Trends in research in the oil crops-to-products chain

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  - Breeding, cultivation, biorefinery, (bio)chemistry and applications
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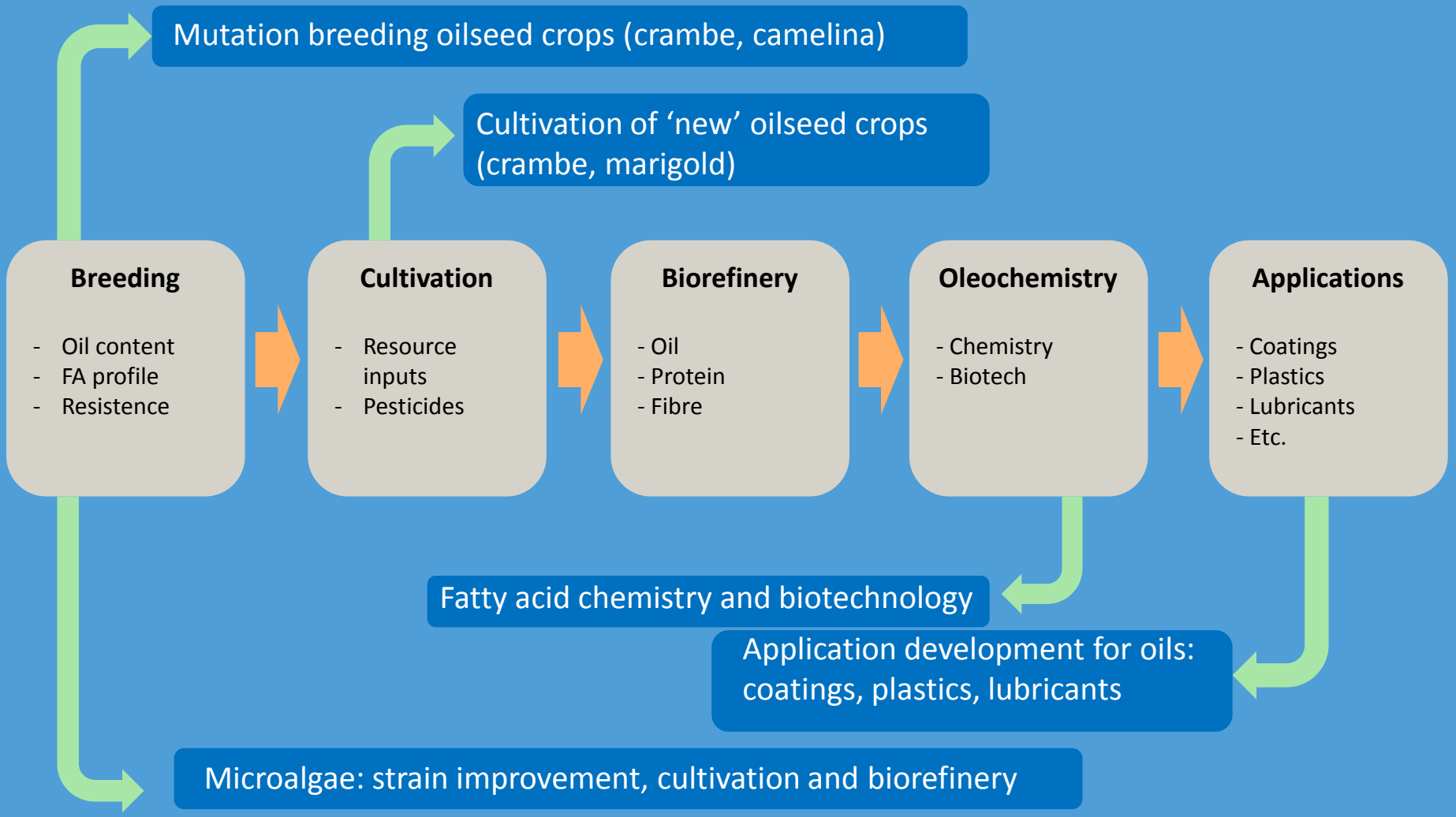
Research areas within the chain



