

An Ecological versus Economical Approach to Production at Rudolf Jelínek a.s.

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ABSTRAKT

Bakalářská práce je rozdělena na dvě základní části, na část teoretickou a praktickou. V teoretické části je popsána historie, obsah a požadavky systémů managementu jakosti a environmentálního managementu. Analytická část se zabývá ekologickým přístupem k výrobě ve společnosti Rudolf Jelínek a.s. a jeho možným ekonomickým užitkem. Je popsáno integrované pěstování švestek a jeho výhody a jsou dány návrhy na možné ekologické a ekonomické využití výpalků z výroby.

Klíčová slova: management kvality, environmentální management, ekologický přístup, integrované pěstování, Rudolf Jelínek a.s.

ABSTRACT

The Bachelor's thesis is separated into two basic parts, the theoretical part and the analytical part. In the theoretical part of my thesis the history, scope and requirements of quality and environmental management systems are described. The analytical part is concerned with the ecological approach to processing at Rudolf Jelínek a.s. and its potential economic benefits, integrated cultivation of plums and its advantages is described and suggestions on ecological along with economical utilization of stillages are given.

Keywords: quality management, environmental management, ecological approach, integrated cultivation, Rudolf Jelínek a.s.

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CONTENTS

| | |
|---|-----------|
| INTRODUCTION | 11 |
| 1 THEORY | 12 |
| 1 QUALITY MANAGEMENT SYSTEMS..... | 13 |
| <u>1.1 Producer.....</u> | <u>13</u> |
| <u>1.2 Business</u> | <u>13</u> |
| <u>1.3 User</u> | <u>13</u> |
| <u>1.4 Quality policy</u> | <u>13</u> |
| <u>1.5 Product liability</u> | <u>14</u> |
| <u>1.6 Process approach</u> | <u>15</u> |
| <u>1.7 ČSN EN ISO 9001.....</u> | <u>16</u> |
| 1.7.1 Compatibility with other management system | 16 |
| <u>1.8 Requirements of ISO 9001 Standard</u> | <u>17</u> |
| 1.8.1 General requirements..... | 17 |
| 1.8.2 Documentation requirements..... | 17 |
| 1.8.3 Management responsibility..... | 17 |
| 1.8.4 Resource management..... | 18 |
| 1.8.5 Product realization..... | 18 |
| 1.8.6 Measurement, analysis and improvement..... | 18 |
| 1.8.7 Internal audits | 19 |
| <u>1.9 Other Standards of ISO 9000 Line</u> | <u>20</u> |
| 1.9.1 ČSN EN ISO 9000 | 20 |
| 1.9.2 ČSN EN ISO 9004 | 20 |
| 1.9.3 ČSN EN ISO 19011 | 20 |
| 2 ENVIRONMENTAL MANAGEMENT SYSTEMS | 21 |
| <u>2.1 History of environmental management systems</u> | <u>22</u> |
| 2.1.1 Environmental management systems in the world | 22 |
| 2.1.2 Environmental management systems in the Czech Republic..... | 22 |
| <u>2.2 ČSN EN ISO 14001.....</u> | <u>23</u> |
| <u>2.3 Requirements of ISO 14001 Standard</u> | <u>24</u> |
| 2.3.1 General requirements..... | 24 |
| 2.3.2 Environmental policy..... | 24 |
| 2.3.3 Planning | 24 |
| 2.3.4 Implementation and operation | 25 |

