

**Italian Technology
Platform**

Plants for
the Future



Plants for the Future

October 2006: workshop at the University of Bologna

July 2007: nomination of the Promoting Committee

November 2007: members of the Sc. Committee elected

June 2008: TP launched at National Academy of Lincei

November 2008: Vision Document and SRA

January-October 2009: Implementation Action Plan



MISSION STATEMENT

IT-Plants for the Future will promote and guide genomic research and will endorse molecular breeding of plants, in order to stimulate the competitiveness of the national Agro-food and Agro-industry chains

Organization of the National Platform

Steering committee of IT-Plants

Chair: Dr. Silvio Ferrari (Assalzo)

Co-chairs: Prof. Giorgio Morelli (INRAN), Dr. Roberto Ranieri (Barilla),
Prof. Francesco Salamini (Parco Tec. Padano)

Dr. Aldo Ceriotti (CNR), Prof. Paolo Costantino (IPCC), Prof. Roberto
(CRA), Dr. Romeo Lombardi (Centrale S. Maria S. Stefa),
Sicilia), Dr. Marco Nardone (CNR)

**More than 100 consultants
Ca. 150 colleagues in total**

**Mirror
Group**

Scientific Committee

Chair: Prof. Roberto Tuberosa
University of Bologna

**Healthy,
Safe and
Sufficient
Food and
Feed**

**Plant-based
Products-
chemicals
and Energy**

**Sustainable
Agriculture
Forestry and
Landscape**

**Vibrant and
Competitive
Basic
Research**

**Consumer
choice and
Governance**

Pillar 1. Healthy, safe and sufficient food and feed

Pasta, tomato-derived products, olive oil, vegetables and fruits are key ingredients for the Mediterranean diet and its beneficial effects on health. Food sector is the second in Italy for economic relevance.

Some food has the potential to prevent the onset of chronic diseases such as obesity, diabetes, cardiovascular diseases and some cancers.

Animal husbandry is important for our diet and for the “Made in Italy” products. Our internal production is insufficient to meet the demand of the feed industry.

Research priorities:

- improved quality and safety of plant raw materials for feed and food;
- discovery of genes for improving crop yield and nutritional quality.
- new sources of raw materials for the production of functional foods;

**Pillar 1. Healthy, safe and sufficient food and feed
GOAL EXAMPLE**

Goal, Research Challenge, Deliverable and Species	Duration & funding
<p>Goal. Produce, trace and control safe plant raw materials for feed and food.</p> <p>Research Challenge. Develop improved cultivars to reduce mycotoxins and anti-nutrients in food.</p> <p>Deliverables. Durum wheat genotypes resistant to <i>Fusarium</i> Head Blight for safe food production.</p> <p>Species. Durum wheat.</p>	

Pillar 2. Plant-based products: chemicals and energy

Plant-based resources can provide new functionalities.

New plant-based raw materials: peptides, proteins, oils, starches, fibres
bioremediation and secondary metabolites.

By 2030, the EU standards call for 25% replacement of non-renewable energy sources with biomass. This challenge can only be met with energy crops with a high yield.

Plant-based production systems are also ideal platforms for low-cost production of therapeutic molecules and can drive the establishment of a new “green” industry and technologically advanced enterprises.

Pillar 2. Plant-based products: chemicals and energy
GOAL EXAMPLE

Goal, Research Challenge, Deliverable and Species	Duration & funding
<p>Goal. Bioenergy and biofuels.</p> <p>Research Challenges. Develop new high-energy plant biomass production systems with minimal energy input requirements and higher energy retention. Develop third-generation “green” systems for coupled production of biochemicals and energy.</p> <p>Deliverables. Microalgae cultures for energy production. Low-input plant varieties for the production of raw materials suitable for biorefining.</p> <p>Species. Case by case.</p>	

Pillar 3. Sustainable agriculture, forestry and landscape

Urgent need to:

- develop strategies for a more sustainable agriculture able to better cope with climate change;
- protect biodiversity, particularly relevant also for landscape management.

Four interdisciplinary goals:

- Reduce the environmental impact of agriculture
- Preserve and boost biodiversity
- Improve plant productivity and quality
- Enhance the sustainability of the landscape.

The activities for this Pillar require interaction with Pillars 1, 2 and 4.

**Pillar 3. Sustainable agriculture, forestry and landscape
GOAL EXAMPLE**

Goal, Research Challenge, Deliverable and Species	Duration & funding
<p>Goal. Reduce the environmental impact of agriculture.</p> <p>Research Challenge. Identification of genes for a) resistance to pests and pathogens; b) responsiveness to mycorrhizal fungi; c) water- and nutrient-use efficiency.</p> <p>Deliverables. Genes/QTLs for resistance to biotic and abiotic stresses. Gene and metabolic networks influenced by root-beneficial microbes and leading to improved qualitative traits. New environment-friendly methods of crop protection.</p> <p>Species: Tomato, model legumes (<i>Medicago</i>, <i>Lotus</i>), artichoke, asparagus, garlic, citrus, rice and other species</p>	

Pillar 4. Vibrant and competitive basic research

Basic research on model plants (e.g. *Arabidopsis*, *Brachypodium*, Rice) will play a key role in future biotechnological activities.

Genomics approaches, platforms and technologies will play an essential role.

Data generated by these and other “omics” (e.g. proteomics, metabolomics, phenomics, etc.) will facilitate the identification of candidate genes regulating plant growth and functions.

The Italian scientific community working on model plants is highly competitive at the international level.

**Pillar 4. Vibrant and competitive basic research
GOAL EXAMPLE**

Goal, Research Challenge, Deliverable and Species	Duration & funding
<p>Goal. Building human resources, infrastructure and networking.</p> <p>Research Challenge. Centres specialised in high-throughput phenotyping for screening of mutant collections and mapping populations.</p> <p>Deliverables. Mutants and genes for agronomically important traits.</p> <p>Species. Trait-specific model plants.</p>	

Pillar 5. Consumer choice and governance

Improve the knowledge of the real benefits/risks of new technologies.

Social demand for specific foods and environmental features (e.g. healthier food, reduction of pesticide use, etc.) would benefit from the new technologies dealt within this Technological Platform.

The challenge is to adequately support basic research at the national level while enabling it to contribute to society's goals in a consensual manner.

Goals that will be explored are:

- Public and consumer involvement.
- Ethical, safety, legal and financial environment.

Pillar 5. Consumer choice and governance
GOAL EXAMPLE

Goal, Research Challenge, Deliverable and Species	Duration & funding
<p>Goal. Public and consumer involvement.</p> <p>Research Challenge. Analysis of the contribution of new technologies and varieties on technical developments in agriculture and the food chain, and on their role in contributing to consumer welfare, economic growth and rural/regional development.</p> <p>Deliverables. Studies on expected diffusion, rationale, cost/benefit analysis of prospective technologies from a social, economic and environmental point of view.</p> <p>Species: Case by case.</p>	

Accomplishments and future activities

- Implementation Action Plan approved
- Ongoing contacts for activities at EXPO 2015 in Milano
- Contacts established at MIUR, MIPAF and D
- Providing suggestions at National and Regional levels
- Providing suggestions of topics for the next FPVII and FPVIII calls
- Networking with other KBBE national platforms
- Stimulate greater involvement of private industry

Many thanks for your attention!