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Acceptance of innovation and pathways to transition Philippe Baret (Louvain-la-Neuve)

From adoption of innovation to systems of innovation

The classic sequence of innovation





The classic sequence of innovation









The climate change revolutio





e emergence of new challenges for od systems such as reduction of pact on climate change, biodiversity as or water pollution implies the evelopment of new agricultural odels based on new pathways of novation







New balance of traits, path depency and lock-ins

Addicted to yield



Yield is

- The main objective of breeding
- The target of optimisation
- A key element of income
- The Y of most of our graph

From old balance ... **YIELD** 2000 Minimum goals for 2050 Food distribution and access Real food production Resilience of food system al agricultural production, Food security goals **Environmental goals** nhouse gas Disease res. Water pollution sions Unsustainable water **Nutrition optim** withdrawals diversity loss **Drought resistan**





...to new balance





Most of the present potato production systems are based varieties that are high yield, fit for industrial processing and dependent on the use of chemicals for disease control and management of weeds

Less pesticides for late blight in Belgium ?



Less pesticides for late blight in Belgium ?



A system of innovation





Low input wheat

ECOLOGICAL ECONOMICS 66 (2008) 436-446



LYSIS

y are ecological, low-input, multi-resistant wheat cultivars w to develop commercially? A Belgian agricultural 'lock-in' e study

an Vanloqueren*, Philippe V. Baret

ment of Applied Biology and Agricultural Productions, Université catholique de Louvain, Belgium

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ABSTRACT

The use of multi-resistant cultivars allows a significant reduction in fungicide use in lowinput cropping systems. However, many major wheat cultivars used in Europe remain sensitive to frequent diseases and require fungicide protection. This paper aims at understanding the factors explaining the low level of adoption of multi-resistant wheat cultivars in Wallonia (Belgium). Cultivar adoption has been an important topic of research, We identified twelve factors impedin wider adoption of multi-resistant cultivars.

These factors explain why current wheatcropping systems are maintained in a 'pesticid lock-in' situation,

an economic concept that could be used more frequently to study agricultural innovations.

Vanloqueren & Baret, Ecological economics, 66

ow input wheat

rmers

arket

- blic extension rvices and search
- blic gulation
- st agricultural licies

- 1 · Direct cultivar choice criteria of farmers : disease resistance comes only after gross yield resistance to lodging and commercial quality
- 2 · Incomplete resistance of resistant cultivars and the unpredictability of epidemic develop
- 3 · Limited number of cultivars resistant to all frequent diseases
- 4 · Contradictory objectives of crop protection and seed departments in supply companies (which disadvantages resistant cultivars)
- 5 · Influence of supply companies' salespeople on farmers' practices
- 6 · Breeding history and breeding objectives of seed companies
- $7\cdot\,$ Omnipresence of gross yield and absence of economic optimum estimates
- $8\cdot\,$ Concentration on one cultural system at the expense of alternative systems
- $9\cdot$ Perception of, and information given about, resistant cultivars
- 10 · Cultivar registration norms
- 11 · More important challenges: food safety, traceability, etc.
- 12 · Payments based on output influenced cultivar choice towards highest-yielding cultivars



Classic paper



JOURNAL ARTICLE

Sprayed to Death: Path Dependence, Lock-in and Pest Control Strategies

Robin Cowan and Philip Gunby The Economic Journal Vol. 106, No. 436 (May, 1996), pp. 521-542

Published by: Wiley on behalf of the Royal Economic Society DOI: 10.2307/2235561 Stable URL: http://www.jstor.org/stable/2235561 Page Count: 22

Diversity of production systems and imbalances

New expectations





Paradigm and pathways



Pathways of innovation

Paradigm and pathways



Pathways of innovation

Imbalances

a world of limited resources, novation paradigms are in mpetition.

me innovation pathways are vored by path dependency

en the options implies a new lance between the paradigms of novation



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Research Policy	

How agricultural research systems shape a technological regime that develo genetic engineering but locks out agroecological innovations

Gaëtan Vanloqueren*, Philippe V. Baret

Earth and Life Institute, Université catholique de Louvain, Belgium

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ABSTRACT

Agricultural science and technology (S&T) is under great scrutiny. Reorientation towards mo approaches, including agroecology, has recently been backed by a global international asse agriculture S&T for development (IAASTD). Understanding the past and current trends of ag S&T is crucial if such recommendations are to be implemented. This paper shows how the co technological paradigms and trajectories can help analyse the agricultural S&T landscape and Genetic engineering and agroecology can be usefully analysed as two different technological p even though they have not been equally successful in influencing agricultural research. We u terms of Innovation (SI) approach to identify the determinants of innovation (the factors that

Elements of imbalance



Classic paper

The Matthew Effect in Science



The reward and communication systems of science are considered.

Robert K. Merton

This paper develops a conception of ways in which certain psychosocial processes affect the allocation of re-

image and the public image of scientists are largely shaped by the communally validating testimony of signifi-

Merton, Science 1968





Reconnect

Store -









Take home message



- Innovation is no more a linear process from research to farmers
- Innovation is embeded in multi-actors systems
- A diversity of pathways of innovation is possible
- Investments in paradigms of innovation are imbalanced
- A better balance between paradigms of innovation is relevant for
 - Adressing ecological issues and planet boundaries
 - Answering society expectations

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Papers and presentation available on www.philagri.net -> postdoc position - @PhilippeBaret