Needs of the Plant Research Community - a Dutch perspective

July 2, 2014

TransPLANT & Elixir-NL


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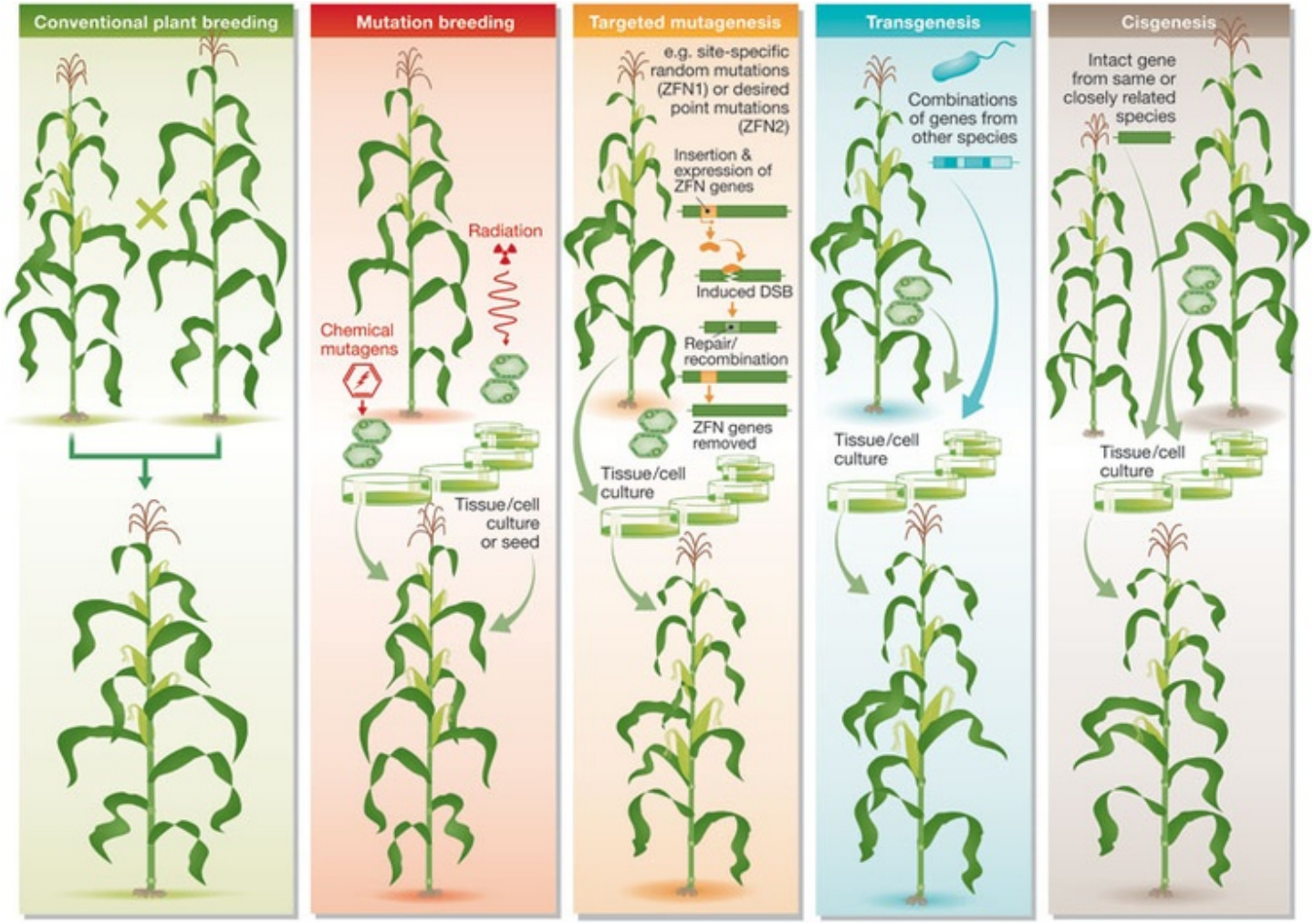
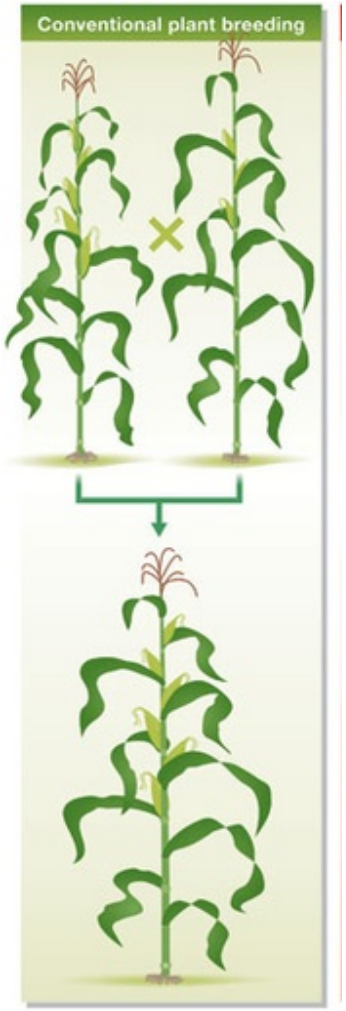
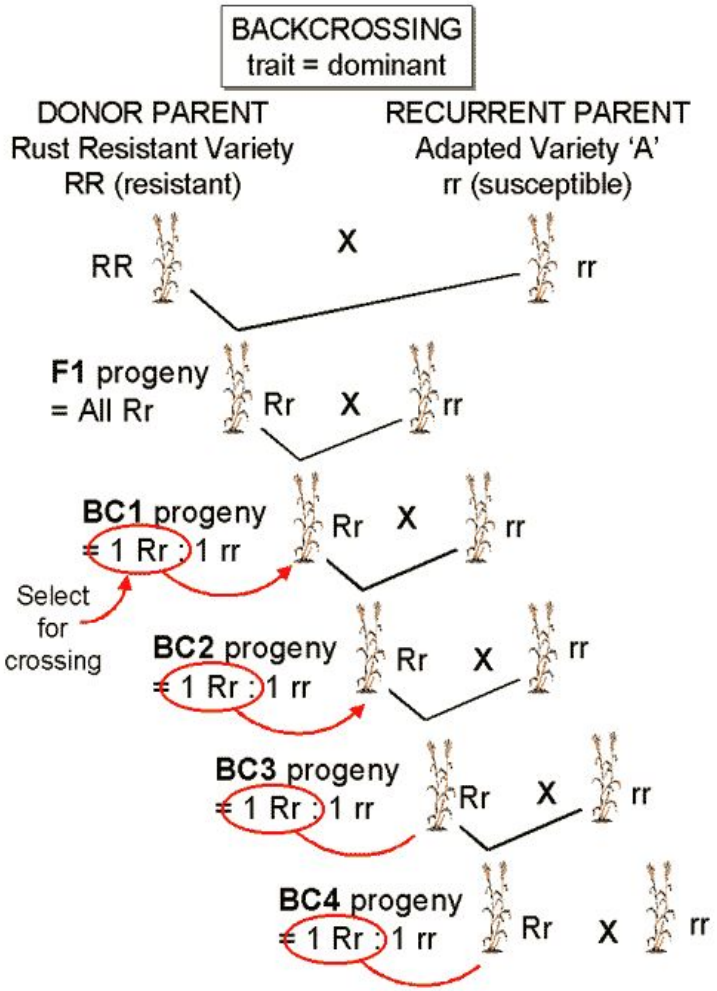
Plant breeding and beyond: basics

