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Envisioning a Brighter, More Golden Horizon

Looking back to look forward:
The state of the global rapeseed industry

Stewart Brandt
Head of Global Oilseed Breeding
BASF Agricultural Solutions

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Agenda

Looking Back

Grounding ourselves in the innovations and collaborations that have moved the industry forward

Looking Forward

Unlocking the growth potential of the rapeseed industry

Looking back: 1971 – 1980

1971 — 1980 | 1981 — 1990 | 1991 — 2000 | 2001 — 2010 →

A transition from rapeseed to canola

- Double ’00’ “Canola” developed
- Blackleg disease identified

Constraints:

- *Small market crop*
- *No Blackleg resistant varieties*
- *Limited yield improvements*

1-3M Ha planted annually in N. America

Improved varieties introduced

- GRAS status granted
- Adaptation & adoption of varieties
- First HT varieties
- First Low Linolenic variety
- First hybrid registered

Constraints:

- *Spread of Blackleg disease*
- *Rotational challenges*
- *Small R&D investments*
- *Limited weed control options*

3-4M Ha planted annually in N. America

New Traits & Technologies

- Blackleg tolerant varieties
- GM herbicide tolerance & hybridization
- Molecular markers & DH adoption
- Grower options increase

Constraints:

- *Higher yields leads to increased lodging*
- *Disappearance of polish canola*
- *Fluctuating market, annual hectares planted*

3-6M Ha planted annually in N. America

New markets & gaining recognition as a profitable crop

- Hybrid adoption expands, lodging tolerance improves
- Early napus hybrids launched
- Specialty oil market grows
- Clubroot tolerant hybrid (2009)

Constraints:

- *Crop rotations begin to shorten*
- *Fusarium Wilt & Clubroot disease identified (2003)*

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Looking back: 2011 – 2015

2011 — 2015 | 2016 — 2020 2021 — Present

Acreage expands, focus on disease challenges

- Yields increase via high yielding hybrids
- Clubroot resistant varieties adopted
- Pod shatter tolerant hybrids launched
- Canola surpasses wheat as cash driver on farm
- Improvements in genotyping

Constraints:

- *Clubroot disease expands & first-generation tolerance is challenged*
- *Blackleg disease evolves*
- *Verticillium Stripe identified*

7-9M Ha planted annually in N. America

Expanded stable acreage & new solutions

- Pod shatter more widely adopted – harvest management tool
- Better agronomic practices & new solutions
- More predictable, stable yields
- Trait stacking and new generation disease and herbicide tolerance
- Growers plant Canola more often in their rotation

Constraints:

- *Extreme weather, crop rotations & diseases threatening yields*
- *Sustainability of growing Canola every year*
- *Growers waiting for new solutions*

8-9M Ha planted annually in N. America

Breeding advancements to meet evolving challenges

- Herbicide tolerance stack to manage resistant weed populations
- Increased focus on developing hybrids for Brown Soil Zone
- Predictive Breeding tools, precise phenotyping
- Gene editing

Constraints:

- *Never-ending cycle of disease*
- *Climate change*
- *Restrictions on acceptance of new technologies*

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Europe

Breeding solutions drive investment

State of the Region

- Pod shatter introduction
- WOSR – turnip yellow virus
- Native trait efficacy
- Flea Beetle control
- Weed control options
- Biofuel uses (renewable biodiesel)

CONSIDERATIONS

- *EU regulatory requirements*
- *Ukraine/Russia conflict (SOSR)*
- *Reduction in planting*
- *Social responsibility*

8M Ha

Australia

Demand continues to drive valuable exports

State of the Region

- Major export player
- Technology acceptance
- Weed resistance to specific herbicides
- Blackleg pervasiveness
- Fluctuating market
- Importance of IPM process

