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16th INTERNATIONAL RAPESEED CONGRESS
24 - 27 September 2023

GLOBAL CROP - GOLDEN OPPORTUNITIES

Forecasting the Future of Oilseed Rape Co-Products: Traditional Breeding and Modified Genetics Trade-Offs

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Background



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- ▶ Oilseed rape products, such as HOLL and DHA are co-products as identical technology is used but different market segments consume those products
- ▶ New markets are needed as oilseed rape faces stiff competition from other vegetable oils.
- ▶ But, genetically modified organisms (GMOs) and new breeding techniques (NBTs) raise concerns about their safety and environmental impact in some countries what keeps those markets closed for co-products of oilseed rape.
- ▶ Regulation and communication addressing these challenges is vital for sustainability of the industry.

Objectives



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- ▶ The objective is improving sustainability of oilseed rape industry by development of specific market segments for GMO and NGT co-products.

Methods



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- ▶ Three scenarios were developed and compared according to needs of different market segments using industrial attributes.
- ▶ Those attributes of oilseed rape were genetic composition, isolation of territories, climate change impacts, availability of land and water resources, government policies and regulations on GMOs and NGTs.
- ▶ The study compared how scenarios of consumer preferences incentivize growers and scientists to develop competitive co-products.
- ▶ Consumer preferences were identified by comparison of features of oilseed rape oil with other vegetable oils.

Results



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- ▶ The first scenario involves the continued cultivation of traditional oilseed rape varieties, with a focus on improving yields and quality to meet market demand for vegetable oils. This scenario is relatively low-risk and may provide stable returns for growers and processors, but may face increasing competition from other vegetable oils, such as soybean and palm oil.
- ▶ The second scenario changes PUFA content of genetically modified oilseed rape varieties, such as HOLL or DHA, which offer competitive advantages in terms of nutrition and functionality. However, this scenario also poses greater risks due to regulatory constraints on environmental impacts.
- ▶ A third scenario proliferates supply chain by the development of alternative co-products, such as biofuels or industrial chemicals, which can be produced from oilseed rape. This scenario may provide opportunities for growers and processors to sell their products to new market segments, but may also require significant investment in research and development.

Conclusions



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- ▶ The three proposed scenarios if verified will simplify setting of breeding objectives, farming structures, and return on investment for industry. More precise specification of market segment properties will provide opportunities for the commercialization of these co-products, and technologies which improve competitive advantage for oilseed rape over other crops.
- ▶ The listed competitive advantages of oilseed rape in the three scenarios over other vegetable oil crops and starch/sugar-producing crops has highlighted trade-offs of different target segments.

Conclusions



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- ▶ The first scenario of traditional improvement of yields and oil quality targets global consumers in recent structure which is more price driven than quality driven.
- ▶ The second scenario of principal changes of composition of oils either with or without GMO or NBT is targeting prosumers who can solve administrative barriers by argument of quality. Small and large farms may benefit from the development of high-yield, disease-resistant varieties of oilseed rape that can be grown with less pesticide use.
- ▶ The third scenario targets investors of advanced industrial technologies which satisfy global consumers by non-GMO and NBT-free oilseed rape oils due to advanced industrial processing.