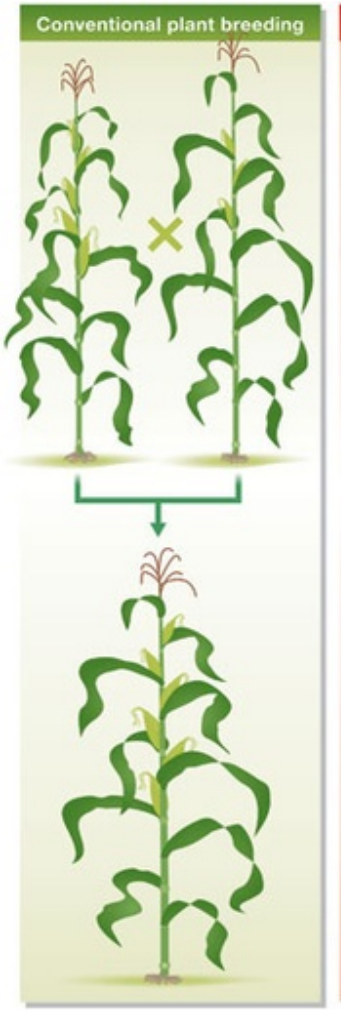


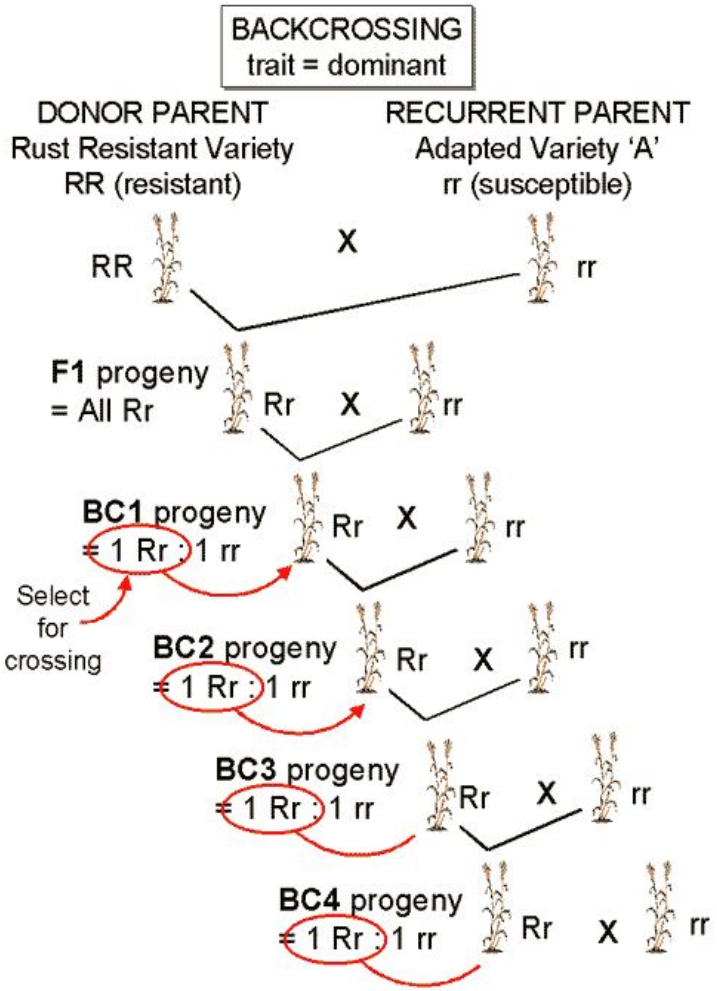
Plant breeding and beyond: genetics



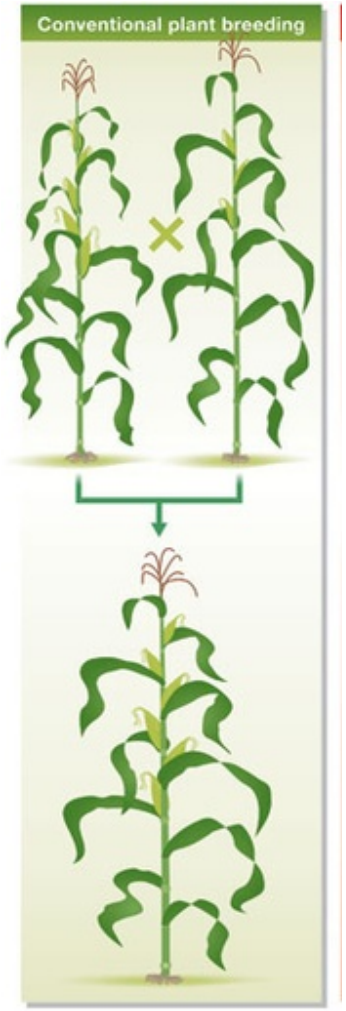


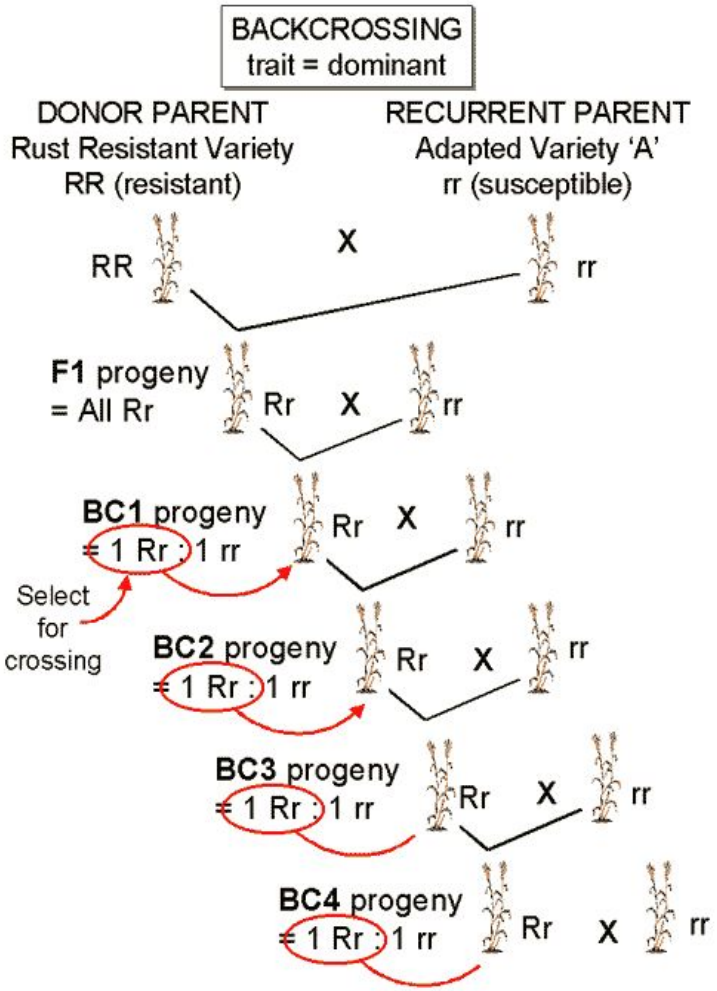
