



**Ensuring a competitive
workforce for plant sector
- industry, academia & farmers**

www.plantetp.org

www.epsoweb.org

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EPSO and ETP 'Plants for the Future'
24 October 2014, Gent



What is EPISO?

Advancing plant science in Europe

Independent academic organisation

Mission:

- Promote plant science and support plant scientists
- Discuss future plant science programmes across Europe
- Provide authoritative source of independent information on plant science
- **Promote training of plant scientists** to meet the 21st century challenges in breeding, agriculture, horticulture, forestry, plant ecology and sectors related to plant science

**CREATING A FUTURE FOR
PLANT RESEARCH IN EUROPE**





EPSON membership

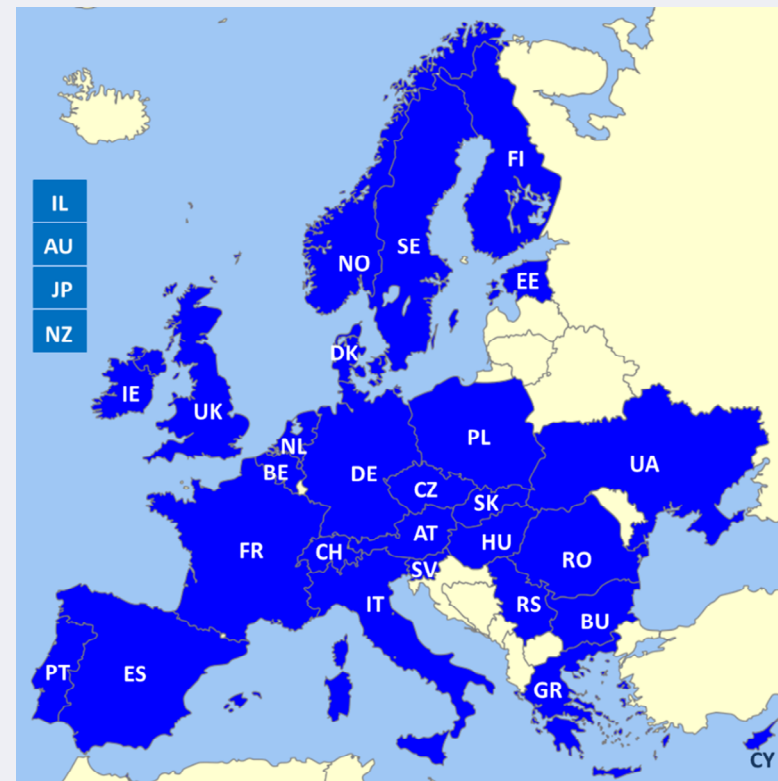
Academic Institutional members:

227 research institutes, universities, research departments

with over 28 000 researchers and staff in plant science

from 31 countries – 28 in Europe and 3 beyond

+ over 3.100 Personal members + you !





EPSO workgroups

- **Outreach and Public Dialogue** (FoPD)
- Towards Innovation Driven **Agriculture** (Concept)
- Plant Research for **Biorefineries** (EU; India)
- **Crops, Food and Health**
(White paper, Horizon 2020, HDHL JPI)
- Opportunities Beyond Present **Crops** (Paper)
- Agricultural **Technologies** (Statements)
- **Global** Plant Research including Developing Countries (EPSO-FAO workshop 2012; GPC)
- **Environment** (FP7, Horizon 2020)
- **Molecular Farming** (Horizon 2020)
- **Education** (Education Action Plan, ERASMUS+)
- **Horticulture** (Horizon 2020, White paper)
- **Basic Plant Science** (Eur. and national advise)





What is Plant ETP ?