CONSIDERATIONS

- *Climate*
- *Commodity price*
- *Follows NA Technology advancements*

3M Ha

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Looking Forward

Embracing growers' challenges as golden opportunities

- Market Overview
- Tools, Technologies & Traits
- Global Considerations

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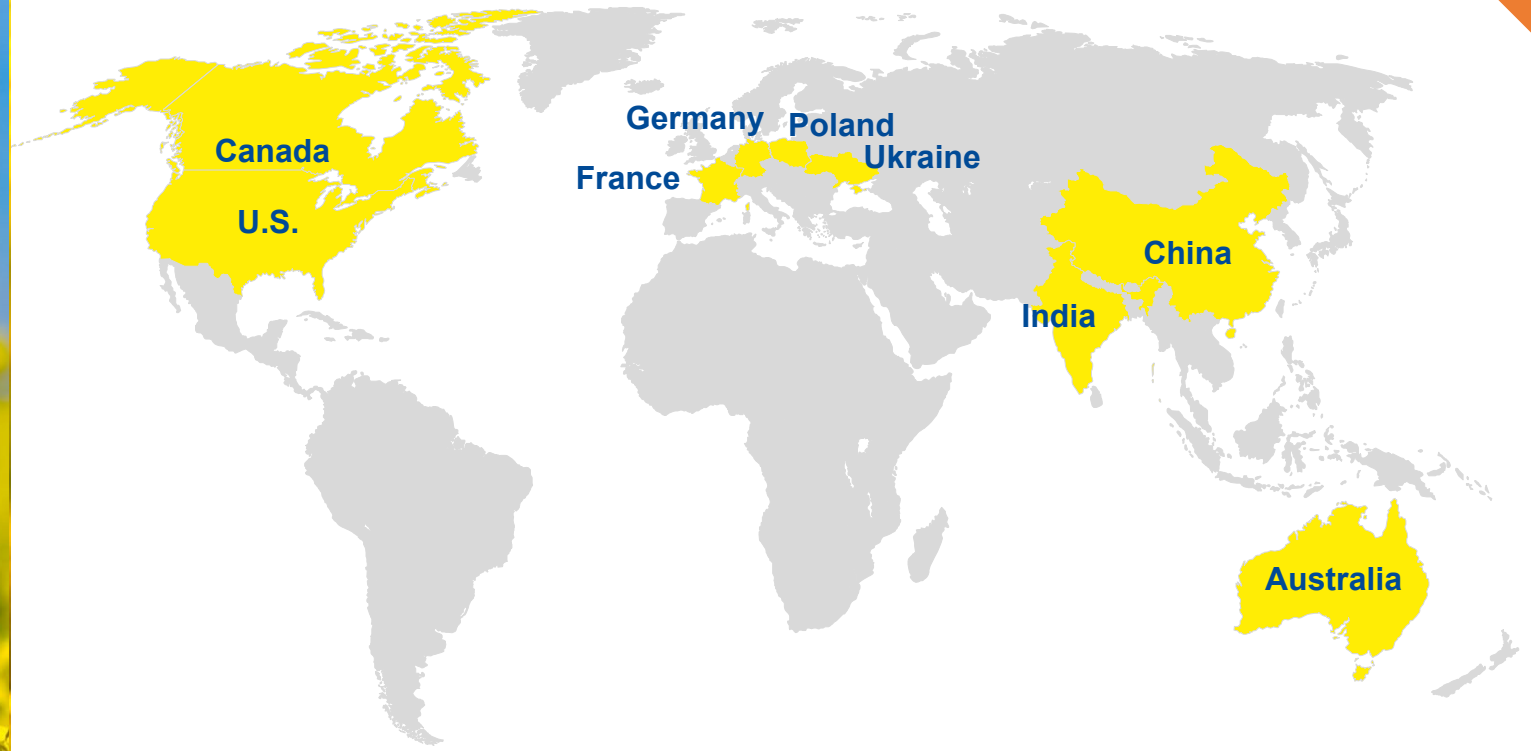
Market Overview

