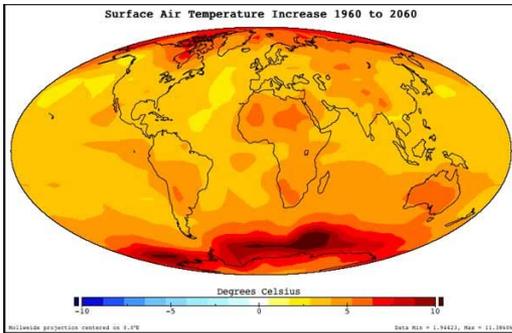




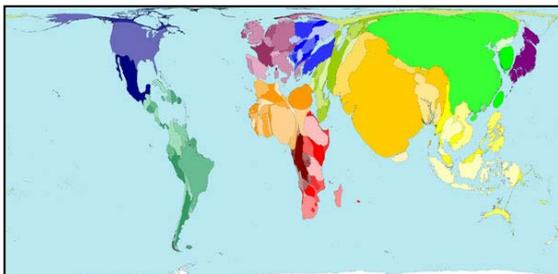
Case study on one bioeconomy sector:  
**Ensuring a competitive  
workforce for plant sector  
- industry, academia &  
farmers**

# Plants are in the center of global challenges

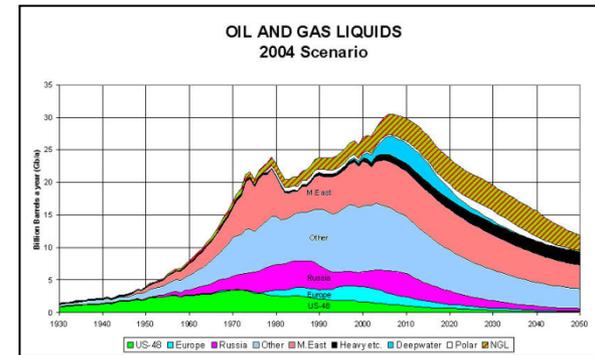
Climate challenge



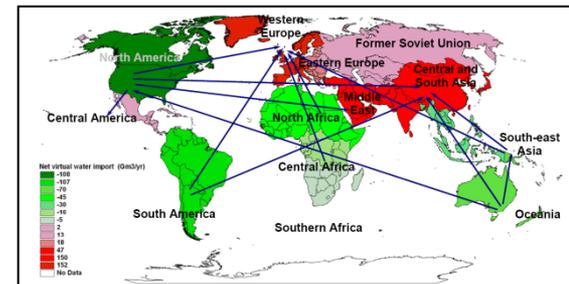
Food demand  
challenge



Energy challenge



Natural resources  
challenge



# 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

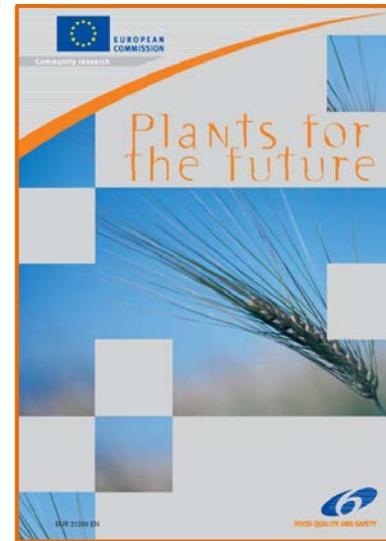


# What is Plant ETP ?

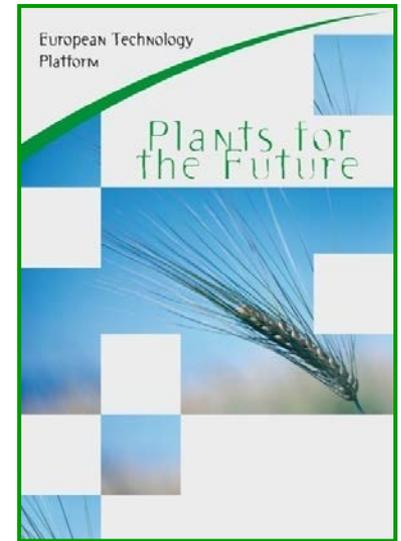
## Industry – Academia - Farmers

### Role: **COORDINATION**

- Steering Council – Executive Committee - Coordinator
- Equal rights for stakeholders & veto right
- Industry lead
- Working Groups



