MATERIAL CHANGE FOR GOOD

CelluComp

CelluComp
sustainable materials

with curran

CelluComp

- **Material Science**
- **Agri-Food Waste & Co-product Streams**
- **Higher-Valued materials**
- **Simple, Low Production Cost**
- **Low Energy and Chemical Usage**

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Why Nano-Cellulose

- Most abundant natural polymer
- Biodegradable
- Biocompatible
- Chemical functionality
- Rheological properties
- Optical properties
- Low Density
- Mechanical Properties

with curran

Why Cellulose

	Typical Modulus (GPa)	Tensile Strength (GPa)
Carbon Fibre	150- 450	3 - 6
Glass Fibre	40-90	4
Kevlar	70-100	3
Wood	5-13	0.05-0.12
Nano Cellulose	150	7-10

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Nano-Cellulose Growth Market

USDA estimate short term (by 2025)
market of 34 million tonnes per Year
(TAPPI 2014)

> *Global Cellulose Nanoparticles Market is expected to be worth* ***US$ 808.30 billion*** *by 2022.*

(Market research reports- July 2015)

Sugar beet waste product could be billion dollar 'wonder material'

REUTERS

Wednesday, September 16, 2015 - 02:16

A natural material made from sugar beet waste to thicken paints, bulk out food, and potentially even manufacture airplane wings has been devised by Scottish scientists. Jim Drury reports.

The Telegraph

HOME » FINANCE » BUSINESS CLUB

The UK's latest 'wonder material' is made from sugar beet

A Scottish start-up is turning root vegetables into an ingenious new material, which can be used to lock moisture into anything from food to cosmetics to concrete

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Industrial Feedstock

Sugar

&

Pulp

ging

Other feedstock possibilities include carrot (already used), potato and other root vegetables

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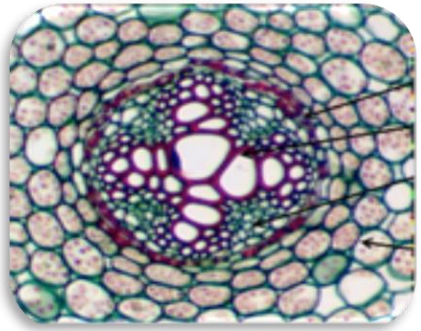
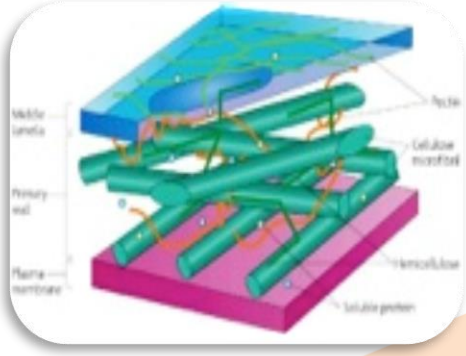
Commodity Product to High-valued Material

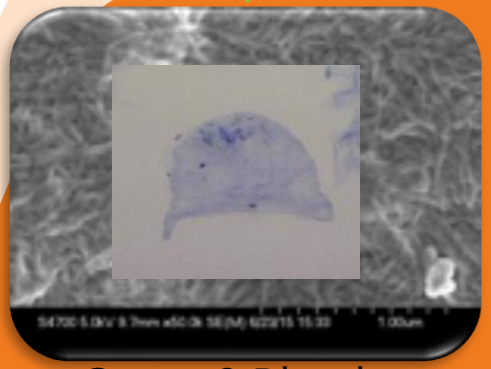
Beet Pellets (Pulp)



