

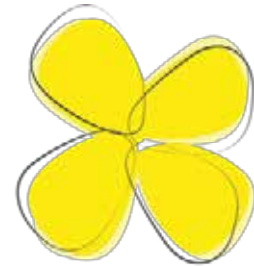
| IRC | 2019 | Berlin |
INTERNATIONAL RAPESEED CONGRESS

Challenges of rapeseed production and potential improvement – An outlook to IRC 2019

Wolfgang Friedt



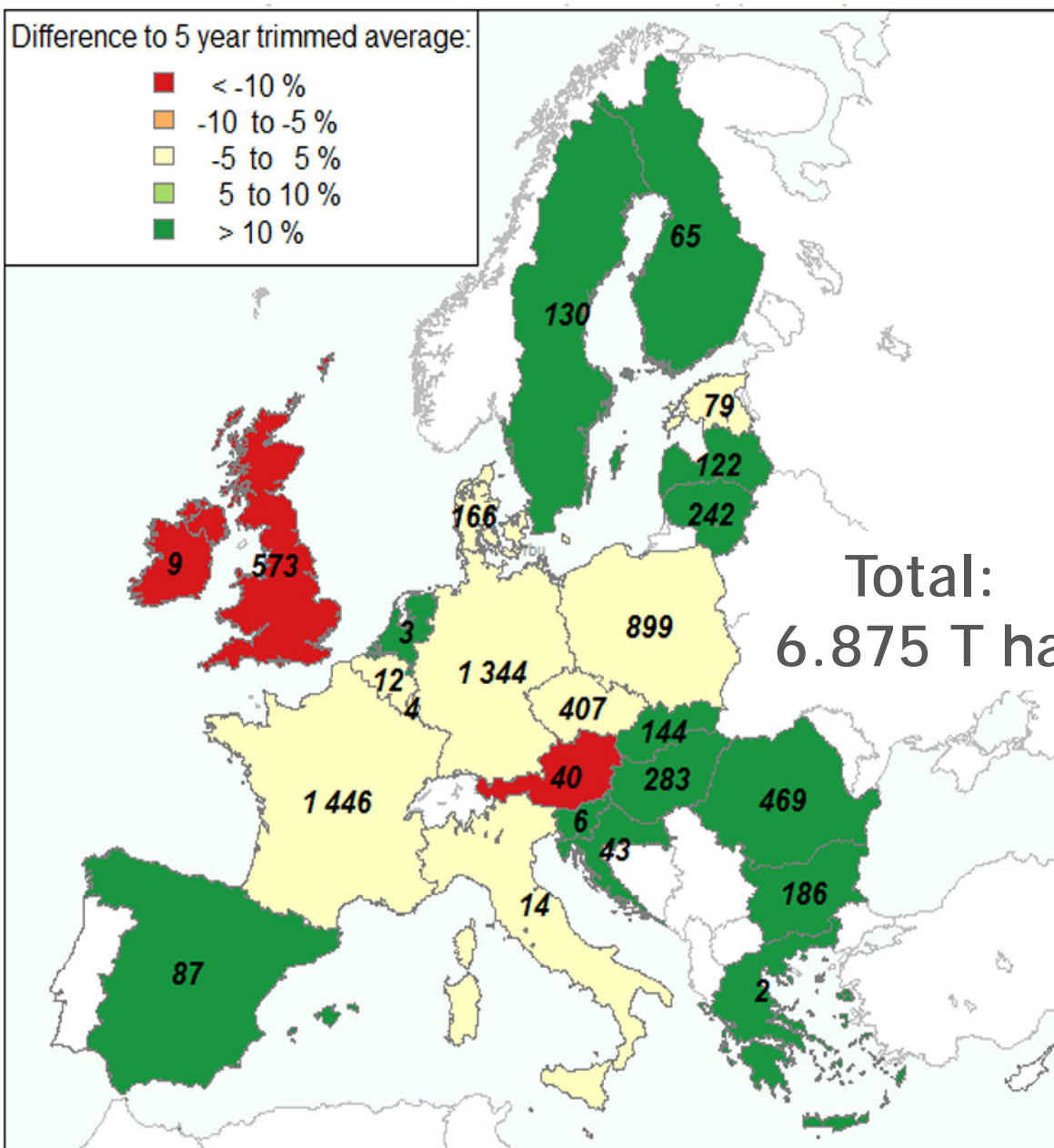
15th International Rapeseed Congress



| IRC | 2019 | Berlin
INTERNATIONAL RAPESEED CONGRESS

16-20 June 2019, bcc Berlin Congress Center





Calculations and cartography: European Commission DG AGRI G4 2017-03-28 © EuroGeographics for the administrative boundaries

RAPESEED Area EU28 in 2017

RAPESEED PRODUCTION

Averages 2012-2014

Canada	16.306 T t
China	14.412 T t
EU28	21.508 T t

http://ec.europa.eu/agriculture/sites/agriculture/files/cereals/presentations/cereals-oilseeds/market-situation-oilseeds_en.pdf



