



NOWA: WHAT TO DO WITH VINEMAKING LEFTOVERS?

Bioplastics should come neither from fossil, nor from food resources — but from agricultural waste, finds **Nathalie Gontard**, INRA Montpellier

Talking to Nathalie Gontard, one is immediately aware of a strong ambition, and enthusiasm for plastic recycling. ‘My life’s mission is the eradication of plastic waste,’ the French professor repeats like a mantra during an interview on Skype. Well aware of the magnitude and the complexity of this mission, she has dedicated great parts of her life as a researcher to finding eco-friendly and safe solutions for plastic and plastic waste, using biological residues.

When the food engineer started her research 30 years ago, she was dealing with vegetable leaves as a basis for food packaging material. Now, Nathalie Gontard has become Research Director at the INRA Research Centre in Montpellier, and is currently leading on the international NoAW project (www.noaw2020.eu), which looks at global plastic chains from very different angles, aiming at the avoidance or degradation of plastic waste. ‘We want to work towards becoming a zero-waste society,’ she says. To reach this goal, the project partners also cooperate with China.

The NoAW project approaches the entire biomass and plastic waste chain from a holistic viewpoint. It aims at finding strategic answers to deal with agri-waste and to reduce it towards zero by applying the principles of a circular economy. The project also intends to develop eco-guidance tools for an eco-efficient design of biomaterials and biogas solutions.

Following this path, trials are being run to transform bio-waste into low-cost polymers using anaerobic digestion, the methanisation of straw and manure, or using the leftovers from vinemaking to produce new bioactive molecules. To develop early concepts into viable solutions, the project has set up a business platform to carry out the mission, handling develop-

ments under a fast-track strategy and liaising with industry partners.

But the NoAW mission will not stop there. The long-term management strategy continually assesses the eco-efficiency and safety of the entire waste value chains, including the potentially emerging applications. For the coordinator, Nathalie Gontard — who, as an expert in food packaging, is advising the European Food Safety Authority (EFSA) on safety aspects relating to plastics, including nano-tech solutions — both the leakage of plastic gadgets into the environment but also a leakage of non-biodegradable plastic, are no-gos: ‘We need to invest in bio-degradable plastics and recycling, aiming at correctly and efficiently collecting, sorting and decontaminating. We do not need more bad Life Cycle Assessments.’

Recycling Credibility and Early Eco-Design Guidance

The jargon among experts includes words like ‘recycling credibility and ‘early eco-design guidance.’ For the consumer, as Nathalie Gontard knows, the buzzwords should be ‘safety’ and ‘ecology’. Food packaging safety is, for example, a crucial issue for the project, because the material needs to be anti-toxic and its residues must not diffuse into the environment: ‘Nano-packaging materials can diffuse everywhere while degrading,’ she explains, referring to one of the EFSA’s concerns. Food packages in general are another issue in terms of material efficiency, because they are generally only used in the short-term and, as a result of their ubiquitous use, are very difficult to control and have myriad entry points into nature.

Avoiding packaging and promoting bio-degradability are the priorities for the coming decades, the same applies for the raw materials of the packaging, which should come 'neither from fossil, nor from food resources,' the project's researchers emphasise.

NoAW is collaborating with its allied projects, Resurbis (dealing with urban waste streams) and AgroCycle (studying approaches to agri waste streams). Together they can capitalise on earlier research co-operations such as the project EcoBioCAP, which developed early showcase products from agriculture and forestry waste.

The seasonal availability of agri waste for supply chains and conversion streams, and its sustainability, is assessed under the NoAW schemes. Case studies are conducted in rural areas of France, Italy, Germany, Denmark and Serbia. Swedish researchers from the RISE Research Institutes are elaborating on modified Life Cycle Assessments with a better consideration of the environmental impacts and the eco-efficiency of recycled products, in order to inform future eco-design guidelines. Consumer safety aspects, such as undesired pesticides in agro-residue recycling materials, are also under investigation.

And the biz-development platform under the heading 'cross-chain valorisation' is there to integrate all stakeholders, from farmers and biomaterial suppliers, to product development engineers and industry partners.

For a long time, Nathalie Gontard has been drawing inspiration from outside Europe. In the early years of

her career she worked in Africa and Asia for CIRAD, the French agricultural research and international co-operation organisation. In the present project, Chinese partners are collaborating, with a mirror-platform, and Nathalie Gontard is currently planning a big event on China in 2018. Though still coping with different priorities between Europe and Asia, she recalls that her enthusiasm points to global

thinking. When facing the challenge of total plastic waste eradication the French Research Director emphatically stresses the fact that, 'It makes no sense to create a circular economy solely in little Europe, we need to have the other continents on board!

Photo credit: Emile Guilbert, INRA Montpellier, Naturally biodegradable tray

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Nathalie Gontard is Research Director at INRA (National Institute for Agronomical Research) formerly Professor at the University of Montpellier. She is co-author of more than 150 A level papers (h-index 31). She is the leader of a team working on food packaging and food waste reduction with a focus on modeling and decision support tools, active and intelligent bio-materials, nano-technologies and agro-food wastes reduction and conversion. She is involved in numerous international, national and industrial projects. She is the coordinator of the H2020 NoAW (www.nowa.eu), EcoBioCAP FP7 (www.ecobiocap.eu) and NextGenPack (www.nextgenpack.eu) projects, European expert for the EC and the EFSA, promoter and editor in chief of the journal "Packaging Research" (degruyter.com/view/j/pacres).