Cell Wall



Cellulose Extraction



Curran® Platelet w/nano fibres inside

with curran

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End product - 2 Options

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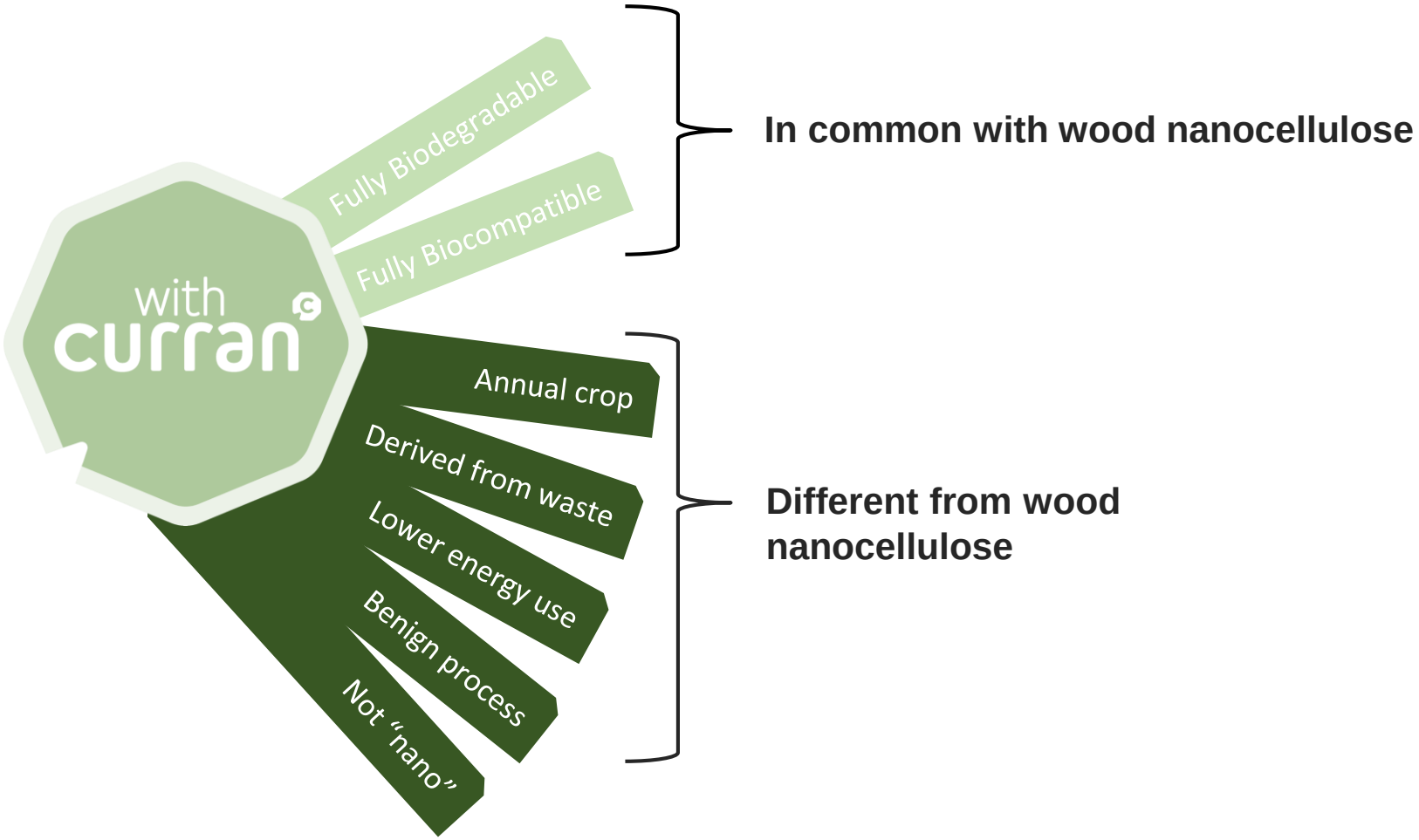
Curran®


with curran
Fully Biodegradable
Fully Biocompatible
Annual crop
Derived from waste
Lower energy use
Benign process
Not "nano"
In common with wood nanocellulose
Different from wood nanocellulose

Curran Markets

Composites

Drilling Fluids

Paint & Coatings

Concrete

Food

Home Care

Personal Care

Paper/Packaging

Curran Advantage

1. Only company to produce similar product in Platelet form (additional properties).
2. Less lignin in vegetables (compared to wood) means lower processing costs