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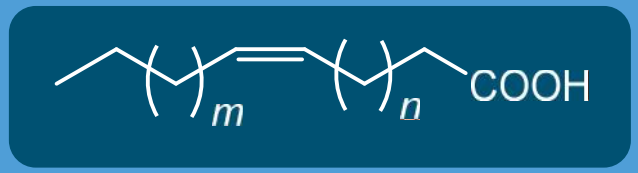
R&D topics

- **Breeding**: high content of monounsaturated FA (MUFA)



  - food: '*high oleics*' : oxidative stability, less need for hardening ('trans fats')
  - technical: oleic, erucic acid, etc., as feedstock for oleochemical products

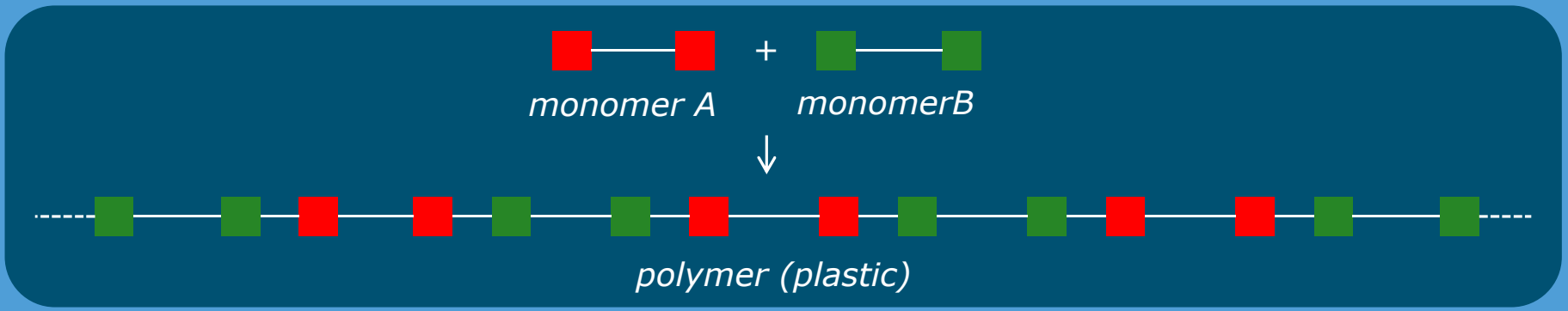
- **Cultivation:**
  - New oil sources: *microbial oils* (microalgae, oleaginous microorganisms)
    - CO_2 and sugars conversion to oils
    - High biomass production and isolation costs
    - Microalgal proteins

AlgaePARC, Wageningen

R&D topics (continued)

- **Biorefinery**:
  - Easier / more efficient separation of oils and proteins
  - Increased value of protein fraction

- **Oleochemistry**:
  - Glycerol as feedstock for chemicals
  - *MUFA conversion to building blocks for plastics:*



COSMOS: **C**amelina and crambe **O**il crops as **S**ources for **M**edium-chain **O**ils for **S**pecialty oleochemicals