Topical issues and research activities in OSR

1. Challenges in agronomy (Economic yield, N use efficiency)
 - *Rapsodyn* project
2. Plant protection: Disease and insect resistance
 - Clubroot and others: *GEWIDIS* project
3. Protection of bees as pollinators and producers of honey
 - Dropleg technology
4. State of variety development in Europe
 - Progress in hybrid breeding for yield and efficiency
5. Market potentials: Oil & fatty acids vs. meal & protein
6. Field phenotyping: Equipment, sensor techniques, etc.
7. New genomics-based breeding methods



Optimisation of the RAPeSed Oil content and Yield under low Nitrogen input



French Program 'Investments for the Future' – 2012-2019

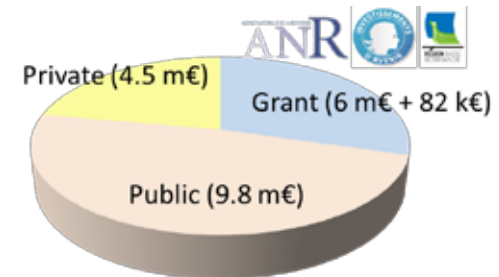
- A large public-private partnership with 16 partners



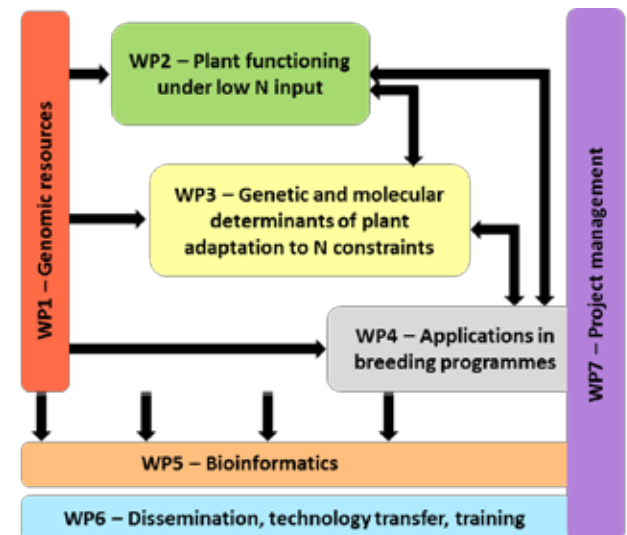
- Coordination:, Dr. Nathalie Nesi, INRA Rennes
- <http://www6.inra.fr/rapsodyn/>



- A substantial investment
 - 20.3 m€ total costs
 - 24 FTP over 90 months



- An integrative approach (7 WP)



