

## Changing External Conditions Require High Levels of Entrepreneurship in Agriculture

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### Abstract

**Society including markets and policies rapidly changes. Farmers or agricultural entrepreneurs need to become more flexible and develop strategies to pro-actively adapt their farm, product portfolio, networks, partnerships, knowledge systems, personal skills and competences to the changing external conditions. Entrepreneurship is an important research theme of the Agricultural Economics Research Institute (LEI) in the Netherlands. Some of the aspects studied are:**

- 1. analysis and evaluation of the conditions in which agricultural entrepreneurs have to do their work;**
- 2. monitoring and evaluation of the results of entrepreneurship;**
- 3. analysis of the behaviour of groups of entrepreneurs itself to find explanations for past reactions or to predict future reactions of farmers on market or policy developments;**
- 4. improvement of the level of entrepreneurship through training in different aspects of this topic; ISP (Interactive Strategic Planning) can play a role in such learning processes.**

**In agriculture, passive, moderately active and very active entrepreneurs can be discerned. In general, more active entrepreneurs have a stronger vision and strategy toward integrated crop protection and lower levels of pesticide use and environmental burden than passive colleagues. In general, there is a strong need to improve the level of entrepreneurship in agriculture, and the ISP-process and toolbox are helpful instruments to facilitate such improvements. The entrepreneur is in the centre of this process. He is facilitated to define his own goals, strategy and plans, and to adapt them when external conditions (are foreseen to) change. Therefore, the major decision maker and performer in agriculture, the entrepreneur himself, is equipped not only to survive but to develop a strategic approach that makes him an interesting partner to work with in the eyes of many stakeholders in his network.**

### INTRODUCTION

In former days, farmers only needed to be healthy strong people who could work hard during many hours. Labour and craftsmanship were important to be a successful farmer. On large farms, management of large groups of labourers was an additional capacity required. In recent decennia, entrepreneurship has become an (or probably the most) important aspect of farming and will increasingly be so in the new century. Developments in the market (globalisation, enlargement of the EU, certification, food safety requirements, and so forth), in the agricultural policy (reform of the Common Agricultural Policy of the EU, WTO-negotiations, and so forth) and in society in general (e.g. growing concern about environment, nature, biodiversity, landscape, animal welfare, natural resources, and so forth) urge for higher levels of entrepreneurship.

Entrepreneurship means to undertake an enterprise, e.g. a farm. It comprises of activities as gathering of information, communication with chain partners, market orientation, strategic decision making, learning, and so forth. Entrepreneurship deals more with strategic issues than management which focuses more on operational and tactical decisions.

Craftsmanship and management can be learned more easily than entrepreneurship; the first two aspects have a more technical or procedural character, whereas entrepreneurship involves a lot of 'special' skills of the farmer, like communication and risk management, and competences like leadership, taking initiatives, openness to signals from society, vision, creativity, self-reflection, and so forth (De Lauwere et al., 2004b).

In LEI-research (in many cases carried out in co-operation with related research institutes in different countries), entrepreneurship is an important object. The entrepreneur is the one who makes decisions and therefore his attitude and behaviour are decisive for the success or failure of governmental policies on food quality and safety, environmental and land use issues, disease and plague spread, and so forth. Political and societal demands for an ecologically and socially sustainable agriculture thus involves the conviction and collaboration of the agricultural population of the country. Thus, the entrepreneur is the key factor in transition processes. This paper gives an overview of different aspects of research that LEI does and describes some of the methods and results in more detail.

In the paper the words 'farm' and 'firm' are both used for an enterprise in dairy or arable farming, flower bulb and field vegetable growing and glasshouse horticulture. The same applies for the words 'farmer', 'grower' and 'entrepreneur'.

## **OVERVIEW OF RESEARCH TOPICS**

Research on entrepreneurship at LEI focuses on different aspects:

1. The conditions in which agricultural entrepreneurs have to do their work are described, analysed and evaluated, e.g. on market perspectives (Janssens et al., 2004) or the consequences of changing EU-policies (Smit et al., 2004).
2. The results of entrepreneurship are monitored and evaluated, e.g. in accountancy reports, sector reports, environmental and nature evaluation reports, innovation monitoring reports, and so forth. LEI produces or contributes to such reports, e.g. on the quality of soil water (LEI/RIVM, 2004), the use of pesticides in different crops (Buurma et al., 2002) or the FADN (Farm Accountancy Data Network of the EU).
3. The behaviour of groups of entrepreneurs is studied for several reasons:
  - a. To find explanations why certain sectors in agriculture have developed or why they have reacted to agricultural, environmental or economic policies as observed; Smit et al. (2002) found that potato growers in different regions of The Netherlands have different crop protection strategies, which is partly related to differences in soil and climatic conditions in the regions analysed.
  - b. Partly from reason a, to predict how specific groups of entrepreneurs will react on future market or policy developments. As an example, expert knowledge on starch potato growers was modelled and combined with FADN-data to conclude that full de-coupling of the production of starch potatoes and the EU-subsidies for that crop would lead to a 50% decrease of the area of starch potato in the Netherlands. Such a development would have had enormous socio-economic effects. As a result, the Dutch Ministry of Agriculture decided to maintain a 60% coupling of subsidies and production (Smit and Prins, 2003).

