SESVANDERHAVE
sugar beet seed

TAILORING SUGAR BEET FOR EFFICIENCY BOOST

APRIL 2-4 2017

Efficiency gain in sugar supply chain

- SESVANDERHAVE
- Challenges in beet sugar industry, EU post quotum 1/10/17.
- Business case

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Who is SESVANDERHAVE?

- SESVanderHave is part of the Florimond Desprez group and the 2nd biggest sugar beet seed producer in the world.
- Our focus is exclusively on producing sugar beet seed, which makes us unique in the world.
- We handle every step in the process, from the research and breeding activities untill the commercialisation of our famous blue seeds.
- Strong focus on R&D, 1 out of 3 of our more than 600 employees worldwide work in R&D.

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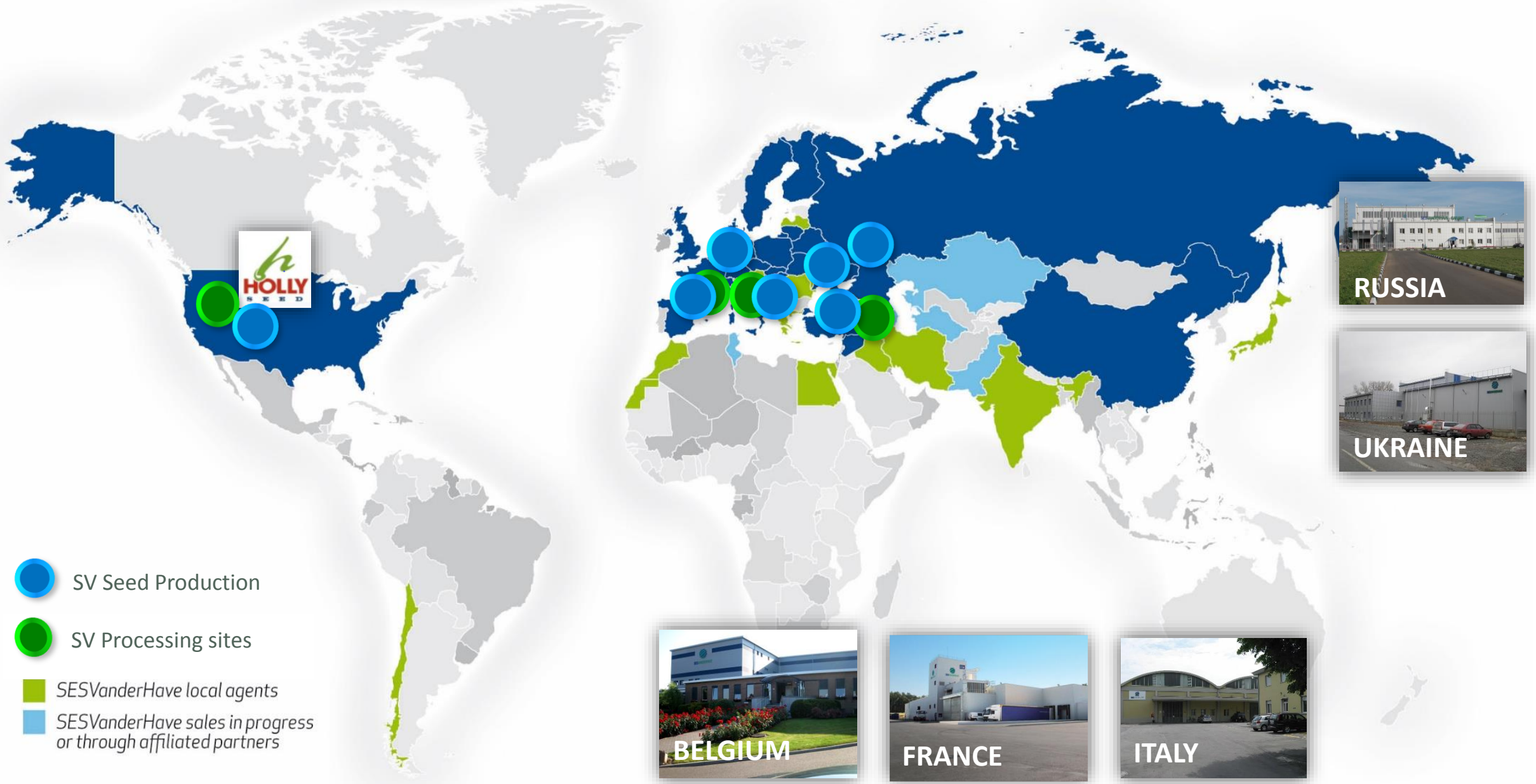
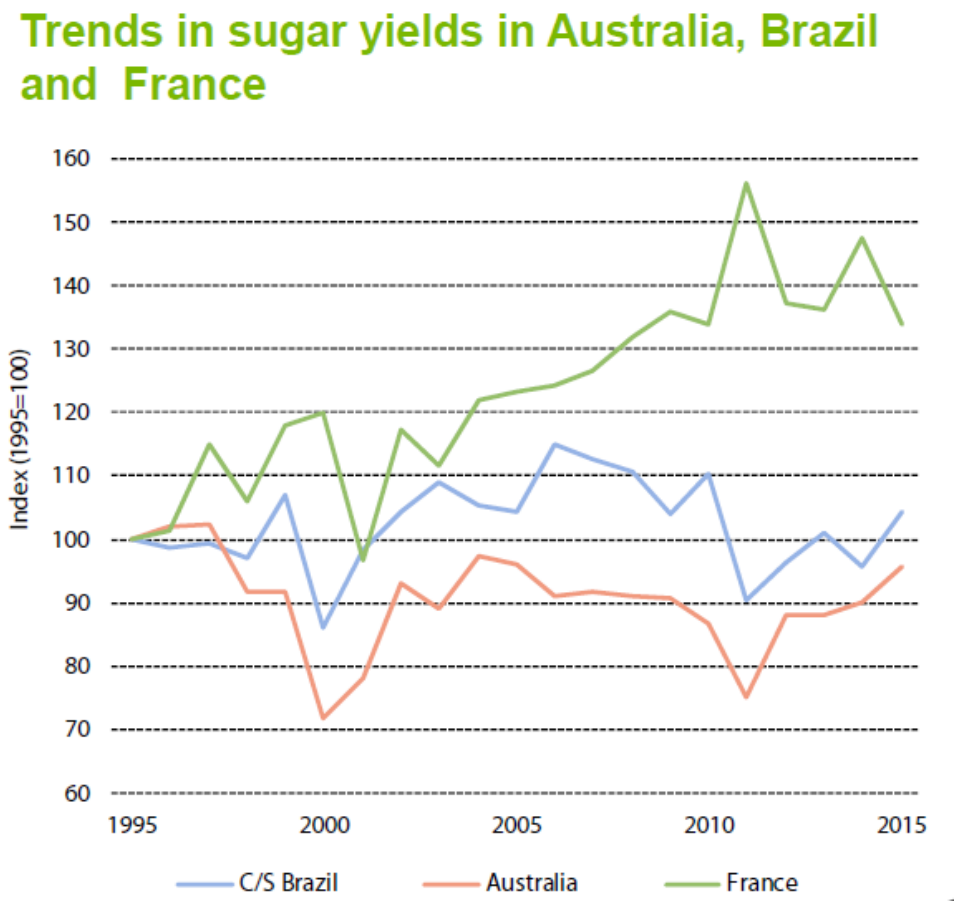
SESVANDERHAVE, an international company

