

# The Research On Intelligent Soybean Decision-Making System

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**Abstract:** After the flow of soybean growth technology having been analyzed, the design of soybean decision-making consultation system follows the life cycle standard of software engineering; database technology and the theory of expert system. The system will be exploited in steps and the summary is brought up by using frame- work analytical method. The article concludes the structure of system; function realization and character. [Nature and Science. 2006;4(1):34-36].

**Key Words:** reasoning machine; decision-making system; agricultural information

## Introduction

Intelligent Soybean decision-making system is by modern technology and informational measures to help peasants to solve the practice problems which they encounter in the production of soybean about picked seeds; balance fertilization; prevention and cure the pests; analysis of economy benefit, and it provide the technician of soybean production with decision-making service.

## 1 System introduction

The structure of system which bases the triangle structure increases repository; method library ;model dictionary ;reasoning machine ;data extract ;special data-base of DSS and so on .The system constructs four libraries including language process system and problem process system which is inserted in four libraries.

Intelligent Soybean decision-making system makes up of four parts which are before production decision-making system; during production decision-making system; after production decision-making system and management system of

informational library, moreover every system include many subsystems.

## 2 Technology key

### 2.1 The design and achievement of reasoning machine

The problems in agricultural field are particular complexity and illegibility. To solve the fuzzy problem, the system adopts fuzzy matched arithmetic which bases fuzzy production rule and applies target drive of origin knowledge control and heuristic search arithmetic to clear up conflict .The system looks upon exact reasoning as a particular example of fuzzy reasoning and naturally supports the reasoning in the case of incomplete knowledge .

### 2.2 The function of automatism acquisition in the system required information

During the decision , to the exact the system needs peasants to input a few data-bases ,some of which are very professional and difficult to understand for peasants .We adopt indirect input ,the system makes certain the required data on the relation of two

data. For example, the system asks the content of quick result nitrogen in the fields, we will create a soil fertility data-base, the matter of which is the content of soil quick result nitrogen; potash and so on. The peasants only input the place where they stay, because the system can research the required data from the relevant data – base on the peasant's place to easily finish input of many items of the organic matter; quick result nitrogen; potash; phosphor and so on.

### 2.3 The application of buffer library

During the decision, some data are temporary or the middle result. To reduce the occupancy of EMS memory variable; the redundancy of data and improve the rate of the decision and analysis and simplify the program of output, the data-base system adopts the buffer library, and the target library and fact library of the system adopts the method of buffer library.

To have peasants rapidly understood the option flow of system, we design a option guide, namely from the first step every steps have explanations which make clear to do something in the step, then press the button of next step till accomplish, so as to greatly improve the system easy option and achieve the stupid of intelligence decision-making support system.

### 3 The design and development of system

The interface of human machine accepts expression of decision-making problem and object in direct natural language and approach natural language manner, then the function of natural language processing by parsing; semantic structure and so on switches them into the forms which the system can understand. After the program has run, the dialog subsystem outputs the process of solve and result in a manner which decision maker can legibly understand and appointed manner. The dialog subsystem commences a solve process of decision-making problem by ceaselessly mutual of decision maker, furthermore it provides decision maker with kinds of

information and supports the data extract; data organization; model building and knowledge manipulation and soon.

The intelligence soybean decision-making support system to solve the need of different decision makers and the adaptability of different decision-making problems combine the independent model with other model to constitute the composite model in equal sequence. The process of found involve with dynamic; close coupling and calling and so on to form model sequence. Such as balance fertilization system.

The model library of this system has prediction class model, such as the disaster forecasting model; output forecasting model; seeding quantity forecasting model and so on, which is memorized in the case of subprogram; language statement and data. The data modulus storage save the data according to the format of rule, and the system combines the decision-making model and data into the knowledge representation.

The collection; making-up and analysis of data are very important sector in development of decision-making support system, we must pay more attention to them. Under the guidance of field experts, we widely collect books of dependent field; science research finding; science discussion result and the related data of word; picture; language and tape. We discard the dross and select the essential and eliminate the false and retain the true and analyze the process to find regularity of data and build the logical relation model and so on with the abundant of knowledge of experts.

The field of agricultural knowledge continually enriching, the knowledge structure complicating and the feature of decision-making problem make the knowledge representation of DSS more and more difficult with the development of agricultural economy and science technology. The knowledge representation of this system is carried out the tradeoff between consistency and complexity to solve the contradiction of uniform and isomerization representation, so the system not only has better representative ability but

also is convenience to achieve the interface between the decision-maker and the system and between every subsystem. Because of the above reasons, the modality of knowledge representation comprises the rule knowledge; variable declaration and data image knowledge and so on three partitions.

The system on the man and machine interaction interface uses generalized form processing technology and mode of dialog to be simple and visual expedience paper layout. As decision-making, users only quiz on the need of system and gain the requisite decision-making results according to prompt option. The system provides users with speech and kinescope data for reference to the effect of the picture and its accompanying essay.

#### 4 Conclusions

The research under the guidance of system engineering theory adopts the method and measure of knowledge engineering and put the soybean expertise knowledge; experience and the method of solving problem into systematization and formalization on the computer artificial intelligence. We build the intelligence soybean decision-making support system of the northeast by model technology and expert system technology. The process of research adopts advantage technology not only on the agriculture but also on the computer, and the built environment can partly replace the experts to widely guide production and practice. It is somewhat meaning of theory and

practice to generalize and apply the intelligence agricultural information technology. The system has already been generalized and applied in most towns and countries of hei long jiang province, and the peasants at large reflect well effects.

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