From Scottish Bog to International Beauty Counter - the Story of Sweet Gale

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Introduction

Sweet Gale is a deciduous shrub that grows, as the name suggests, in damp conditions in upland regions. Its essential oil containing leaves have been used for flavouring beer, porridge and vinegar for over a thousand years. The plant has also been used traditionally as an insect repellent and has been used as a dye plant for cloths such as Harris Tweed. The plant is still wild harvested in small quantities for these traditional uses. Analysis of the essential oil by the Scottish Agricultural College (SAC) showed it to contain some interesting terpenes but also showed a high level of compositional variability, from plant to plant, growing location to growing location and season to season. The plant had not been commercially propagated or cultivated. Given that the plant grew in inhospitable conditions, mechanical harvesting had not been developed. Large-scale production of the essential oil was not understood and the benefits for health and beauty products were also not fully determined.

However if, by using good sustainability and corporate and social responsibility principals, it was possible to develop a method of producing Sweet Gale essential oil at a cost and quality that would allow them to be used in new health and beauty products, then this essential oil had the potential to become a valuable ingredient in the formulator's palette. All of the unknowns, composition, propagation, cultivation, harvesting, distillation and end use, as described above required addressing before the objective of having a commercially viable essential oil source available could be achieved.

Agronomy and propagation

The first issue to investigate was the agronomy and propagation of the plant. We were looking to grow some four million plants for the initial production quantities and to grow them efficiently.

SAC studied the range of variation in oil composition of Sweet Gale populations in the Scottish Highlands and, following analysis of over 500 samples, the first reliable description of Scottish Sweet Gale oil was developed. Two broad categories of monoterpene-rich types and sesquiterpene-rich types were identified. Using the knowledge gained it is now possible to blend oils of varying composition to produce a standardised product. Oil from North American and European sources of Sweet Gale were also investigated. These were found to have different compositions to the Scottish oil, the climate and soil types of Scotland combined to produce a unique oil.

Leaf yield was also found to be highly variable within and between populations but it was not possible to identify geographical or environmental factors affecting yield of wild populations. SAC completed a successful programme aimed at developing efficient methods of propagating Sweet Gale plants. As a result, micro-propagation techniques for Sweet Gale clones are now well understood and are capable of providing material for commercial-scale production of plants (Figures 1 and 2). Conventional propagation by seeds and cuttings was also investigated and reliable techniques are now in use by commercial growers (Figure 3). Agronomic investigations conducted by SAC considered some of the basic requirements of commercial Sweet Gale production including the effects of soil type, plant spacing, planting time, planting methods and harvest timing. The preliminary conclusions together with practical experience gained during the project have been used to develop a growers' guide. However, it should be emphasised that further research over more growing seasons will be required to provide ongoing improvements to crop production methods. It would take three to five years for plantations to become fully productive.