

### 3 . SOURCE MATERIAL | PLANTS

Only 15-20% of the plants grown for food - usually the roots, fruits, seeds or juices - actually end up as food. Part of what remains is used for animal feed, but billions of tons of agricultural residue remain, often ending up as waste, which is burned or used for energy generation. Now some companies are experimenting with the previously discarded leaves and stalks of products – to make the packaging.

#### 3a CORN & VEGETABLES | CLEAR FILMS

	
<b>STARTING LIFE</b>	<p>MATER-BI is an innovative family of biodegradable and compostable materials developed over 25 years of research in Italy. MATER-BI contains (a) Non genetically modified <b>corn starch</b> grown in Europe using traditional agricultural practices (b) <b>vegetable oils</b> from non-transgenic crops.</p> <p>Evolving with each new design phase, MATER-BI's 4th generation contains a greater proportion of renewable raw materials with content typically &gt; 40% and over 60% for some film grades. A higher level of mechanical performance has also been achieved.</p>
<b>WORKING LIFE</b>	<p>Products in the Mater-Bi family can be manufactured in a rigid or flexible format and are suitable for both fresh and dry foods. The range extends from <b>transparent films, liners, wrappers for products like butter, netting, cardboard trays and clear bags for potatoes and carrots.</b></p> <p>MATER-BI can be produced on standard plastic converting equipment which means Novamont's production line needs no new facilities or machinery.</p>
<b>ENDING LIFE</b>	<p>MATER-BI packaging is fully biodegradable and compostable. Ideally MATER-BI products are designed to be disposed of together with organic waste in separate collection systems and preferably sent to an in-vessel composting facility.</p>
	<ul style="list-style-type: none"> <li>- OK Compost certified.</li> <li>- European industrial composting certified (EN13432).</li> </ul>
<b>WEBSITES</b>	<p><a href="http://www.novamont.com/eng/corporate-responsibility">http://www.novamont.com/eng/corporate-responsibility</a></p> <p><a href="http://materbi.com/en/wp-content/uploads/sites/2/2016/05/packaging-solutions- EN_LR.pdf">http://materbi.com/en/wp-content/uploads/sites/2/2016/05/packaging-solutions- EN_LR.pdf</a></p> <p><a href="http://materbi.com/en/wp-content/uploads/sites/2/2015/12/Scheda-bioplastichecoltivazioni EN_MR.pdf">http://materbi.com/en/wp-content/uploads/sites/2/2015/12/Scheda-bioplastichecoltivazioni EN_MR.pdf</a></p>
<b>REFS</b>	<p>- See website(s) above.</p>

### 3b TOMATO STALKS & LEAVES | PUNNETS

		
<b>STARTING LIFE</b>	<p>In 2017 Waitrose trialed a new environmentally friendly punnet made from tomato leaves and stalk 'waste' mixed with recycled cardboard pulp for their organic tomato range. For red lentil and green pea pasta, boxes partly made from <b>pulses</b> are also being used, reducing virgin tree pulp by 15% and greenhouse gas emissions by 20%. And for Duchy Organic eggs, a box using a mixture of <b>rye grass and recycled paper</b> has been developed.</p>	
<b>WORKING LIFE</b>	<p>Pending successful trial results, Waitrose predicts using the new punnet will save 3.5 million plastic trays per year. If a biomaterial film to seal this punnet were adopted, this would be a perfect example of using food to wrap food which comes full circle by composting down at the end of its life to create soils - to grow our food.</p>	
<b>ENDING LIFE</b>	<p>Waitrose punnets can be mixed with food waste in household waste streams and are fully compostable.</p>	
<b>WEBSITES</b>	<p>- OK Compost certified.</p> <p><a href="https://www.packagingnews.co.uk/news/environment/canadian-and-french-firms-introduce-packaging-from-tomato-plants-03-01-2017">https://www.packagingnews.co.uk/news/environment/canadian-and-french-firms-introduce-packaging-from-tomato-plants-03-01-2017</a></p> <p><a href="http://www.producebusinessuk.com/insight/insight-stories/2017/10/30/waitrose-pilots-punnet-made-from-dried-tomato-leaves">http://www.producebusinessuk.com/insight/insight-stories/2017/10/30/waitrose-pilots-punnet-made-from-dried-tomato-leaves</a></p> <p><a href="https://www.packagingnews.co.uk/news/environment/canadian-and-french-firms-introduce-packaging-from-tomato-plants-03-01-2017">https://www.packagingnews.co.uk/news/environment/canadian-and-french-firms-introduce-packaging-from-tomato-plants-03-01-2017</a></p>	
<b>REFS</b>	<p>- See website(s) above.</p>	

### 3c AGRICULTURAL SOURCES | MULTIPLE PRODUCTS

		
<b>STARTING LIFE</b>	<p>NatureWorks use agricultural crops as one of the most abundant, locally available, and sustainable sources of biobased carbon to supply to food packaging companies worldwide. Today the prime sources for NatureWorks include cassava, cornstarch, sugar cane, and beets with an eye to new sources including sugarcane bagasse, wood chips, switch grass and straw.</p>	
<b>WORKING LIFE</b>	<p>NatureWorks provide the biomaterial for multiple companies worldwide to produce a range of food packaging items including transparent deli containers, infusion bags for teas, sachets for dry products, coffee capsules and food trays. NatureWorks supply Vegware with much of their biomaterial.</p>	
<b>ENDING LIFE</b>	<p>All Vegware's materials are compostable, which means they break down in commercial composting facilities in less than 12 weeks.</p>	
	<p>- European industrial composting certified (EN13432).</p>	

<b>WEBSITES</b>	<a href="https://www.natureworksllc.com">https://www.natureworksllc.com</a> <a href="https://www.vegware.com">https://www.vegware.com</a> <a href="https://www.natureworksllc.com/~media/Files/NatureWorks/Ingeo-in-Use/Food-Service/NTR_Ingeo-Food-Service-Guide_pdf.pdf?la=en">https://www.natureworksllc.com/~media/Files/NatureWorks/Ingeo-in-Use/Food-Service/NTR_Ingeo-Food-Service-Guide_pdf.pdf?la=en</a>
<b>REFS</b>	- See website(s) above.