

Sweet Success-View from the East Dr Keith Dawson (Continental Farmers Group PLC)

As I write we are completing our sugar beet harvest in the Ukraine with a major campaign lifting, storing and transporting over 150,000 tonnes of beet from our farm to the local factory at Radechov. This was our largest ever logistics operation in the eighteen years operating in Eastern Europe! It provides a major boost to the local economy creating higher output and more jobs (not in itself a good thing unless they also increase efficiency and profitable output)! Winter crop drilling is complete and in contrast to Scottish conditions, whilst rape is looking well and went into good seedbeds, the wheat has suffered from droughted seedbeds and slow and patchy emergence throughout Ukraine, especially the Central and Eastern areas. It has been the driest autumn for fifty years in East Ukraine! This will have an effect on global prices going forward as Ukrainian hectarages are down in any case and of those planted 40% are in poor condition! An increase in maize drillings in failed wheat fields next spring is forecast in the East. As reported earlier our yields have been good this season and forward market prospects look favourable especially for our expanded healthy rape crop. The increasing global demand for soya is again helping all oil crops, although Argentina harvest forecasts are high. On a recent visit to Singapore and Indonesia to look at a new palm oil project I was struck by the lack of advances in variety improvement in this important oil crop. This is in stark contrast to the improvements in soya and oilseed rape breeding which we are gaining from in both Ukraine, Poland and Scotland, producing more crop from the same or less land.

The Agri-Energy project with Havana Energy in a joint venture with the Cuban Government is developing a useful trajectory. We were delighted recently to facilitate the first visit of the new Cuban ambassador to Scotland. Glasgow is twinned with Havana and through Scottish Development International we entertained her to dinner in the stunning Glasgow City Chambers, the tallest marble building in Europe, ahead of the Vatican. The Ambassador has spent the last twenty years in various African states as a representative of the Cuban government so has a unique insight into the global problems of food and energy security. She made a strong case as to why the role of women in solving

the current global problems was so important. "It is because women constitute half of the global population and we gave birth to the other half!" she told us in her post dinner speech. She also emphasized the strong historical links between Cuba and Scotland and that Cuba was definitely open for business, a particular welcome for Scottish companies and farmers. She was particularly enthusiastic about the renewable energy developments in Cuba, who are largely reliant on imported diesel oil from Venezuela and import 70% of their food. Food ration books are still in place. This has resulted in us signing a partnership agreement between Scotland and Cuba to share and develop academic, consultancy and research initiatives between the two countries. It was agreed with the Energy minister and Speaker of the Parliament on our recent visit to Cuba. The biomass energy is based on the removal of the invasive woody tree marabu from former Cuban sugar cane fields and returning these good soils to food and energy crop productivity.

The Cuban sugar industry was the most productive on the globe several decades ago providing 30% of the US sugar consumption, but is now only 10% of its former formidable size, with Brazil now the leader. All Cuban rail and port infrastructure is still in place and in relatively good condition, ready to go with an injection of capital and expertise! The sugar mills were just gearing up in late November for the eight month long cane harvest and processing campaign ahead, starting in December, with unirrigated crops producing 50-70t/ha and irrigated crops producing around double that abundance with 10-11% sugar content. This compares to UK sugar beet at 60-80t/ha at 16% sugar. Unlike sugar beet the cane is planted from small pieces of cane rather than pelletised beet seed. Sugar cane is a C4 photosynthetic plant as opposed to a C3 like potatoes or wheat and so is a much more efficient producer in hot tropical climates. It is planted once every seven to eight years, so planting and growing costs are much lower than beet, it grows rapidly to a height of 7 foot per annum and is harvested every year and requires much less crop protection. Biological control using a released parasite controls the major pest cane stem borer *Diatraea*. Disease control is mainly by varietal resistance, although smutted plants are removed. Early season cane is "ripened" using Fusilade to widen the processing campaign window.

Once the sugar is extracted this leaves a lot of fibrous residue called “bagasse” which can be used as a feedstock to produce electricity via boiler driven turbines. With Havana Energy we aim to utilize this bagasse with marabu wood filling the three month gap between sugar processing campaigns. This introduced African tree, which covers 1.5million hectares of good agricultural land in Cuba, can be harvested for chipping and biomass electricity generation. In addition this marabu is such a dense highly calorific wood it is ideal for the production of high value “activated” carbon. This product has a value of \$1200-1800/t and has a rapidly growing market in water filtration and for production of the new generation of batteries and super capacitors. A great deal of work has been carried out in Scotland by Prof Peter Hall at the University of StrathClyde, a globally renowned expert on energy storage. In Shanghai there is a pilot project utilizing these novel carbon batteries to power electric buses. They can be recharged up to 10 million times more than standard lithium ion batteries and are lighter and less toxic. From a Weed Tree to Transport and Timekeeping through watch and bus batteries-quite a process. Who knows they may even power our farm machinery in the future!

The soils and climate in Cuba are very productive and the sugar cane varieties are produced by a similar process to potato varieties with cloning and propagation in aseptic conditions, not dissimilar to Scottish micro-propagation of mini tubers. This produces a disease and pest free seed stock and rapid multiplication of promising new varieties. There is a current drive at the Sugar Cane Research institute I visited to develop earlier maturing varieties with higher sugar contents thus broadening the processing window further. An astounding new breeding initiative is the development of Energy Cane with 25% fibre rather than 15% with sugar cane giving a staggering sixteen feet of growth in one season and up to 200t/ha of wet weight per annum, if irrigated. A prodigious producer of biomass to power renewable energy plants to replace imported diesel. As it is a flexible crop it avoids lodging during the hurricane season by just swaying with the elements-not unlike the Scottish and Ukrainian farmer this season!