the soil attaching to them. The washing water is extracted from the beets themselves. The water is also used by neighbouring greenhouse growers to irrigate their crops in the summer. The soil is used to raise the level of farmland, build roads and strengthen dykes. We process broken beet tops and tails together with the washing water and other vegetable residues into green gas. This energy is used in our factories and elsewhere; some of it even fuels our bulk trucks. We are the biggest producer of green gas in the Netherlands!

When washed, the sugar beets are fed into a slicer and cut into thin strips known as cossettes.

8

JUICE EXTRACTION

To extract the sugar, the cossettes are carried to a diffusion tower, where they are slowly conveyed upward through hot water. The sugar in the beet cells dissolves and is released into the water. This produces raw juice with a sugar concentration of approximately 14%. The residual beet pulp is pressed and marketed as animal feed and as a raw material to make paper, sustainable packaging materials and other biobased applications.

9 10 10c

JUICE PURIFICATION AND EVAPORATION

As well as sugar, the raw juice contains minerals, salts and proteins. By recovering them, we purify the raw juice into thin juice. This process also produces calcium carbonate, a natural lime fertiliser (Betacal) that improves soil structure. Thin juice contains approximately 15% sugar. It is heated with steam in evaporators in order to thicken the juice and increase its sugar content to 70%. The juice is then known as thick juice. To work flexibly throughout the year, some of the thick juice is held in dedicated storage tanks at the factory and processed into granulated sugar after the beet campaign.

At the factory in Germany, we also produce bio-ethanol; during the beet campaign, we produce it from thin juice and after the campaign from thick juice. Bio-ethanol is a sustainable alternative to fossil fuels and a raw material for disinfectant hand gels and other applications.

11 12

BOILING AND CENTRIFUGING

In the boiling station, the thick juice is further concentrated in large, vacuum pans until it is saturated with sugar. Continuous evaporation of the water causes the sugar to crystallise. The crystal mixture is evaporated further until the crystals have grown to the desired size. A centrifuge then presses the mixture through a sieve to separate the pure sugar crystals from the syrup. The syrup is molasses, a raw material used in the fermentation industry to produce, for instance, baker's yeast and citric acid. Molasses is also applied as a binding agent in animal feed and fermented molasses is used to produce alcohol.

13 14 15 16 17 18

DRYING, COOLING, STORAGE AND FURTHER PROCESSING

The sugar crystals are then dried and cooled and stored before being sent to customers, packed in consumer packages or processed further, for instance into syrup or sugar cubes.

The sugar is now ready to be consumed! Every part of the beet has been used. It's a production process without waste!

About Cosun Beet Company

3 sugar factories
2 in the Netherlands,
1 in Germany (also bio-ethanol)

2 speciality factories
Producing icing sugar, syrup, etc.

850 employees
Including 200 in Germany
9,000 beet growers
Members of Royal Cosun

More than 75,000 ha of beet fields
In the Netherlands

BAS – Beet Advisory System
Tailored growing advice via the BAS app

Beet campaign
From September to mid-January

Demo plant in Dinteloord
Producing vegetable protein from beet leaves

Platinum EcoVadis status
One of the top 1% of the most sustainable companies in the world

25 million m³ of green gas
Biggest green gas producer in the Netherlands

Cosun Beet COMPANY

This folder is printed on sugar beet paper.

SUSTAINABILITY

Working on the world of tomorrow. We are passionate about getting the very best out of our beets and creating sustainable solutions that address the challenges facing society. Cosun Beet Company is a firm believer in sustainability and bears its responsibility for nature, the environment, people and society. In the interests of current and future generations. We frequently work in close cooperation with partners from inside and outside our supply chain.

MORE INFORMATION

Check out our website
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Bright Beet Solutions

Cosun Beet COMPANY

Welcome to the world of sugar beet

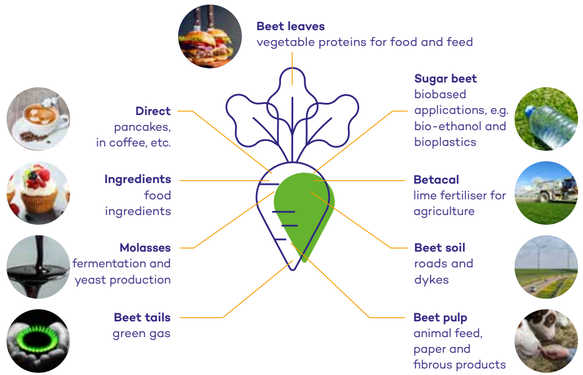
Bright Beet Solutions

The Best of the Beet

Cosun Beet Company's ambition is to be the greenest, most innovative and most successful sugar beet processor in the world. Every day our 850 employees and 9,000 beet growers dedicate themselves to getting the very best out of the beet. By using every part of the beet, we produce no waste and maximise their value.