SIGNIFICANT RAPESEED-GROWING NATIONS



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Market Overview

Demand

Strong for mid term,
promising for long term

Yield

+ 1 to 2% per
annum **globally**

Acres

Limited growth
in acres globally

Collaboration

Increasing collaboration
across key players & industries

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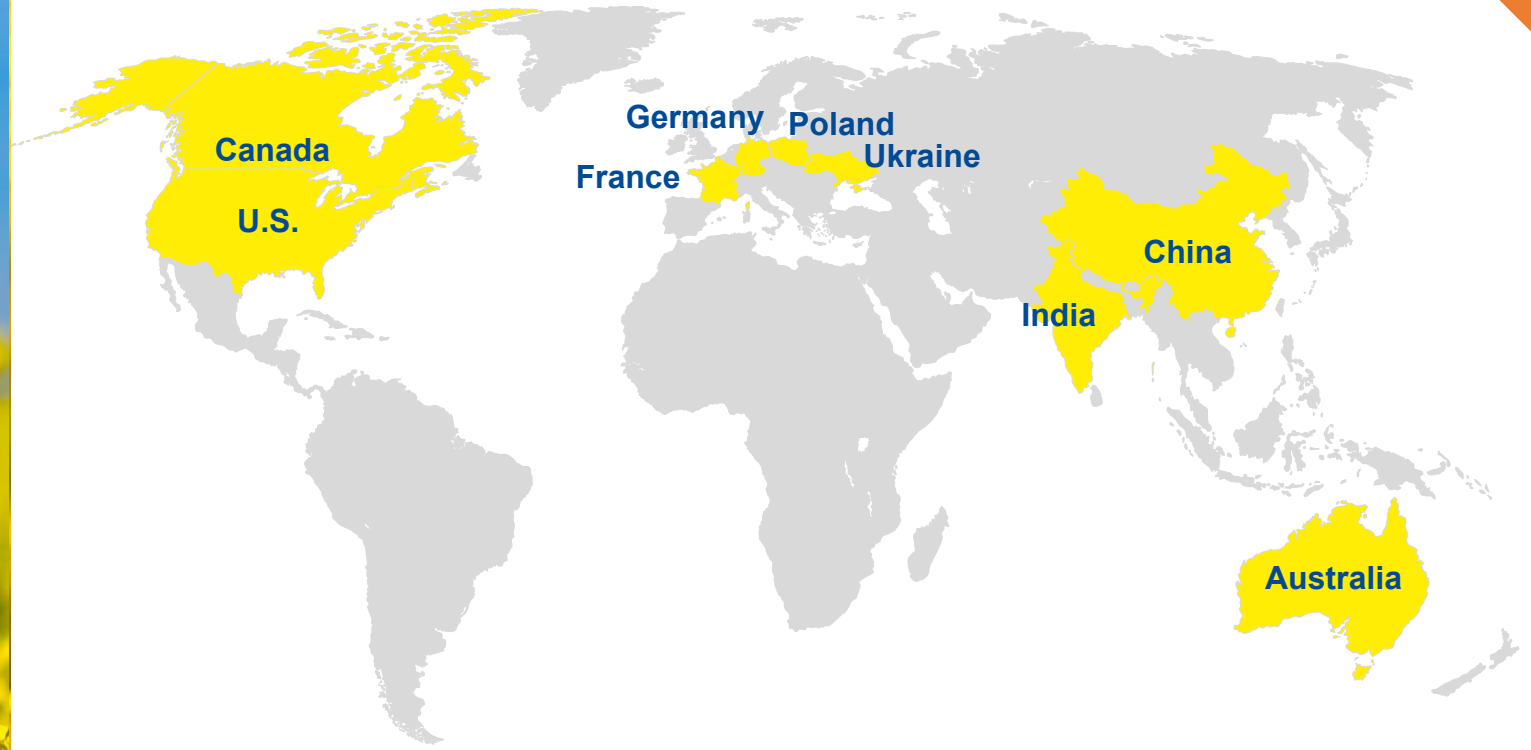

