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WHITEPAPER CULTIVATION POTS

Introduction

In the beautiful horticultural sector a lot of plastic is being used, from trays and sleeves to labels and pots. Leaders in the sector want to work together on various sustainability subjects to be able to reach successes at a quicker pace. A whitepaper will be written for each sustainability subject. Van Dijk Flora and Royal Lemkes have taken the lead on the subject of 'cultivation pots'. Billions of cultivation pots are being traded in Europe each year. And most of them are not being recycled but incinerated. This can be made more sustainable. Following thorough research and consultations with the major stakeholders in the chain, the companies have expressed the following ambition:

In 2023 90% of the cultivation pots traded by our companies will be made of at least 80% PCR and be fully recyclable.

The main insight underlying this ambition is:

- that a widescale sustainable alternative for plastic cultivation pots is not in sight;
- that the amount of recycled plastic originating from the household waste (Post-Consumer Recycled plastic, PCR¹) will increase drastically in the coming years;
- that the horticulture sector, as end user of the plastic recycling rounds, can play an important role to make the total circular economy stronger.



Royal Lemkes and Van Dijk Flora are happy to invite other trading companies to join this ambition.

¹ Definition PCR: According to the ISO 13021:2001 norm Post-Consumer Recycled plastic is defined as: Post-Consumer waste is material generated by households or commercial, industrial or institutional companies. In their end user role the material cannot be used anymore for its original purpose. This includes as well the material returned from the supply chain.

1. UNDERLYING INFORMATION

Background

In 2018/2019 Royal Lemkes and Van Dijk Flora worked together on a project within the program 'Plastic packaging waste as raw material' (KVG). This program was aimed at finding useful applications for recycled plastic from household waste (Post-Consumer Recycled plastic, PCR). The amount of household waste is increasing and is becoming a growing problem worldwide. Van Dijk Flora en Royal Lemkes wanted to contribute to the solution. The horticultural sector does not have to deal with strict requirements regarding food safety and can therefore be a good end user for PCR in packaging.

Choice of pots

During the research it turned out that in the horticulture sector cultivation pots and plant trays are the most suitable for using PCR. Because plant trays are mostly made of Polystyrene (PS), which hardly ends up in household waste in the Netherlands we soon came to the conclusion that the cultivation pot, made of Polypropylene (PP) had the best credentials for the use of PCR. Billions of plants are traded yearly in the Netherlands and with them billions of cultivation pots, for which tens of kilotons of plastic are involved². The main markets are the Netherlands, Germany, the United Kingdom and France³. The Dutch production of PP cultivation pots amounts to approximately 73.000 tonnes per year. The production is in the hands of approximately 10 companies using injection moulding and thermoforming techniques.



Currently **73.000 Tonnes of PP cultivation pots** produced per year in the Netherlands. **PCR can be used for them.**

² NRK (Federation of Rubber and Plastic Industries)

³ VQB (Federation of Wholesalers in Horticultural Products): top 10 in billions euros: Germany 1.666; UK 855, France: 813

Use of PCR in cultivation pot

All (relevant) pot producers were consulted during the investigation. We can conclude from the research that cultivation pots are virtually (> 90%) no longer made of virgin plastic⁴. All the pot producers we spoke to, use recycled plastic for their pot production. This can be Post Industrial Recycled plastic (PIR) originating from packaging 'cutting waste' from, among others, the food industry. But often enough PCR is also used already. Ratios and percentages PIR/PCR are the secret of the smith in production and are not published. Pot producers like to work with PIR due to its uniform quality and the way it can be processed. However the use of PIR means here a write-down of relatively high quality plastic.

Ambition circular cultivation pot

Based on the idea that the horticulture sector can be the end user of the plastic recycling rounds, Royal Lemkes en Van Dijk Flora came to the conclusion that it is an achievable ambition to reach a circular cultivation pot within a few years. On the one hand this means a pot which is made of at least 80% PCR and which, after use, is also fully recyclable and can be used as a raw material for a new application (for example as packaging or as a new cultivation pot). At the beginning of 2020 Royal Lemkes and Van Dijk Flora have expressed the following joint ambition:

In 2023 90% of the cultivation pots traded by our companies will be made of at least 80% PCR and be fully recyclable.

All the cultivation pot producers⁵ we asked in joint research have endorsed the feasibility of this ambition. They do see some bottle necks which have to be solved when, in the long term, the whole sector is to switch to this pot. More about that below.

⁴ Important exception for orchids: they are grown in transparent pots which are not (yet) made of recycled plastic.

