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15th International Rapeseed Congress

16.–19.06.2019 in Berlin

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Table of Contents

Detailed Information About All Topics

The IRC 2019 especially springs to life with the contributions and insights given by its participants. We are looking forward to fascinating speeches, lively discussions, and valuable poster contributions. Following, you will find eight different topics in which contributions will be presented.

1. GENETICS, GENOMICS AND BREEDING

- Pan-genomic revolution in crucifer genetics and breeding (genome organisation, structural variation, plasticity
- New diversity, interspecific hybridization, wide crosses
- Improving plant development: plant architecture, phenology
- Genetics, physiological basis and improvement of resource use efficiency
- Genetics and breeding for improved seed composition for human and animal nutrition (oil, protein, minor components)
- Breeding for higher heterosis and hybrid yield in OSR/canola
- Transgenics and New Breeding Techniques (NBT) – applications in OSR/canola research and breeding
- Genomic selection in OSR/canola
- Breeding for abiotic stress tolerance in OSR/canola (cold, heat, drought, etc.)

2. DISEASES AND PESTS, PLANT PROTECTION AND WEEDS

- Major fungal and viral diseases, regional impact and measures of control (e.g. Blackleg, Clubroot, Sclerotinia, Verticillium, Alternaria, TuYV)
- Breeding for disease resistance
- Chemical protection against insect pests, safeguarding beneficials and non-target organisms (e.g. bees)
- Breeding for insect resistance or tolerance in OSR/canola
- Weed control in OSR/canola incl. herbicide resistance

3. AGRONOMY AND CROP SCIENCE

- International comparison of OSR/canola cultivation
- Optimizing crop rotations for/with OSR/canola
- NUE – Nutrient use efficiency (N, P, other)
- Requirements of OSR/canola cultivation in temperate regions
- Identifying suitable variety types adapted to adverse conditions

4. ANALYSIS, USE OF PRODUCTS

- Economy in gross quality of OSR/canola commodities (long-time trend)
- Seed chemistry and seed composition
- Oil quality (low sats, omega-3, HOLLI, HEAR)
- Meal quality – protein and antinutritives (fibre, glucosinolates, phytate, sinapin): Genetic vs technological approach
- OSR/canola oil as biofuel

5. RAPESEED/CANOLA FOR HUMAN NUTRITION

- OSR/canola oil for human nutrition
- Oil composition vs. stability and functionality – Quality requirements for oil from OSR/canola (minor components, sensoric aspects)
- "Fish oil" (EPA, DHA) from crucifers (OSR/canola)
- Protein for human nutrition
- Politics, markets, consumer affairs (e.g. GMO)

6. RAPESEED/CANOLA FOR ANIMAL NUTRITION

- Requirements for the use of OSR/canola cake and extraction meal: breeders' and nutritionists' view
- Improvement of meal/protein quality for ruminants, pigs, poulty, and aquaculture
- Politics, markets, environment, acceptance (e.g. GMO)

7. ECONOMY AND MARKET

- Global comparison of OSR/canola farm economy
- Optimizing farm economy with OSR/canola: Australia, Canada, China and Europe
- Global status of genetically modified or genome edited OSR/canola
- Global markets of OSR/canola oil (incl. biodiesel), meal and protein
- Sustainability of OSR/canola production

8. MUSTARD AND OTHER CRUCIFEROUS OILSEED CROPS

9. OTHER TOPICS

ADDRESS

PLENARY TALKS

ORALS

POSTERS

WORKSHOPS

#000 Challenges and prospects of oilseed rape production

Hubertus Paetow

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The DLG was founded in 1885 with the goal to implement scientific and economic knowledge, technical novelties and organizational competence into practice. Above 130 years later, nearly 3,000 voluntary and 250 full-time employees just as more than 30,000 members still have the same goal: Impulses for progress. Despite the long persistence, progress is not a rigid ritual for the DLG, but rather a goal that has to be redefined to survive.

In keeping with this tradition, we did that again in 2017. With the ten theses "Agriculture 2030", we have faced the challenges of feeding a growing world population while protecting natural resources and respecting social goals. At the same time, for agriculture, this means increasing productivity, reducing environmental damage, and organizing arable and livestock farming in ways that are supported by a broad social consensus.

