

TACTICAL MANAGEMENT IN POT PLANT PRODUCTION; WHICH KIND OF DECISION SUPPORT IS MOST SUITABLE?

G. Trip

Department of Farm Management
Wageningen Agricultural University
Hollandseweg 1
6706 KN Wageningen
The Netherlands

Abstract

This article is based on a literature review on decision support, especially for tactical management in pot plant production. It is argued that there are two distinguished views on decision support. The first emphasizes the role of the organisation, whereas the second is information-oriented. Both views can be worthwhile in supporting tactical management because they deal with different sources of difficulty in the decision-making process, being complexity, uncertainty, multiple objectives and different perspectives (Clemen (1991)). The information-oriented view is mainly concerned with decreasing uncertainty and to some extent with multiple objectives, while complexity and different perspectives can be dealt with from an organization-oriented viewpoint. One of the questions for further research is: can these two views on decision support be combined?

1. Introduction

Recently, the concepts of M.I.S. (Management Information system) and D.S.S. (Decision Support System) have become a popular topic of research. The introduction of these computer systems on agricultural firms however has been very limited. So one might ask some basic questions like (1) what kind of support does the agricultural manager need and (2) what is the most suitable way to meet his needs. We will try to answer these questions with respect to the tactical management of a pot plant grower.

First, we will investigate the nature of the decision and the decision-maker involved (sections 3.1 and 3.2). Then, two different views of supporting management decisions will be distinguished (section 3.3). Finally (section 4), some conclusions are drawn and some research questions are raised. In the next section (2) the method of research is described.

2. Method

The research starts with defining tactical management on pot plant firms and judging whether this is a worthwhile field for decision support. We will look for criteria that indicate the difficulty of a certain decision. Then we will shortly discuss the nature of a

decision-maker in general and the pot plant grower in particular. Combining the notions on the decision and the decision-maker should lead to ideas on decision support. Which views on decision support have been generated so far? We will look for similarities and essential differences. Finally, the theory of Critical Success Factors is related to these two distinguished views on decision support.

This article is based on an orientation, by no means complete, of existing literature. It serves as a first step in a broader research on decision support of tactical planning in pot plant production. The next step consists of observing growers and firms in a one year period of time.

3. Results

3.1. The nature of tactical management on a pot plant firm

Tactical management is second in line, after strategic management and before operational management. In the strategic part of management the long-term goals of the decision-maker(s) are set, one might call it "the mission statement of the business" (Eidman, 1992). This gives the framework for tactical management, it e.g. reduces the number of options.

Tactical management consists of making a tactical plan, implementing it, and controlling the results. A tactical plan on a pot plant nursery consists of a production plan - also called cultivation plan - and some dependent plans for labour (and materials), finance and marketing. Production planning includes: (1) the decision which products to cultivate during the next planning cycle, and (2) the decisions on how much of each product to pot, to sell and to space out during each planning period. Most growers work with a planning cycle of one year, consisting of 52 planning weeks (see e.g. Hofstede 1992, p.3). Thus, a production plan specifies the occupation of the greenhouse in the coming year. From this production plan the dependent plans for labour, finance and marketing can be generated, and together they constitute the tactical plan.

Is tactical management a worthwhile field for decision support? If so, it must be in some way a difficult decision, the need for support must be felt. On the other hand it should not be too difficult. The decision-making must be in the scope of present day science, to ensure that it can be modelled with some kind of quantitative or qualitative method.

In order to answer whether tactical management on pot plant firms is difficult, we must first formalize the common word 'difficult'. According to Clemen (1991) there are four basic sources of difficulty in decision-making: complexity, uncertainty, multiple objectives, different perspectives. Let us regard the difficulty of tactical management on pot plant firms in the light of these four criteria.

Complexity relates to the number of aspects of the problem at hand and the number of options to make. The tactical plan on a pot plant nursery comprises many aspects. A change in production has consequences for the other parts of the tactical plan: labour, finance and marketing. A change of enterprise may for instance endanger the

contacts with regular customers, bring liquidity problems or necessitate the hiring of more labour. And since there are over a thousand different registered products, the grower has many options as well. So we can conclude that making a tactical plan on a pot plant nursery is a 'complex' (in the given formal sense) problem.

