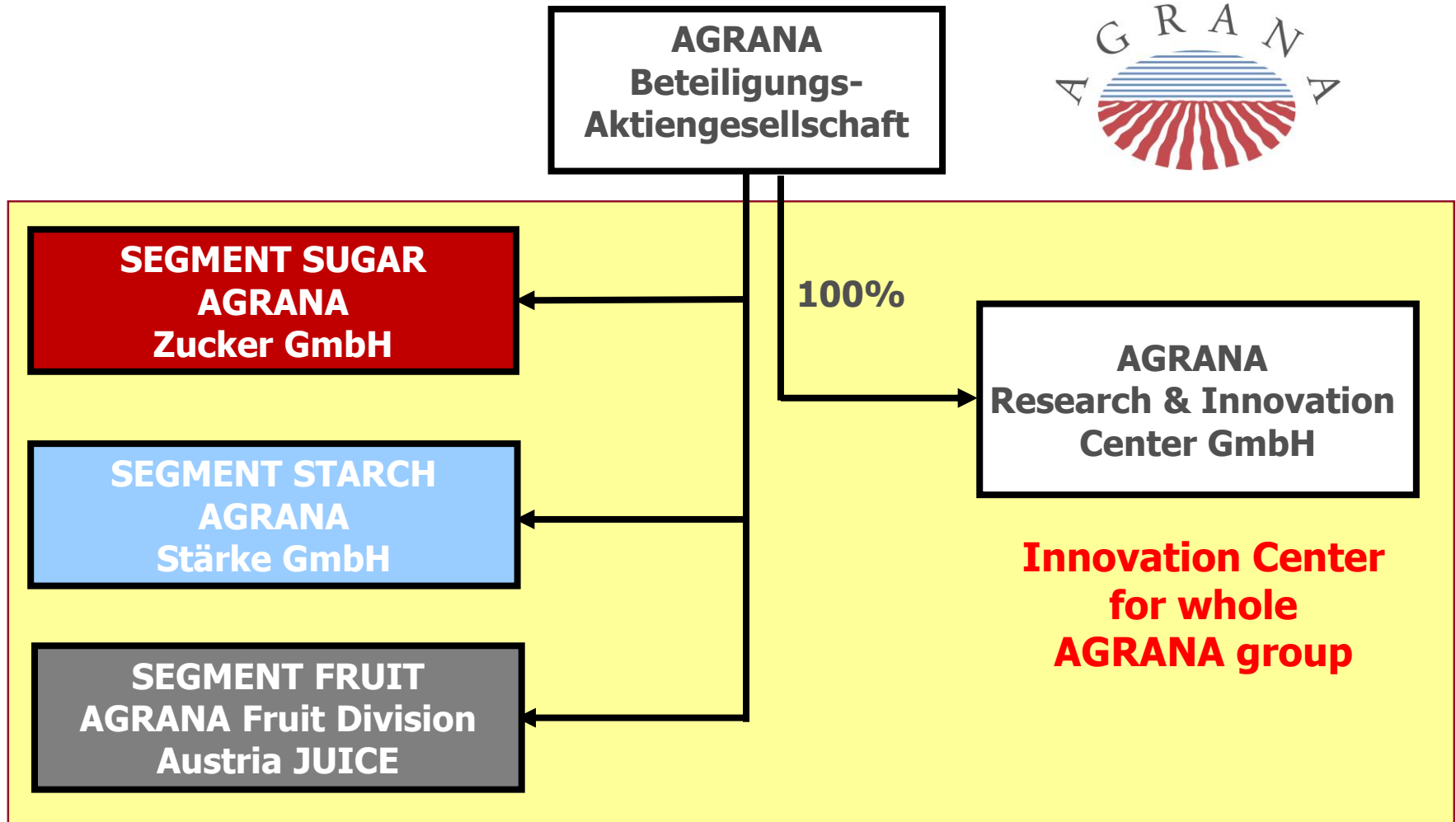
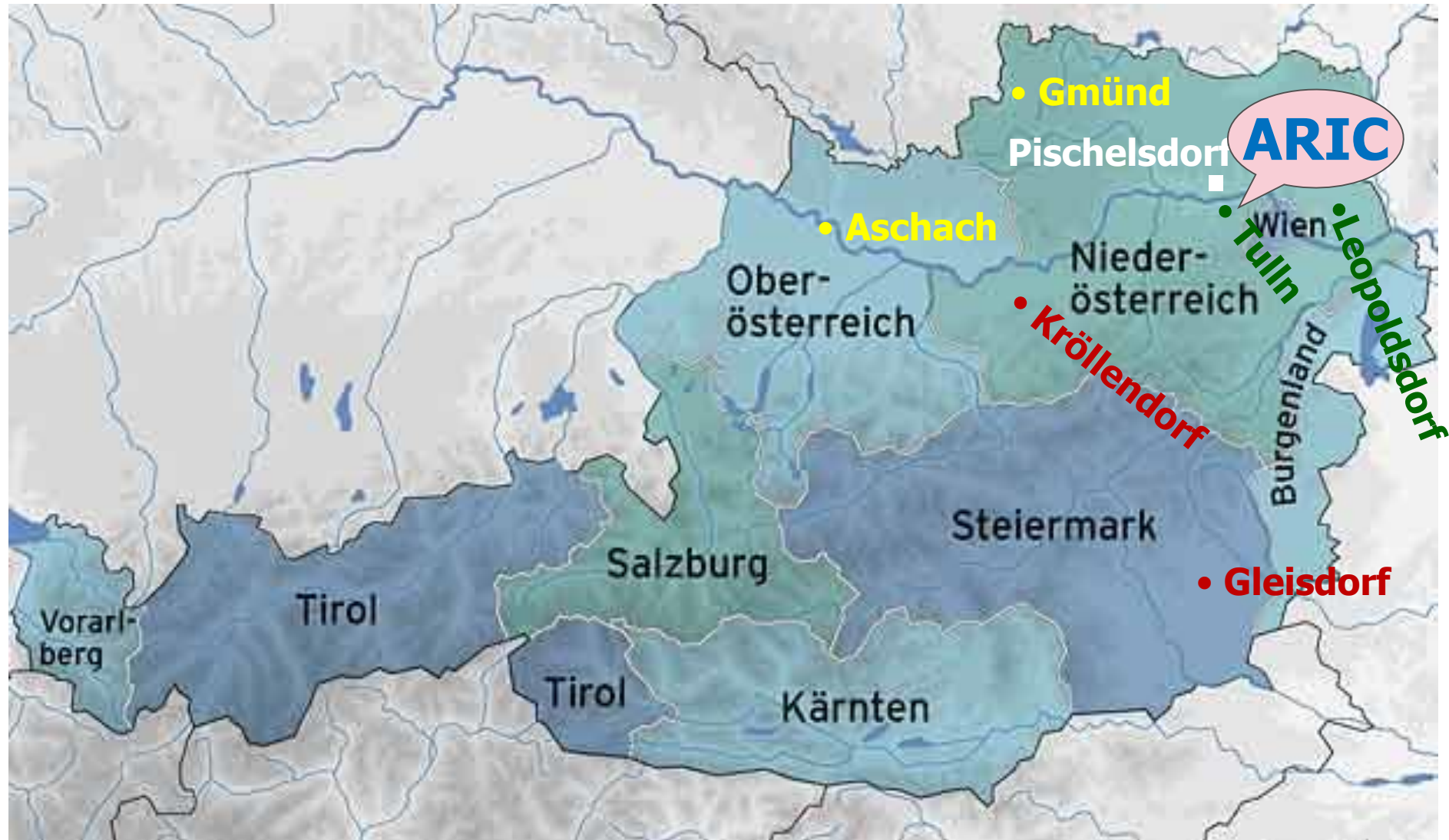