| | | |
|-----------|---|-----------|
| 2.3.5 | Checking..... | 25 |
| II | ANALYSIS | 27 |
| 3 | RUDOLF JELÍNEK A.S..... | 28 |
| 3.1 | <u>General information.....</u> | <u>28</u> |
| 3.2 | <u>Company bodies</u> | <u>29</u> |
| 3.2.1 | Board of Directors | 29 |
| 3.2.2 | Supervisory Board | 29 |
| 3.3 | <u>Company profile</u> | <u>29</u> |
| 3.4 | <u>Subsidiary companies</u> | <u>29</u> |
| 3.5 | <u>History of company.....</u> | <u>30</u> |
| 3.6 | <u>Organizational structure.....</u> | <u>31</u> |
| 3.7 | <u>Products</u> | <u>31</u> |
| 3.7.1 | Slivovitz..... | 31 |
| 3.7.2 | Original Spirits | 31 |
| 3.7.3 | Plum vodka and vodka | 32 |
| 3.7.4 | Gold Cock whisky | 32 |
| 3.7.5 | Fruit Brandy..... | 32 |
| 3.7.6 | Other products | 32 |
| 3.8 | <u>Environmental management systems.....</u> | <u>33</u> |
| 4 | INTEGRATED CULTIVATION..... | 34 |
| 4.1 | <u>SISPO</u> | <u>34</u> |
| 4.1.1 | Obligations of SISPO | 35 |
| 4.1.2 | Obligations of members..... | 35 |
| 4.1.3 | Rights of SISPO..... | 35 |
| 4.1.4 | Rights of members | 35 |
| 4.2 | <u>Integrated Cultivation at Rudolf Jelínek a.s.</u> | <u>36</u> |
| 4.2.1 | Těchlov orchard..... | 36 |
| 4.2.2 | System of planting | 37 |
| 4.2.3 | Economic benefit of monitoring of pests | 37 |
| 4.2.4 | Fertilizing..... | 38 |
| 4.2.5 | Donations..... | 39 |
| 5 | STILLAGE..... | 40 |
| 5.1 | <u>Stillage utilization in agriculture</u> | <u>40</u> |
| | CONCLUSION | 41 |
| | BIBLIOGRAPHY | 42 |

| | |
|--------------------------|-----------|
| FIGURE LIST | 44 |
| APPENDICES | 45 |

INTRODUCTION

According to The New Ecologist magazine, popularity of “green” and environmentally friendly products is rising continuously. Companies are aware, that ecological aspects of production are more important from year to year. The quality of a product is not enough anymore. Chain stores demand their suppliers to hold certificates and trademarks proving that their approach to production is environmentally focused and their requirements are satisfied. That is why an ecological approach to processing is closely connected with business results nowadays. Companies concentrating on ecological processing have more options in search of customers and when applying to foreign markets. Certifications of quality of environmental management system are becoming a significant marketing tool, because customers know the high-quality product is even friendly to the environment. However, the process of certifications is not advantageous only for gaining customers, but it can be useful for improving internal system in company, better utilization of available resources and cooperation of the various levels of the organization.

I. THEORY

1 QUALITY MANAGEMENT SYSTEMS

The main reason, why should companies implement quality management system is a profit enhancement. Although the implementing and maintenance of the system is not cheap, systematic managing and emphasis on a quality of product or service should improve operating results of a company. (management.jakosti 2005)

1.1 Producer

The manufacturer is primarily interested in creating products that bring economic benefit to him. The main aspect is the aspect of economic benefits; therefore, the quality of the product is connected to the corporate economy. Improving product quality usually requires the rising costs. Finding the optimal level of quality is also searching for an optimal relationship between costs and benefits of quality. Currently, the quality of the products is connected together with their technical sophistication, so the quality is becoming a major technical and economic parameter. (Mládek 1999)

1.2 Business

On the world market supply outweighs the demand. The customer puts on the manufacturer requirements to which the manufacturer must adapt. The products on which is no interest are not sold, and if so, the price is lower than the cost of production. These products create difficulties at local and foreign markets. (ibid 1999)

1.3 User

The user of the product is the most important reviewers evaluator of the quality, because he is directly in contact with the product, uses it and evaluates it. Retailers and manufacturers are influenced by evaluating of users. Among individual users may be differences of opinion when assessing the same product. Each user has somewhat different ideas and requirements. (ibid 1999)

1.4 Quality policy

The concept of the quality policy means aims of the organization in quality of the product, formally expressed by top management. Quality strategy must be based on careful study of production possibilities. (ibid 1999)