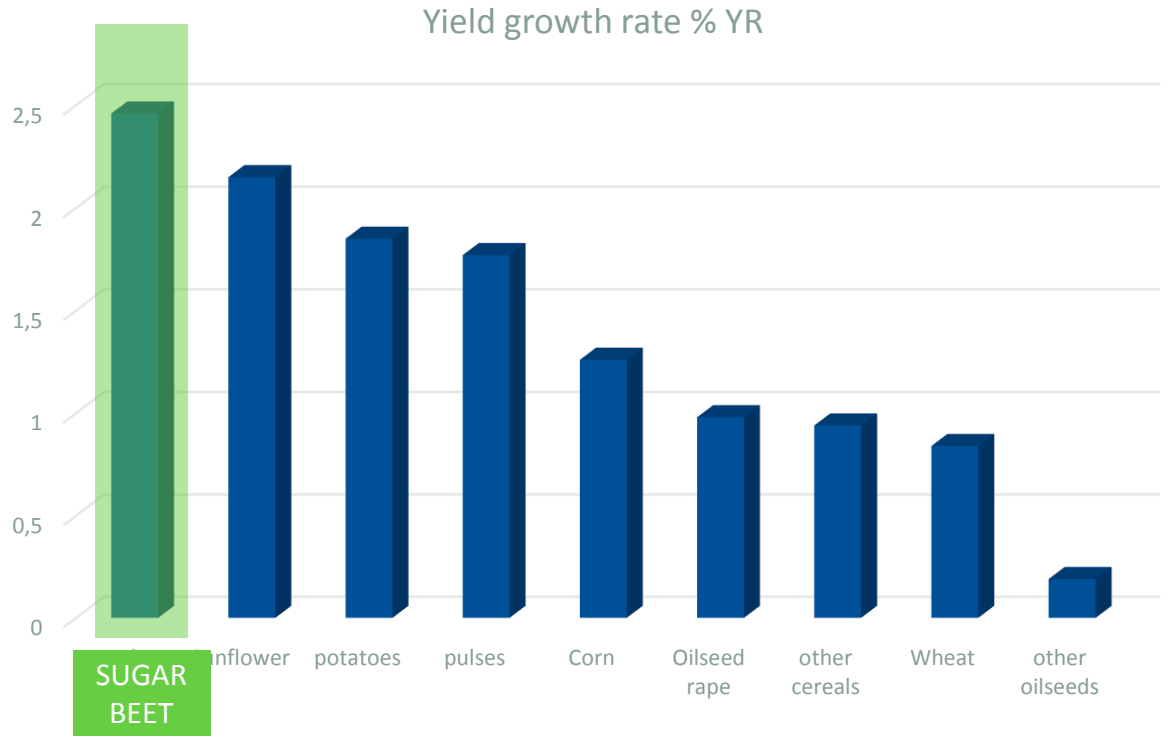


Improved competitiveness for European beet sugar

EFFICIENCY GAIN



PRODUCTIVITY GAIN



Over 25 years:
productivity x 2

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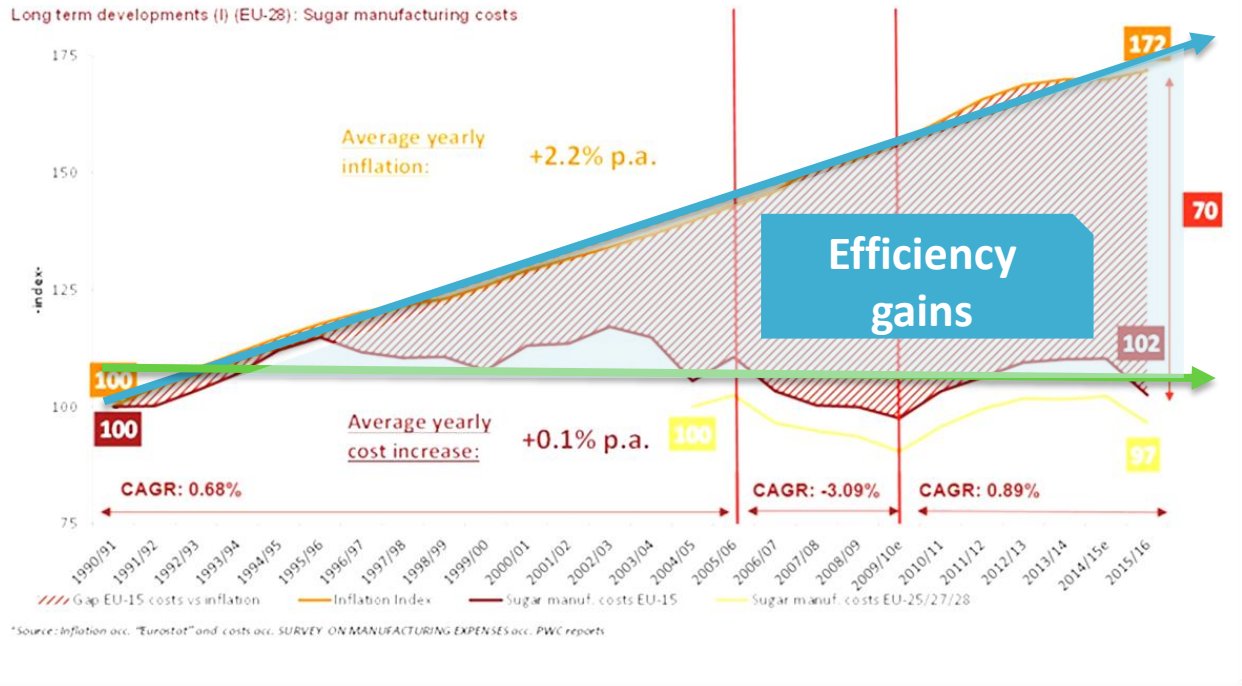
What contributed to this increasing competivity?