## COMPANY STRUCTURE







## RESOURCES & AIMS

### ***PERSONNEL***

75 EMPLOYEES  
1/3 UNIVERSITY GRADUATES

### ***PREMISIS: TOTAL 3900M<sup>2</sup>***

LABORATORY AREA APPROX. 2/3  
PILOT PLANT AREA APPROX. 1/3

### ***BUSINESS OBJECTIVE***

R&D OF SUSTAINABLE MATERIALS FROM  
BEET, POTATO, CORN, WHEAT, FRUIT  
TO FINAL PRODUCTS IN THE AREA OF

CARBOHYDRATES  
PROTEINS  
FIBER  
FRUIT PREPARATIONS



# R & D ACTIVITIES



Accredited Testing Unit for  
Yield and Quality Evaluation  
of Sugar Beets

**R&D  
Management**

**R&D Field  
SUGAR**

**R&D Field  
STARCH**

**R&D Field  
FRUIT**

**Sugar Technology**  
Process Optimisation  
Cost optimisation  
Natural Antibacterials  
Sugar Beet Quality  
Sugar Analytics

**Starch Food/Non-Food**  
Product Development  
New Applications  
Application Technique  
Analytics (Mycotoxins)  
Pilot Plant Stations

**Microbiology**  
Fermentation  
qPCR-analytics  
Bioethanol  
Process Optimisation  
Strain Collection

**Fruit Preparations**  
1<sup>st</sup> Transformation  
2<sup>nd</sup> Transformation  
Aseptic Processes  
Line Design  
Decontamination



## Laboratory

Development & testing of recipes

Analysis of products

Testing of new technologies &  
modification in small scale



## Pilot trials

Scale-up of laboratory recipes

Production of samples

## Production

Creation of production instructions

Attendance of production trials



## **Improvement of current processes for starch separation & modification**

Slurry- & paste modifications

Spray drying

Drum drying

Extrusion

Bioplastics

Pilot plant for starch separation

New kinds of starch raw materials



## **Development of new technologies**

Spray cooking: baby & children food

Physical modification of starch (Clean Label)

Enzymatically modified starches (EMS)

*STARCH IN*  
*BIOPLASTICS*





# *PRODUCTION OF THERMOPLASTIC STARCH (TPS)*

## **Starch**

- native or modified
- e.g. corn starch

## **Plasticiser(s)**

- H-bonding interactions
- e.g. glycerol

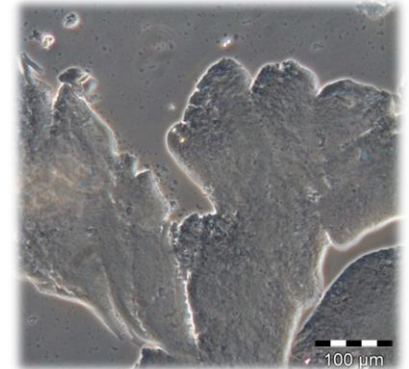
## **Additives**

- as required
- e.g. processing aids

## **Destructuring & plasticizing** (e.g. extrusion)

## **Thermoplastic starch**

- amorphous or semi-crystalline
- melts when subjected to heat & shear forces





**Starch**



**Extrusion**



**TPS**



**Blending Process**



**TPS-Blends**



**Blowing**



**Finished Product**



**SEM Microscopy:**  
Compatibility,  
morphology



**HP-SEC:**  
Molar mass distribution



**DSC:**  
Glass transition, melting,  
gelatinization



**Rheology:**  
Melt viscosity,  
flow behavior



**HPLC, HPIC, GC-FID:**  
Analysis of modification  
Composition of additives



**FTIR:**  
Analysis of modification  
Composition of additives



**Thank you for  
your attention!**

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