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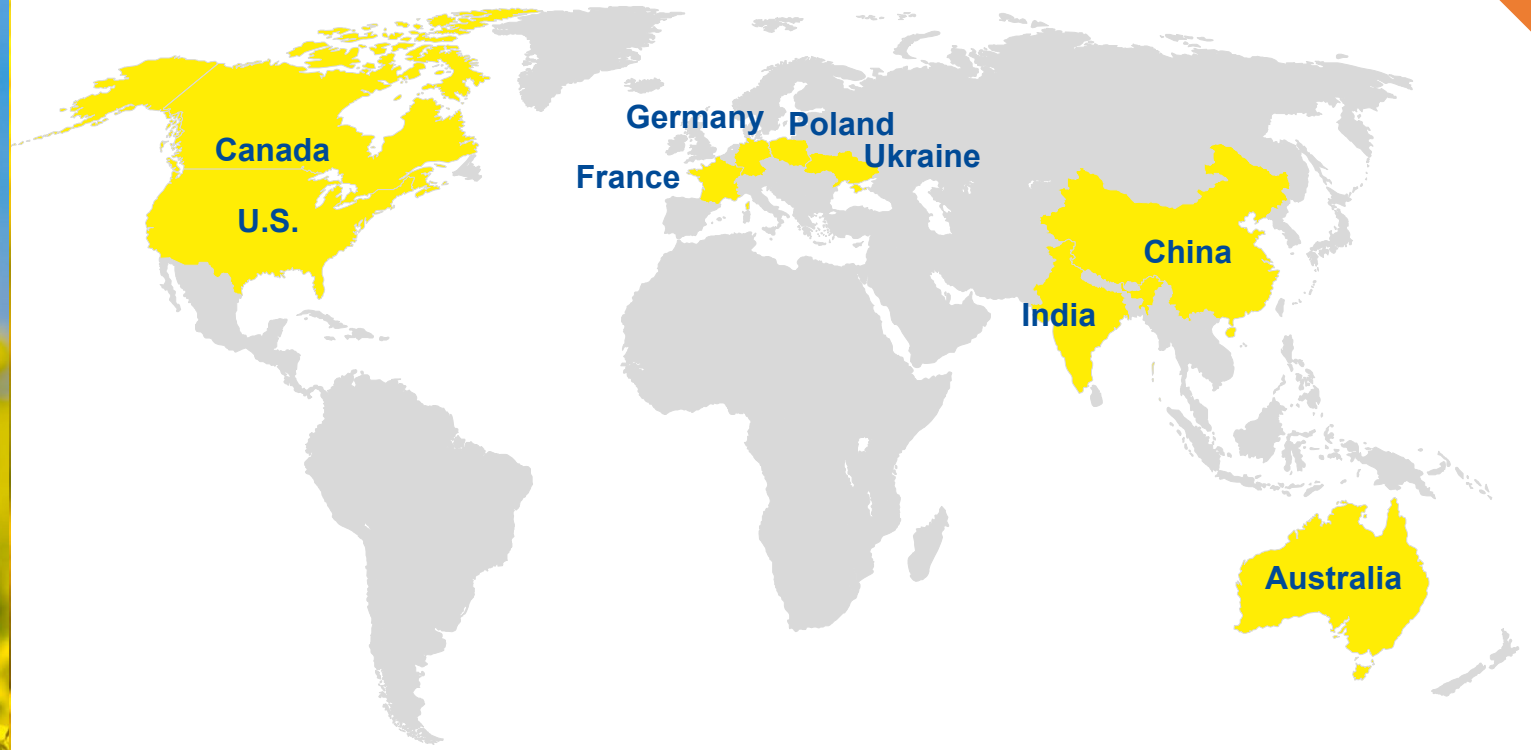

OPPORTUNITIES	CHALLENGES
Global regulatory consistency	Shorter rotations
Producer management traits	Anticipating the next pest/disease
Biofuel	IP complexity

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Tools, Technologies & Traits