Plant breeding and beyond: genetics





Plant breeding and beyond: SELECTION



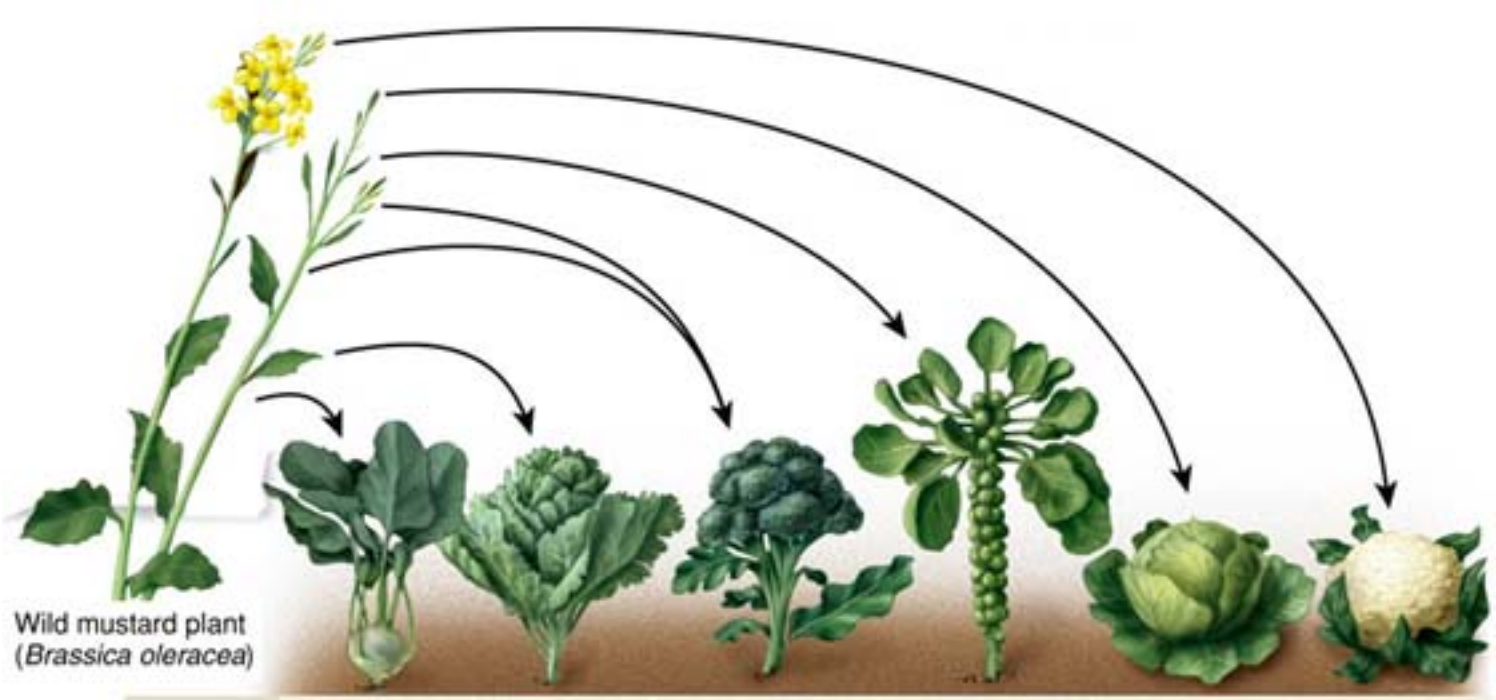


Selection of

- parents
- genetics
- trait
- algorithm
- population
- environment
- market
- legislation
- consumer