	GENETICS			AGRONOMY		
YIELD						
CROP HOMOGENITY						
DISEASE CONTROL						
INSECT CONTROL						
HARVESTABILITY						
STORABILITY						
TRANSPORT FIELD > FACTORY						
INTERNAL BEET QUALITY						
FACTORY PROCESSING						

Many steps have been taken!
What's next ?







Main challenges for the next decade?

FURTHER INCREASE COMPETITIVENESS AGAINST SUGAR CANE AND OTHER CROPS

- Increasing sugar yield per ha
- Limit effects biotic and abiotic stress factors
- Reduce production costs on farmland and processing costs.
- Transport costs represent >13% of total beet production costs.
- How to reduce transport cost?

ENVIRONMENT

- more sustainable sugar production
- reduce CO2 footprint
- re-use of by-products
- tracibility beet/sugar througout the supply chain

ALTERNATIVE USE OF SUGAR BEET

- Pulp; additive in paint industy
- Pulp; Omega3
- Avantium; PEF bottle
- Biomas
- Protein

BIOGAZ

Cost reduction on beet transport?

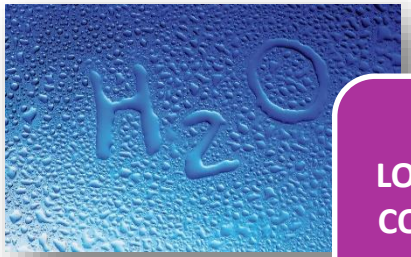
INCREASE SUGAR CONTENT, MORE SUGAR PER TRUCK

ROOT SIZE

CLEANESS OF BEET

REDUCE TRANSPORT DISTANCE: CONCENTRATE BEET PRODUCTION CLOSE TO THE FACTORY

LOWER MOISTURE CONTENT OF BEET



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CASE: Reduce moisture content in sugar beet?

FACTS

- Sugar beet = 77% water, 16-20% sugar, 3-5 % fibers and minerals
- Reduce moisture content with 30%
- EU sugar industry processes 120 MIO MT beet.
- Estimated EU transport cost: 600 MIO euro
- -25% reduction = 150 MIO euro reduction
- 68 MIO kg CO^2 emission

REQUIREMENTS

- Triggering mechanism close to the harvest
- Should not have negative side effects on growing and beet processing
- Non GMO solution

HOW TO DELIVER?

- Plant goes from vegative stage, into generative stage
- Understand ‘dehydration’ path way
- Leverage information on genes across other crops
- Find the right genes involved > activate evaporation

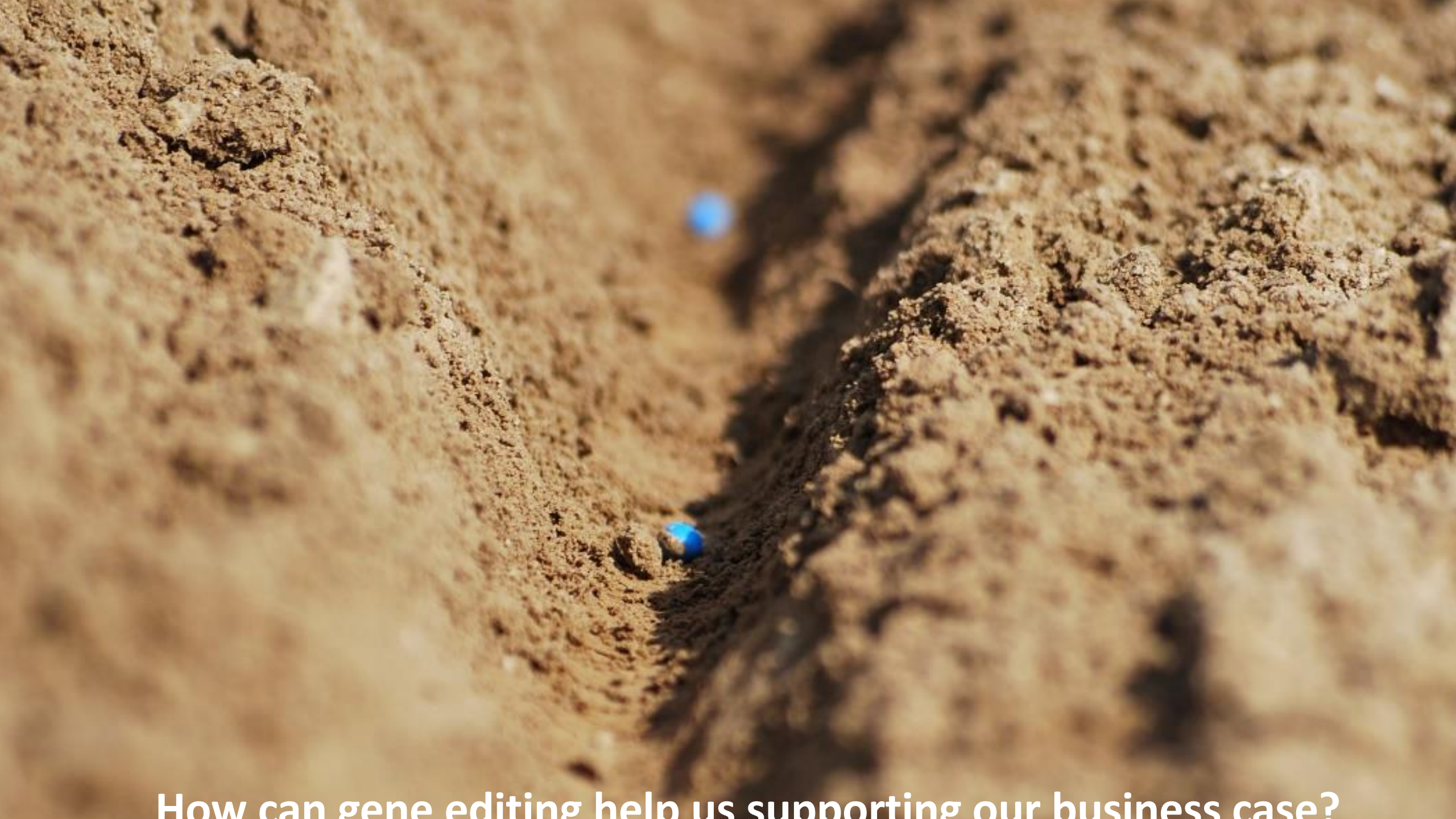
How can we realise this?

TRIGGERING MECHANISM

- Cold
- Day length
- Sugar content
- Wounding response after cutting of leaves
- Applying chemicals: switch on/ switch off

CONSEQUENCE

- Plant wilting
- De-hydration
- Senescence
- Loose water



How can gene editing help us supporting our business case?