Two Fundamental Properties with one small dose of Curran

1. Mechanical Enhancement
2.Thickening

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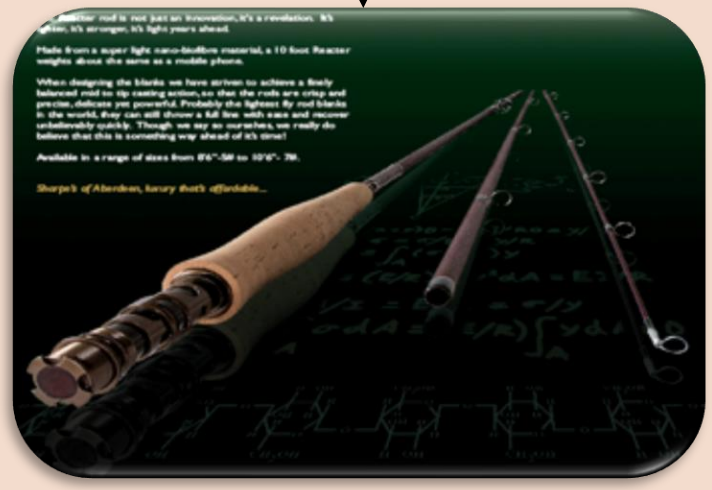
Curran® in Composites

- Stiffness up to 23 GPa
- Strength (bending) up to 350 MPa
- Density 1.2-1.4 g/cm^3

Proof of Concept

“Bunny Racer”



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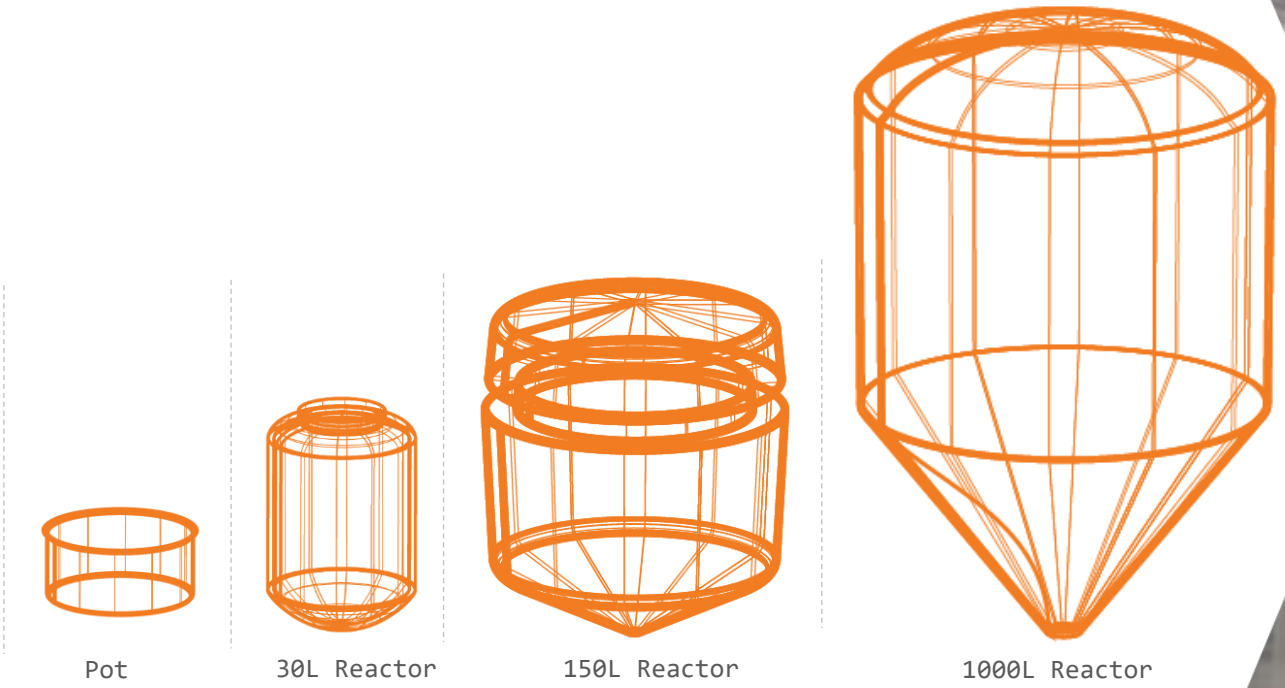
Scaling Up



CelluComp has successfully managed the scale-up of its product in incremental steps. Reaction vessel sizes have developed over time:

5L - 30L – 150L – 1,000L – 5,000L

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