For arable farming, this implies that the focus must be return on a holistic approach and moving away from the falsely emphasis on short-term optimization of the profit margin. This requires site-adapted designing crop rotation using a well-filled toolbox.

In the area of rapeseed cultivation, Germany is second in the EU ranking, behind France, with 1.225 million ha in 2018 (AMI 2018), which corresponds to about one-ten of the arable land. Rapeseed is an all-rounder in use, as it fills the plate, tank and trough, almost without competition, because main and side products complement each other. Of the 3.7 million harvested tonnes, around 1.5 million tonnes of rapeseed oil, 2.2 million tonnes of rapseed cake and extraction meal are produced. 0.5 million t of rapeseed oil are annually used in human nutrition.

But even in terms of arable farming, rape has hardly any other crop, despite or precisely because he is not self-sufficient and thus can be only cultivate in a wide crop rotation. He has highest demands on the soil and the supply of nutrients. Rape is particularly important in crop rotation with a high cereal content, as it promotes the structure and biological activity of the soil as well as the humus content through roots and remaining straw. Winter rape, for example, can take up released amounts of nitrogen in the autumn.

However, the high standards also include a high level of occupational and crop protection intensity. Especially here, the toolbox is restricted by unilateral prohibitions in the field of neonicotinoids and thus repealed the balance, especially since there are no alternatives. At the same time, rape cultivation within the EU is characterized by very volatile prices. Reasons for this are strong international competitors, including other oil-producing plants. In addition, extreme weather conditions, as in the past year, make cultivation even more difficult. According to the German Federal Statistics Office, only 0.917 million ha were drilled with rap in 2018, which corresponds to a decline of 25% compared to autumn 2017.

Possibilities that counteract the described trend are the expansion of the toolbox for example with mechanical weed control, which involves spaced planting and precision farming technology, thus combining old-fashioned and innovative methods. An opportunity in the marketing is to replace imported soya by rapeseed cake as an energy and protein supplier.

In order to stop the decline in cultivation due to restrictions in fertilization and crop protection as well as the increase in crop rotation diseases, emphasis is needed on research, breeding and testing for alternatives in crop protection. Futhermore it takes also new editions of pest damage thresholds, breeding against diseases and fertilization experiments in combination with growth models based on weather forecasts. A wide range of measures is the

#473

Postharvest changes of rapeseed oil quality as affected by storage conditions

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The aim of this study was to test whether variations in storage conditions throughout one year affect quality of oil of five different rapeseed genotypes (NS Vid, NS Pek, AMJ3, Traviata, NS Ras) harvested from three localities in Serbia (Pancevo, Rimski Sancevi, Sombor). Harvested seeds were stored in a cold room with invariable conditions (4±1°C, 60% humidity) and store room with variable conditions (up to 5°C higher than environmental). Oil samples were obtained by cold pressing rapeseed 0, 6 and 12 months after the harvest and further analyses were performed to monitor content and composition of fatty acids, tocopherols and antioxidant capacity (2,2-diphenyl-1-picrylhydrazyl radical scavenging activity assay). The fatty acid composition was determined by gas chromatography coupled with a flame ionizing detector after derivatization to their volatile methyl esters. Quantification of tocopherols was carried out using high performance liquid chromatography with fluorescence detection. Genotypes had stable major fatty acids content (linoleic-20%, linolenic-10.5%, oleic-61%, palmitic-4.2%) throughout the year. However, variations were observed in the contents of erucic (0.1%), eicosenoic (1.2%), stearic (1.6%), myristic (0.08%) and lignoceric acids (0.1%) which were higher in oils of Traviata and NS Ras genotypes from Sombor locality mostly stored in the cold room. Antioxidant capacity was in a correlation with total tocopherol content (approx. 391-413 mg/ml, α-tocopherol:Y-tocopherol=1:2) and was decreasing during the year. The highest antioxidant capacity had AMJ3 genotype which was constant throughout the year (up to 70% neutralized radicals, depending on the locality). These subtle changes in reserve compounds and oil antioxidant status show that change in rapeseed metabolism during storage is affected not only by storage conditions and genotype, but microclimate at the growing site as well.

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Please excuse any misspelling or grammatical errors that may occur in the book of abstracts. The book of abstracts contains data from diverse sources. The IRC-Team has requested clearance for all presentations.

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