Context and targets of RAPSODYN



Need to improve **YIELD** and its **STABILITY** under **LOW N** supply

Determinants of NUE

Impact of G×E on NUE

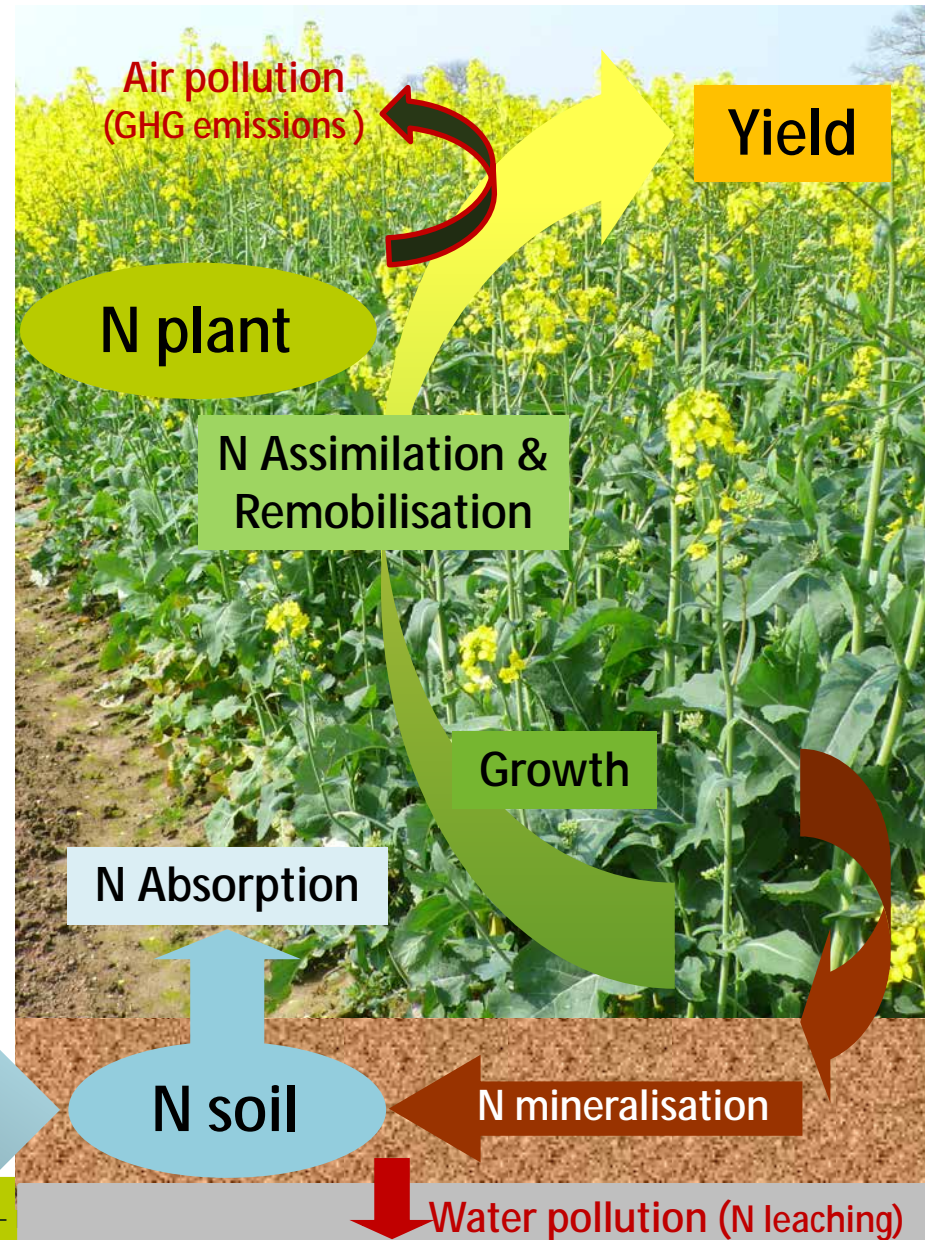
Integrative approach

- Field network
- Plant canopy
- Individual plant
- Organs

- Genetics, genomics
- Plant physiology
- Agronomy
- Crop modeling

NUE

N fertilizer
(150-180 kg/ha)





Winter oilseed rape genotypes showing extremely different **root systems** (fine roots!) at the time of seed maturity.