An expanding toolbox unlocking value for canola growers

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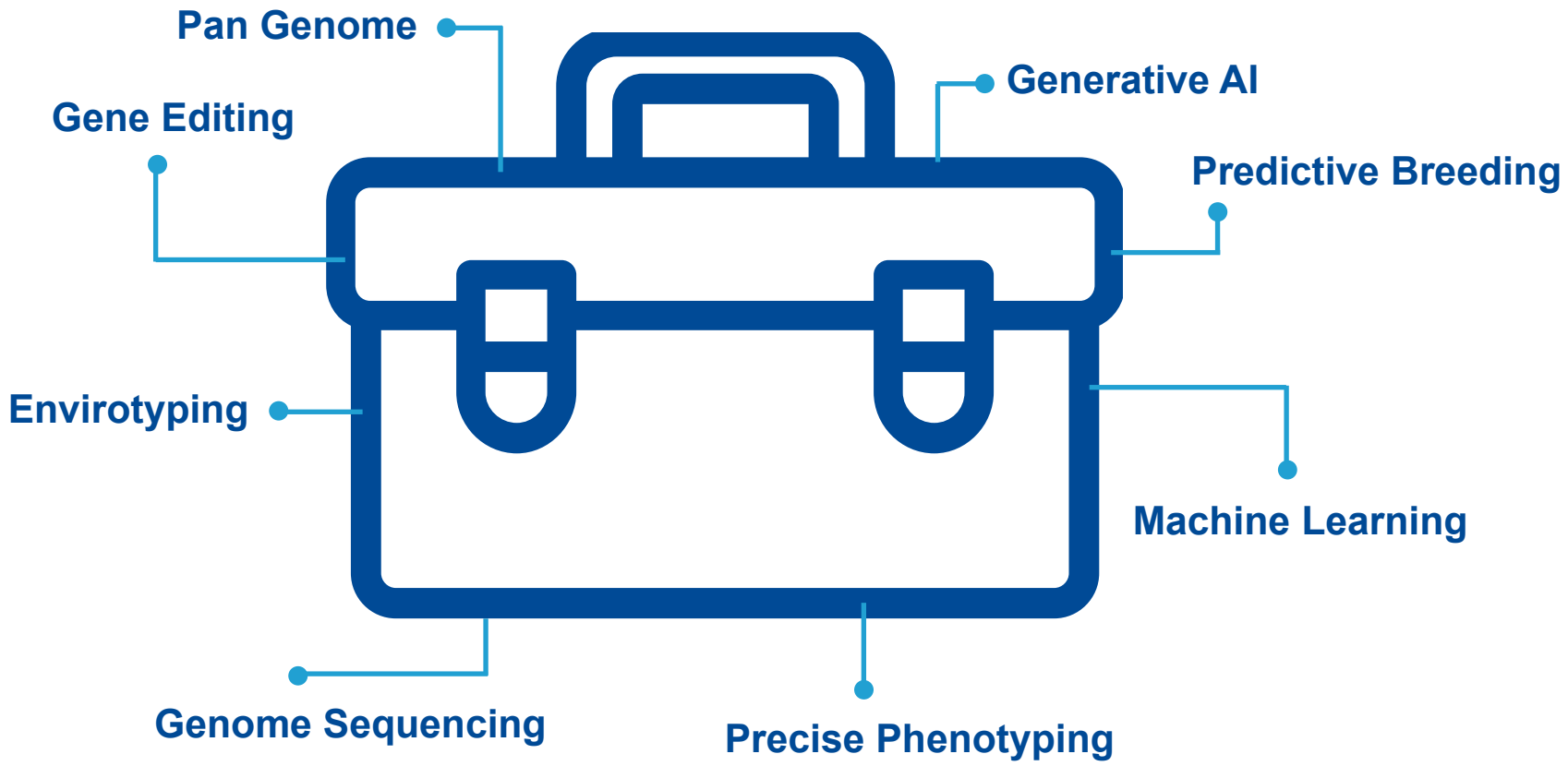

