



SME of the Month - Phytowelt GreenTechnologies



[Phytowelt GreenTechnologies](#) took home the *Most Innovative European Biotech SME Awards 2018* in the Agricultural Biotech category. The German SME is focussing on plant-breeding projects that aim at enabling regional production of renewable resources. It is the first company able to produce a biotech raspberry fragrance in high quantity and quality without using energy inefficient petrochemical processes, which helps meet the big and unmet demand of the perfume, food and cosmetic markets for natural fragrances and flavours. We interviewed the CEO of the company, Peter Welters.

How did Phytowelt GreenTechnologies start out?

Phytowelt GreenTechnologies is a merger from 2006 out of the two companies Phytowelt and GreenTec, a spin-off from the Max-Planck-Institute for Plant Breeding Research in 1997 with Jeff Schell as one of the founding shareholders. I started Phytowelt myself as a service provider in biotechnology in 1998. Due to the merger we combined the best of the two companies, the large client data base of Phytowelt and the R&D capabilities of people educated and trained in one of the most prestigious plant biotech institutes of the world, with Jeff Schell being one of founders of genetic engineering in plants, besides van Montague.

In the meantime, we used this knowledge to develop plant breeding accelerating procedures leading to non-GMO plants. Combined with our enzyme and fermentation technology, we developed a biorefinery concept for the production of high value compounds out of poplar wood. We patented the production process for R-alpha-Ionone by fermentation of E.coli. Our first approved poplar variety developed by protoplast fusion is named "Jeff Schell", to honour one of our founders.



(From left to right: Ulrich Garvert, Senior Consultant;
Dr. Peter Welters, CEO and founder; Nicolai Assenmacher, Junior Sales and Project Manager)

How would you describe your Unique Selling Point compared to other companies also combining plant and industrial biotechnology?

Our USP, which gives us such a big advantage compared to other companies, is to master the expression of plant derived genes in micro-organisms. This enables us to offer our clients the tremendously rich world of plant biosynthetic pathways. There were several attempts to copy us, but no other company has twenty years of experience, dedicated to plant biosynthetic pathways in micro-organisms. On top of that, due to our knowledge of optimized expression of plant genes in bacteria, we are now able to improve these pathways in planta. Thereby, we are revolutionizing the production of high value compounds in plants, opening the way to a real sustainable production by increasing the concentration of secondary metabolites and derivatives useful as nutra- and cosmeceuticals as well as APIs in pharma.

Can you give a bit more details about your biotech raspberry fragrance that is chiral pure and smells intensive?

R-alpha-Ionone is a blue ocean product, which nobody was able to produce naturally in sufficient amounts necessary to commercialize before we developed our fermentation process. However, it is highly demanded by the aroma industry. First, we have established a general production process for terpenes and then optimized it for carotenoid production. Finally, we found a very efficient way to degrade a special carotenoid by a CCD class enzyme to two molecules of R-alpha-Ionone. So, we developed a product, which is currently based on sucrose as a resource but will soon be made from poplar wood. Thereby, our R-alpha-Ionone is independent of oil and food production. Poplar can be grown on poor soils and marginal lands, thus delivering an inexpensive and sustainable carbon source. Due to the high product purity and natural synthesis pathway from the raspberry plant, our R-alpha-Ionone can be commercialized as natural aroma. Looking at all these facts, it is a truly bio-based product.

You had a first commercial run in 2018. What has been your process to raise enough capital and reach the market?

We earned the money to develop our own product as an R&D provider. It is not the most ideal way because it slows down the development and you need a lot of patience and dedicated people. But in our case it worked because we combined it also with our ability to raise money in publicly funded R&D projects. Here we improved our technologies, gained new knowledge through our academic partners and also increased our network significantly. We are constantly asked by academic consortia to join their proposal. Exemplary, in 2011, I have counted 51 independent partners in running R&D projects. Overall, we raised more than 12 Mio. Euros in publicly funded projects but the lever we have had for our partners is also tremendous - as our partners raised more than 100 Mio. Euros in these projects and initiatives.



Phytowelt's "Agargarden" with Drosera

As a SME active in green biotechnology, what is your opinion on the low level of political acceptance on GM techniques in Europe?

It inhibits progress, leaves us to the pity of the rest of the world and damages two main pillars of the European industry: the innovation potential and the establishment of SMEs. And it is not only plant breeding and the food industry who are affected. In addition, industrial biotechnology cannot thrive because it needs plants as feedstocks. If you are not able to produce feedstocks with the best technologies, you are dependent of those countries who are able to. The same is true to pharmaceutical and cosmetical applications. Furthermore, SMEs are innovation drivers in the agile and rapidly developing field of genome editing through CRISPR/Cas and Co. By more or less prohibiting the use of genome edited organisms through unreasonable registration procedures and generalizing GMO definitions, scientific and economic progress is damaged. Changing this would lead to various innovative plant varieties with pathogen resistances, drought and salinity tolerance or increased nutritional value, which could be launched by SMEs and universities to foster a sustainable but still highly productive agriculture with a much higher biodiversity on the field as it is right now.

Did the unfavourable and restrictive EU legislation on GMOs have an impact on the development of your business? If so, how did you cope with it?

You need a lot of flexibility and frustration tolerance: Phytowelt was founded in June 1998 to provide services to plant breeders for field trials of genetically engineered plants. In September 1998, the EU started their moratorium and no new field trials were allowed until 2004. When the EU court ruled in 2018 that plant bred with NBTs had to be considered as GMOs, we lost 4 of 5 tenders we gave to clients to improve the content of secondary metabolites in plants. The agility and innovative ideas of our team is a big asset in our ambition to bring the most profit to our clients. Our switch after the merger in 2006 to industrial biotechnology as our main source of income helped enormously, proving that the EU would be better off in the development of SMEs if the legislation actually allows to bring products to the market.

What advice would you offer to young entrepreneurs that are still in the development phase and seeking to build a sustainable opportunity in plant biotechnology?

Start on another continent and come back when you have established your business elsewhere.

What are your aspirations for 2019 and beyond?

Singing with the Bee Gees "Staying alive..." would be an underestimation of our potential. I think 2019 will be the best year in all key performance indicators in the 20 years since our foundation. We will expand the sale of our Ionone, use a portion of this revenue to continue to promote our disruptive technologies and be a serious aspirant as defending champion for this year's EuropaBio SME Award.

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About EuropaBio

EuropaBio, the European Association for Bioindustries, promotes an innovative and dynamic European biotechnology industry. EuropaBio and its members are committed to the socially responsible use of biotechnology to improve quality of life, to prevent, diagnose, treat and cure diseases, to improve the quality and quantity of food and feedstuffs and to move towards a biobased and zero-waste economy. EuropaBio represents 75 corporate members and 17 national biotechnology associations and bioregions.

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