There are two main sources of uncertainty involved in making a tactical plan: economic circumstances (prices of input and output) and physical circumstances (e.g. rate of growth). The physical conditions can be controlled to a certain extent but prices are very hard to predict and control, i.e. the grower is to a large extent a price-taker.

Maximizing profits is often regarded as the ultimate goal of an entrepreneur, but there may be other objectives such as leisure time, avoiding stress, job satisfaction. These other objectives may be in conflict with the main goal.

Different perspectives can complicate decision-making when more persons are involved who disagree about what the nature of the problem exactly is. There may be disagreement on the goals and the scope of tactical management, or on the relative importance of several aspects. In decision support this complication may well arise. The perspective of the adviser likely differs from the perspective of the grower, e.g. the adviser may assume a risk neutral optimizing goal, whereas the grower is risk averse or not optimizing perse. On the other hand, the possible complication resulting from different perspectives is tempered since most pot plant firms are managed by one person only.

These remarks mainly relate to the planning part of tactical management, the implementation and control may complicate the decision-making even more.

Concluding, we can consider tactical management as difficult, mainly because of its complexity and uncertainty, and to a lesser extent because of multiple objectives and different perspectives. Hence tactical management is a tempting field for decision support, but is it in the scope of what present day science can cope with? This question will be addressed in section 3.3.

3.2. The nature of the decision-maker

"Decision support should be devised from the perspective of the decision-maker in his cognitive capacities and limitations, not from the complexity of the decision. Therefore the phrase decision support should be replaced by the phrase decision-maker support." (Timmermans, 1991, proposition 3; our translation). This proposition, accompanying the thesis, shows the importance of the role of the decision-maker. It also implies that support of a certain decision might work for person X and not for Y. Timmermans draws a distinction between a "pragmatic decision-maker" and a "fallible rationalist" and she argues that both need another kind of decision support. When a problem is too difficult to handle, so he has no idea of what the optimal solution might look like, the decision-maker acts like a fallible rationalist. In this situation he is supported best when

provided with information that helps him to organize and structure the problem. A pragmatic decision-maker on the other hand knows, at least in theory, how to find the optimal solution, and only uses decision support if the benefits exceed the costs. Computer software - readily available at low cost - that facilitates making comparisons and calculations or extends the human memory can be helpful for him in making the right choice.

Translating these ideas to pot plant growers one might ask whether they behave like 'fallible rationalists' or 'pragmatic decision-makers' in performing tactical planning. Do they need help in organizing, structuring their tactical management or is it enough to supply software that facilitates the planning, e.g. by making comparisons between products? This question will be dealt with in the next section where two different views on decision support are presented.

3.3. Different views on decision support

In some recent studies the emphasis in decision support has been laid on structuring the decision-making process. We start with an example from another economic sector and then turn to agriculture, pot plant production, the research field of this study. Van Schaik (1988) studied decision-making of financial managers participating in a management game (thus in a laboratory environment) and compared two means of decision support: a spreadsheet program, meant as a conventional DSS, and a "decision strategy". The latter can be seen as a way of structuring the problem, by relating its constituent parts in a flow chart. Van Schaik concluded that this kind of decision support was more helpful than the conventional DSS.

Relating the constituent parts of tactical management on pot plant nurseries may be helpful for (some) pot plant growers as well. Relating the production plan to labour, finance and marketing can avoid partially optimizing behaviour. A grower who has lost overview may be optimizing part of the problem but ignoring other parts, e.g. producing the most economic pot plants but having problems finding enough labour in a peak period, or disappointing regular customers who were used to other varieties. So, the integration of the different parts of tactical management seems important.

Integration - in this particular sense - is one of the four criteria to judge the quality of the decision-making process, according to the "Wageningen Administrative Approach (WAA)", developed at the department of Management Studies at the Wageningen Agricultural University. The other three criteria are: looking forward, looking back and a systematical approach (treating the same question in a similar way on different occasions). These criteria play an important role in the research of Bots (1991) who applies the WAA to the pot plant sector. Bots remarks that complex firms, i.e. firms with e.g. many different products, climates, employees and a high level of investment, need more administrative means than less complex firms, in order to attain a high level of quality of the decision-making process. And a high level of quality of the decision-making process

in turn leads to high financial results. Because of the small number of companies (eight), the empirical results in this study, however, "should be interpreted and used with circumspection" (Bots, 1991, p. 161).