Funded by the Horizon 2020 Framework Programme of the European Union

COSMOS

ADDING VALUE TO CAMELINA AND CRAMBE OIL

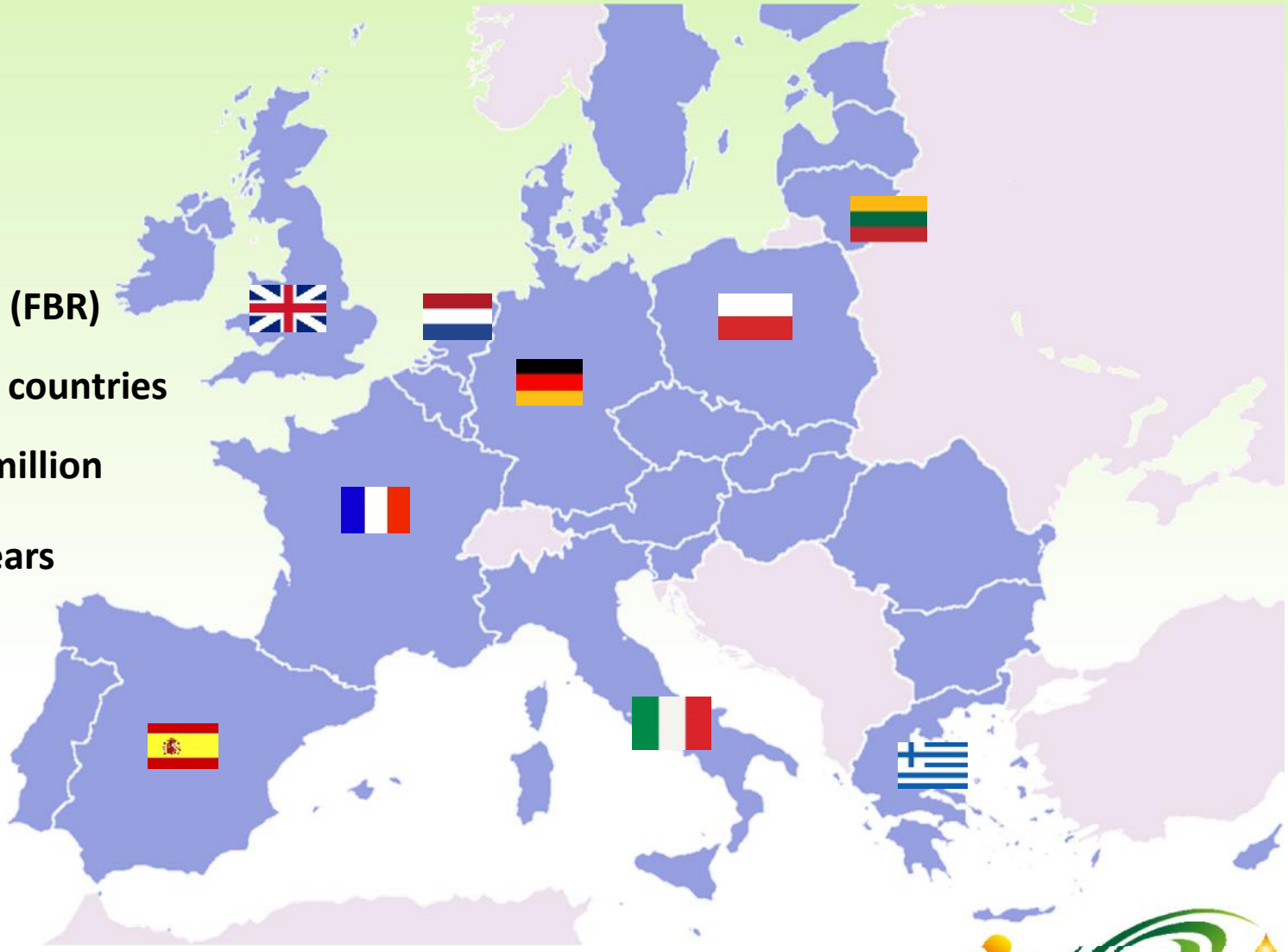
COSMOS

Coordinator:
Wageningen UR (FBR)