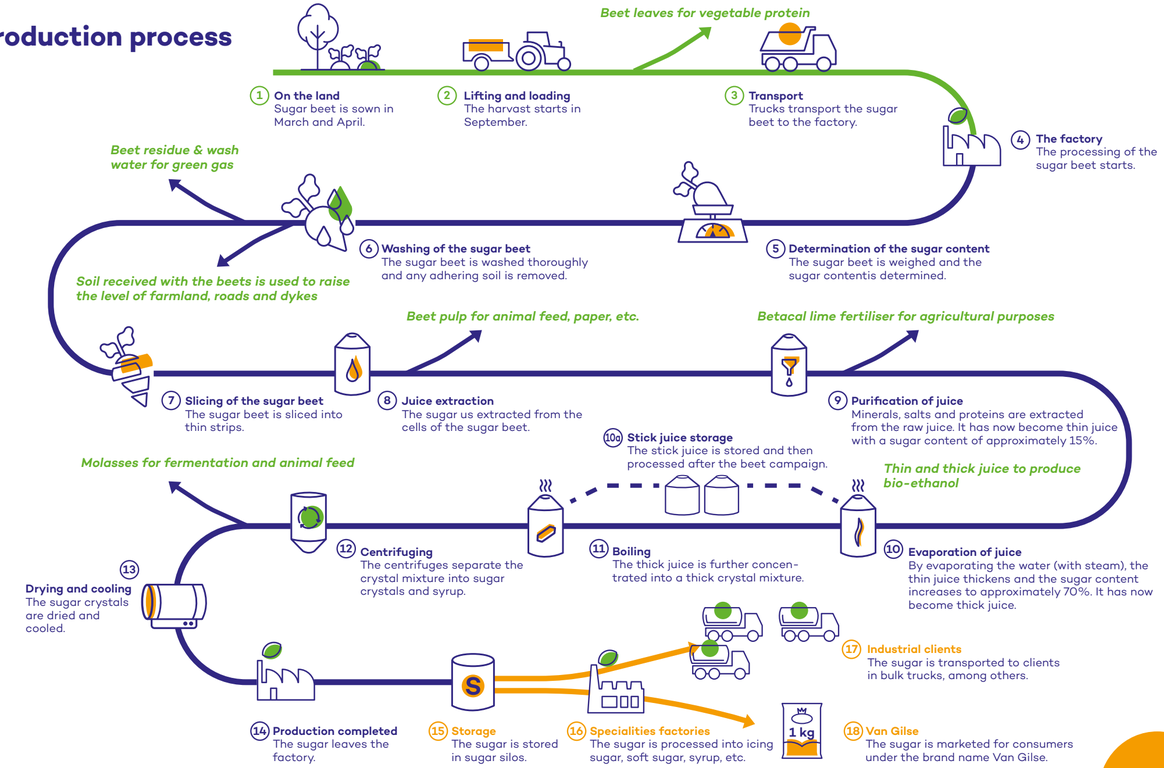
BRIGHT BEET SOLUTIONS

Sugar beets are a source of innovation and sustainable, future-proof applications: Bright Beet Solutions. They include food, proteins from beet leaves, animal feed, packaging materials, biobased domestic products, raw materials for disinfectant hand gels, and green energy (green gas and bio-ethanol).



We are working on a circular economy by creating solutions that address the challenges facing society. How are we doing it? We'd love to tell you!

Production process



The steps illustrated here show the production process in a nutshell. See the text below for more information.

There are many step between sowing the sugar beet and creating high-value products.

1 2

SOWING AND HARVESTING THE SUGAR BEET

In March and April, our growers sow sugar beet seeds of the highest quality on more than 75,000 hectares of land. With the minimum use of fertilisers and plant protection agents, the seeds grow to produce the desired sugar beet. In September, the time is ripe to harvest the sugar beet. Together with our growers we are continuously working on the most sustainable arable farming possible.

In a demo plant, we extract vegetable protein from the beet leaves. This functional protein might replace chicken protein one day.

3

DELIVERY TO THE SUGAR FACTORY

Our growers work hard to deliver the sugar beets as clean as possible. The removal of soil considerably reduces the weight and consequently fuel consumption when the beet are transported to Cosun Beet Company's factories.

As many trucks as possible leave the factories full of pressed beet pulp for animal feed processors and are loaded with sugar beet when they return to us.

4 5

DETERMINATION OF SUGAR CONTENT

On arrival at the factory, the sugar content of the beets is determined, as well as the extractability of the sugar and the amount of tare (the leaves and soil attaching to the sugar beets).

6 7

WASHING AND SLICING THE SUGAR BEETS

Cosun Beet Company washes the sugar beets in its factories to remove