1.5 Product liability

Important requirement for quality is that the product cannot endanger its future user during manipulation. Therefore, many countries created legislation on producer responsibility for product. Product liability means that the manufacturer must provide compensation for damage caused to property, injury or loss of business, which is due to defects of the product. The producer is the one who produces the product or gives the product its name, trademark or other distinguishing mark. The producer is also the one who delivers the product for resale, lease or other forms of use within their business. If the manufacturer is not known, manufacturer is considered everyone who supplied the product for resale and did not disclose the true identity of the producer to user within one month of a product defect. The product is any movable thing which was produced and is intended for placing on the market. The product is defective, if the term of its use does not guarantee the properties that can be expected, particularly with regard to the product information provided by the manufacturer, the intended purpose for which the product is used or the time the product was put on the market. The manufacturer shall be relieved of liability when prove that the product was not delivered to the market by him, defect did not exist at the time the producer put the product on the market but was later, the product was not manufactured for sale or the state of technical knowledge did not allow to find a defect when the product was marketed. (ibid 1999)

1.6 Process approach

“ISO 9001 Standard promotes the adoption of a process approach when developing, implementing and improving the effectiveness of a quality management system, to enhance customer satisfaction by meeting customer requirements. For an organization to function effectively, it has to identify and manage numerous linked activities. An activity using resources, and managed in order to enable the transformation of inputs into outputs, can be considered as a process. Often the output from one process directly forms the input to the next. The application of a system of processes within an organization, together with the identification and interactions of these processes, and their management, can be referred to as the "process approach".” (internal documents of Rudolf Jelínek a.s.)

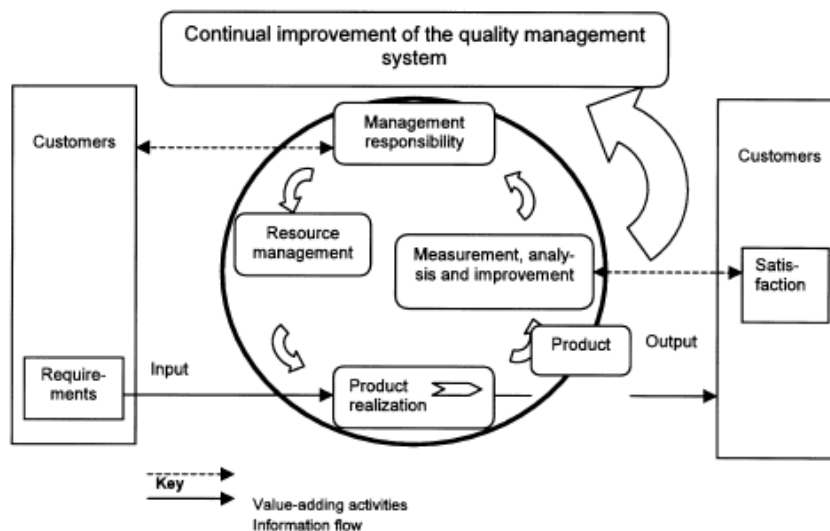


Figure 1 – Model of a process-based quality management system

Figure 1. Model of a process-based quality management system 1 (internal documents of Rudolf Jelínek a.s.)

1.7 ČSN EN ISO 9001

This standard was published in 1987 as a part of so called ISO 9000 Line. Standards were developed by TC 176 group. The aim of this group was to define criteria for certification of systems of quality. These standards were gradually implemented into national standards systems in more than 170 countries all over the world and became the only respected platform for creating and development of quality management systems. (Nenadál 2006; Mládek 1999)

Quality management system according to ISO 9001 standard is intended for every organization, no matter what its size or subject of undertaking are. ISO 9001 standard can be applied in various kinds of businesses, for example in commercial, service and counseling companies, health service or educational institutions. Quality management system is very suitable instrument for companies, which want to improve processing and set clear rules. (ISO 9001 2008)

“This standard is the collection of requirements organizations have to adhere to prove they are able to secure desired quality of their products or services. This International Standard specifies requirements for a quality management system where an organization:

- a) needs to demonstrate its ability to consistently provide product that meets customer and applicable regulatory requirements
- b) aims to enhance customer satisfaction through the effective application of the system, including processes for continual improvement of the system and the assurance of conformity to customer and applicable regulatory requirements.” (internal documents of Rudolf Jelínek a.s.)

