Yellow Gold - Innovative systems for sustainable daffodil derived galanthamine production in the uplands

In the spring of 2015, a consortium consisting of Agroceutical Products Ltd, based in Mid Wales, together with the Institute of Biological, Environmental and Rural Sciences (IBERS), Upland Resesrch Centre, Pwllpeiran, which is part of Aberystwyth University (AU) and Harper Adams University (HAU) Engineering Department, were awarded a 4.5 year Agri-Tech Catalyst Industrial Research grant to investigate "Innovative systems for sustainable daffodil-derived galanthamine production in the uplands", so called – Yellow Gold.

Galantamine is a pharmaceutical product that had been an approved Alzheimer's disease treatment since 1998. Galantamine is mainly produced from plants, as although chemical synthesis is possible the process is difficult and expensive. Daffodils are the only economically feasible plant source for cultivation in the UK. Research has established that growing daffodils in upland areas triggers a 50% higher yield of galanthamine (the 'Black Mountain effect'). This research project aims to investigate a new approach for producing daffodil-derived galanthamine based on integrating daffodil growing into existing upland pasture while avoiding the need to plough the field. It is hoped that doing this will increase the economic sustainability of hill farming by providing farmers with a high value crop while maintaining traditional farming systems in the upland areas.

During the summer of 2015, Jim Loynes, Simon Cooper and David White (all Agricultural Engineers at HAU) have redesigned and rebuilt a machine for planting bulbs, at varying rates (e.g. between 4 to 6 tonnes per hectare) under upland long-term grass leys at Pwllpeiran. In September 2015, the single row planter was used to plant 24 tonnes of daffodil bulbs into field scale, agronomy trials at the IBERS upland research farm, Pwllpeiran. A limited trial area was also planted at HAU, next to the old free range poultry unit, to check whether the planter performed as expected. The next phase of the project for the Engineering Department was to evaluate commercially available harvesting machinery to harvest the above ground growth of the daffodils when they reach a suitable growth stage in the spring (the bulbs will remain in the ground to produce successive crops over the duration of the trial).

This year (2016) further trial plots are to be established at Pwllpeiran, again with varying planting densities and HAU have again modified and converted their single row planting machine into a 2 row machine. This year we are planting approximately 21 tonnes of daffodil bulbs of varying sizes in apprrovimately 4 hectares of permanent pasture with adjacent control plots. AU are continuing to monitor sheep growth and performance on the trial and control plots and APL are assessing the galanthamine production from all the plots. The final trial and project results will not be known until late in 2019.

Agroceutical Products

For more information about APL, please see their website http://www.agroceutical.com/
Alternatively follow the link to the Country File report by James Wong from April 2011

https://www.youtube.com/watch?v=yAKb9wQd8eM&feature=youtu.be