Industry – Academia - Farmers



>7000 Companies (90% SMEs)



European Plant Science Organisation
>220 Research Institutes & Universities



european farmers european agri-cooperatives

76 Farmers' Organisations & 40.000 Cooperatives

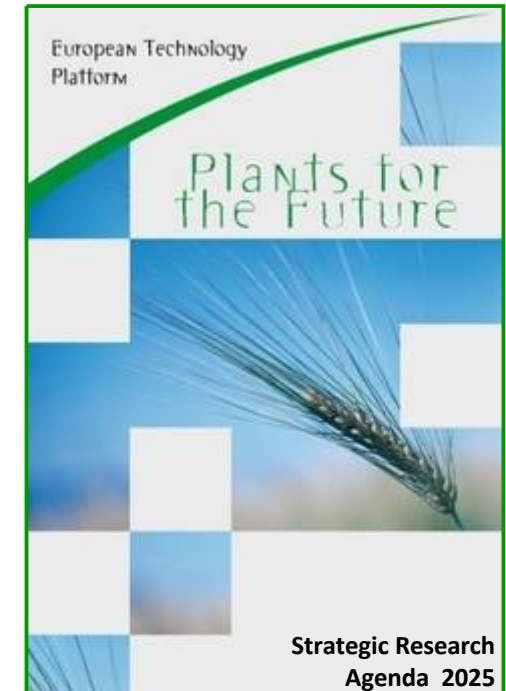
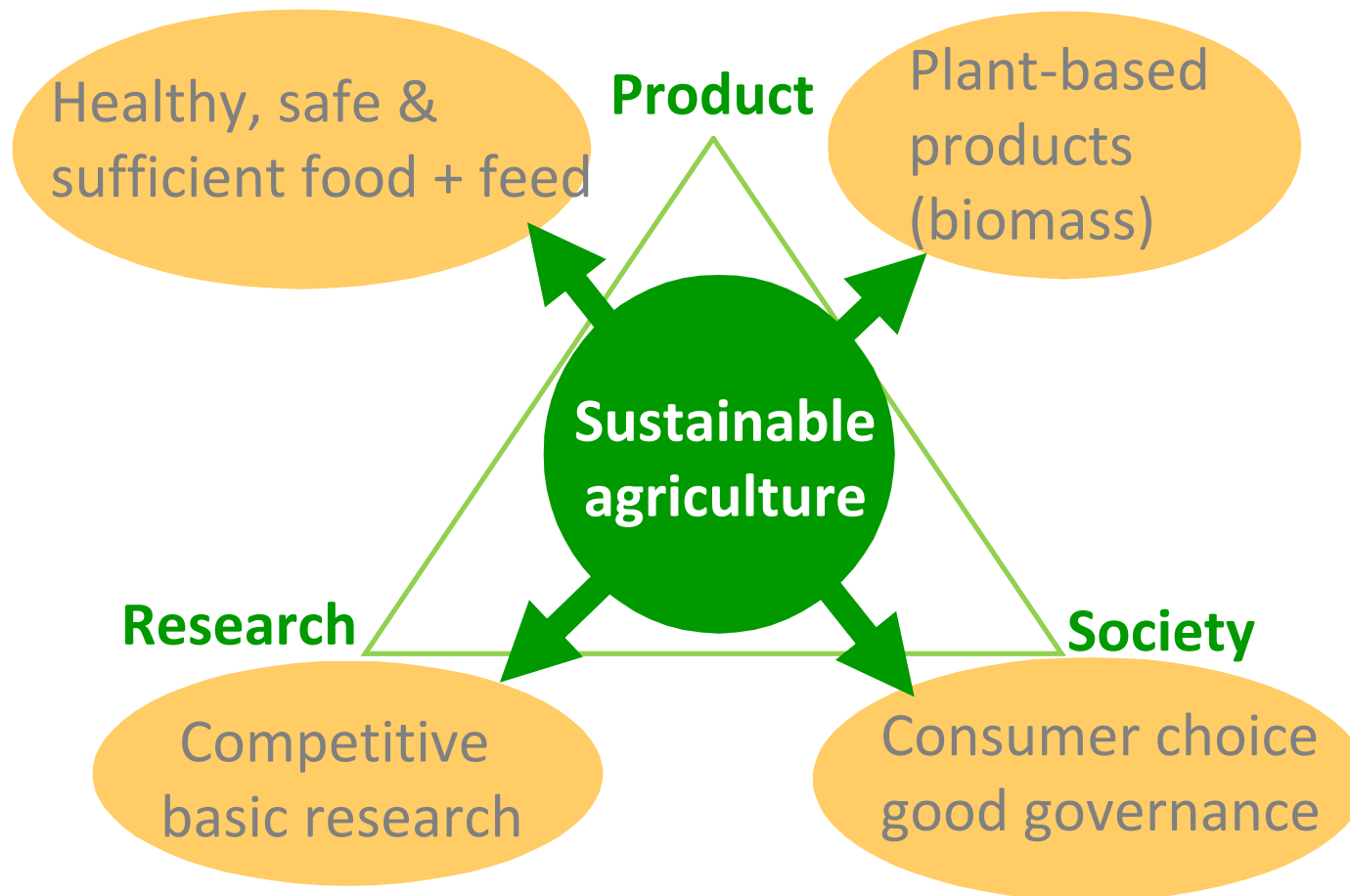


