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BASIC PRINCIPLES FOR THE RATIONAL DESIGN OF AGRICULTURAL PRODUCTION PROCESSES

K. Georgieva*

Technical Colleje-Yambol, Trakia University, Stara Zagora, Bulgaria

ABSTRACT
Used traditional methods of research and design of technologies for growing crops, which must be regarded as living biological systems can accurately enough to predict and identify the technical characteristics of the devices, but it is impossible to determine the effect of technological expectations on the basis of technique used.
Reliability of performance assessment embedded in techno-economic justification for these decisions in the design remains low.

Key words: operation, technology, engineering, network model, automation of technological processes

INTRODUCTION

Agricultural processing operations defined technological process - technology for growing different crops. In the technological process operations are in calendar order and form a complex of activities relating to preparation of the seed and soil, care for the crops to harvest, processing and storage of agricultural produce received

Each technological operation is determined if known: agriculture requirements type sets and preparation of machinery and components realizing the operations of state preparation and field work organization aggregates quality control of its implementation, labor safety, ecology and conservation of environment.

Used traditional methods of research and design of technologies for growing crops, which must be regarded as living biological systems can accurately enough to predict and identify the technical characteristics of the devices, but it is impossible to determine the effect of technological expectations on the basis of technique used.

Reliability of performance assessment embedded in techno-economic justification for these decisions in the design remains low.

***Correspondence to:** *Krasimira Georgieva, Technical Colleje-Yambol, Trakia University-Stara Zagora, "Graf Ignatiev" street №38, Yambol, 8600, e-mail:k.g.georgieva@gmail.com*

EXPOSE

Methodologies used to assess the feasibility decision applied technology for growing crops must have a composite criterion for choosing the engineering solution. Given that each design technology to be placed multicriteria problems, it can select criteria in two ways: all the indicators (main and supplementary) are kept to a meaningful average, as determined by appraisal, by all indicators choose one to be dominant and the other to be restrictive.

When reporting the effectiveness of used farm equipment is necessary to consider the following cases: a new technique used in security equipment which are made several technological operations simultaneously or use an old technique which arise additional costs for operation and maintenance. On the other hand an important feature in the production of agricultural production is a biological object - soil, seeds, plants, fruits, vegetables and others. Therefore, the effect of using the technique for a specific operation depends not only on its parameters and characteristics of the agreed subject of biological and engineering.

Elements that should be developed to design a process in agriculture, according to [1] are:
- Technological tolerances for quality execution of operations;
- Cultivation period of implementation of each operation;
- Duration and pace of implementation of

operations;
- Structure and composition of technological facilities;
- Eksplotatsionno care system;
- Requirement for reliability of technological operations;
- Reporting of risk in designing and vzenmane decision for each operation;
- Ensuring safe operation.

Proetirane rational principles of agricultural processes run on the characteristics of agricultural production: Season nature of operations within the time limits of their performance, changes in natural climatic conditions, inter-working of the large number raznotipni machines and components and more[2].

The main task of the design taking into account those features is the implementation of agricultural processes within specified periods of sufficient quality for high performance of all units in the smallest eksplotatsionni costs and losses.

The main design principles of technological processes in agriculture are:
- Continuous operation of machinery or movement of material being processed;
- Consistency of operations in time and space (in a strictly defined time and set a field or area);
- At full load of all units of the technological complex;
- The smallest material and machine tovaroobrashtaemost ie minimal movement of goods, since these operations consume the most resources and labor in the production of any crop;

Rhythm (flow) process, ie equal intervals to work the same amount of material, which requires equality of performance of all units in the complex:

$$n_1.W_1.T_{Д1} = n_2.W_2.T_{Д2} = ... = n_i.W_i.T_{Дi}$$

where: n_i is the number of aggregates;

W_i -Proivoditelnost every unit of **i** type- $ha/h(T/h)$

$T_{Дi}$ - Duration of the working day - (h)

- Probabilistic nature of the modification of external factors, and thus the parameters of the complexes

Before proceeding to the design of technology for cultivation is necessary to examine specific consecutive technological operations and processes which it is up (down).

Usually detailed model of technological operation contains a large number of variables having chrko expressed nonlinear character and is sometimes represented by differential equations or variables listed as having a probabilistic nature.

In general, any technological operation (n_i - mnozhesvoto operation of the operations N defining the technology for growing crops) may be in the form of draft scheme **Figure 1.** Typically, each operation is characterized by a transitional function, F_n which is managing the transition variables and describes the system from one operation to another as a result of technology (technological process)

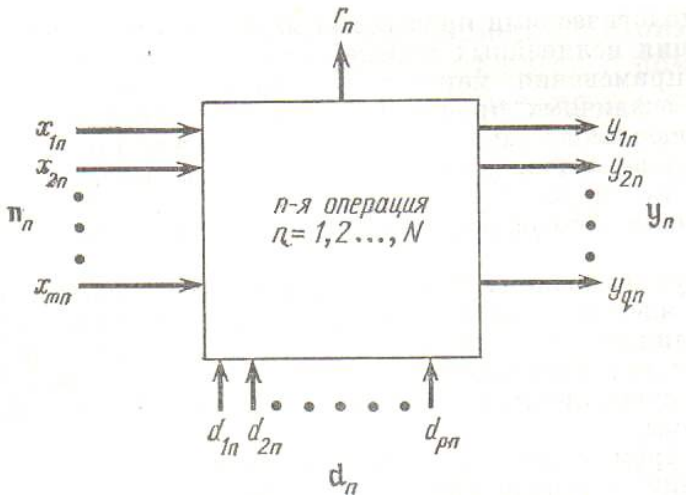

Fig. 1. Schematic presentation of technological operation

In this initial and final state of the system is described with the help of state variables x_n and y_n input and output, taking into account internal and external disruptive and manageable and unmanageable impacts Transition system from one state to another constitute a change of status indicators and research facility.

The result of any technological operation is the transformation of an object with certain properties and characteristics. You can then use the methods of operations research to analyze all the various private naoperatsiite models and technology of cultivation.

On the basis of technology developed for the production of certain agricultural products is to create an organization to realize the technological operations being established timetable.Broad band has received widespread pattern known as Grandovi timetables easily create and use visual aids in the expression of complexes and during operations.

Given the contemporary methods of research into technologies designed in an environment of uncertainty conditions, risk, reliability and efficiency of implementation of various technological operations showed that lentotite models have several important shortcomings.

Belt models can be extended to express clearly the links between technological operations, they serve as the basis for siting achieve more or less accurately determine time and load time, can not get an idea of what the technology operations and in what amount have the necessary resources when necessary to change the duration of operations, a different technique or maintenance; tape models indicate only operations that must be met, but not konkretezirat final results, therefore they can not serve as a real scientific basis for planning .

These and other shortcomings of models of tape removed from the network models for planning and management, it is a system of complex mathematical and economic methods, organizational arrangements, control methods and means to coordinate and dynamic programming, imaging and analysis of complex technological and Service Areas operations in the execution of which the most common outcome is the creation of a technological outcome.

Use of network models allow using modern methods of operations research to allow automated processes in agriculture. To take into account the influence of variation of possible parameters, factors and parameters, mathematical models of basic technological operations, technical support and more. need to develop an information base.

CONCLUSION

The design of technologies for crop must include elements, based on principles that take into account mnogovariantnostta patterns obtained from various agronomic, technical and economic conditions and environmental factors with options for an optimal solution. Given the shortcomings of the band model for the design of technology for cultivation is proposed to use network models that allow technology to automate processes and operazii.

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