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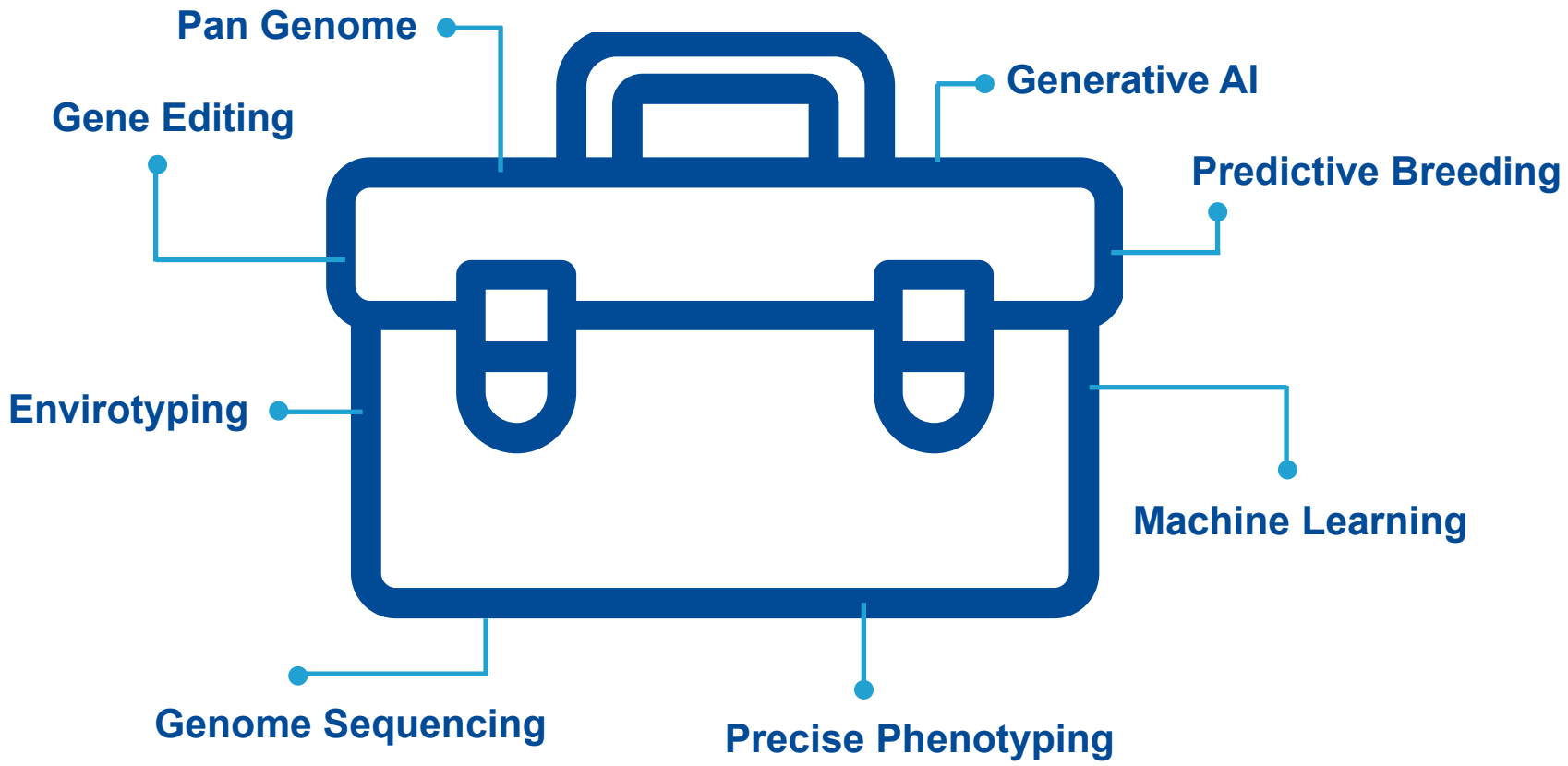
An expanding toolbox unlocking value for canola growers



BENEFITS

- Problem-solving
- Efficiency
- Affordability
- Abiotic stress
- Herbicide tolerance
- Insect tolerance
- Disease tolerance
- Improved rotation flexibility
- Portfolio offering