Bayer CropScience

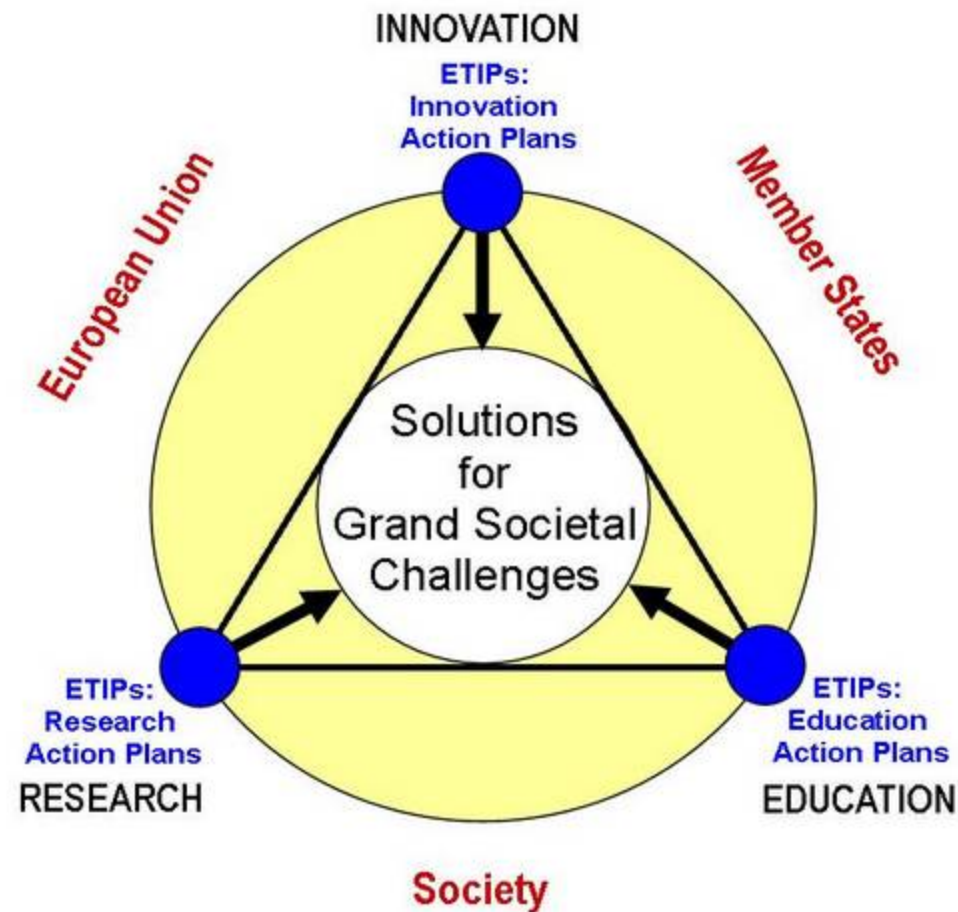


sugar beet seed

Strategic Research Agenda addresses 5 challenges

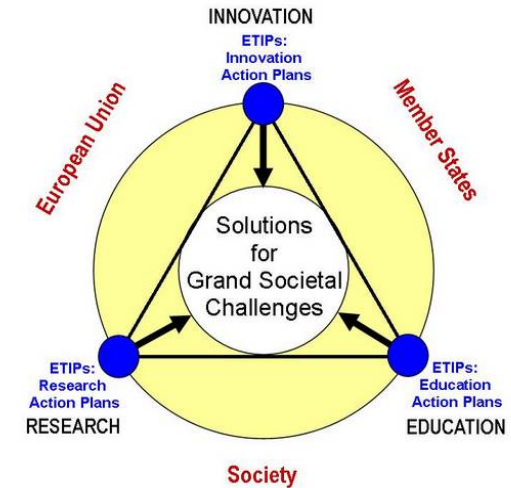


Integrated approach of Plan(t)s for the Future



(Source: *EC Experts Group on ETPs 2009*)