An important observation from this type of research is that different sectors and even different groups of entrepreneurs within sectors or in different regions will respond differently to market, policy and other societal and technical developments, and that different types of entrepreneurs can be distinguished (e.g. Theuws et al., 2002; De Lauwere et al., 2003; De Lauwere et al., 2004a).

4. The level of entrepreneurship can become higher when entrepreneurs are trained in different aspects of this topic. To this end, LEI has developed a tool box called ISP, Interactive Strategic Planning (Smit et al., 2002). ISP-tools have been developed in the first place to predict farmer behaviour as a service to policy makers (e.g. Beldman et al., 2004). However, commercial partners (e.g. accountancy and bank advisors) are increasingly interested to apply the tools as a service to their clients. LEI is a research institute and not equipped for large scale application of the toolbox, i.e. with many groups of farmers all

over the country. Our role is to develop and improve tools in co-operation with commercial partners, and to educate facilitators. The process aspect of ISP-projects is very important. The entrepreneur is in the centre of the process. The researcher or advisor does not tell the entrepreneur what to do or not to do; he only coaches the entrepreneurs in the process of growing awareness, insight and clarity and in the strategic decision making phase. Researchers and advisors involved have a different role than they usually have. In this conversion process, education and coaching is required as well as an openness to this new way of working for both farmers and coaches.

In the following, attention is mainly paid to the study of Theuws et al. (2002) on types of agricultural entrepreneurship and to the ISP-toolbox.

## **TYPES OF ENTREPRENEURSHIP**

### **Introduction**

The Dutch crop protection policy aims for reduction of pesticide application and its environmental burden. According to De Snoo and De Jong (1999), the environmental effects of crop protection would decrease by 33% if for each crop the 10% most polluting agricultural firms would decrease the application level to the average level of all farms with the specific crop. An important question is if the farms that belong to the 10% most polluting group, would have relatively hard conditions in terms of weed, plague and disease pressure so that in the situation given not much can be done to reduce pesticide use, or that the problem would be a matter of management and entrepreneurship. In short, is there a relationship between entrepreneurship and environmental effects in crop protection? The project focused on knowledge aspects of entrepreneurship: gathering of information, learning processes, use of internet, advice, and so forth.

### **Materials and Methods**

About 140 firms in arable farming, flower bulb growing, rose growing in green houses or mushroom growing in dark cells received and returned a questionnaire focusing on entrepreneurship on one hand and vision and strategy in crop protection on the other. Most firms were involved in the Dutch FADN-system or a certification system, in which the application levels of pesticides on their farms and in many cases also the added value and farm income was monitored and registered. Therefore, a link could be made in the first place between the level of entrepreneurship and the level of 'integration'. The level of entrepreneurship was higher when the entrepreneur was more active in information gathering and learning activities. The level of crop protection or integration was higher when the vision and the strategy of the entrepreneur aimed more for low levels of pesticide use, e.g. through paying more attention to hygienic, preventive and mechanic crop protection measures. Both levels could also be compared with the crop protection activities at the firm, expressed in amount of pesticide and environmental burden.

In this paper, the results of mushroom growing have not been included. This sector uses only small amounts of pesticides. The environmental burden is mainly related to the application of soap and other hygienic chemicals between two production sessions. Therefore, the results were not very well comparable with the other three sectors, in which crop protection did play an important role.

### **Results and Discussion**

A general result over all sectors was that three groups of entrepreneurs could be distinguished: very active, moderately active and passive entrepreneurs in the field of information gathering and learning. In general, more active entrepreneurs had relatively high levels of integration, and more passive ones had lower scores on vision and strategy in crop protection. More specific results per sector were:

**1. Arable Farming.** Most active and moderately active entrepreneurs appeared to be member of a study group, i.e. a group of farmers who try to learn about crop growing through

discussion, field visits, workshops with crop growing specialists, and so forth. Almost all passive farmers in the test were not a member. Both very active and passive entrepreneurs had many contacts with advisors but for different reasons. Very active entrepreneurs tried to improve their own knowledge level, so that they could develop their own vision and strategy, and would act accordingly. Passive colleagues, on the contrary, depended on advisors and took over their advice as a kind of recipe. Crop protection advisors (at least the commercial ones) are risk averse, i.e. the types and levels of pesticide that they 'sell' aim for guaranteed success (Buurma et al., 2002). The monitoring data confirmed that passive farmers had the highest levels of active ingredients applied, although the differences within the group were great. The passive farmers had relatively small farms and a high proportion of their income can from outside their firm, probably because of the small farm size. Spending a lot of time in a regular job outside the farm could result into little availability of time and energy for the farm itself, so that a passive approach of the farm and the crops was more or less unavoidable. It also appeared that the moderately active farmers, who generally had a low cost strategy, had the lowest pesticide use. The very active farmers had more intensive crops than their colleagues and experimented a lot. As a consequence, they had relatively low but not the lowest score in pesticide application. The active farmers were in general relatively young and had relatively large farms. Their income was not always higher than of the other two groups, but that may be a consequence of the relatively early phase in the farm circle, i.e. the phase relatively shortly after take-over.

**2. Flower Bulb Growing.** The moderately active entrepreneurs appeared to be member of a study group. The very active entrepreneurs were not only member of a study group but were also involved in research and demonstration projects. The passive colleagues were not involved in either of both activities. Active entrepreneurs had the largest firms, the highest incomes and the greatest self-confidence. The passive colleagues had the smallest firms, the lowest incomes and the lowest self-confidence. The very active and the moderately active bulb growers had a significantly more positive view on society than the passive ones. The active growers observed many more opportunities than the passive entrepreneurs. The use of pesticides was comparable as described for the arable farmers. The very active growers had relatively large areas of lily, which required a higher input of pesticides than other species. The use in terms of active ingredients was higher, but the environmental burden was not higher. Thus, the high input level was compensated for with relatively environmentally friendly chemicals.

**3. Rose Growing in Green Houses.** The positive relationship between scores on entrepreneurship and crop protection was not very strong for the sample of rose growers selected. It appeared that in general, the passive growers had relatively old glasshouses and an unfavourable financial situation. They were mainly focused on improving that situation. However, there were great differences between active rose growers. A closer analysis of this group revealed that two subgroups could be distinguished: growers with and without application of biological control, i.e. the use of natural enemies of plague insects. The firms that applied biological control had a significantly lower input of insecticides and fungicides than the ones who did not. Thus, in this sector the choice for biological control is of major importance to the level of integration as well as the environmental burden.

## **Conclusions and Outlook**

There was a relationship between the level of entrepreneurship and the level of integration in the groups of arable farmers and flower bulb growers but not very clearly for the rose growers involved in the project. Passive growers tend to have higher levels for both amounts of pesticides applied and environmental burden than more active colleagues. In general, improvement of the levels of entrepreneurship and integration would lead to a decrease of pesticide use and pollution. However, the passive entrepreneurs will not be very open for activities in that field. In general, crop protection policies of the government or the farmers union will have relatively little effect on their behaviour.

The effect will be greater when the 'wrong-doers' see the consequences in their bank

account. That will be the case when the chain partners including the consumers demand certificates with guaranteed low levels of pesticide use. Non-commitment could lead to lower prices or to a loss of the licence to deliver. Such measures become increasingly probable, since food safety is a hot issue in consumer discussions. The numbers of certificates like EUREPGAP, HCCAP and so on increases.

Another means could be to introduce a recipe system for the use of relatively heavy pesticides. Such pesticides are then only allowed when application is unavoidable due to very unfavourable conditions and when the entrepreneur is prepared to receive advice for his specific situation (Van Kempen and Buurma, 2004). However, part of the problem will be solved more or less automatically, since many passive farmers are relatively old and have relatively small farms or old greenhouses. They will stop farming within a limited number of years due to age or too little farm income.

## **ISP-TOOLBOX**

### **Introduction**

The ISP-toolbox consists of a number of tools, which can be used separately or in a combination. The selection of tools for a (series of) workshop(s) depends on the goals and on the time and farm data available. The tools in the ISP-toolbox are:

- QSEM (Quick Scan Economics and Nutrients), a benchmark tool to reveal strong and weak aspects of the firm in comparison to comparable firms;
- Game simulation, a simulation model for strategic and tactical decision making at farm or crop level. Effects of decisions on farm size, number of cows, cropping plan, nutrient supply levels, and so forth on profits, farm income and nutrient surpluses are calculated. The farmer virtually 'plays' with his own farm (data). He acquires insight in the 'buttons' that he can push in his specific situation and the effects of single or combined decisions. Game simulation models have been developed for dairy (GSD) and arable-field vegetable farms (GSA) and for crop protection;
- SMR (Strategic Management Report), a tool to develop a strategic plan; this tool is described more extensively in Materials and Methods;
- SMT (Strategic Management Tool), a tool to confront people working with SMR with the (un)logical strategies that they have selected during the planning process.