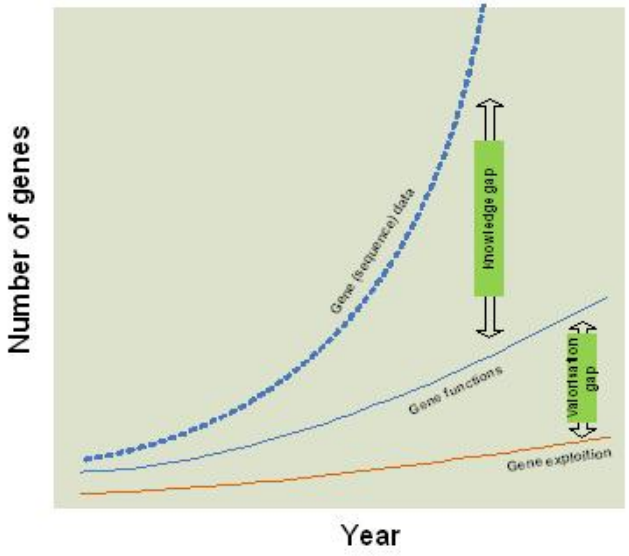
and more

Plant breeding and beyond: example



Strain	Kohlrabi	Kale	Broccoli	Brussels sprouts	Cabbage	Cauliflower
Modified trait	Stem	Leaves	Flower buds and stem	Lateral leaf buds	Terminal leaf bud	Flower buds

Plant breeding: aims



- Yield, yield, yield
  - more with less
- Yield stability
  - different environments
- Disease resistance and abiotic stress tolerance
- Quality
- Input and environmental impact
  - fresh water
  - Agrichemicals
- (Marketability)

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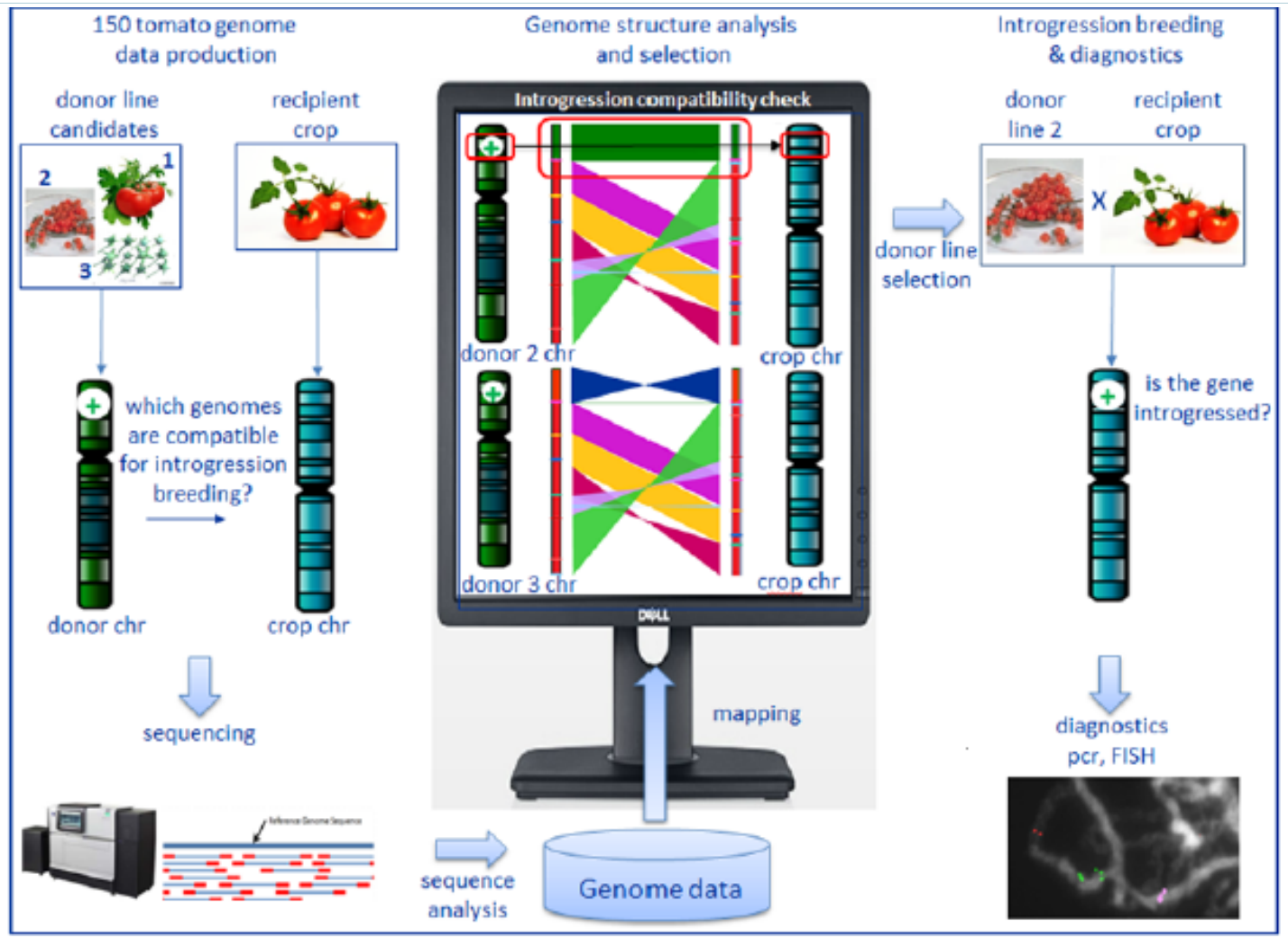
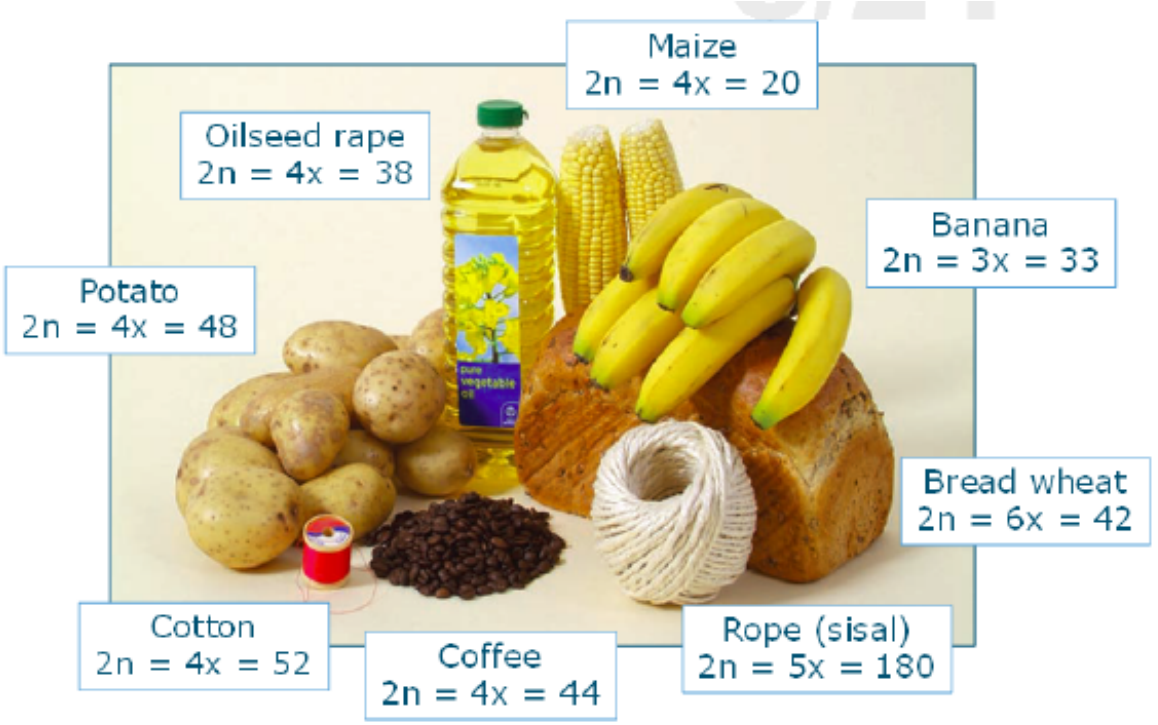
Precision breeding