Three Action Plans



2010 – 2014

WoGr meetings

– workshops

– stakeholders public consultations:

- **Research Action Plan** to improve:
 - Competitiveness and critical scale of European plant research
 - Balancing knowledge- and application-driven plant research
- **Education Action Plan** to clarify:
 - Short, mid and long term skill needs in plant R&D
 - Short, mid and long term career opportunities in the plant sector
- **Innovation Action Plan** to improve:
 - Linkage of market needs and idea generation
 - Flow from idea to marketable product
 - Innovation culture in Europe

Research Action Plan

Making Europe more competitive

Research & Innovation contributions from the plant sector in H2020

6 Challenges

- Improved resource use efficiency and resource stewardship
- Improved yield & yield stability in dynamic environments
- More nutritious plants for healthy food & feed
- Improved plant health for resilient production
- Improved plants for non-food products
- Horizontal actions

Education Action Plan



- **Who are the plant scientists, plant breeders and farmers of the future?**
- **Who will be carrying out the necessary research** to deliver new plant varieties that meet the needs of farmers and growers?
- **Which key plant science skills** does the European plant sector need to secure and to develop for an economically viable future?
- **How can higher education institutions provide** an optimal **education** in plant sciences to produce graduates with the knowledge, skills and training **relevant to the needs of the plant sector?**

Education Action Plan

Goals + Actions in 2012/2013

Goals:

Identify current/future needs; gaps & how to address

- **Shortfalls** in skills
- **Shortcomings** in areas of expertise
- **Specific needs** in Eastern countries

Assemble in the Education Action Plan

Discuss this EAP with the responsible policy makers – mainly at national level
– to encourage appropriate actions

Actions in 2012-2013:

Consultation of plant sector industry, academia, farmers across Europe
→ information & evidence on needs for the future workforce via
three online questionnaires



Education Action Plan

The **Industry** survey (end 2012)

Survey sent to:

38 national seed associations

47 individual companies across Europe



Aims are to identify potential shortages in:

(1) Highly qualified future employees for the breeding and agri R&D industries trained in state-of-the-art new plant biology

(2) Future employees with strategically important but vulnerable plant-related skill areas

Very good feedback:

From almost 40 companies across Europe and beyond

Good representation of SME's and large green enterprises (global)

Education Action Plan

Results of the **industry** survey



(1) **Need for more postgraduate students**

(Master's & PhD) trained in the **state-of-the-art new biology: YES !**

- In coming 5-10 years, companies will hire more
- Important under-represented skills: bioinformatics, statistics, data analysis & quantitative genetics
- Trained students in Life Sciences as useful

(2) **Vulnerable disciplines identified**

- The '**fundamentals**' such as classical breeding, plant biochemistry & physiology, cell biology, plant virology, etc
 - But **also aspects of agronomics**: plant nutrition, soil science, phytopathology, seed management etc
- => **multidisciplinary & cross-sectorial: integrated bioeconomy**

Education Action Plan

Results of the **industry** survey - *Continue*



(2) **Vulnerable disciplines identified (cont.):**

- **Associated skills shortages** incl. field trials, knowledge of IP, general management skills **AND team work**
- **Generalists** with both capacities to balance 'traditional' with 'new' methodologies
- Strong development of most seed companies to **Eastern countries: scientists with appropriate training are scarce**

(3) **Visibility of plant sciences and green industry**

- **Too few students interested** in plant sciences; work in green companies gives **little status**; green industry has **not a positive image** etc.
- Awareness of agribusiness to be promoted more widely to the public and at school level

Education Action Plan

The **Farmers** survey (2013, is ongoing)

Survey sent to:

57 National Farmers Organisations across Europe
involved in training of farmers (school & professional levels)



Aim is to identify how to improve farmers' awareness to bring technologies to the farm gate:

- Nb. farmers/yr following professional training programmes
- Nb. of crops (list of crops)
- Average level of scholarship of farmers
- How innovation & new technology is developed in scholarship
- How many times/yr farmers visit demonstration farms
- Contacts with public / private organisations?