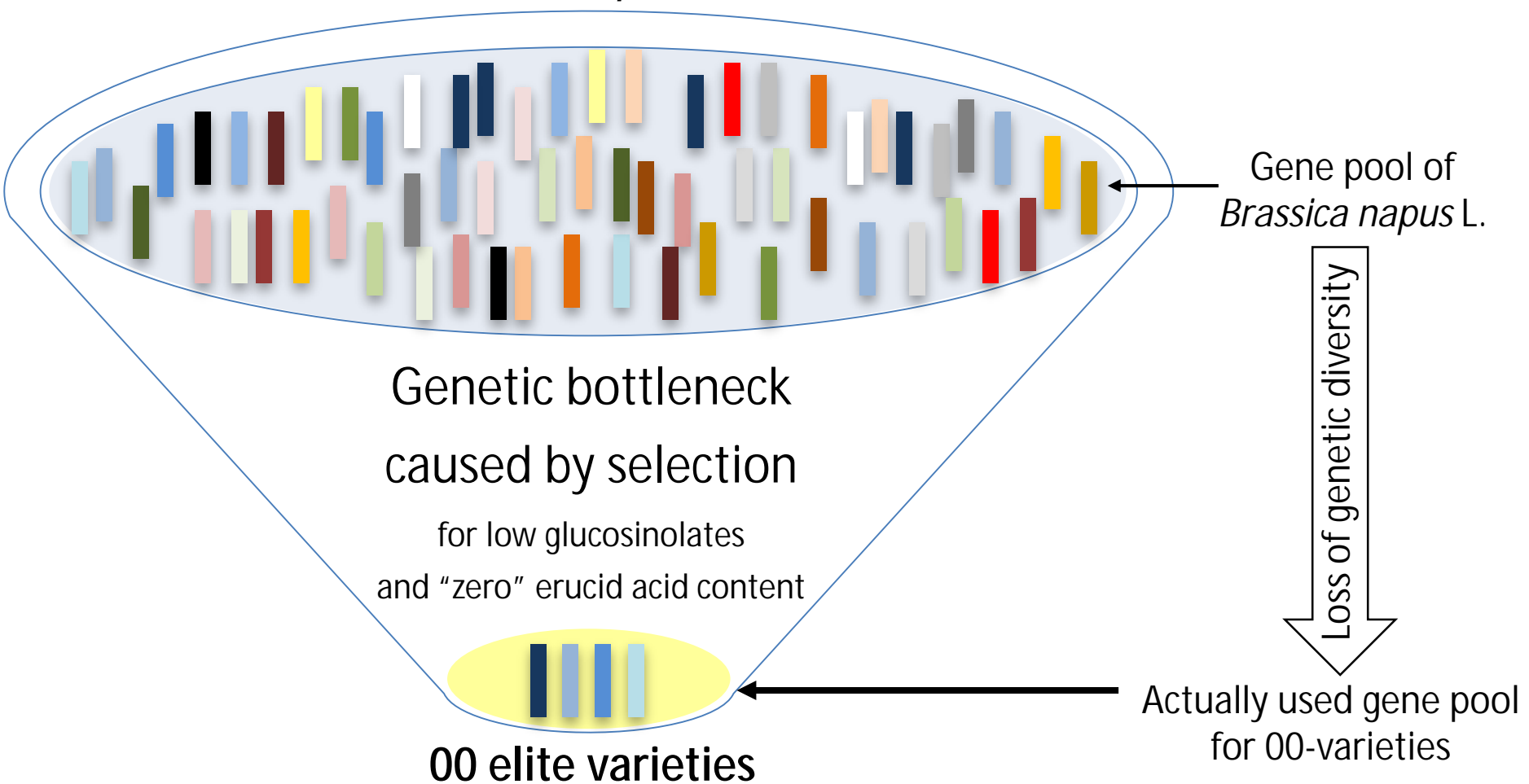
A. Stahl, U Giessen



Gene pool of oilseed rape

Brassica rapa (AA) x *Brassica oleracea* (CC)

Brassica napus (AACC)





GEWIDIS: Exploiting Genome Wide Diversity for Disease Resistance Improvement in Oilseed rape

Coord. Régine Delourme, UMR IGEPP, Rennes
INRA-Agrocampus Ouest-Université Rennes 1

Identification, utilization and ultimate deployment of effective and **durable host resistances** to the most important pathogens through the design of new multi-resistant varieties In oilseed rape.

March 2014- February 2018



<http://www.agence-nationale-recherche.fr/Project-ANR-13-KBBE-0004>

GEWIDIS Project

WP1: Assessment of phenotypic diversity for resistance

Blackleg
Clubroot
Sclerotinia
Verticillium

WP2: Generation of high throughput genomic data

WP 3: Genomic organization of resistance factors

WP 4: Identification of valuable alleles in the Brassica resources

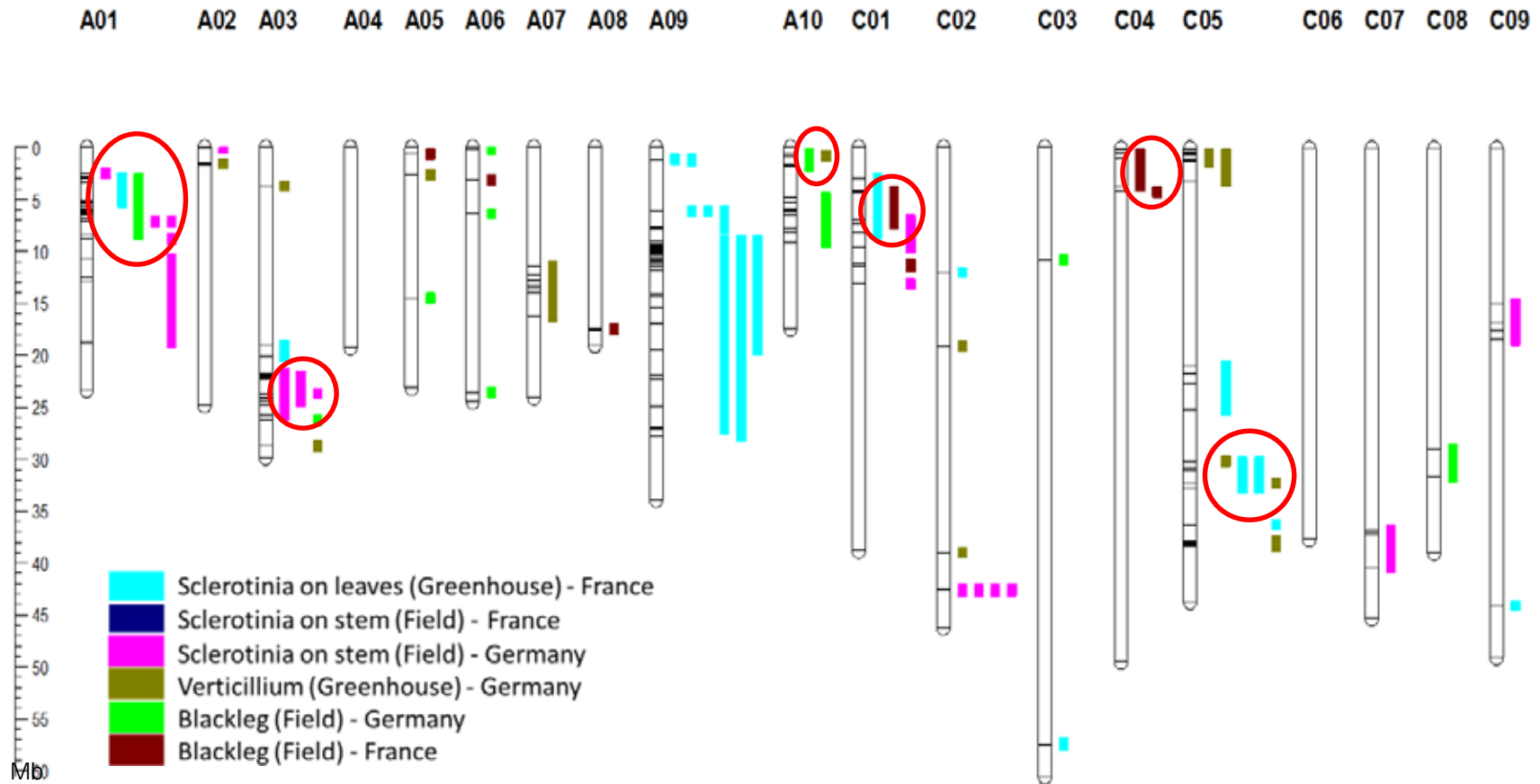
WP5: Characterization of rearrangements in resistant materials

