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Agriculture Case Base

Decision Support by Harnessing Knowledge and Experience

Akira Otuka*1, Chikayoshi Kitamura*2

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Ⅰ Introduction

The sharing and reuse of farming knowledge and experience is very useful and helpful for farmers, especially between those farmers who grow the same crops. By using other's experience, farmers can solve a problem efficiently, or documents describing questions and answers between farmers and extension advisers could give the farmer a good clue as to the solution. This approach to decision-making, experience utilization, is a common way of human problem solving. Actually, farmers have been taking this approach for many years and they will continue to do so. We have, therefore, developed a system, called Agriculture Case Base (ACB), which shares knowledge and experience among farmers and advisers. In this paper, farming knowledge and experience are referred to as agricultural cases. The system retrieves agricultural cases described in textual documents to support user's decisions.

A computer system based on this approach is known as a Case-Based Reasoning (CBR) system. CBR systems were first proposed in the 1980's and much research on CBR and application development, including successful operational systems, was done in the 1990's. Among them, there were some projects

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*1 Department of Information Science and Technology, National Agricultural Research Center
*2 Department of Research Planning and Coordination, National Institute of Agrobiological Sciences

Summary

Because farming is based on a complex system where many factors interact each other, it is rather difficult to construct a crop model that takes all the factors in account in a "scientific" way. This is why farmers have been using their own experiences for their problem-solving so far. The use of heuristics brings the farmer an effective problem solving mechanism. This approach is known as a descriptive approach in the decision making research. We took the descriptive approach and have developed Agriculture Case Base, a web-based system to share and reuse farming knowledge and experience. An agricultural case is a textual document describing farming knowledge and experience. Agriculture Case Base stores and retrieves agricultural cases. The system consists of three components: the Case Retrieval System, the Specialist Retrieval System and the Mailing List System. Characteristics of agricultural cases and Agriculture Case Base are presented in detail in this paper. An integration method of a model-based approach that is a normative decision-making, and Agriculture Case Base is also proposed.

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農業事例ベース

― 経験と知識を用いた意思決定 ―

大塚　　彰[*1]・北村實彬[*2]

摘　　要

営農は多くの要因がお互いに関連し合う複雑なシステムに基づいているので，それら全ての要因を考慮した科学的な作物モデルを作ることは大変困難である．このため，農業者は営農の問題解決のために彼ら自身の経験を用いてきたのである．経験則の利用は農業者に効率的な問題解決手段を提供する．この手法は意思決定の研究分野では記述的方法として知られている．我々はこの記述的アプローチをとり，農業事例ベースを開発した．農業事例ベースとは営農に関する知識や経験を共有し再利用するWEB上のシステムである．農業事例とは営農の知識や経験を記述したテキストの文書である．事例ベースはこの事例を蓄積し検索する．システムは３つの部分からなる．それは事例検索システム，専門家検索システムとメーリングリストシステムである．本論では農業事例と事例ベースの特徴を詳細に紹介する．また事例ベースと規範的意思決定手法であるモデルベースとの統合化手法の提案を行う．

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[*1] 農業情報研究部営農情報システム研究室
[*2] 現（独）農業生物資源研究所