

## BENEFITS OF NZLGA GAS CHROMATOGRAPHIC ANALYSES

Detailed gas chromatographic (GC) analyses were first used at Lincoln DSIR in 1981 to evaluate various lavender lines established by individual growers in NZ. Over the following 10 years, we also ran exploration programmes on seedling lines, which eventually gave rise to Pacific Blue. Since then, I have worked with Virginia McNaughton, assessing the oil composition of the inspired selections from her breeding programme – the source of Avic Hill, Violet Intrigue and Molten Silver. Shortly after the establishment of the NZLGA, I upgraded the GC equipment and methods for oil analyses giving the relative levels of 5 of the major oil components. In 1996, I analysed the first annual batch of oils as a service to the NZLGA and its members. In 2000, I upgraded the method again to provide levels of the 12 main components and provided annual analyses for NZLGA members until 2014 when access to GC facilities ended.

Over nearly 20 years, the detailed data from GC analyses has benefitted NZLGA members and NZ trade in lavender and other oils in a number of valuable and significant ways.

- Cultivar identification – More often in the early days, but still recently, the GC data has been valuable in definitively confirming and correcting identification of cultivars.
- Variations within cultivars – The variation within a cultivar due to its terroir – climate, soil and location – has been graphically illustrated over the years and has given us a better understanding of what to expect from each cultivar.
- Meeting buyers' requirements – Overseas buyers, particularly for larger volumes of oil, will want a GC analysis to evaluate quality and suitability for purpose, and to provide trust in what they are buying. Being able to provide that data proactively as an integral part of a marketing campaign generates a valuable impression of a professional business.
- Quality control and assurance – GC data provides support for any aromatic evaluation to give growers confidence that they are producing oils that are true to type for a particular cultivar and to spot any major contaminants or mix-ups between cultivars.
- Improvement of oil quality – The GC data reveals a number of oil faults for which there are easy solutions and gains in quality. These include wrong flowerhead maturity, excessive stem material, poor distillation practice and poor handling of harvested material. Over the years, it has been obvious in the annual analyses and the oil competitions that feedback on such problems has resulted in fewer of these problems.
- Characterising cultivars – In 2009, I compiled a database of results from the annual analyses to indicate the variability of oil from the main cultivars, and also to indicate the expected ranges of major components. While not being a formal and binding specification as used overseas, this GC data provides growers with an expectation of what the composition of the oil from each cultivar should be. GC data from individual oils, as above, and the expectation of each cultivar is a valuable tool for growers to ensure their oils are true to type.
- Evolution of NZLGA and the NZ lavender industry – The use of GC analyses and the oil competitions to provide feedback to growers has established NZLGA and its members as the most technically educated in the world. This is of real benefit to NZ growers in their marketing.

- Future opportunities for improvement of oil quality – Although the GC methods used in the past could produce accurate and useful data on relative levels of major and minor components, it was too laborious and time consuming to relate these data to any subjective measures of oil quality. With the huge new computing power and built-in statistical programmes in modern GC software, there are new opportunities to locate in the GC trace specific aromatic components that are involved in top oil quality and also components responsible for off notes. Having associated specific peaks with quality characters, there is then the opportunity to chemically identify such components. Identifiable components could then be traced from the plant through the harvest, distillation and storage to locate opportunities to maximise good aromatic components. Similarly, there is the opportunity to explore minimising components responsible for off-notes. Such future opportunities are of immense potential to improve quality, compliance and relevance in the markets of an industry that will become more and more demanding of the growers.

Thanks to Peter Jemmet's efforts, the NZLGA now has the opportunity to re-establish the facility for affordable GC analyses tailored to the members' requirements. Enquiries to professional analytical providers indicate that their cost per sample is too high, and that expert interpretation of the results is lacking. I have discussed and examined the possible arrangements Peter has suggested for such a facility and service. I think that they are most suitable and should provide what the NZLGA needs. I am enthusiastic about working with Peter to help establish this facility. The projected cost is very affordable compared with analyses from other providers and gives every NZLGA member the opportunity to obtain essential information for improving their oil quality and presenting a professional market face. The more members that use the facility, the more cost effective it will be.

I strongly recommend members to support the establishment and use of NZLGA's own GC facilities.

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