Challenges

- Polyploid crops
- Huge genomes
- Repeat content
- Recombination
- Protein function
- QTL regions



Precision Breeding in TransPLANT2020

- Rationalization of selection decisions on all levels

- Interoperability of data as accelerator of innovation
  - HTP genotyping, HTP phenotyping
  - Ontologies and standards
  - Tools and management
  - Networks

Rationalization = data interoperability

Elixir-NL

Data interoperability and exchange

Several Dutch groups have specialized in data capture standards, software, semantic web standards and formats to enable meaningful exchange and integration of biological information. ELIXIR NL will focus on implementing and developing professional capturing, publishing and hosting of data in standard (semantically interoperable) format that will be offered in a public-private partnership in close collaboration with other ELIXIR nodes and the Hub

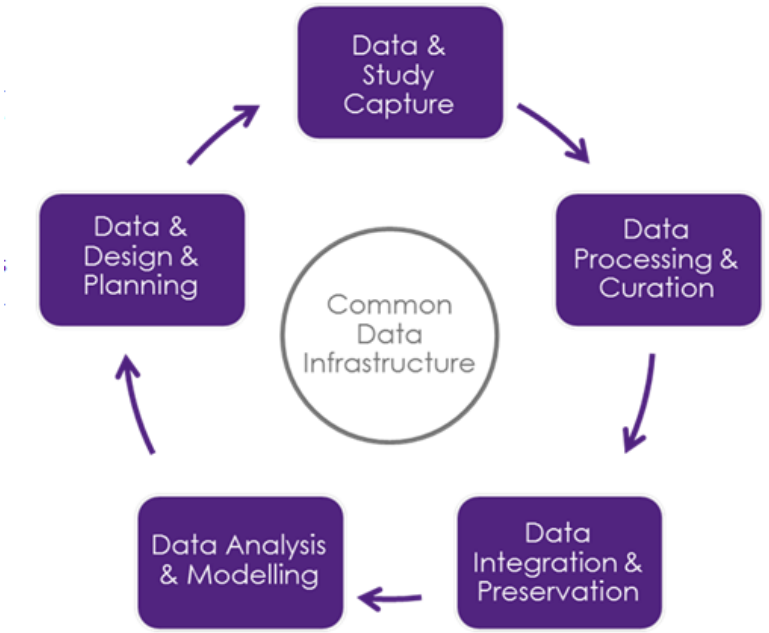
Compute and storage infrastructure services

The e-infrastructure capabilities of the Dutch national compute, data and ultra high speed network infrastructure are a clear strength of the ELIXIR NL Node, with extensive experience in running a shared compute and storage environment for collaborative life science projects. The ELIXIR NL node will focus on supporting complex data/compute-intensive life science projects, in collaboration with, and complementary to the offerings of other ELIXIR nodes.

Training

ELIXIR-NL will contribute extensive experience and capacity in bioinformatics training built up within NBIC, and will leverage broad education & training capabilities of the broader DTL partnership in a comprehensive portfolio in the broader scope of the ELIXIR train programme.

