a living thing with a finely balanced micro-fauna and flora, which in turn support very complex life cycles and organic interactions in the soil biome. A teaspoon full of healthy soil contains roughly a billion living organisms - an astounding accomplishment for something many regard as dirt on their shoes or upon which we build and cover with buildings and roads. You are sat upon soil wherever you are reading this article.

It has taken millions of years for the soil on which we all depend to be generated from the earth's crust through natural processes. Yet we only actively started farming it some 15,000 years ago - a mere blip in the history of the earth and the soil upon which we rely to develop and grow.

The importance of crop choice for the soil on which they grow relates to maintaining this soil in tip-top condition. So avoiding mono-cropping (the same crop continuously for a number of years) is desirable unless the crop is perennial and therefore does not need re-planting each year and thus avoids disturbing the soil.

Also, utilising naturally generated nutrition of the crops from supporting and protecting biological soil activity say by the use of mixed rotations is very important e.g. growing nitrogen producing crops as a natural fertiliser or avoiding the build of crop pests by regular rotation of the cropping.

When moving on to the processing of the crop feedstock by millers then for us as human beings, it should be no surprise that we thrive on fresh and natural food ingredients.

Thus, considering this fact in the design of milling processes is very important e.g. wholemeal flour, the effect of process heat, the use of natural wrapping.

The presently under-utilised crops that grow in their natural environments are good indicators of soil characteristics and climate change. For this reason alone they need to looked at far more closely and boosted in their production and use by millers. Indeed climate change and its effects on food production is increasingly becoming a major consideration for all of us and that includes millers. The time scale for plants to adjust to climate change is lengthy - at least 80 to 90 years. So in order to speed up this adjustment process then identifying crops that are more suited to these climatic changes and then growing them is a major and essential step forward. Millers are not independent of this process so their greater involvement through product identity preservation and chain of custody is a positive and essential business step.

Further the present high energy costs and declining supply of fossil fuels are exacerbating the attempts to increase food production and assure food security. Particularly our dependency on high yielding modern varieties, which require high inputs of fertilisers and pesticides also results in increasing indebtedness of farmers. Together with this unwelcome looming energy pressure also population growth is resulting in the need to use less fertile land and increase the use of farm and homestead gardens. So our over-dependency and continued concentration on a few plant species for our staples is a trend that must be changed; e.g. rice is replacing other sources of carbohydrates such as sago.

Very importantly since women grow most of the currently under-utilised crops in developing countries, so promoting these crops goes some way to satisfying that need to crucially further empower women and increase their incomes.

So for all of the above myriad reasons and concerns the crop feedstock choice and milling process design goes to the heart of the future success of the business and science of milling and the welfare of humankind as a whole. The science is constantly evolving as are the business models used and more recent events such as the Arab Spring, GM developments positive and negative, geo-political shifts through migration and changes in political leadership and style (Brexit and the US elections) signify even more new opportunities for forward thinking millers.

A milling businesses that can demonstrate it is paying heed to much more than the product itself and its price, has a unique proposition that differentiates it from other millers. Opportunity beckons in the fast changing world!

A few of the underutilised grain crops for increased consideration by millers are, sorghum, millett –pearl, finger and others, African rice, fonio, teff, naked oats, rye, cowpea, groundnut, grain amaranth and quinoa.

Field production systems that are to be encouraged and developed in the crop feedstock production process are 'no till' where the soil is not inverted prior to planting and thus is less exposed to weathering loss, carbon loss and desertification. Also removing the use of chemical dessicants by incorporating swathing and pick up techniques at harvest is a simple but healthy step. Also the use of cover crops plus inter row mechanical cleaning for weed control, and under-sowing or relay cropping results in healthy soils and nutritious grains. The increased use of so called C4 grains, presently only a small part of global cropping and which are much more efficient than C3 grains at holding carbon even has a significantly tangible effect on climate.

Finally increased nutritional knowledge and characteristics of these underutilised grains and the need for data that equals that of the big three of wheat, rice and maize is of paramount importance to positive future agricultural developments. Millers can steer this process by the choices they make in crop feedstock and the subsequent processing product development paths that they take. There is certainly an increasing public appetite for these considerations that can be tapped to the benefit of both the milling industry and their customers. Milling4Life will be positively contributing to this process in its charitable activities going forward.