(Vision paper, June 2004)



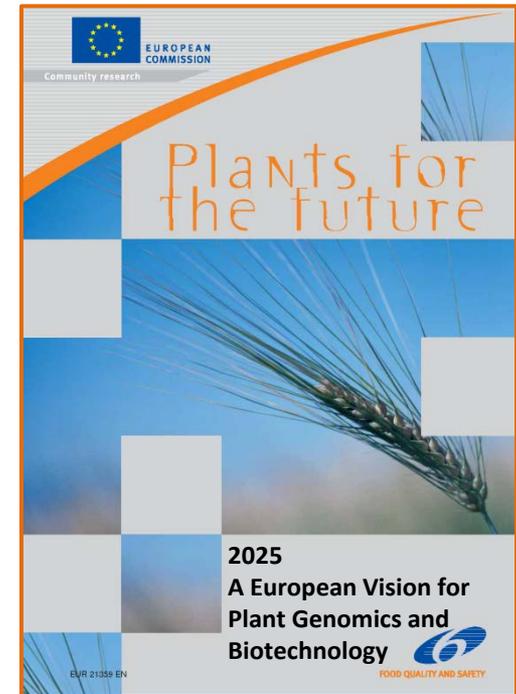
(Strategic Research Agenda, June 2007)

# Plants are at heart of EU competitiveness

## Agriculture + Public & Private organisations

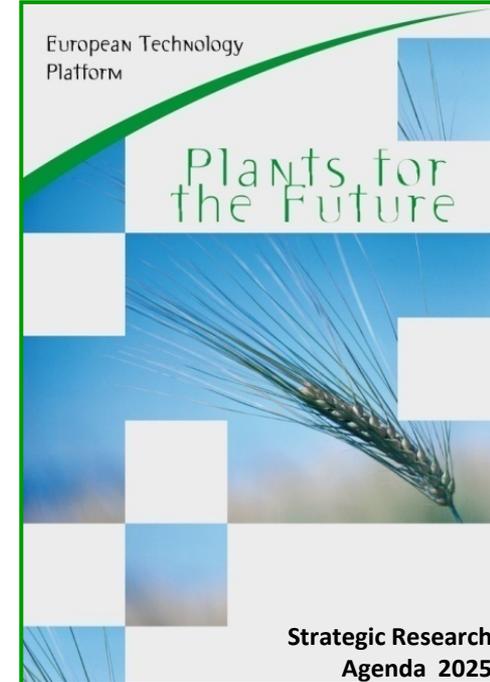
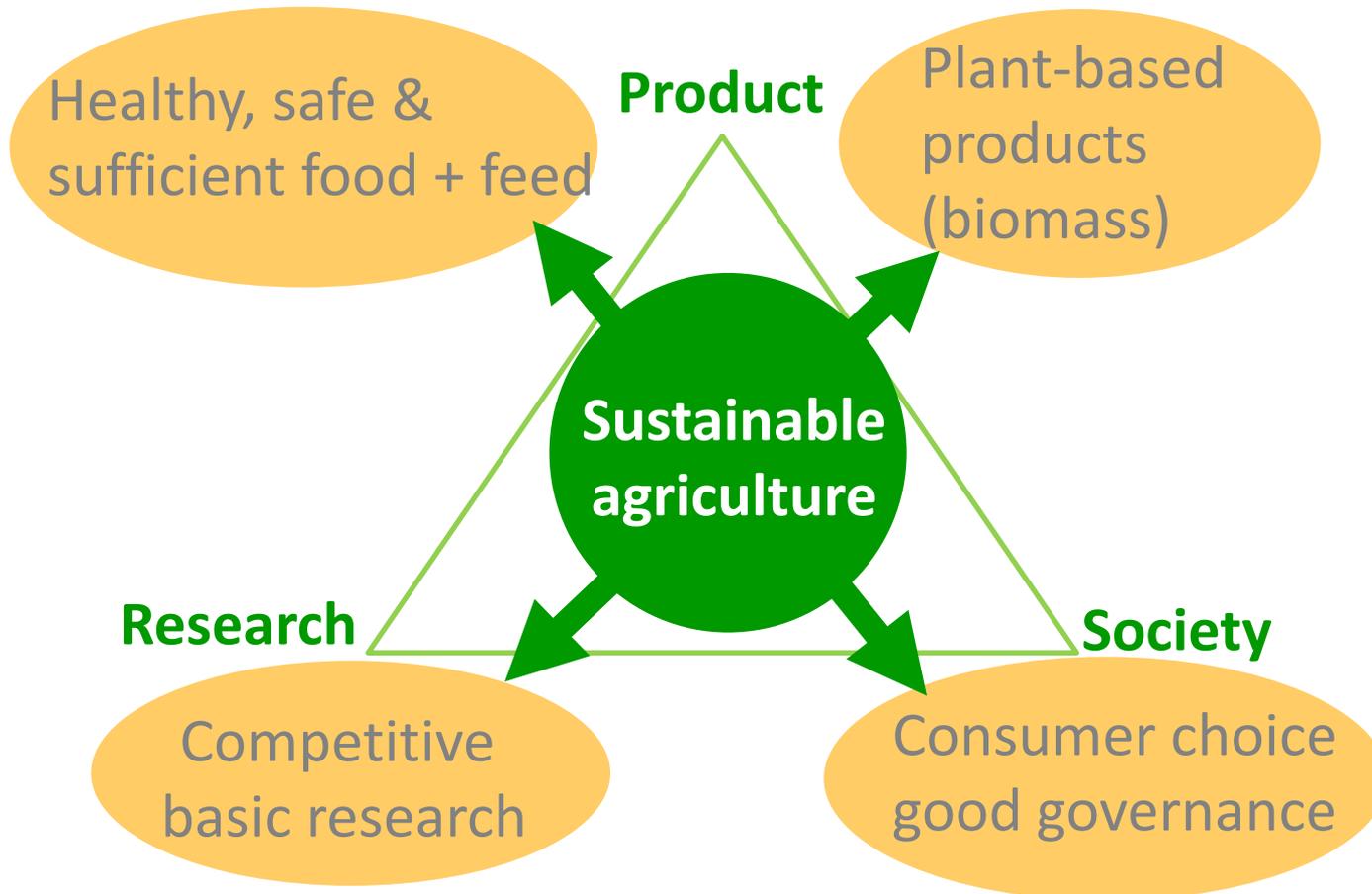
- € 700 Billion annual turnover
- 30 Million jobs and 20 % of EU lands
- 15-20 % of annual turnover in R&D