ELIXIR NL: focus within the Data Cycle



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Mode of action Elixir-NL

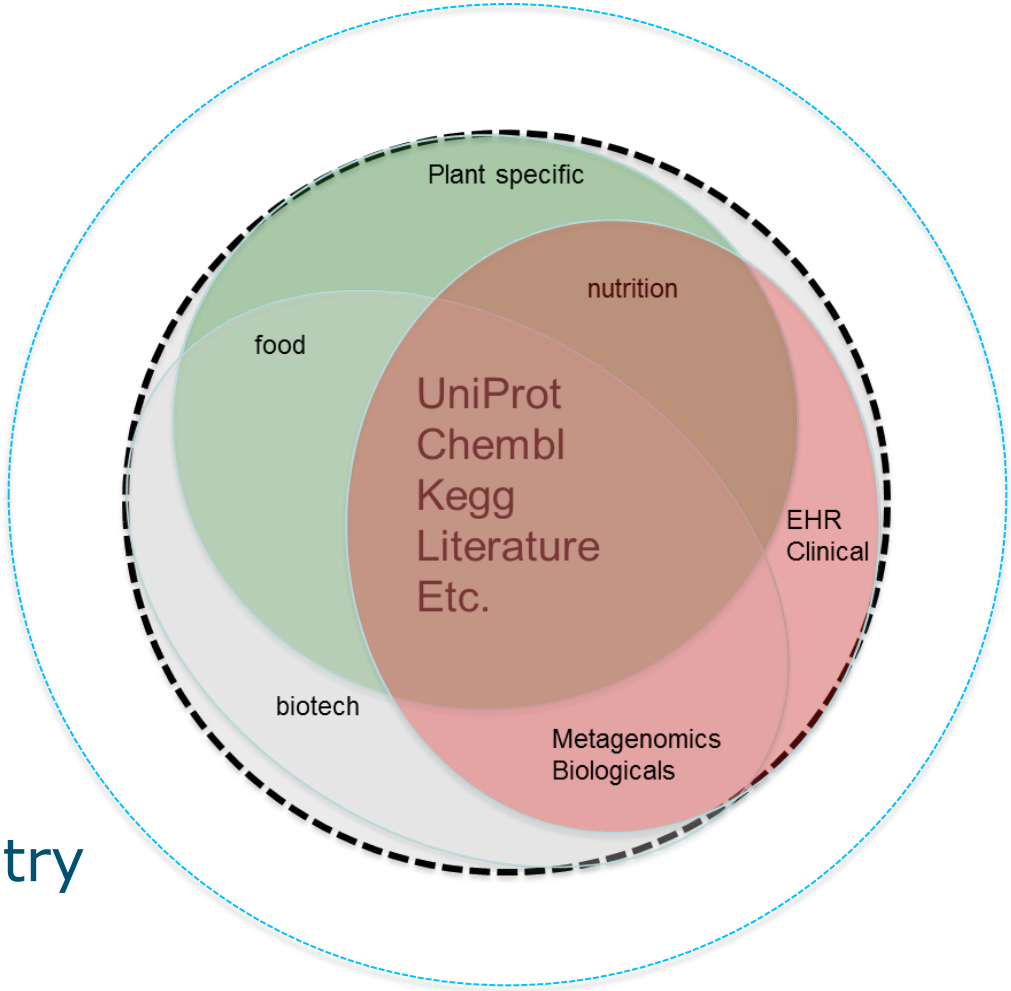
- Community based
- Facilitator & organizer
  - cross fertilization
  - cross sectoral

    (plant, food, animal,

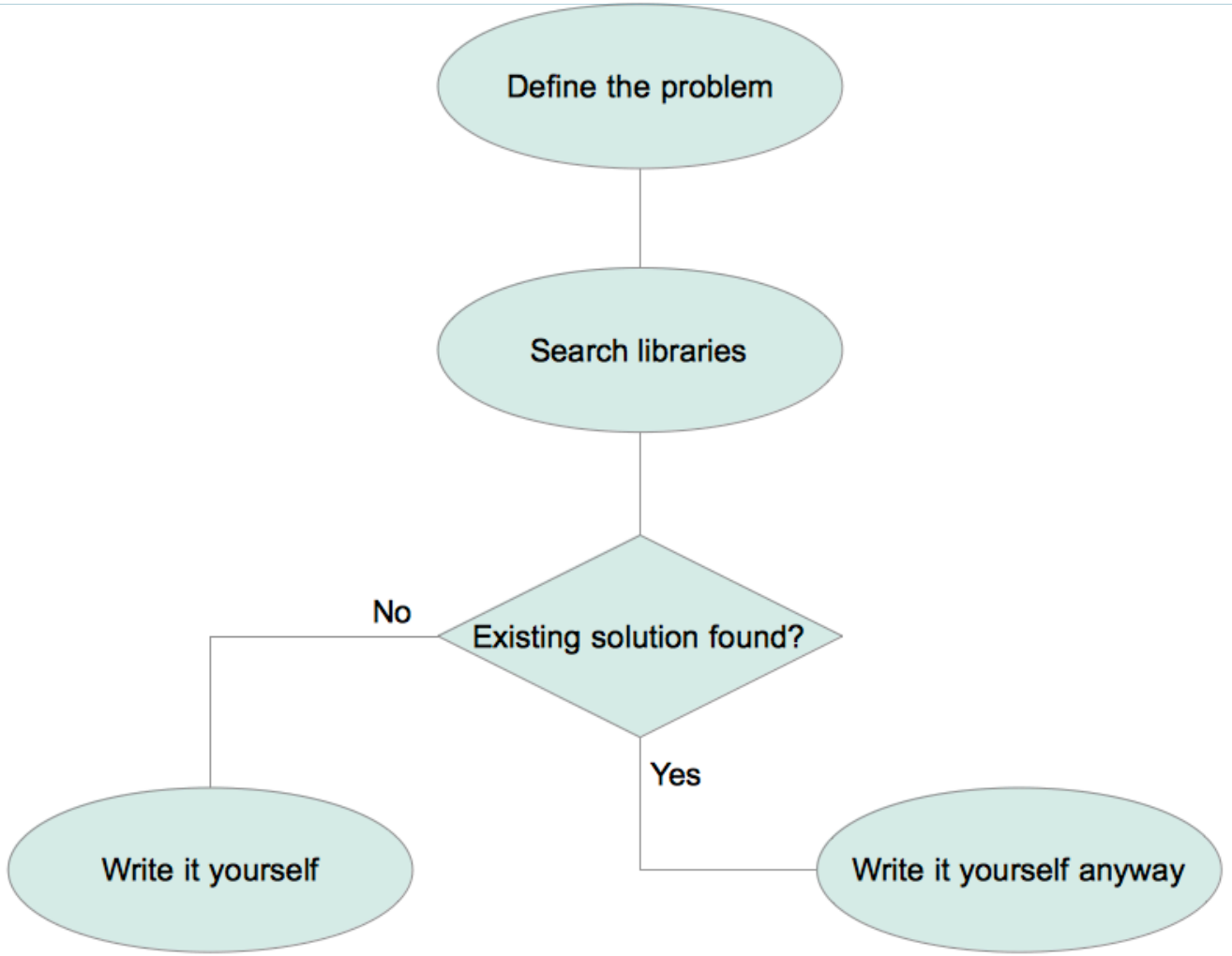
    red, white, blue, energy)
  - cross collaboration

