

## Supply Chain Management Initiatives Aiming at a Reduction of Pesticide Use in Agrofood Product Chains : Motivation and Design of a Short Research Project

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### Introduction

The objective of the study is to make an inventory of private initiatives in the retail and agro-food industries throughout EU member states that aim to increase the market share of food products produced with substantially less or no pesticides. Examples of such initiatives in the Netherlands include those taken by companies such as Hak (producer of branded vegetable preserves) and Albert Heijn (leading supermarket chain) to contract only farmers observing strict operating rules of integrated crop management (ICM), including severe restrictions on pesticide use. Table 1 provides examples of actors in the supply chains of organic and ICM food products. Comparable initiatives may be found in other EU countries. There is some evidence that the number of such initiatives has been growing over the past few years (Den Hond et al. in press). An overview is lacking, however, which is an impediment to conducting research into success factors of such initiatives and the role of government policy.

### Example<sup>1</sup>

Albert Heijn is the largest food retailer in the Netherlands with an estimated market share of almost 30% realized through its 640 shops (including franchises). In 1996 the company had a turnover of some 10 milliard guilders. In the late 1980s, Albert Heijn decided to change its purchasing policy of fresh vegetables and fruits such as to buy only those grown under ICM schemes. At the time of preparing this decision, the Ministry of Agriculture was preparing a policy plan aiming at reducing the environmental impact of pesticides (Ministerie van LNV 1991). By then Albert Heijn was already trying to develop a green image, mostly through a well publicized packaging policy. The company positions itself as a high-quality supermarket, attracting a relatively large share of the better educated, middle and higher income groups of the Dutch population. Because of its concern for quality, the company has traditionally exercised a very tight control over the various supply chains, including those for fresh vegetables and fruits. The company's supply chains in vegetables and fruits comprise of a limited number of direct suppliers who buy the produce of selected farmers. Thus, the company saw a "unique opportunity" in being able to contribute to the realization of the Ministry's policy objectives by stimulating its agricultural supply chains to shift to ICM

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<sup>1</sup> The Albert Heijn case study is based on company material and interviews with responsible managers.

practices, reasoning that its client base would appreciate the environmental benefits if product prices remained at the same levels.

The program started in 1990 by developing ICM norms and criteria to which suppliers and farmers have to conform. The norms and criteria include maximum loads of fertilizers and pesticides, choice of cultivars, crop rotation schemes, maximum concentrations of nitrate and pesticide residues on products, and regular control of spraying machinery. They were developed in close cooperation with an agricultural consulting company, who is also involved in the annual review and down-ward adjustment of the norms and criteria.

In order to maintain a high level of product quality, Albert Heijn has traditionally worked with long-term supply contracts with a limited number of suppliers who buy from selected farmers. The program has been implemented step-wise within the existing supply chain management system. In 1990 a small number of farmers started to implement the ICM scheme on a limited number of crops. Initially, they served as pilot and demonstration projects allowing the company to start discussions with suppliers and farmers on the conditions and consequences of the ICM scheme. Both the number of crops and the number of participating suppliers and farmers were gradually increased such that by 1997 an estimated 90% of all the crops sold by the company were grown under ICM schemes. As the company sees supply chain management as “keeping good relationships with people”, the implementation of the program was accompanied by measures to assist farmers in making the transition to ICM practices. The company claims that through the implementation of the ICM schemes significant reductions of pesticide use at the farm level have been realized, in some cases of more than 50%. Additional extensions were to develop tailored ICM schemes for the foreign suppliers of vegetables and fruits.

In addition to the ICM schemes Albert Heijn also experimented with fresh organic vegetables in its assortment<sup>2</sup>. In 1989 organically grown potatoes, carrots, onions, cabbage and mushrooms were introduced. Over the past couple of years the program has been extended to include the sales of fresh organic dairy and meat (start of sales in 1996). In 1998, Albert Heijn introduced its own company brand of organic products (“AH Biologisch”) under which label are sold: bread, eggs, cookies, coffee, tea, fruit juices, dairy products, chicken meat, and a selection of fruits and vegetables. Reportedly, the company decided to extend the organic product range only after consumers requested to do so through a petition (*HP/De Tijd* July 17, 1998). Now, the company aims to further enlarge its assortment of organic food products for various reasons, among which are: a wish to innovate home brand products, belief in the market for organic food products, the consumers’ confidence in AH company brands, and the need to control organic product chains.

## Motivation

The example of the Albert Heijn initiative is illustrative of the sort of initiatives that are to be collected during the study. However, they need not be restricted to food retailers and supermarkets, but may also include the food processing industry. There are two main reasons to suggest that such private initiatives may be interesting routes to explore.

One reason is related to the slow and unequal dissemination of alternative agricultural practices among farmers. Different explanatory factors are suggested to account for the slow

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<sup>2</sup> Since long, Albert Heijn has been a sales outlet for the bio-dynamic products of the private brand ‘Zonnatura’. ‘Zonnatura’ markets groceries and processed products, not fresh products.

and unequal dissemination. For example, Assouline (1998) suggests that the little number of farmers that operate according to alternative farming practices (and less do so successfully) is in itself a reason why the diffusion should be slow and unequal. They have to find out effective working methods themselves, the cost of meeting with equal-minded colleagues is relatively high, their numbers are too small for an effective extension service to be created, et cetera. In general, the small numbers of organic farmers limit their ability to build up supportive networks. Other factors relate to the difficulty that organic farmers face in realizing premium prices as to cover the extra expenses of their alternative farming systems (reportedly, a substantial part of the relatively high market share of organic produce in Austria and Switzerland is to be attributed to price support by the government), and the limited access that they have to efficient, large-scale distribution networks (Michelsen 1996). Many authors have suggested reasons why farmers are reluctant to adopt alternative cropping systems. Table 1 summarizes several of the most frequently cited problems that farmers have to face when deciding to adopt alternative farming systems.