18 partners in 9 countries

Budget: € 10.8 million

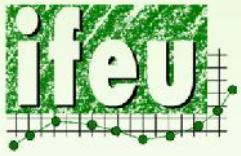
Duration: 4.5 years



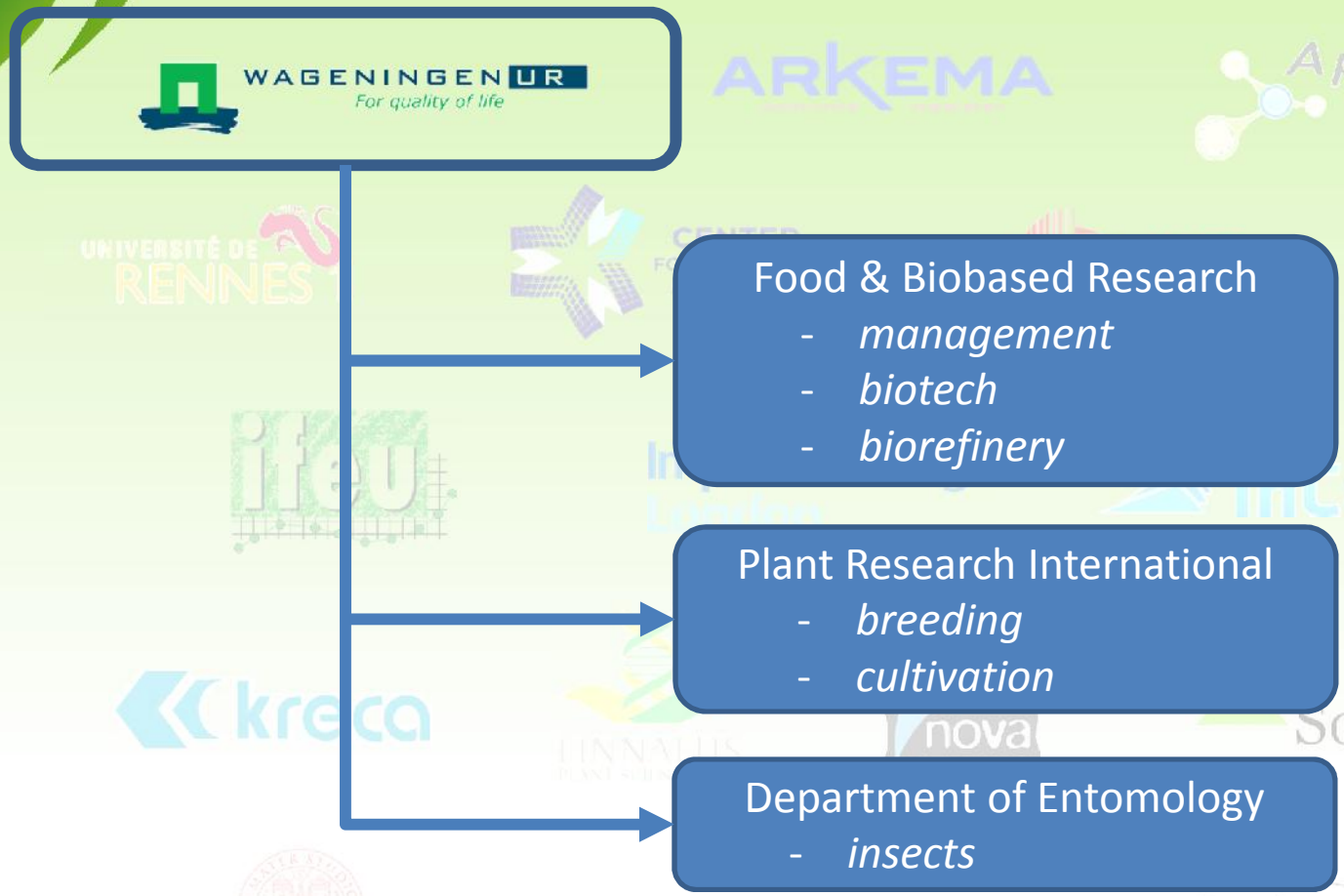
COSMOS: primary aim

- To reduce Europe's dependence on imported tropical oils (palm kernel, coconut, castor) as sources for medium-chain-length oleochemical surfactants, lubricants, polymers and other high-value products, by:
  - turning camelina and crambe into profitable oilseed crops
  - creating and optimizing sustainable value chains

COSMOS consortium



COSMOS consortium



Approach

WP2 & 3

Camelina

Crambe

WP4

Long-chain fatty acids

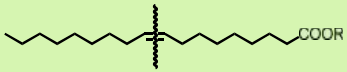
Fatty acids

(Refined) Oils

Fatty esters

WP6

Chemical and Biotechnological chain scission



Application tests

WP5

Co-products

Glucosinolates
Insect oils
Insect proteins

Medium-chain fatty acids

C10-C14
Palm kernel & coconut markets

High-value Products

Bio-plastics
Lubricants
Surfactants
Flavours
Fragrances
Biopesticides
Food/Feed

Expected results

- Improved crops (oil/hectare, FA composition, etc.)
  - Non-GM crops: many industries do not accept GM oils
- Fatty acid separation technologies (MUFA vs PUFA)
- FA cleavage technologies
- High-value oleochemicals
  - Bio-plastics
  - Lubricants
  - Surfactants
  - Flavours and fragrances
  - Bio-pesticides
- Insect growth on crop residues and insect biorefinery
- Sustainable value chains

Thank you

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- The COSMOS presentation reflects only the author's view. The Research Executive Agency of the European Commission is not responsible for any use that may be made of the information it contains.

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