    - ESFRI, other

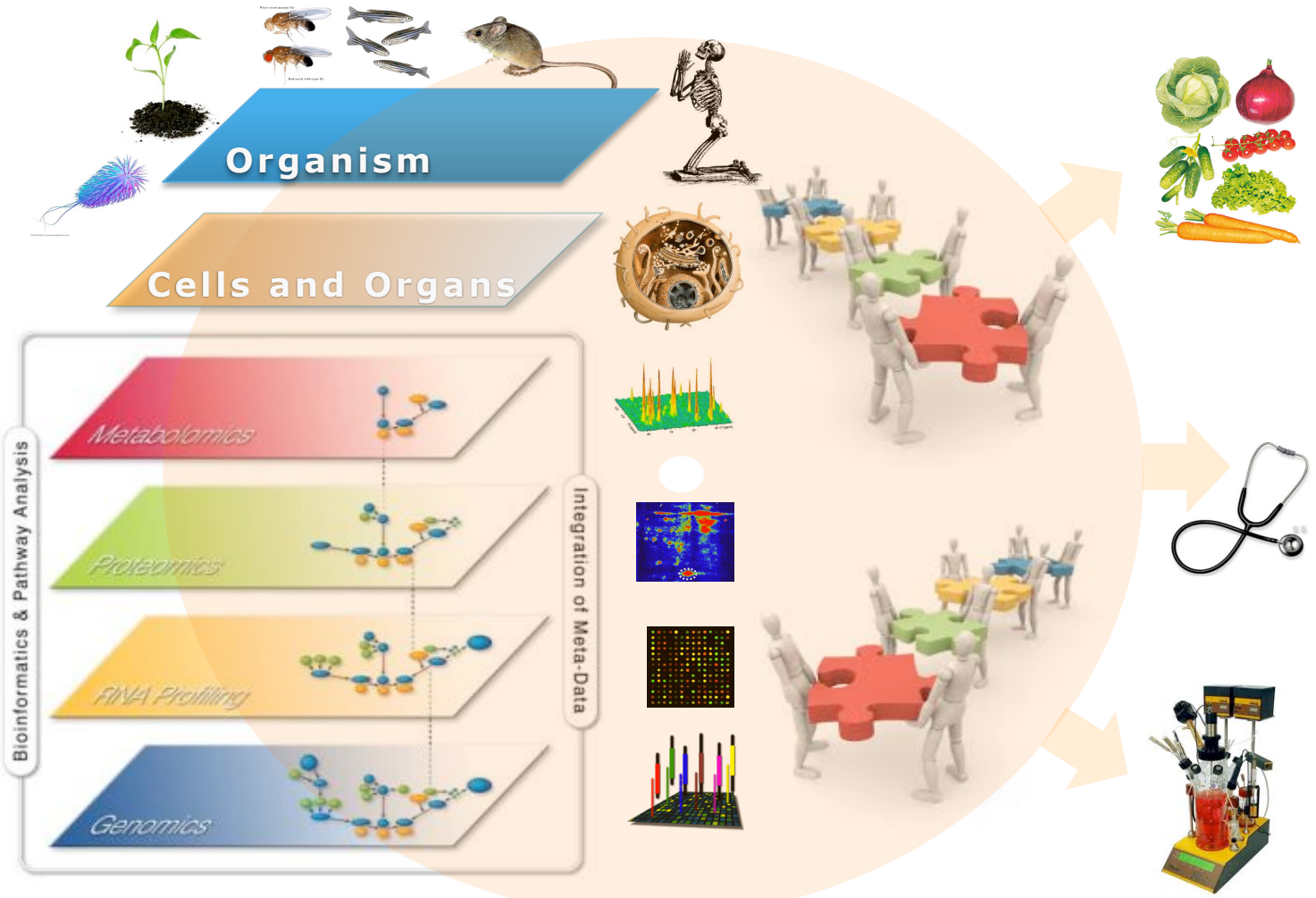
    - academia - industry
- Agenda setter



as to prevent....