⁵ Desch Plantpak, Kreuwel, ModiForm, , Soporco and Van Krimpen

Recyclability of cultivation pots

In principle every cultivation pot made of PP is recyclable. In practice, however, a pot is actually recycled only if it is recognized in the waste separation process as being made of recyclable PP. During the waste separation process in the Netherlands as well as in the neighbouring countries the various types of plastic are detected using Near Infra-Red (NIR) detection. However this Near Infra-Red is absorbed by the pigment Carbon Black, making a cultivation pot with carbon black not detectable at all and condemned to end up in the incinerator.

The choice of carbon black pigment has a number of reasons.

1. The light density of the pot: plants grown in pots (as opposed to plants grown in open ground) are in their totality exposed to sunlight. This can have a negative effect on root growth. A black pot will protect the roots from abundant sunlight.
2. Carbon black is a cheap (and relatively environmentally friendly) colouring agent.
3. The more the plastic is recycled, the darker its colour. Black is then a good colouring agent to keep on producing uniformly.

In the last years, under the influence of various stakeholders including retailers, a lot of pressure has been put on the sector to switch to cultivation pots that are not coloured with carbon black. Thanks to new colours and new techniques it has become possible to make non-black pots lightproof.

This change is currently being made on a wide scale, certainly for plants intended for the European retail⁶.

⁶ Tree nursery products for professional use (park, landscaping) are still often grown in carbon black pots. This is not a problem as these pots do not end up in consumer waste. They can be recycled via industrial waste.

All pot producers indicate that it is quite possible to produce NIR detectable pots (almost) without carbon black as a colouring agent.

Deadline end 2021 is no problem.

Some remarks:

- Carbon black is a relatively cheap colouring agent. Replacing it by other colours may in some cases affect the price of the pot Especially when the pot must be completely light-tight for cultivation reasons.
- As achieving the ambition also means that more Post-Consumer Recycled plastic will be used and the plastic will get darker, the detection of carbon black will eventually become a condition to keep on producing. It is therefore important to discuss with the waste processing industry and to move them towards the detection of carbon black⁷.

Feasibility of Post-Consumer Recycled plastic as a raw material

At the end of 2020 pot producers indicated that it was possible - by the end of 2023 – to produce from PCR all pots for the plants traded by Royal Lemkes and Van Dijk Flora. They indicated nevertheless a number of challenges when scaling up to the whole sector (list underneath).

Mid 2021 the situation has changed due , among other reasons, to the worldwide corona crisis.

The limited availability of virgin plastics leads to higher prices and a shift in demand to PIR and PCR. Bulk users of virgin plastic shift their demand to recycled raw materials, causing the supply of recycled material for cultivation pots – traditionally of low value literally and figuratively - to shrink sharply in the short term.

It is uncertain how long this situation will last but long term effects are expected.

When scaling up to the whole sector, a number of challenges still stand in the way:

- At the moment there is no (quality) control for PCR. Traceability is therefore complicated. A label for PCR would be a favourable step.
- Particularly for thermoforming (in comparison to injection moulding) PCR is sometimes more difficult to use.

⁷ Detection of carbon black is already possible. Some Dutch companies have the possibilities but it is far from an European standard.

- Availability of PCR and the resulting price fluctuations are a potential problem. Although a lot of plastic waste stills ends up in the incinerator or landfill, it is likely that the demand for PCR will continue to grow. Companies which traditionally work with virgin material, have been increasing their knowledge of the use of recycled plastic, while anticipating the emerging legislative and market requirements for a minimum percentage of recycled material.
- PCR is in itself duller than virgin plastic (or well sorted PIR). This implies that the pot colour is duller than the colour of a pot made of virgin plastic or PIR. The colour can also differ per batch. This should not be a 'dealbreaker' for the consumer. More and more consumers are open to sustainable solutions and it is consistent to expect that (possibly with a good explanation) the consumer will accept such a colour difference in exchange for sustainability.

Long term

At the moment (April 2021) a circular cultivation pot seems to be the highest achievable. Ideally, the use of a cultivation pot should become completely unnecessary. Sustainable alternatives and Research & Development will have to be stimulated by the sector.

Lobby

Lobbying is wished on the following subjects:

- Legislation for a mandatory PCR percentage in packaging or for the circularity of packaging.
- Stimulating plastic recycling (no incineration or landfill) to be able to respond to the market demand
- Uniformization of sorting and recycling in the EU.
- Long term detection of carbon black.
- PCR may not be qualified as PIR if it is used as raw material for packaging. There is a need for clear definitions, standards and agreements.

We believe that the Federation of Rubber and Plastic industries (NRK, Federatie Nederlandse Rubber- en Kunststofindustrie) is the right candidate to do this lobbying.



Whitepaper
Cultivation pots