Optimization of the introduction of new variability into OSR

Régine Delourme, UMR IGEPP, Rennes

GWAS: co-localizing disease resistance QTL

MLM(K+P), $-\log(p\text{val}) \geq 3$, 23,911 SNP (INRA), 197 NAM RILs, 5 families, 3 diseases, 16 traits



28% (18/64) of QTL regions show overlaps for multiple disease resistance

Other main projects in progress

Securing Yield stability of Brassica crops in changing climate conditions



FACCE-ERANet+:
Agriculture, Food
Security and Climate
Change

Partnership:

- INIA – Spain Madrid
- JIC – Norwich UK
- JLU – University Giessen Germany
- AU – Aarhus University Denmark
- INRA – IGEPP France
- NPZi – Hohenlieth Germany
- GCRC – Brno Czech Republic

Content and quality of rapeseed proteins: Exploration of genetic diversity to optimize their use in animal and human nutrition

SEEDPROT



Partnership:

- INRA Rennes (IGEPP) – Genetics B.napus
- INRA Nantes (BIA) – Biochemistry
- INRA Versailles (IJPB) – Functional genomics Ath

Brassica 2018

The 21st Crucifer Genetics Conference – Brassica 2018 will be held in Saint-Malo, France, from 1-4 July 2018.

The conference will cover aspects of genetics and genomics in all Brassica species, from basic to applied research.



Informations at:
<https://colloque.inra.fr/brassica2018>

Contact:
brassica2018info@inra.fr

We look forward to meeting you in Saint-Malo in July 2018!



Raising seed yield of Oilseed Rape (OSR):

OSR is an optional self- and cross-pollinator, but cross pollination by insects (e.g. bees) can raise practical yield





Spotlight on protecting solitary bees and innovative bee-friendly spraying technology in the IV edition of the European Bee Award

“Innovative technological solutions” **DroplegUL device** and application technique, developed by *Lechler GmbH* in partnership with the University of Hohenheim and Südwestdeutsche Saatzucht