Vision for TransPLANT2020 – Elixir-NL



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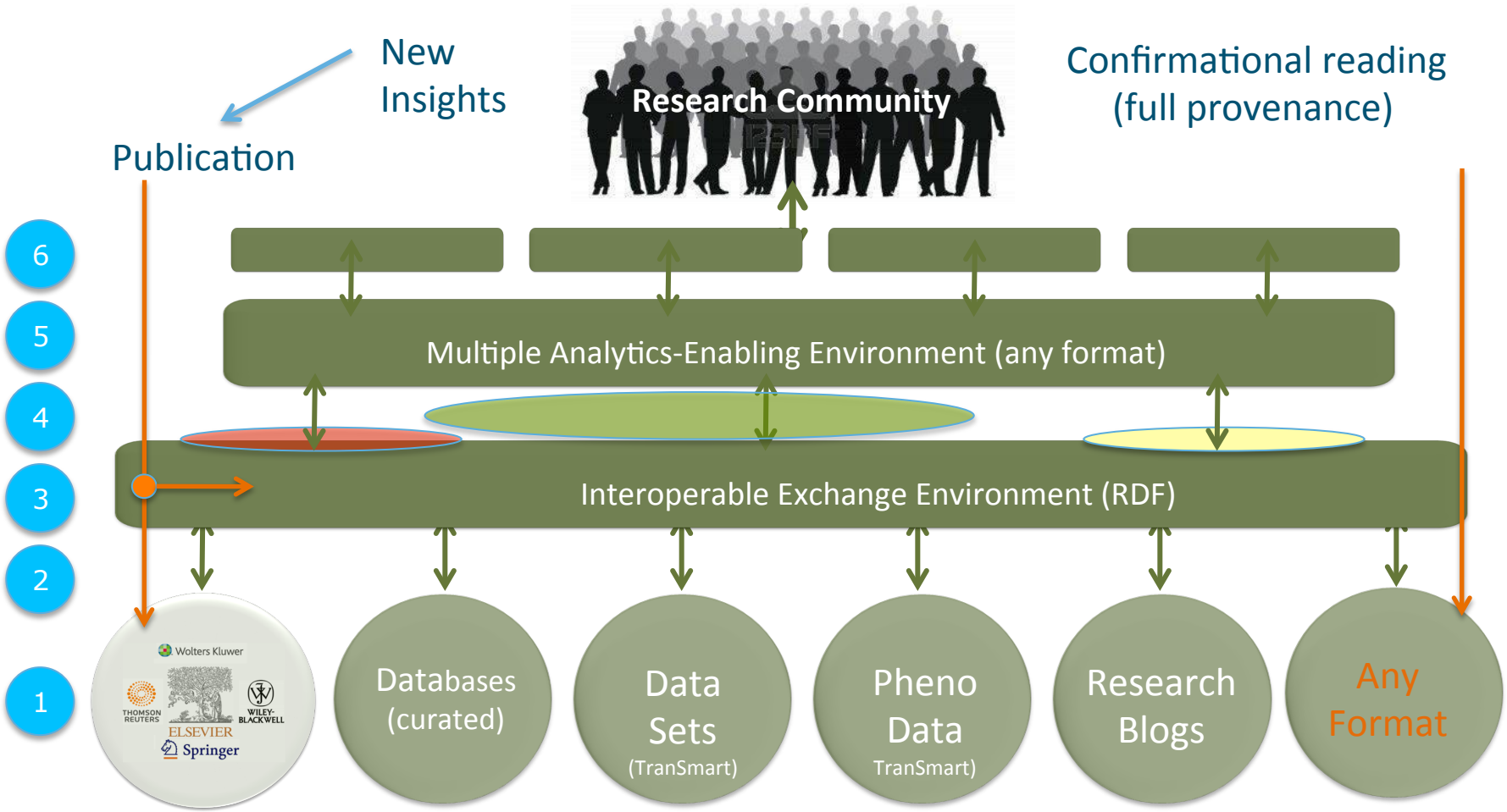
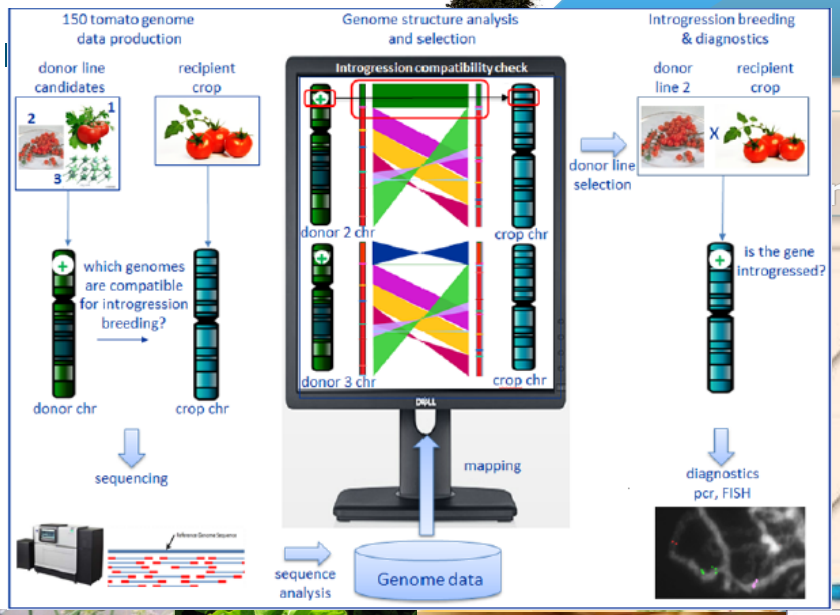
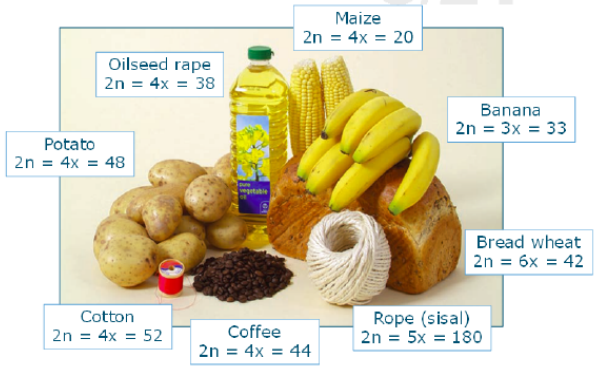
Vision for Elixir-NL - Transplant2020



Precision breeding in Transplant202





Let’s do it....
Let’s go for TransPLANT 2020

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