

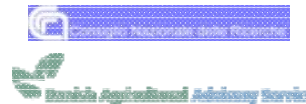
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ENDURE scientific support to policies

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FOOD
QUALITY
AND
SAFETY



Overview



- Background
- Comparison of pesticide action plans in five European countries
- Research initiatives supporting current policies
- Possible reasons for differences in pesticide use in wheat in some EU countries
- EU project PURE



ENDURE



- Background, goal and products
 - Societal expectations for safe food and environmentally friendly agriculture
 - Crop protection: de-fragmentation of scientific knowledge and R&D community
 - Case studies in various crops (wheat, maize, orchards, vine grapes, ...)
 - Platforms for knowledge transfer

➤ Research

- Resource Centre
- **Scientific support to p**

➤ Extension

- Facilitating exchange across EU
- ENDURE Information Centre: Creating dialogue between policy makers and researchers
- ENDURE Network of advisers: Acting as a resource in the implementation process of the EU Framework Directive
- Networks of
- Scientific su

<http://www.eurowheat.org>



Scientific support to policies



- ENDURE analysis of existing national plans for pesticide use reduction
 - Countries: DE, DK, FR, NL, UK, IT
 - Retrospective comparison
 - Goal setting
 - Stakeholder involvement
 - Research & Extension

Goals – a few examples



Volume → Dose - Frequency → Risk / Impact

- DK: Pesticide Action Plan I 50% volume reduction by 1997 relative to 1981- 85
- NL: Multi-Year Crop Protection Plan included a target of 50% overall volume reduction by 2000 relative to the 1984-1988 reference period
- Both examples based on phasing out of critical *active ingredients*
- Substitution to low-dose, more potent pesticides not reflected
 - certain water problems persisted (DK)
 - Insignificant reduction of the treatment frequency index
- **Research:**
 - Bichel Committee evaluation and to clarify alternative options
 - NL: rejection of next reduction plan – missing tools



Goals (2)



Volume → Dose - Frequency → Risk / Impact

- DK: Pesticide Action Plan II – TFI from 2.5 (1997) to TFI 2.0 (2003) achieved
Pesticide Action Plan III - TFI from 2.0 (2003) to TFI 1.7 (2009) not achieved
- FR: Ecophyto 2018 - 50% reduction of NODU (No. of Unit Dosages), if possible

➤ Shortcomings:

- limits of voluntary approach
- increasing farm size
- pesticide use in weed management

➤ Linked research activities

- DK targeted TFI = 1.7 scenario -studies showed no economic losses for farmers
- Ecophyto R&D evaluation in different sectors - 30% overall reduction attainable



Goals (3)



Volume → Dose - Frequency → Risk / Impact

- NL: 2003 National Agreement on Crop Protection 95% reduction environmental burden by 2010 (rel. to 1998)
- DE: National Action Plan on Sustainable Use of Plant Protection Products (2008) 25% risk reduction by 2020 (rel. 1996-2005 values)
- DK: Green Growth (2010) adopted a Pesticide Impact Index (combines use, untreated area, pressure on environment & health)

➤ **Linked activities:**

- NL: *Convenant* on crop protection and stakeholder networks
- DE: Network of reference farms and new demonstration farms
- FR: Ecophyto R&D and Demonstration farms
- DK: Demonstration farms and advisory programme



Current Initiatives: Research & Extension



FRANCE - Ecophyto R&D

➤ Scenarios

- “Reasonable Agriculture”: Pesticide use based on thresholds
- “Integrated Protection”: additional use of preventive and alternative methods for each crop in annual management plan
- “Integrated Production”: additional multi-year perspective and management of the whole rotation

➤ Results possible TFI reduction

- Cereals: 50% in “Integrated Production” system
- Potato and pea: not achievable
- Oil seed rape and potato: yield reductions of 15% and 20% respectively
- Viticulture: yield reductions expected in integrated levels
- Apple orchards: 6% in “Integrated Production”
20% TFI reduction in “Integrated Production”
- Vegetable crops: divers production and insufficient data



Current Initiatives: Research & Extension



FRANCE - Supportive actions for IPM implementation

➤ **Demonstration farms**

- 1,000 pilot demonstration farms set up in 2010, and
- 2,000 farms planned by end 2011
- involvement of 37 agricultural school teaching farms

➤ **Training, education and information**

- Training in safe use and knowledge of IPM (30 000 users 2008 - end 2010)
- Crop protection bulletins on a regional basis and tailored to each commodity
 - ✓ designed to help avoid systematic preventive use of sprays

➤ **Research & innovation**

- New institutional arrangements: Mixed Technological networks
- Research funding for “Evaluation and reduction of risks“
 - calls for applied research, breeding and genetic resources, NODU



Current Initiatives: Research & Extension



GERMANY - Model and Demonstration project

- Demonstration farms (27) supporting IPM uptake and reduction of pesticide use
- Broad funding initiative for research, technology development and knowledge transfer to promote the sustainable use of pesticides and IPM implementation

UNITED KINGDOM - Sustainable Agriculture and Food Innovation Platform

- Funding “New Approaches to Crop Protection”
 - focusing on crop productivity
 - investments in the development of highly innovative tools
 - research and development of weed mapping, precision farming, biofumigation, improved breeding for disease resistance



Current Initiatives: Research & Extension

DENMARK – initiatives supporting Green Growth



- New “pesticide impact index”
- Re-structuring of the pesticide tax
- 10 meter permanent spraying-free, fertilizer-free and cultivation-free buffer zones along all watercourses and lakes
- Increase the spray-free buffer zones around public water supply facilities from 10 to 25 meters
- **Framework for plant production in accordance with IPM guidelines and a system of dedicated advice IPM**
 - IPM guidelines
 - Demonstration farms
 - Focus on IPM advice
 - Impact: reduced dependence on pesticides
on-field implementation of IPM/ targeted solutions



Differences in pesticide use in wheat



“Possible reasons for differences in pesticide use in wheat in some EU countries participating in ENDURE”

- Joint effort of several ENDURE activities (wheat CS, winter crop CS)
- Information on pesticide consumption in winter wheat (DK, DE, FR, UK)

– Comparison of TFI values

| | England (2006) | France (2006) | Germany (2007) | Denmark (2007) |
|-------------------|-------------------|------------------|-------------------|-------------------|
| Herbicides | 2.43 | 1,4 | 1.9 | 1.32 |
| Glyphosate | *** | 0,1 | *** | 0,39 |
| Fungicides | 2.26 | 1.6 | 1.9 | 0.56 |
| Insecticides | 1,08* | 0.3* | 1.2** | 0.15* |
| Growth regulators | 0.97 | 0.7 | 0.8 | 0.2 |
| Total | 6.74 | 4.1 | 5.8 | 2.62 |
| Yield t/ha | 8.0 | 6.9 | 7.3 | 7.3 |

Pesticide consumption in wheat as TFI.

- Analysis of differences of the use of fungicides, insecticides, herbicides



Differences in pesticide use in wheat



Comparison of TFI

- TFI is calculated differently in the countries
 - **Sales data - Use data**
 - DK: the theoretical number of pesticide treatments per hectare divided by sales data of active ingredients
 - FR: dividing the amount of pesticides (products) applied on field by the minimal standard approved dosages.
 - DE, UK: the application of pesticides (a.i.) in relation to the approved dosages based on common practices assessed at official surveys or monitoring
 - **Calculation standard dose**
 - FR: the lower standard dose for TFI
 - DK: most widely applied standard/maximum dose
 - DE, UK, DK: the TFI is calculated using the applied dose in relation to the approved/maximum dose and frequency of the application
- **The TFI differences are greater than the scale that could be accounted for by differences in methods of TFI calculation.**



Differences in pesticide use in wheat



Analysis of differences of the use of fungicides, insecticides, herbicides

- Usage in Denmark is generally much lower than in the other countries.
- UK :use of pesticides high for all segments
- Germany between France and UK.

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- Regional differences in large countries: not reflected in national averages.
 - Northern France TFI 4.8- 5.4 vs. Southern France TFI 2.2-3.3



Differences in pesticide use in wheat



- **Differences in TFI are likely to be due to a combination of different cropping systems, climatic differences and socio-economic factors**
- Differences in climatic conditions
- Differences in pest and disease infestations
 - ✓ resistant varieties, yield potential
- Differences in the organisation of advice to farmers and the proportion of farmers relying on company-based advice
- Differences in operating policy action plans that focus on reducing the use of pesticides
- Differences in pesticide prices

PURE – Pesticide Use-and-risk Reduction in European farming systems with Integrated Pest Management



- **Collaborative project** EC 7th Framework Programme
- **Coordinator:** INRA (FR)
- **Duration** 48 month (01.03. 2011 – 28.02.2015)
- **22 Partner** in 10 countries (research, extension, industry)

Goal

- Take stock of existing technologies,
- Enhance their implementation at field and farm level,
- Feed in new and emerging technologies and
- Ensure economic feasibility for farmers



Contributions



ENDURE “Scientific support to policies” – team



Silke Dachbrodt-Saaydeh (JKI), Marco Barzman (INRA), Pierre Ricci (INRA), Per Kudsk (AU), Maurizio Sattin (CNR), Piet Boonekamp (WUR), Jan Buurma (WUR), Bill Clark (RRES)

