



**rainbow**  
professional  
shaping yourenvironment

## Rainbow Bio 1

### About Rainbow Professional

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Rainbow's mission is to help shape the world's transition to a greener environment. Today, it is doing so, by supporting successful tree planting with spirals and guards and by offering more sustainable solutions for edging and paving.

Rainbow's core focus is innovation, launching a number of unique products over the years including the Rainbow Buckle Tree tie, Easy Fix, Chainlock, Super Softee and the Rainbow Tree Guard.

We share the growing desire to enable tree planting in a more sustainable way. In the early 2000s, Rainbow was the first in the market to transition towards recycled materials, and for the last 3 years, we have been working hard on the development of products made from bio-based and biodegradable polymers.

### Addressing challenges in tree planting

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One of the most important challenges in tree planting today is the need to use conventional plastics to ensure survival and healthy growth of young tree plants. Many protective solutions are made from alternative materials, such as cardboard, which have been largely unsuccessful at trails.

Launched in the 1960's, the Rainbow Spiral Guard offers an effective solution for seedling protection that stands up to all weather conditions – does not shrink and allows air circulation through the pre-formed holes. The product is easy to unfurl, fit for purpose and cost effective. Additionally, the spiral protects trees against herbicides drifting in the wind, offering more flexibility, efficiency and effectiveness of weed control.



Rainbow has now developed its first bio-based tree spiral, 'Rainbow Bio 1' that has passed all required tests against EU guidelines at an independent laboratory and is classed as fully compostable. The spiral has also gained the DIN CERTO certificate. Over the last three years, the Rainbow Bio 1 has been field tested in several trials across the UK and Europe. This has resulted in a product that is suitable to last for >3 years at the typical range of temperature extremes that have been found in forests.

## Strong bio credentials

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The Rainbow Bio-spiral offers a significant improvement on products made from conventional plastics; however, Rainbow also recognizes there is a great deal over confusion about innovations in plastics.

This can in part be attributed to legislation being heavily geared toward the packaging industry. The Rainbow Bio Spiral is made from 100% biodegradable polymers; however, the finished product cannot be classed as biodegradable but should be classed as bio-based and compostable. Rainbow encourages all stakeholders to adopt this terminology. The key difference lies in the fact that products classed as biodegradable need to degrade within 6 months, making the product not fit for purpose.

The most exciting improvements compared to traditional tree guards or many other alternatives presented are:

- 1) **Fit for purpose:** Rainbow has invested significantly in developing its raw material formulation and way of processing to develop a product that is designed to last at least 3 years.
- 2) **100% plant-based:** The Rainbow Bio 1 consists of only non-toxic resources, namely PLA and biodegradable additives. Given that PLA / Polylactic acid is made from plants (waste from beets and corn), we are now effectively put plants around our trees instead of products made from oil, which pollute the environment when they break down.
- 3) **Degradable:** Rainbow's spirals are 100% degradable. When inserted in an industrial composting unit, they will degrade within 6 months. When left in the environment, they will degrade over time, either through bacteria found in compost and soil or due to enzymatic reactions. As PLA is highly biocompatible and lactic acid can also be found in the human and animal stomach, the product can also be metabolized when ingested and will in any case not be harmful. As the rate of natural degradation depends on the thickness of the remaining polymers and environmental conditions (heat, moisture, bacteria, temperature present), degradation can take a long time to take place.
- 4) **Less harmful in the oceans:** The product has a higher molecular weight, therefore sinking in water instead of floating. This makes it much less likely that the spirals could find their way into ocean extremes and reduces the threat to wildlife.
- 5) **Widely used and recommended by various bodies:** PLA is the fastest growing biopolymer today, and widely used in other applications. In the packaging industry for example, a UK plastics pact was signed in February 2020 recommending the use of compostable plastics in applications where recycling is difficult. In the medical industry, PLA is the most used biodegradable polymer in clinical applications today.



With the Rainbow Bio 1, Rainbow Professional Limited is encouraging tree planters to take a big leap forward, moving from oil-based plastics to eco-friendly plant-based plastics that degrade under the right circumstances. As adoption grows, Rainbow is committed to learn from field conditions and new polymer technologies and to develop and offer the best available products to optimize biodegradation time. In the meantime, we hope you join us in adopting the next wave forward.

## More information, input and suggestions

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Rainbow is eager to participate in the debate to make tree planting more sustainable and is open to all kinds of feedback and ideas to continuously improve its products and tree planting as a whole.

For more information or with any suggestions, please contact Rainbow Professional Ltd – Tel: 01482 616861 or Email: [info@rainbow.eu.com](mailto:info@rainbow.eu.com).

## References and recommended reads

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<https://www.natureworksllc.com/What-is-Ingeo/Where-it-Goes/Composting>

[https://www.researchgate.net/publication/322226710\\_Biocompatibility\\_biodegradation\\_and\\_excretion\\_of\\_polylactic\\_acid\\_PLA\\_in\\_medical\\_implants\\_and\\_theranostic\\_systems](https://www.researchgate.net/publication/322226710_Biocompatibility_biodegradation_and_excretion_of_polylactic_acid_PLA_in_medical_implants_and_theranostic_systems)

<https://www.hindawi.com/journals/amse/2019/4715904/>