***“The future competitiveness of Europe’s agricultural and Ag processing industries will depend on plant genomics, biotechnology and their smart application”***



(Plant ETP Vision, June 2004)

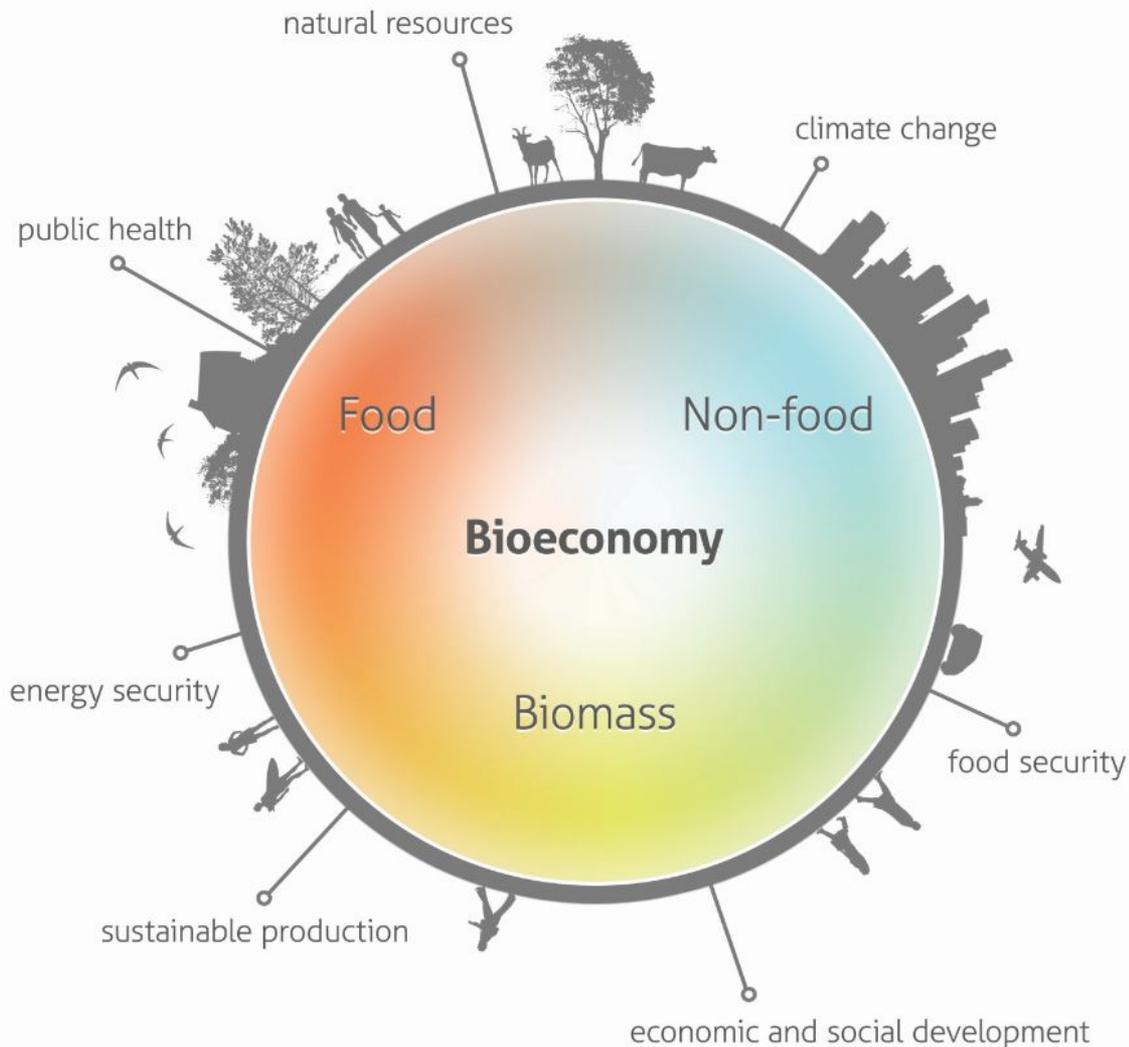
# Strategic Research Agenda addresses 5 challenges



# Plants integrate with other sectors of the bioeconomy

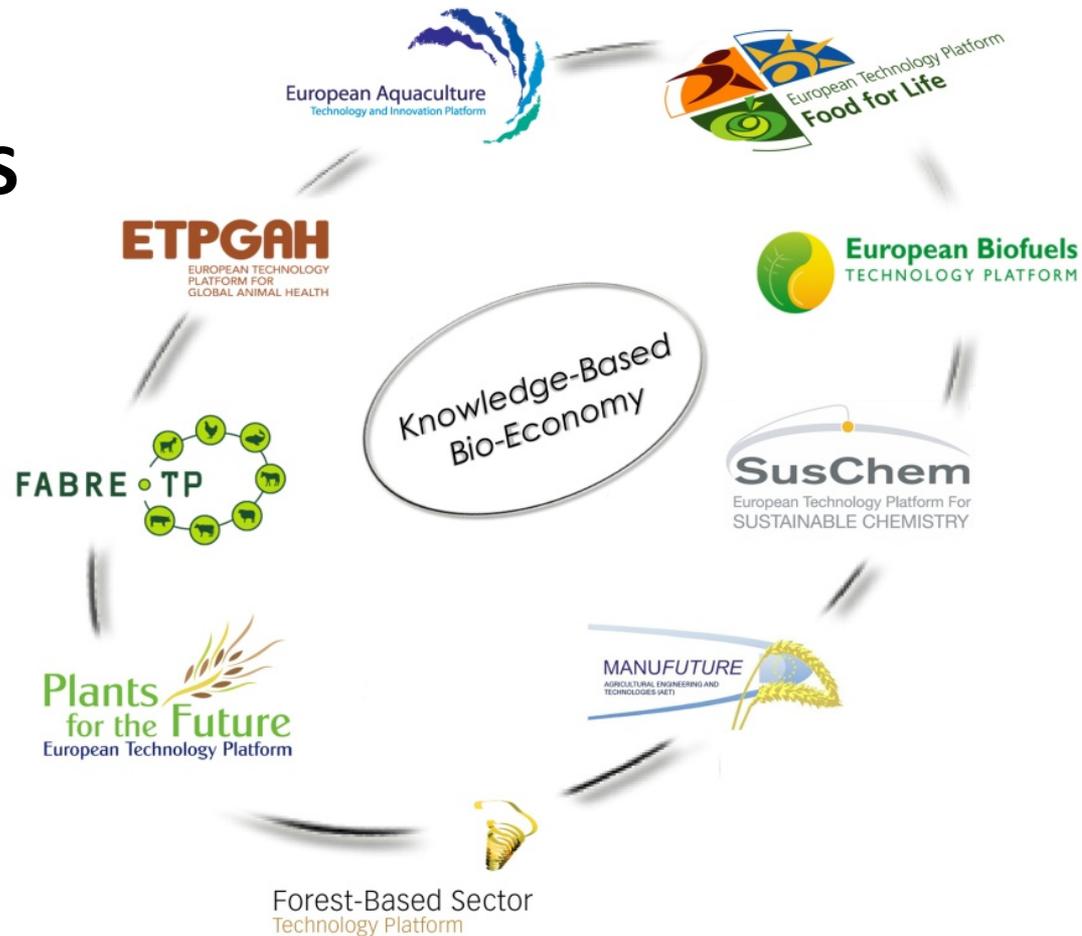
Bioeconomy refers to the sustainable production and conversion of biomass into a range of food, health, fibre and industrial products and energy.

Renewable biomass encompasses any biological material as a product in itself or to be used as raw material



# Need connected ETPs in the bioeconomy - BECOTEPS

FP7 – BECOTEPS  
(2009-2011)





# FP7-BECOTEPS Project

2 years intense collaboration  
(Mar'09-Mar'11)

- “The European Bioeconomy in 2030”: vision & recommendations
- Meetings with stakeholders & policy makers



Unlocking the potential  
of the Bioeconomy

22 March 2011

Royal Belgian Institute for Natural Sciences

**The Bioeconomy**

**The opportunity for Europe – new concepts**  
Nine Technology Platforms are gearing up

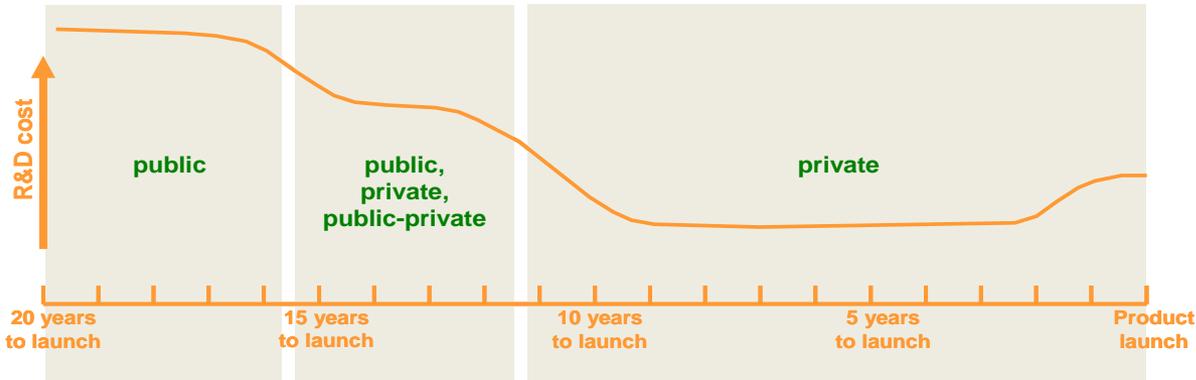
Hosted by  
Giles Chichester, Teresa Riera Madurell, Paolo de Castro, Romana Jordan Cizelj

**5 May Meeting**  
4.30 – 6.30pm  
**Reception** 6.30 – 8pm  
European Parliament  
Room: ASP 5 E 2

THE EUROPEAN BIOECONOMY IN 2030

Delivering Sustainable Growth by addressing  
the Grand Societal Challenges

# Integrated approach of Plan(t)s for the Future

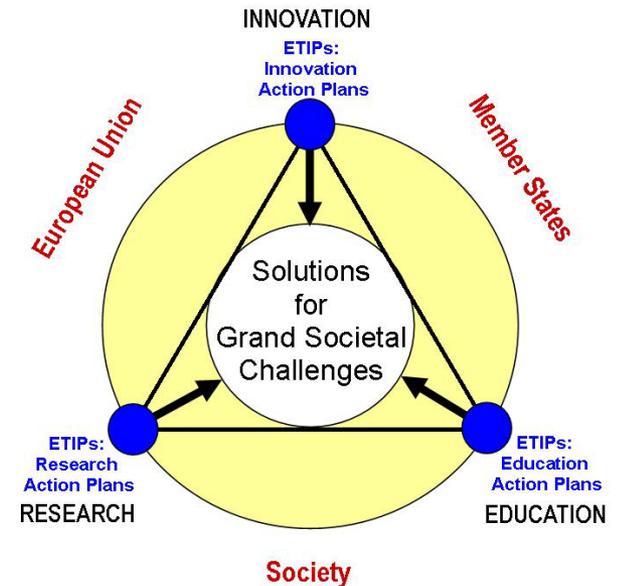


Research Action Plan

Innovation Action Plan

Education Action Plan

- Identify needs & bottlenecks
- Identify potential solutions
- Implement at national, EU (e.g. FPs), multinational (e.g. ERA-NETs, JPIs) & global level (e.g. FAO)



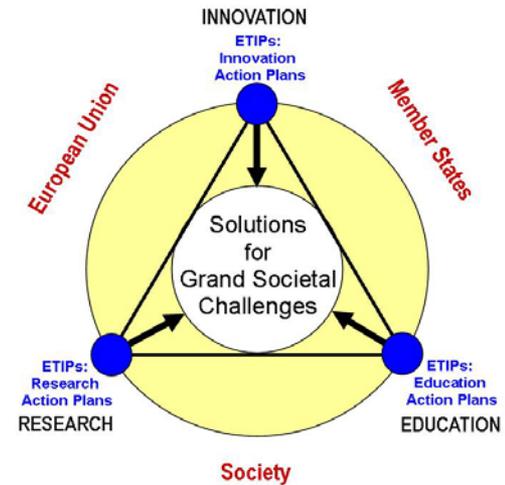
(Source: EC Experts Group on ETPs 2009)

# Three Action Plans

**2010 – 2014**

Agree overall purpose of the three Action Plans

**WoGr meetings – Three workshops each – stakeholders public consultations :**



- **Research Action Plan** to improve:
  - Competitiveness and critical scale of European plant research
    - on yield, quality, resource use efficiency and stress resistance
  - 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

## Making Europe more competitive

Research & Innovation contributions from the plant sector in H2020

Most innovative areas in the plant sector  
in the coming decades

→ 1<sup>st</sup> Input Plant ETP to H2020

→ **Research Action Plan:**

### Improve:

- Resource use efficiency
- Yield (stability) in changing environment
- Nutritious plants for healthy food & feed
- Plant health
- Plants for non-food products
- Horizontal actions

## Making Europe more competitive

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→ **Research Action Plan:**

### Improve:

- Resource use efficiency
- Yield (stability) in changing environment
- **Nutritious plants for healthy food & feed**
- Plant health
- Plants for non-food products
- Horizontal actions



# Education Action Plan

## But...



- 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 develop 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

### Aim: 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 small, medium and large enterprises (global)

# Education Action Plan

## The **Academia** survey (2013)



### **Survey sent to:**

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

**Aim: academic institutions training plant scientists and/or performing academic research 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 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

## The Farmers survey (2013)

### Survey sent to:

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



### Aims : 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:

From Germany and Italy

Not sufficient to provide a representative picture of farmers' needs

# DRAFT Education Action Plan

## Finalised and published by end of 2014



### Three major action points to address

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

- I. **Growing 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**

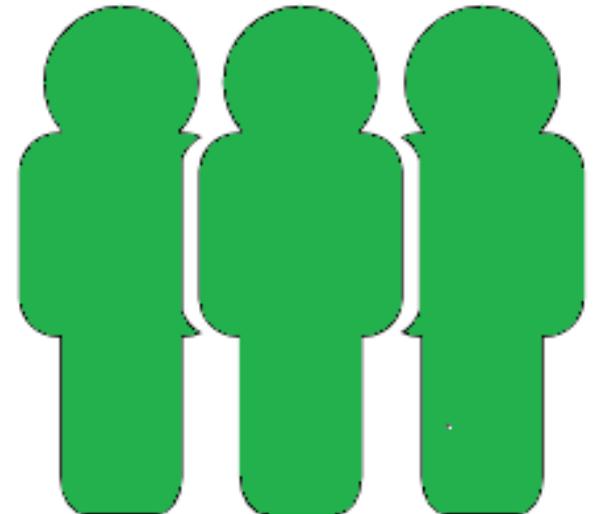
The 3 action plans will be published together by end of 2014

# I. Growing a Sustainable Workforce for the plant sector – DRAFT EAP

## Who do companies need?

Our companies sell innovation and for that, they need:

- Low-, mid- and high educated people in green sciences
- Managers
- ...and in supply technologies (like greenhouses)
- ...and in logistics
- A well equipped (public) knowledge based
  - Professors
  - Post-docs
  - PhD, MSc, BSc students
  - Well educated supportive staff in the labs
  - ...and in mathematics and so on



# I. Growing a Sustainable Workforce for the plant sector – DRAFT EAP

## What goes wrong?

A young student has to make a choice



# I. Growing a Sustainable Workforce for the plant sector – DRAFT EAP

## What goes wrong?

A young student has to make a choice



→ Happens early in education process: school already !

# I. Growing a Sustainable Workforce for the plant sector – DRAFT EAP



## Other major concerns

- Students not sufficiently aware of **fundamental** (classical) breeding techniques & **basic knowledge** of plants
- Huge potential offered by research and training in **new biology approaches** to be **balanced** with acquiring **fundamental skills** in e.g. plant physiology, breeding, cytology & biochemistry
- In view of expansion of plant breeding activities **in Eastern Europe**: strong need to raise levels of training & education in those countries

# I. Growing 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 (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:

***A regional cluster: Bioeconomy Science Centre, North Rhine-Westphalia, Germany***

## II. Fostering future of plant sector through Research & Training – Draft EAP

### Major concerns



- Universities & academic institutions **increasingly under pressure** to contribute to training the future plant sector workforce **AND** also carrying out pioneering research on plants
- **Disproportionate** amount of funding in **biochemical research** compared to plant science research (usually only 1-5% of biology goes to plant science)
- Students lack awareness of **career prospects** both in industry & research
- Postgraduates trained towards a career in plant sector by **integrating industry related topics** within education programmes

Example of clustering of institutes and partnering with industries:

***Transnational public/private cooperation: Nordic Plant Improvement Network***

## 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** via improved mechanisms for effective communication between end-users (e.g. farmers) & research community
  - Promote greater awareness of **practical needs** of industry and farmers to academia (e.g. engage further in education content in universities)
  - Promote greater awareness of **benefits of research developments** to farmers

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

**Poorly recognized** that 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

# As a specific example of outreach Linking European plant sector to the world

[www.plantday12.eu](http://www.plantday12.eu)



Fascination of  
Plants Day

May 18<sup>th</sup> 2013

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

2<sup>nd</sup> International Fascination of Plants Day  
- Over 1.000 events in 54 countries –





# 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 18<sup>th</sup> 2013



Fascination of  
Plants Day  
May 18<sup>th</sup> 2013

## Examples of Activities



Join the FoPd 2015 !

More farmers and companies !

Food Science & Technology sector organise events!



Fascination of  
Plants Day

May 18<sup>th</sup> 2015

Enter →

**Plant Science** . Agriculture, Horticulture & Forestry .  
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Education & Artvation

[www.plantday12.eu](http://www.plantday12.eu)

# European Technology Platforms in Bioeconomy

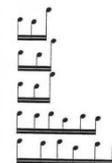
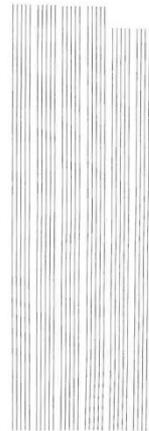
## Conclusions : Make it happen !

Always

Address bioeconomy as a web, at least as chains - and in there:

- complement top-down with bottom-up approaches at all steps from strategy dev. to implementation (ETPs *officially recognized in Horizon 2020*)

Equally strong support of each component – **basic & applied research, knowledge transfer, innovation framework, communication – education - outreach**



**Moving from notes to music !**  
Thank you for your attention