1.7.1 Compatibility with other management system

This International Standard ISO 9001 is given in accordance with ISO 14001 standard, that is intended to help users improve compatibility of these two standards. This International Standard does not contain requirements that are typical for other management systems,

such as environmental management system, health and safety management system or financial management. However, this International Standard enables an organization to align its own management system with the requirements of a quality management system. (Svoboda et al. 2008)

1.8 Requirements of ISO 9001 Standard

1.8.1 General requirements

As indicated on the Finance-management website, identification of all processes running in organization, finding their connections and ensuring their effective operation is controlling of processes organization has to focus on. A special emphasis has to be put on processes closely connected with a customer. (finance-management 2005-2009)

1.8.2 Documentation requirements

Organization has to found and maintain a quality manual, which contains information about areas quality management system was used in and describes connections between the processes of the quality management system. Clear records which are easy to find have to be created and maintained to prove that the organization satisfies requirements of the quality management system. (internal documents of Rudolf Jelínek a.s.)

1.8.3 Management responsibility

Top management should prove its participation on the development and application of quality management system. To ensure quality policy being effective, the importance of meeting customers' requirements and wishes should be spread through whole the organization too. Top management should also determine quality objectives that should be accomplished in each level within the organization for product realization. (internal documents of Rudolf Jelínek a.s.)

Senior management should define responsibilities and authorities of each member in the organization. A member of the management responsible for maintaining the quality management system and reporting to top management about systems performance should be appointed. Top management is also responsible to check the quality management system in defined periods to avoid decreasing its effectiveness. Senior management must ensure that the appropriate organizational units and levels of the organization set quality targets, including targets needed to meet the requirements of the product. Quality objectives must

be measurable and consistent with the quality policy. Senior management has to review the quality management system in organization in planned intervals to ensure its continuity and effectiveness. This review has to include suggestions on improving and changes of the system and objectives of quality. (Svoboda et al. 2008)

1.8.4 Resource management

There is a need to determine the amount of resources to establish and maintain quality management system and increase customers' satisfaction. Talking about human resources, every employee should be assigned to work he is skilled in and experienced with. Organizations must provide training for their staff. Quality of product depends on personnel performance, which is the reason why suitable work environment should be ensured. To ensure manufacture of product satisfying customers' needs, buildings, workspace and corresponding equipment has to be provided. (internal documents of Rudolf Jelínek a.s.)

1.8.5 Product realization

The organization should plan processes necessary to continuous realization of a product. Planning needs to be in harmony with the other processes of the quality management system. The object of planning is quality and coordination of processes to ensure effective manufactural activity. (internal documents of Rudolf Jelínek a.s.)

Kožíšek (Kožíšek 2005) claims that before a fixing a contract with the customer, the organization should determine a range of required delivery, requirements defined by customers, requirements the customer did not define, but which are useful for intended purpose and requirements and obligations which result from the law. Before accepting a commitment, customers' requirements need to be checked by an appointed person to ensure that an order is clear and the organization is able to meet an obligation.

1.8.6 Measurement, analysis and improvement

Measurement and analysis are used to prove that product agrees with quality management system. According to results of analysis, proposals how to improve effectiveness of this system can be given. Communication with costumers is a good way how to find out if the

product or service satisfied their requirements. To find out if the quality management system is implemented, maintained and conforms to requirements of this standard, the system is verified at least once a year by auditors. One of auditors has to be external auditor. In order to find out if all the products attribute meet the given conditions, organization has to monitor and measure their quality. This inspection must be provided in the particular phases of the product realization process according to planned activities. Record of the evidences about conformity with entrance criteria must be kept. In this record, name of the person who approves releasing of the project must be stated. Releasing and delivery of the product cannot be provided until other planned activities are finished satisfactory, unless customer or particular body decides otherwise. Organisation must ensure that product that does not comply with regulations will be identified and by no means will be used or incidentally delivered. Management tools and related reliabilities and competences for manipulation with this product must be stated in the documented routine. Records of the nature of nonconformities and any subsequent action must be maintained. If the nonconforming product is corrected, it must be repeatedly tested to demonstrate compliance with the requirements. If it is found that the product does not match the requirements, organizations must implement measures appropriate to the consequences of non-compliance or potential non-compliance consequences. (Interní materiály společnosti Rudolf Jelínek, a. s.; Kožíšek 2005; Svoboda et al. 2008)

1.8.7 Internal audits

Quality management system is checked regularly audits. Audits are schedule so that each element of the standards is audited at least once a year. Implementation of internal audits is in a combination of internal auditor and external auditor. The external auditor is mentioned in the list of suppliers of services for that company and his activity is evaluated. Each of the identified non-compliances is recorded and the members of top management take corrective action. Auditors specify the date when the effectiveness of corrective measures will be verified.

(Kožíšek 2005)

1.9 Other Standards of ISO 9000 Line

1.9.1 ČSN EN ISO 9000

This standard mentions extensive interpretation and definition of notions related with quality, management, product, documentation, processes of measurement and audits. Eight general principles obligatory for other standards of ISO 9000 are defined. (Nenadál 2006)

1.9.2 ČSN EN ISO 9004

This standard counsels, which things the quality management system needs to contain for operate effectively. This standard is important for every organization to internal application of quality management system. If this standard is followed, the efficiency of organizations is improved. (ibid 2006)

1.9.3 ČSN EN ISO 19011

This standard is a direction for conducting audits. Audits are processes controlling effectiveness of quality management system and its conformity with requirements of ISO 9001. Results of audits are analyzed to identify areas, improving of which leads to better efficiency of the system. (ibid 2006)

2 ENVIRONMENTAL MANAGEMENT SYSTEMS

The company that wants to be profitable cannot act recklessly, but should try to create a long-term strategy for its conduct. Environmental aspects will affect the company's future prosperity increasingly, both in the short term and for long-term success. Pressure on companies to minimize the harmful impact of business activities on the environment is bigger every year and more companies must cope with this situation. The company can choose between two strategies. The first is to reach a point where the manufacturing process takes place at the frontier of environmental requirements of society. Second one is trying to reach a point where the environmental friendliness of undertaking is bigger than what is required. Companies in the Czech Republic are currently focused on the legal framework, which means that they choose the first mentioned strategy. If companies treat the environment better than is required, it is a more expensive solution. But if sometime in the future, more stringent environmental requirements appear, such companies will have an advantage. Environmental management system is one of the methods through which to achieve significantly better condition than that required. Environmental Management System represents a comprehensive approach to environment protection of a company by launching of environmental management system which takes into account the environment. The aim of environmental management system is to incorporate the requirements of environmental protection in the management system so that the result is to ensure sustained economic growth and prosperity of a company. By the implementing of environmental management system it is possible to achieve economic benefits. They should be identified in order to show interested parties, especially the shareholders, what the value good environmental management brings. It provides organization an opportunity to connect environmental objectives and targets with specific financial results and to ensure the resources there, where they give the greatest benefit, both financially and environmentally. The company must understand the environment as a prerequisite for further growth and it must consider the protection of the environment as a strategic problem. (Smolík 2007)

2.1 History of environmental management systems

2.1.1 Environmental management systems in the world

Foundations of environmental management systems were laid in the sixties of twentieth century, when the general secretary of OSN, U Tanth, said in his speech, that a global cooperation of member states of OSN had to be started in order to improve environmental health, eliminate effects of population explosion and concentrate more on development. In 1971, International Institute for Environment and Development was found. Institute put the emphasis on relationship between development and environment. In 1972, OSN Conference about environment took place in Stockholm. Suspension of economic growth was suggested as a main solution of major ecological problems of the world. Suspension of the economic growth was considered impossible by OSN; therefore The World Commission for Environment and Development was entrusted with finding a better solution. In 1987, The Commission suggested the problems to solve by a new type of sustainable development, which was able to satisfy needs of then generations without limiting of a satisfaction of needs of the following generation. In 1991 The Business Charter for Sustainable Development was published by the International Chamber of Commerce and defined sixteen management principles, which described, how to make business activities environment friendly. First standards of environmental management system were published in 1996. A collection of these standards is called ISO 14000 Line. (Smolík 2007)

2.1.2 Environmental management systems in the Czech Republic

In 1997 following standards from ISO 14000 Line were established:

- ČSN ISO 14001
A specification with instructions for use.
- ČSN ISO 14004
A general guideline.
- ČSN ISO 14010
A guideline for environmental audits – general principles
- ČSN ISO 14011
A guideline for environmental audits – procedures of audits

(ibid 2007)

2.2 ČSN EN ISO 14001

Environmental management system according to ISO 14001 standard is intended for organizations, which want to improve their approach to protection of environment and do not want to pay heavy fines to Česká inspekce životního prostředí for infringement of legislative requirements. (ISO 14001 2008)

“This International Standard specifies requirements for an environmental management system to enable an organization to develop and implement a policy and objectives which take into account legal requirements and other requirements to which the organization subscribes, and information about significant environmental aspects. It applies to those environmental aspects that the organization identifies as those which it can control and those which it can influence. It does not itself state specific environmental performance criteria. This International Standard is applicable to any organization that wishes to:

- a) establish, implement, maintain and improve an environmental management system
- b) assure itself of conformity with its stated environmental policy
- c) demonstrate conformity with this International Standard” (internal documents of

Rudolf Jelínek a.s.)

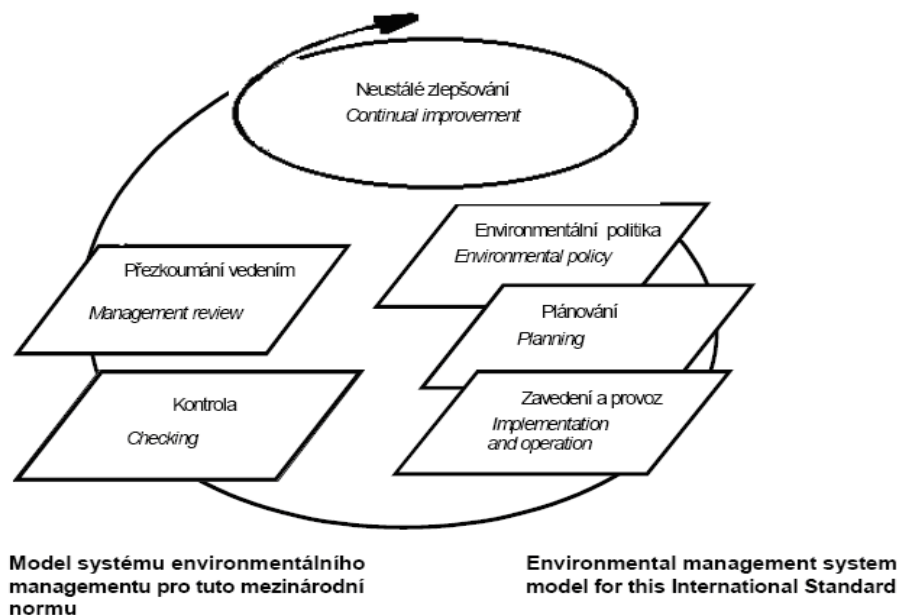


Figure 2. EMS model for ISO 14001 (internal documents of Rudolf Jelínek a.s.)

2.3 Requirements of ISO 14001 Standard

2.3.1 General requirements

“The organization shall establish, document, implement, maintain and continually improve an environmental management system in accordance with the requirements of this International Standard and determine how it will fulfill these requirements. The organization shall define and document the scope of its environmental management system.” (internal documents of Rudolf Jelínek a.s.)

2.3.2 Environmental policy

Environmental policy is a voluntary commitment of a company. Written corporate policies for protection of the environment in line with corporate strategy are explained by formulation of environmental policy. Environmental policy should be defined by top management. Management should ensure the policy correspond to environmental impact of its activities, products and services. The policy needs to include a commitment to constant improvement and to comply with relevant legal requirements. This policy should be also notified to persons working for the organization and be available to the public. Environmental policy has to be conceived in a written form. What is important is environmental policy conformance with environmental programs, environmental objectives and environmental management system. (Svoboda et al. 2008)

2.3.3 Planning

Organizations must implement a procedure for recording of all environmental aspects of its activities, products or services that can control and which can be expected to have any influence on the environment. Those environmental aspects, which have or may have a significant impact on the environment, must be determined. (Kramer, Brauweiler and Ritschelová 2005)

- The organization should establish procedures to define environmental aspects of its activities, products and services. Recognition of these aspects can have important impact on the environment. (Svoboda et al. 2008)
- The organization should establish and maintain procedures to identify the applicable legal requirements and apply these requirements on predefined environmental aspects. (ibid 2008)

- Objectives of organization, which are in harmony with environmental policy and that can be measured, should be established. Before establishing objectives, legal requirements, technical options, financial and operational requirements need to be considered. (ibid 2008)
- Person responsible for achieving objectives should be appointed and a time frame, in which objectives need to be achieved, should be determined. (ibid 2008)

After it had been derived a number of clear objectives, their compliance with established principles of corporate and environmental policy at the highest level of management should be checked. Expansion of planned objectives at all levels of business and allow employees to express their views and give their ideas for solutions is recommended. (Kramer, Brauweiler and Ritschelová 2005)

2.3.4 Implementation and operation

- Top management should determine resources necessary for maintaining environmental management systems. A special representative responsible for maintaining environmental management system should be appointed. (Svoboda et al. 2008)
- The way of communication about significant environmental aspects should be determined and documented. Internal communication includes meeting of working groups, external includes receiving and responding to communication from external interested parties. (ibid 2008)
- The documentation should include environmental policy, its objectives, description of the scope of environmental management system, documents required by ISO 14001 standard and records that relates to environmental aspects. (ibid 2008)

2.3.5 Checking

- Proper functioning of environmental management system should be controlled by monitoring key characteristics of its operations and using verified measuring equipment. (ibid 2008)
- Results of monitoring and measuring need to be recorded and conformity of these results with applicable legal requirements needs to be proved. (ibid 2008)

- When nonconformities occur, its causes need to be defined and organization has to avoid their reoccurrences. (ibid 2008)
- Internal audits of environmental management systems should be conducted in planned intervals. Audits are necessary to determine if environmental management system is implemented and maintained correctly and if it corresponds with predefined objectives of environmental policy. (ibid 2008)

Top management of the company must review the system of environmental management at prescribed intervals in order to insure its further applicability, adequacy and effectiveness. It must be ensured that before this process of reviewing by company top management all the necessary documents are be collected in order to make this review possible. The review must be documented. The review by top management must focus on eventual necessary changes of environmental policy, environmental objectives as well on other elements of environmental management regarding results of the audit, changing conditions or commitment to further improving. Company environmental audit is systematic, documented, regular and objective evaluation of environmental profile of the company, system of management and procedures for protection of the environment. Objectives of company environmental audit are to simplify controls of management regarding behaviours that can affect the environment and to control obeying of company environmental policies rules including general and specific environmental objectives. (Kramer, Brauweiler and Ritschelová 2005)

II. ANALYSIS

3 RUDOLF JELÍNEK A.S.

This chapter deals with important information about Rudolf Jelínek a.s.. At first, general information about the company are mentioned, together with its bodies. Company profile outlines the core business of Rudolf Jelínek a.s. and enumerates important target countries of company export. This part is followed by the subchapter dealing with subsidiary companies. Interesting fact is that they are located not only in Europe but also in the South America. Reasons for implementing environmental management system are given and consequences of this implementing are described in this chapter as well. One of the results of this activity is launching of the integrated cultivation. Basic principles of the integrated cultivation are also dealt with. The next part offers general introduction of Association for Integrated Fruit Cultivation, its duties and rights including duties and rights of its members and gives details of integrated cultivation at Rudolf Jelínek a.s. This chapter is finished by describing manipulation of stillages.

3.1 General information

| | |
|--|--|
| Business Name: | RUDOLF JELÍNEK a.s. |
| Registered Office: | Razov 472, 763 12 Vizovice, Czech Republic |
| ID No.: | 499 71 361 |
| Legal Form: | Joint Stock Company |
| Share Capital: | CZK 233,882,184 |
| Date of Establishment: | January 1, 1994 |
| Main Business Activities: | production of spirits |
| Organizational Sections: | Vizovice, Razov 472 – registered office of the company and management, distillery and storage of finished products, commercial activity Kamínka, Roštín 188 – accommodation and sports facility, restaurant Lesní pezion Bunč, Roštín – accommodation facility, restaurant |
| Environmental protection and labour relations: | The company activities follow all law regulations |

(All these information were gained from internal documents of Rudolf Jelínek a.s.)

3.2 Company bodies

3.2.1 Board of Directors

Chairman: Ing. Pavel Dvořáček

Vice Chairman: Ing. Zdeněk Chromý

Member: Ing. Přemysl Kovář

(internal documents of Rudolf Jelínek a.s.)

3.2.2 Supervisory Board

Chairman: Ing. Miroslav Rychna

(ibid)

3.3 Company profile

Rudolf Jelínek a.s. is a joint stock company, which is concerned with the production of alcoholic drinks. The company is one of the largest producers of fruit spirits in the world nowadays and is very popular all over the world. On the world market, the company has been known since 1934, when it launched its exports to foreign markets. Among the most significant customers belong Slovakia, Germany, Austria or Hungary, on overseas markets USA, Canada, Australia or South Africa. The company plans to extend export to Russia as well. (rudolfjelinek 2005)

3.4 Subsidiary companies

We can find several subsidiaries of the company in the world, especially in European countries. The only exception is a subsidiary in Chile, which was found in 2007. Subsidiary in Chile is focused on fruit purchasing, especially pears, because Chile is one of the biggest producers of pear outside Europe. Other subsidiaries can be found in Slovakia, Poland, Bulgaria, Serbia or Romania. (ibid 2005)

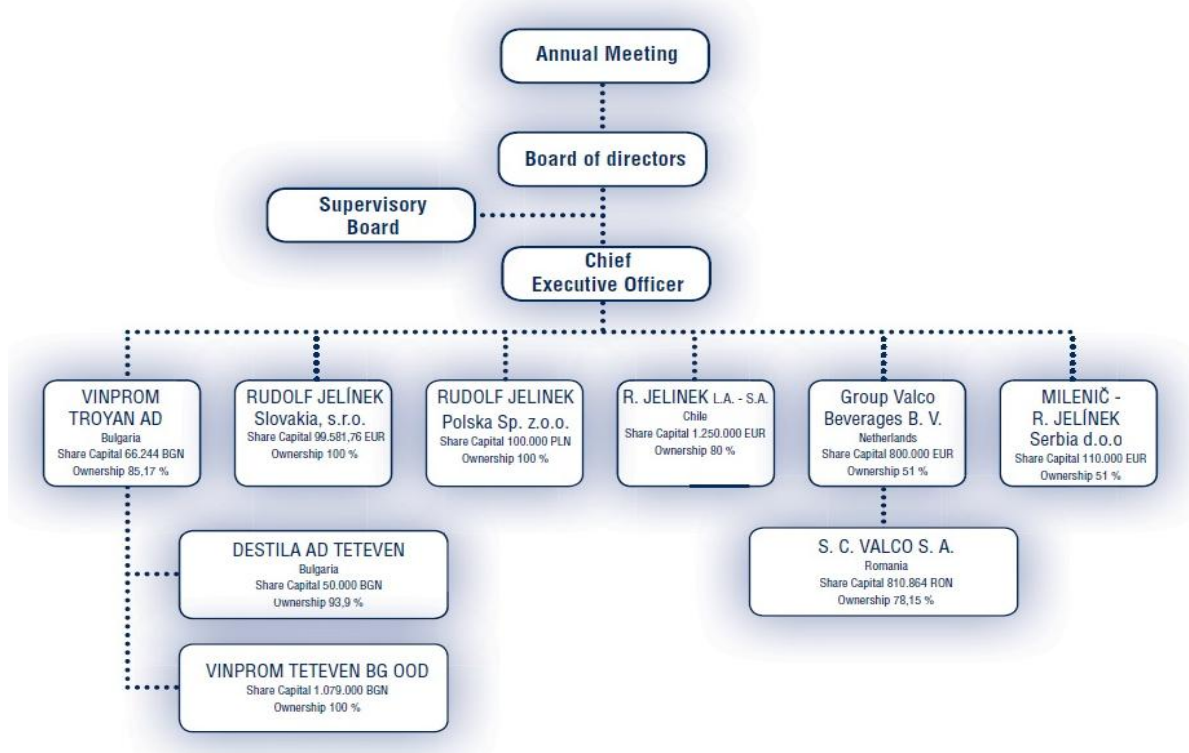


Figure 3. Subsidiaries scheme 1 (internal documents of Rudolf Jelínek a.s.)

3.5 History of company

The production of fruit spirits has had a long tradition in Vizovice for more than 400 years. