



# *New genetic engineering techniques*

What is on the field  
What is in the  
pipeline?

Dr. Eva Gelinsky

Initiative for GE-free seeds and breeding

# What is on the field?



*Rape seed, CIBUS (ODM), Herbicide resistant*

On the field: USA, Canada

USA (2019): 32 000 ha

*Soya, CALYXT (Talen), High-Oleic*

USA (2020): 40 460ha

Total harvest goes to *Archer Daniels Midland*





# What's new in 2021?



*«GABA is said to contribute to relaxation and help lower blood pressure»*

First CRISPR-Plant

CRISPR-Cas9

Tomato, «Sicilian Rouge High GABA»

Tomato contains more than 5 times the amount of GABA (gamma-Aminobutyric acid)



# What's in the pipeline for 2021/2022?

2021: **Alfalfa**, CALYXT (Talen), improved nutrient composition, better digestibility (animal feed).



2022: **Soya**, CALYXT (Talen), altered fatty acid composition (high-oleic) & low linolenic acid (HOLL). APHIS-Permit 2020.



2022: **Wheat**, CALYXT (Talen), high fiber content.



Annual figures: Company data!

# Which traits are dominant?

- **Altered metabolic properties:** e.g. altered fatty acid patterns.
- **Herbicide resistance:** still widespread, some companies focus on this trait (e.g. Bioheuris, Argentina).
- **"Knock-out" traits:** Non-browning - suppression of oxidation processes.



# Potential of the new techniques?

- **Problems of old genetic engineering are not addressed:**  
Development of resistance, pesticide use, etc.
- **Old promises: e.g. drought tolerance.** But: Complex traits are not so easy to produce even with new genetic engineering.
- Traits such as **altered fatty acid patterns** (high-oleic) can also be bred using conventional methods.
- Plants with modified nutrient content: **Effects on human health?**

# Can we code plants like computers?

**Computer Code** – produced Windows, Linux, Excel...

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**Organic Code** – produced Humans, Ants, Apple tree ...

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*“So a product that we’re interested in, sort of it’s a longer term product, **is to create a cherry without a pit.** You can imagine being able to just pop a cherry in your mouth and really enjoy that healthy, healthy fruit. Cherries are in season right now. They’re great, but I keep ending up with purple fingers from eating them all. **I’d love to be able to just pop them over my mouth and eat them like grape.** So that’s the kind of thing where we’re taking it down the barrier so that a consumer can really enjoy the cherry differently.”*

Thank you!

➡ For your attention !