ana.canomanuel@elo.org



Female

Male

Female



Hybrid seed
Female

Hybrid seed
Female

® NPZ Lembke



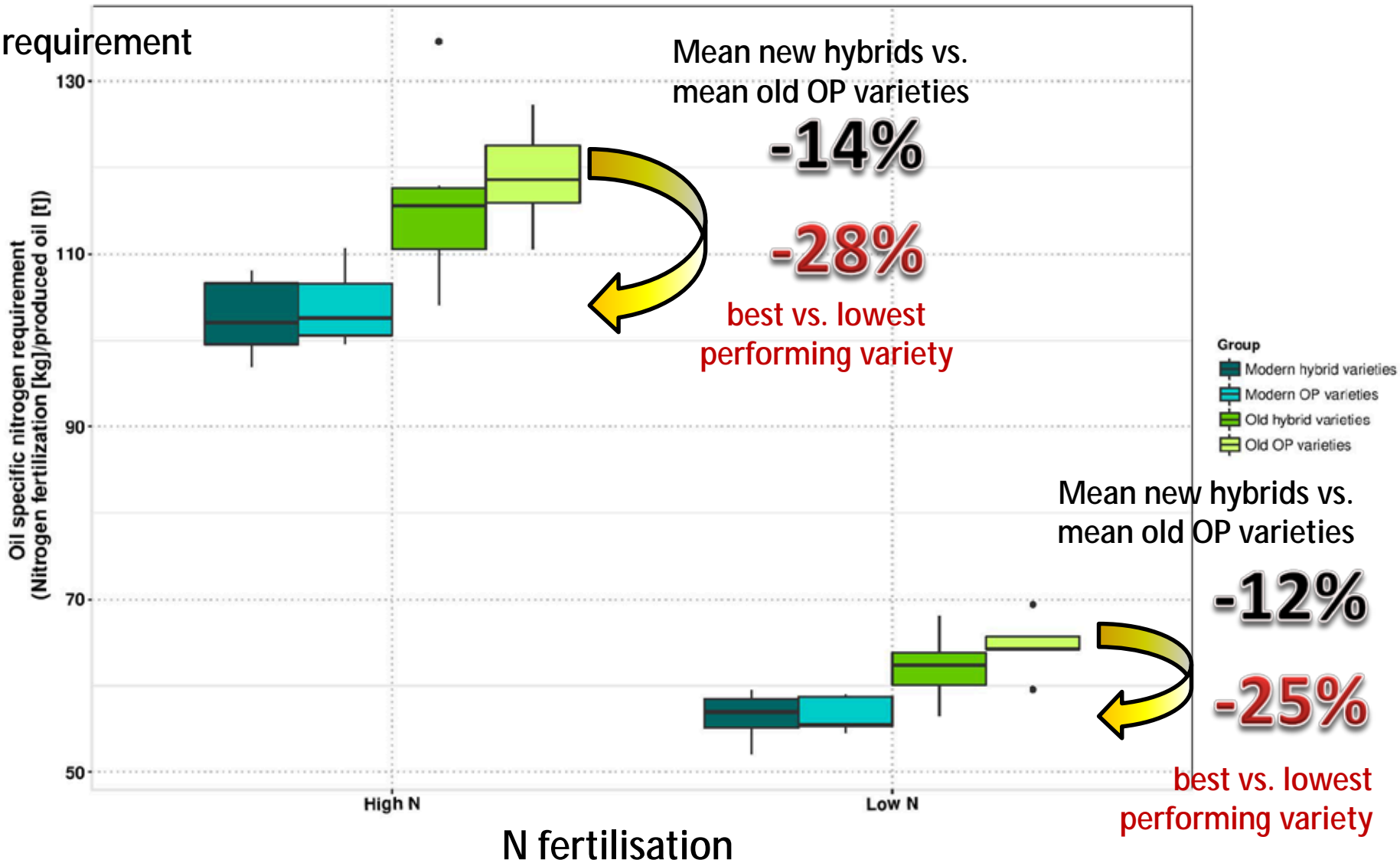
Structure of seed yield in oilseed rape

No. of seeds per pod

No. of pods per plant



N requirement



Nitrogen uptake
efficiency (**NupE**)

$$\frac{N \text{ in biomass at flowering [g]}}{N \text{ fertilized [g]}}$$

x

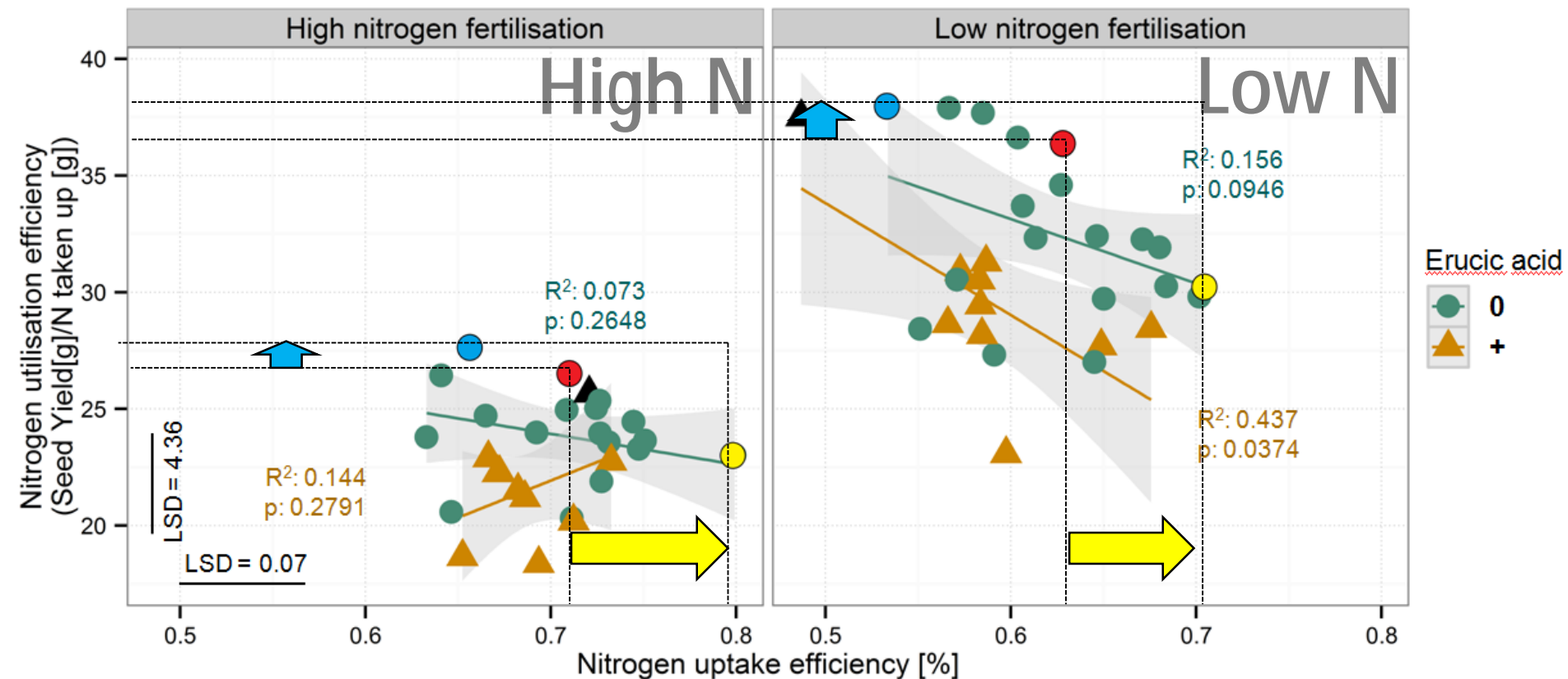
Nitrogen utilization
efficiency (**NutE**)