Only two responses (since mid-April):

From Germany and Italy

-> Not sufficient to provide a representative picture of farmers' needs

Education Action Plan

The **Academia** survey (2013, cont. ongoing)

Survey sent to:

Over 220 institutes and universities across Europe
10 National Learned Plant Societies



Aims are to consult European academic institutions involved in training and/or research and to identify potential shortages in:

- (1) Expertise/skills essential to provide training
- (2) Expertise/skills essential to do research
- (3) Academic institutions to better match industries' needs and training of next generation of plant scientist

Very good feedback:

From over 60 academic institutions & National Societies from 19 countries (ES, UK, FR, IT, PT, RS, NL, DE, CH, DK, SE, IE, PL, AT, BG, HU, SK, NO, CZ)

Education Action Plan

Results of the Academia survey

- All organisations perform both teaching & training
- **All levels of plant scientists were represented** (graduate, junior scientists, PhD, post-doc, senior scientist, technical staff)
- **No significant change in number of students and scientists is expected** in next 5-10 years
- **Expertise & skills** considered **important**, but **not sufficiently available**/ under threat about knowledge of new and classical biology, modern techniques/ methods
- **Concern** of the green industry **on visibility/bad image** of plant science is shared. Problem starting at school.

DRAFT Education Action Plan

Finalised and published in spring 2015



Three major action points to address

→ help ensuring an appropriately qualified & skilled future workforce for the plant sector

I. Building a sustainable workforce for the plant sector

II. Fostering the future of the plant sector through research and training

III. Increasing public appreciation of the plant sector

I. Building a Sustainable Workforce

Main recommendations – DRAFT EAP

Concrete measures to prepare future workforce: **ensure we can meet needs** associated with sustainable agricultural production

- Ensure plant science courses offer students opportunity to access **education & training in classical & new biology**
- **Encourage interdisciplinary culture** to build & combine knowledge (i.e., plant science and management)
- **Encourage ‘clustering’** of plant science disciplines (classical & new biology) amongst universities and at regional & national levels
→ make better use of existing structures

Example of clustering of research institutions and disciplines:

***A regional cluster: Bioeconomy Science Center (BioSC),
North Rhine-Westphalia, Germany***



II. Fostering future through Research & Training – *Main recommendations*

Improve funding & support for plant science research and education **across all its components** (basic – applied research; KT; innovation) AND **across range of disciplines** (new biology to classical)

- **Stimulate cooperation between academia & industry** in education & training
- **Incentives** to attract and retain high calibre students (e.g. Marie-Curie, Erasmus)
- Urge employers to **promote career opportunities**
- Boost **rural development** by attracting highly skilled workers
- Facilitate **knowledge exchange** for effective communication between end-users (e.g. farmers) & research community

Example of clustering of institutes and partnering with industries:

Transnational public/private cooperation: Nordic Plant Improvement Network

III. Increasing public appreciation of the plant sector – Draft EAP

Poorly recognized : production of sufficient & safe food in a sustainable manner requires state-of-the-art research in plant science and a strong agricultural industry (incl. farmers & coop.)



Key Recommendations

- Encourage **all stakeholders to engage with the public** to raise awareness of plants and **improve** their **attractiveness**
- Through **outreach** for education, **inspire students** to take an interest in plant science education & training (*starts at school*)
- Through ‘**inreach**’ initiatives, **encourage undergraduate students** to choose plant science modules and projects at undergraduate and graduate levels



Fascination of
Plants Day
May 18th 2013

Purpose of the FoPD

- Promote plant sciences, both to the general public, but also politicians and research councils
- Create an interest in plant sciences - on the decline around the world
- Promote photosynthesis as the most important chemical process in the world
 - we could not be here without it





Fascination of
Plants Day
May 18th 2013

Examples of Activities



Join the FoPd 2015 !

More farmers and companies !

Food Science & Technology sector organise events!



Fascination of
Plants Day

May 18th 2015

Enter →

Plant Science . Agriculture, Horticulture & Forestry .
Plant Breeding . **Plant Protection** . Sunlight into Sugars .
Food & Nutrition . Environmental Conservation .
Climate Change Mitigation . **Smart Bioproducts** .
Biodiversity . Sustainability . **Renewable Resources** .
Education & Artvation

www.plantday12.eu



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