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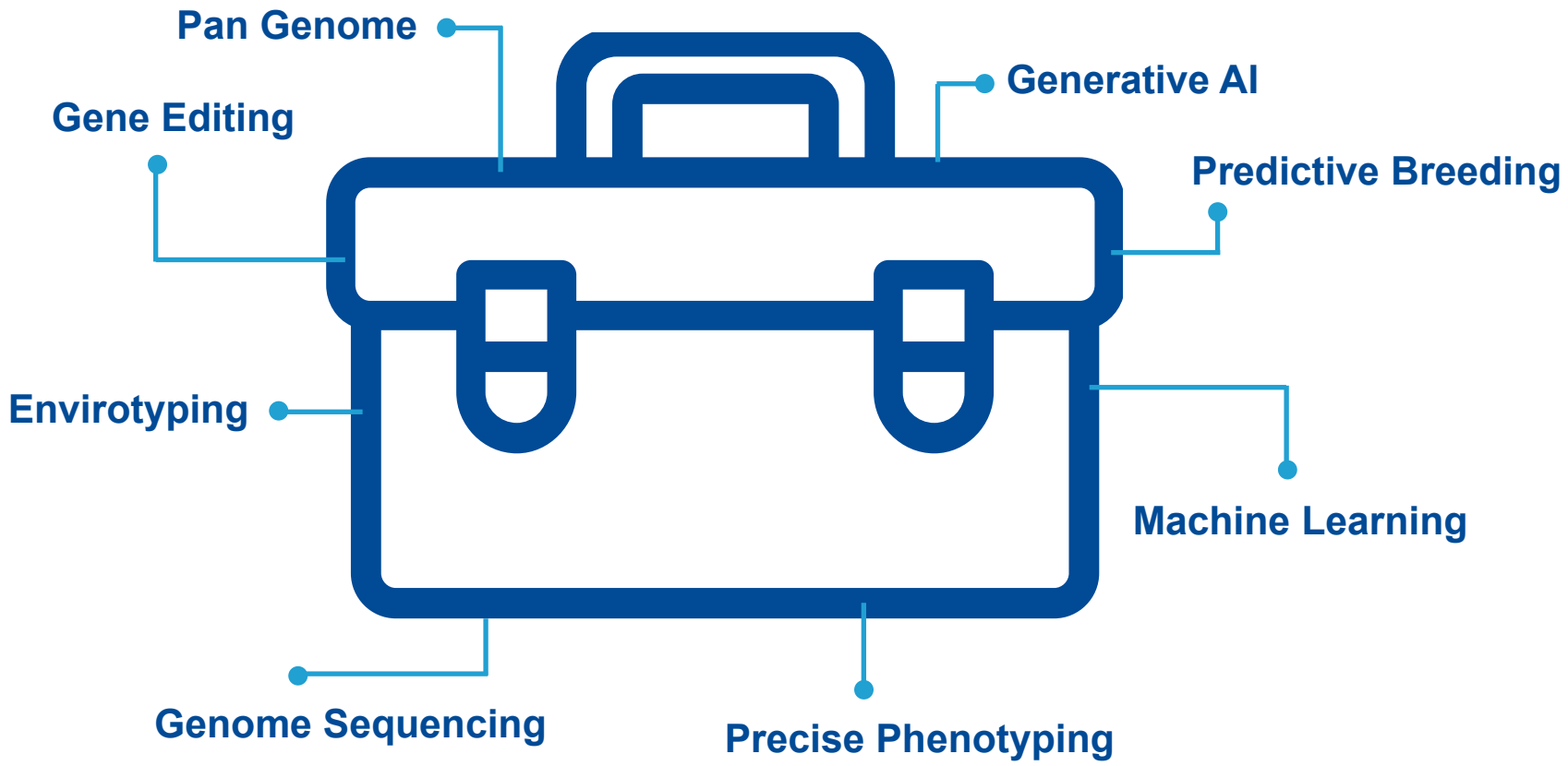

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- Problem-solving
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CONSTRAINTS

- Over regulation
- IP complexity
- Expertise building

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Global Considerations

Policy

- Sustainability
- Food vs. Biofuel
- Trade (e.g. EU Palm)

Technology

- Soil Health
- Carbon Intensity (CI) Reductions
- New Breeding Technologies

I hope you walk away from this session feeling:

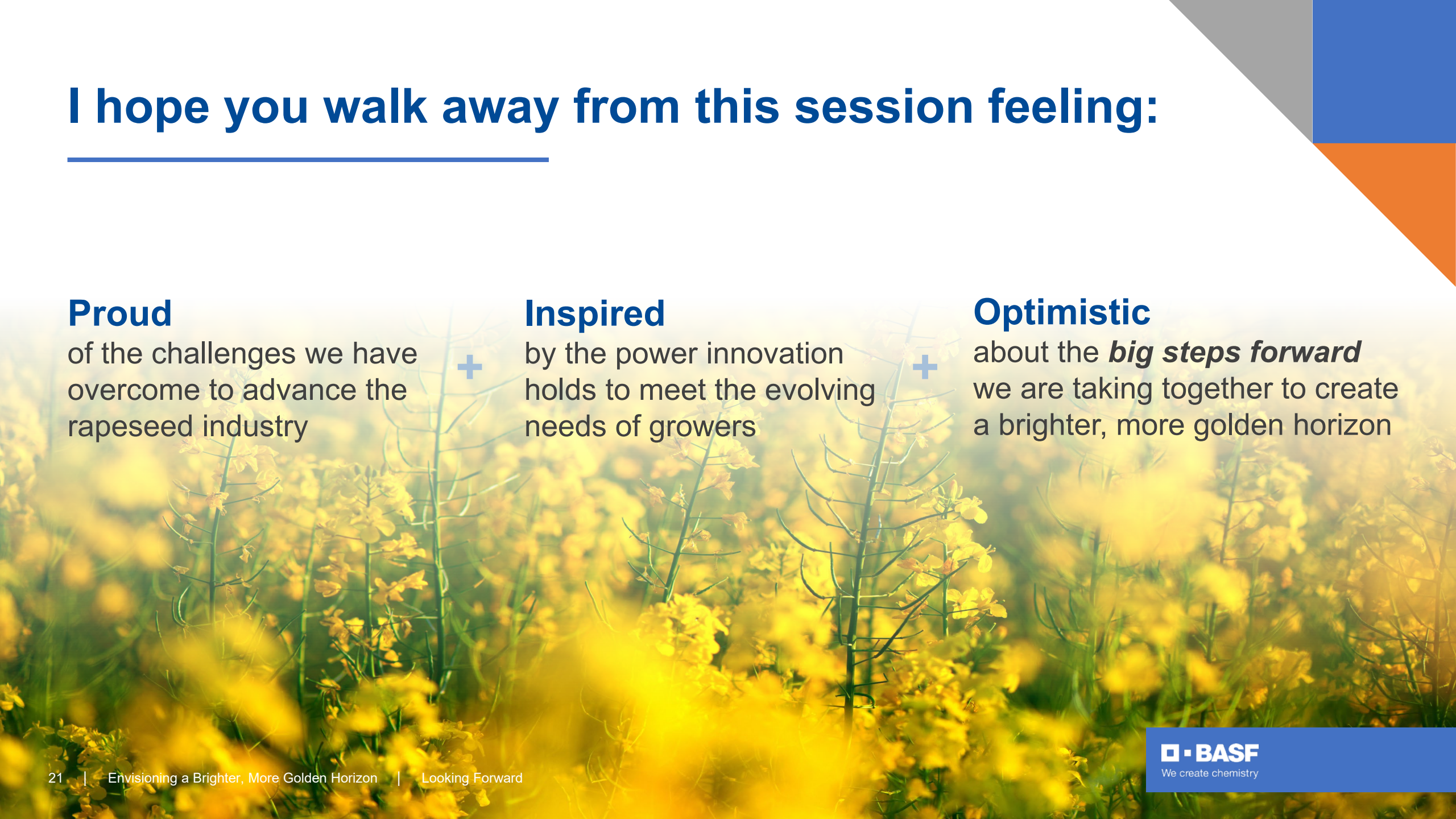
Proud
of the challenges we have overcome to advance the rapeseed industry

+

Inspired
by the power innovation holds to meet the evolving needs of growers

+

Optimistic
about the ***big steps forward*** we are taking together to create a brighter, more golden horizon



A more golden horizon ahead

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Thank you

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