$$\frac{\text{Seed yield [g]}}{N \text{ in biomass at flowering [g]}}$$

=

Nitrogen (total) use
efficiency (**NUE**)

$$\frac{\text{Seed yield [g]}}{N \text{ fertilized [g]}}$$



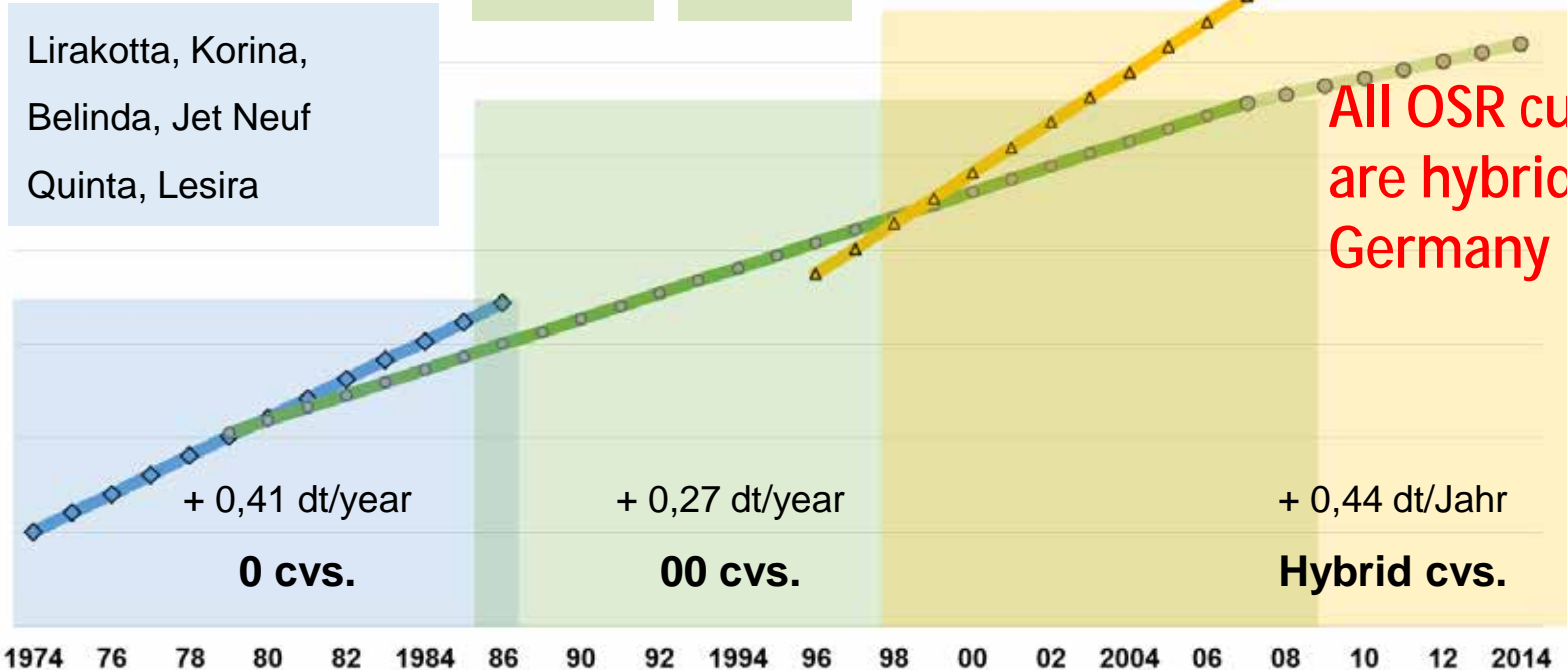
40 years of breeding progress in oilseed rape (RAPOOL, Germany)



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Artus	Elektra	Visby	Avatar
Pronto	Talent	Titan	Sherpa
Joker	Mendel	Dimension	Genie

Ceres	Lirajet	Express	Oase	Adriana	Marathon Mercedes
Lirabon	Idol		Lorenz		
Librador	Madora				



Schematic presentation based on the Federal Statistical Office, Germany (Dr. Martin Frauen)

IRC15 Programme Structure

Topical Areas

Genomics & biotechnology - Diversity

Breeding methods & application

Agronomy & Crop Science

Plant protection (genetic vs. chemical)

Analysis, Use of products

Nutrition/protein (animal, human)

Economy and market



Location & Travel

- bcc is located in the immediate vicinity of the Berlin TV Tower right at the **Alexanderplatz**, in the very city center
- excellent public **transport** connections ensure an easy arrival and minimized commuting times.