It is impossible to extensively describe and discuss all elements of the ISP-toolbox in this paper. Since QSEM, game simulation and SMT support the process of strategic planning with SMR (although they can be used for other purposes as well); the following text focuses on SMR, being the heart of ISP.

### **Materials and Methods**

SMR is a report which is filled in c.q. created by the farmer himself during a process of strategic planning. The fill-ins can be performed by himself without help of a process facilitator, but in practice it appears to be much more stimulating to confront the results of the different steps with the opinions of relatives, employees and, most of all, colleagues. Therefore, (about) four meetings are arranged, in which the process is explained and supported by researchers or advisors, and farmers present their views and plans to their colleagues and discuss them together. For active involvement, the participants need to do homework in between the meetings. A surprising task the farmers have to perform is to arrange and hold an interview with an entrepreneur in a quite different economic branch, i.e. outside agriculture. Farmers tend to think that farming is not to be compared with other types of industry, but in the interview they discover that the main questions (e.g. on market perspectives), dilemmas (e.g. between people, planet and profit) and planning processes (information gathering, networking, decision making, and so forth) are very well comparable. Such an interview appears to be very stimulating and refreshing for the participants involved in the process.

SMR has mostly been applied in different animal husbandry projects (e.g. Smit,

2002). Recently, the process has also been applied in a plant production group, as described by De Wolf et al. (2004). The ISP-process consists of the following steps:

1. The participants have to reflect on their own competences (personal characteristics, abilities, skills, and so forth), the farm conditions, the strong and weak aspects of the farm, and on the external threats and opportunities (e.g. market, society, and politics).
2. They define the goals they have for their farm and for their private life (e.g. spending time with the family) as well as the critical success factors for reaching those goals, e.g. the co-operation of the bank in farm enlargement.
3. From steps 1 and 2, they define the most promising strategies for their farm for the next ten years or so and the consecutive steps to make the strategies real.
4. They define a procedure in which they measure relevant variables for evaluation of the progress they make in performing the strategies selected. Evaluation moments are defined and used to check whether the elements on which the selection has been based, are still valid or that they need adaptation.

## **Results and Discussion**

The aim of preparing an SMR is not in the first place to create research data. Therefore, the results of ISP are mainly impressions on the processes that take place during an ISP-project. In the future, a broader analysis on the long-term effects of different ISP-projects on the farms and their partnerships involved would be very worthwhile.

In general, ISP appears to be a stimulating process of becoming aware of the internal or external position of the farm, but also of the entrepreneur himself, his goals and personal interests and opportunities. In the past, the entrepreneur himself did not receive much attention in farm development planning. A 'simple' SWOT-analysis (strengths, weaknesses, opportunities, threats) led to more or less 'technical' plans. It did not recognize the farmer as the major factor in the creation and performance of strategies. Very important critical success factors in farming are the conviction, the drive, the energy, the enthusiasm, the well-being and so on of the entrepreneur (and his relatives and partners). In ISP, competences and personal and business goals receive extensive attention and lead to unique and surprising strategies, in which not seldomly niche markets and unique partnerships are developed e.g. with health care organisations for hospitality to sick people.

Moreover, the strategic plan is the plan of the farmer himself. The researcher or advisor is mainly the process facilitator in ISP. He can assist the participants in the reflection and planning process, mainly through confronting him with critical questions on his findings and stimulating discussion among the farmers. Farmers tend to learn more from colleagues than from 'outsiders' and are stimulated to build partnerships. Another effect is that farmers are challenged to develop daring strategies, which are new and, as a consequence, more risky in terms of availability of knowledge, financial means, and so forth ISP can stimulate (system) innovation, which is so important in a rapidly changing society. Therefore, the group process must be considered as a critical success factor.

ISP leads to strategic, well-based plans. These plans become rapidly more important for banks, administrators and policy makers, since they represent the self-confidence and the vision of active entrepreneurs. Farmers become interesting partners for other stakeholders to work with, e.g. in countryside developing plans. Therefore, ISP is an interesting and promising process and the LEI-toolbox is helpful to support this process.

## **Conclusions**

Society including markets and policies rapidly changes. Farmers have to become more flexible to develop strategies to pro-actively adapt their farm, production processes, product portfolio, networks, partnerships, knowledge, personal skills and competences to changes in the external conditions. There is a strong need to improve the level of entrepreneurship in agriculture, and the ISP-process and toolbox are helpful instruments to facilitate such improvements.

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