Böckelmann (1992) studied the relation between financial results and the type of organization of pot plant firms in Germany. His hypothesis was that information stress is an important explanatory factor for low financial results. So, a type of organization that reduces the information stress of the manager is beneficial for high financial results. Böckelmann surveys 104 firms (with at least 5000 m² glasshouse area and 4.5 employees), distinguishes four styles of management and four types of organization by means of factor analysis. He finds corroboration for the hypotheses: there seems to be a tight relation between information stress and (a low) financial result, and moreover, by choosing the right type of organization the manager can reduce the information stress to a large extent.

The common aspect of the studies mentioned so far is that they all accentuate the role of the organization in the decision-making process. However, the answers to an increasing complexity of the decision-making process differ somewhat: formulating a decision strategy (Van Schaik), increasing the number of administrative means (Bots) and reducing the information stress (Böckelmann).

Besides these studies in which the accent of decision support has been laid on the organization of the decision-making process, other research concentrates on the information part of the decision-making. Which information do growers need to perform tactical planning in a better way? By means of optimisation models, e.g. Linear Programming (Saedt et al., 1986), simulation models and statistical analyses based on farm comparisons scientists tried to understand, simplify and support tactical planning.

The *raison d'être* of both views (organization-oriented versus information-oriented) can be made clear from the four basic sources of difficulty in decision-making (Clemen, 1991, see section 3.1). The sources complexity and different perspectives can be handled best by improving the organisation of the decision-making, whereas improving the information seems to be a better way to deal with uncertainty and multiple objectives.

4. Discussion

In this article two distinguished views on decision support, concerning tactical management in pot plant production, have been presented. The first view concentrates on improving the organisation of the decision-making process, whereas the other tries to realize better decisions by supplying information e.g. in the form of quantitative methods. We have shown that both views have their *raison d'être* by looking at the nature of tactical management, and especially the sources that make it difficult, and the nature of the decision-maker. The organization-oriented view deals with other sources of difficulty in the decision-making process than the information-oriented view.

Interesting questions for future research are: (1) can both views on decision support be combined and (2) what are the critical success factors of both views. This latter question means a search for "those few areas where performance must be strong if business objectives are to be met" (Rockart, 1979 - cited in King et al., 1992).

5. References

- Böckelmann S. (1992). *Unternehmertypus und Organisationsstruktur*. Hannover/Weihestephan, Forschungsberichte zur Ökonomie im Gartenbau, Heft 70. Dissertation.
- Bots J.M. (1991). *De besturing van het primaire agrarische bedrijf: een toepassing van de Wageningse Besturings Benadering in een voorstudie met betrekking tot potplantenbedrijven*. Wageningen, Landbouwuniversiteit. Proefschrift.
- Clemen R.T. (1991). *Making hard decisions, an introduction to decision analysis*. PWS-Kent Publishing Company, Boston.
- Eidman V.R. (1992). *Strategic Management*. Postgraduate course. Not published.
- Hofstede G.J. (1992). *Modesty in modelling; on the applicability of interactive planning systems, with a case study in pot plant cultivation*. Thesis Publishers, Amsterdam. Dissertation.
- King R. et al. (1992). *Workshops for identifying farm information system needs*. In: *Farm computer technology in search of needs?*. Congress Proceedings 4th International Congress for Computer Technology in Agriculture. Paris-Versailles, 1-3 june 1992.
- Rockart J.F. (1979). *Chief executives define their own data needs*. Harvard Business Review, March-April, pp. 81-91. (Cited in King R. et al. (1992)).
- Saedt A.P.H., Th.H.B. Hendriks, F.M. Smits (1986). *Production planning with a microcomputer in potplant nurseries*. Wageningen, IMAG-nota 197.
- Schaik F.D.J. van (1988). *Effectiveness of decision support systems*. University Press, Delft. Dissertation.
- Timmermans D. (1991). *Decision aids for bounded rationalists; an evaluation study of multi-attribute decision support in individual and group settings*. University of Groningen. Dissertation.