It is unclear whether the same factors apply to the same extent in explaining the rate of diffusion of ICM cropping systems. Likely, ICM cropping systems, being circumscribed at the operational level as a loosely defined set of practices, will have found a wider diffusion, since the specific practices that make up ICM cropping systems can be applied in a range of situations (Den Hond et al. in press). Nevertheless, farmers wishing to adopt ICM face similar problems in terms of acquiring the relevant knowledge and skills and the risk of not being able to recoup the (initial) extra cost in the market. For some farmers, adopting ICM principles and practices is an intermediate step towards a more radical change into organic farming.

The Albert Heijn example is illustrative in how farmers may be assisted in overcoming some of the problems associated with the adoption of alternative cropping systems. Farmers are offered access to a mainstream, efficient distribution network and other complementary assets. The agricultural consultant is brought in to provide expert advice and state-of-the-art knowledge to participating farmers, thus enhancing their knowledge and skills levels. Farmers are stimulated to discuss actual problems and solutions, thus enhancing mutual learning. The combination of ICM practices (rather than more radical organic farming methods), economies of scale in distribution, expert advice and mutual learning through the social network allows this initiative to be effective.

The other reason why such initiatives are interesting is from a policy perspective. Agricultural pesticide policy in the Netherlands has traditionally been oriented at keeping the environmental impact of pesticide use within established norms while simultaneously guaranteeing the availability in the market of a sufficiently wide range of pesticide products for crop protection not to endanger the continuity of the farming sector. Specifically, it is aimed at (1) a diminishing of farmers' dependency of pesticide use in their cropping and husbandry systems, (2) a reduction of the load of pesticides, and (3) a reduction of the environmental impact of pesticide use (Ministerie van LNV 1991). Progress has been made on the second and third objectives by a range of technical adaptations in the formulation and application of pesticide products, but no significant progress has been made concerning the first policy objective (Van den Heuvel et al. 1997). This may be due to a bias in pesticide policy towards technical measures in the 'environmental impact chain' at the expense of attention to the 'agro-food production chain' (Figure 1). It has been suggested that increased demand for organically grown produce, stimulated by various policy measures along the production chain, may act as a lever in helping farmers to diminish their dependency of pesticide products (Groenewegen et al. 1997). Private initiatives such as Albert Heijn's may

be instrumental in reducing farmers' dependency of pesticides. Recently, the Ministry of Agriculture published a Strategic Plan on Organic Agriculture which also pays attention to the development of conventional markets (Ministerie van LNV 1996). As yet, the ministry is working on the implementation of this plan.

## Study design

These two reasons raise the question of what are success factors of such initiatives, and of whether and how government may play a stimulating role. To address these issues, first an inventory is to be made of relevant initiatives in EU member states. Initiatives will be identified by various means, including computerized data search, personal contacts, networking and internet search. Given the relatively short period of time available for the inventory, emphasis is on the level of diversity of initiatives rather than on the comprehensiveness of the inventory. Special attention is paid to market leaders in the agro-food and retail industries. Initiatives are assessed on a number of criteria, including those summarized in Table 2. The inventory is intended to be used as a benchmark for the Dutch situation.

The second, and final, step in the research is an interactive workshop in which participants from industry, agriculture and policy are invited to reflect upon the results of the inventory. Three issues are at the focus of attention during the workshop:

- future perspective of chain initiatives in the Dutch context
- opportunities and threats to different types of systems
- the need for government support

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Table 1: Actors along the supply chains of organic and ICM food products (to be completed)

	ICM	organic
retail	<ul style="list-style-type: none"> <li>conventional supermarkets (Albert Heijn, ...)</li> </ul>	<ul style="list-style-type: none"> <li>nature food stores (about 250 in the Netherlands, aggregate turnover of 225 million guilders, annual growth 10-15%)</li> <li>conventional supermarkets (Konmar, Albert Heijn, ...)</li> <li>conventional greengrocers</li> <li>alternative farmers' markets</li> <li>subscription schemes to delivery of selected vegetables and fruit (Odin)</li> </ul>
wholesale		
processors	<ul style="list-style-type: none"> <li>vegetable preserves (Hak)</li> <li>conventional dairy producers (Campina Melkunie)</li> </ul>	

Table 2: Some problems that farmers face when deciding to adopt alternative cropping systems

lack of knowledge about alternative cropping systems  
 high production costs  
 slow diffusion of knowledge among farmers  
 slow development of knowledge about alternative cropping systems  
 underdevelopment of advice and service on alternative cropping systems  
 limited availability of pest and disease resistant cultivars  
 lack of efficient distribution systems  
 small operating scale of organic farms

Table 3: Criteria to assess initiatives

- CHARACTERIZATION AND TYPOLOGY—home country, starting date, initiator, development, role and position on food chain, product type(s), type of alternative production mode (e.g. organic, ICM), use of logo or certified quality control, market share in relevant market, growth of turnover and/or market share per annum, indication of environmental benefits / effectivity of initiative, future perspectives
- CONTEXT—pesticide use in home country, government policy in areas of pesticide use and alternative farming methods

Figure 1: (adapted from Groenewegen et al., 1997)