bcc



Berlin Congress Center



bcc



Plenary Hall C-level



bcc



IRC 2019 - LOCATION OF THE VENUE



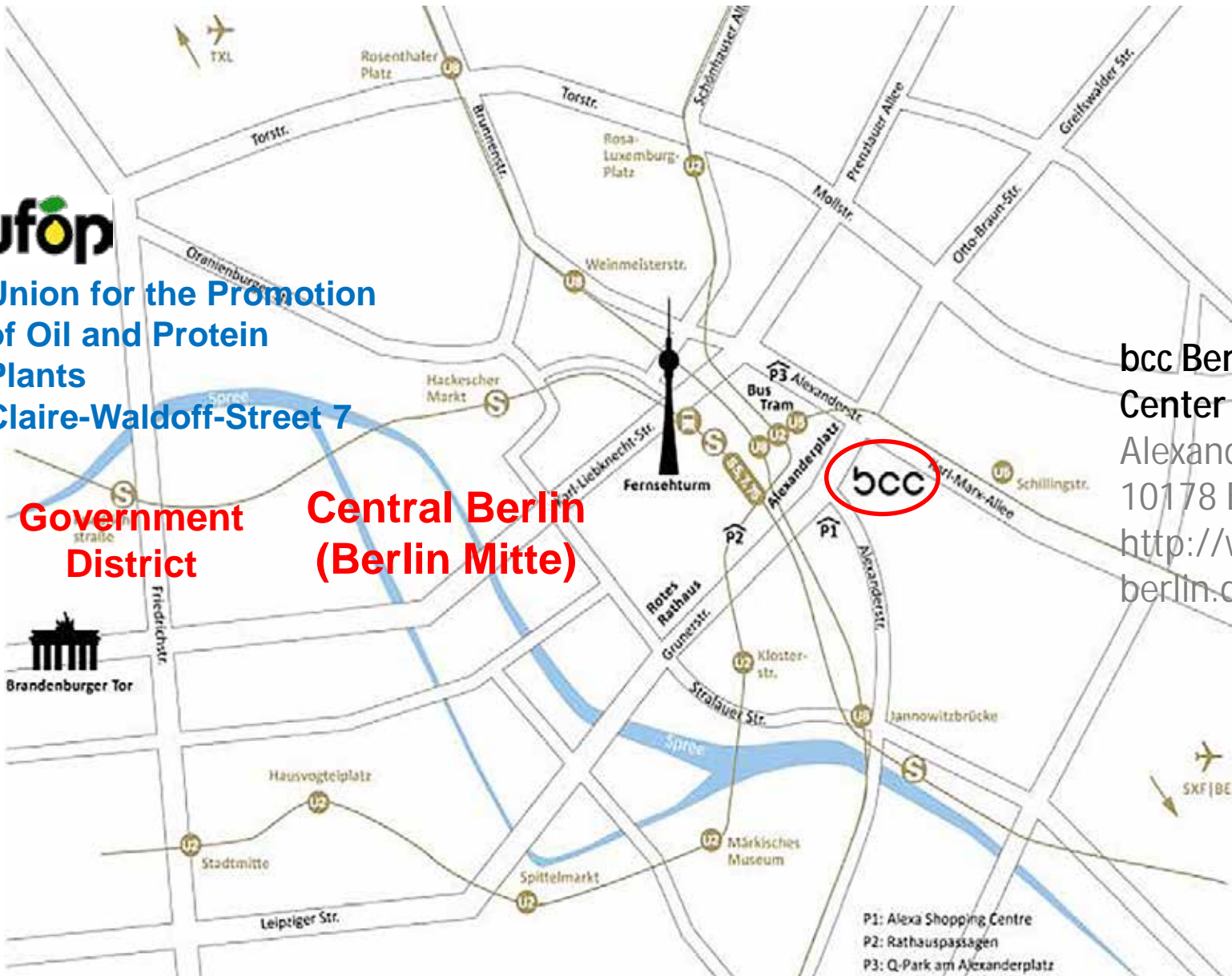
Union for the Promotion
of Oil and Protein
Plants
Claire-Waldoff-Street 7

Government
District

Central Berlin
(Berlin Mitte)



Brandenburg Tor



bcc Berlin Congress
Center
Alexanderstraße 11
10178 Berlin
<http://www.bcc-berlin.de/en/>

P1: Alexa Shopping Centre
P2: Rathauspassagen
P3: Q-Park am Alexanderplatz

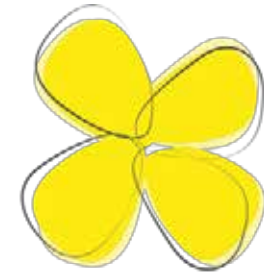


Post Congress Excursions, 20/21 June 2019

- a) To the North (1-2 days):
- Mecklenburg-West Pomerania
 - most important OSR-growing region, incl. Malchow/Poel (return to Berlin)
- b) To the West (2 days):
- Quedlinburg, Göttingen, Giessen - heading for Frankfurt/Main (Fraport)
- c) To the South (1 day, opt.):
- Dresden, Leutewitz, a.s.o.



***SEE YOU...
...IN BERLIN!***



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15 IRC Core Team: W. Friedt / M. Frauen / St. Arens

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info@irc2019-berlin.com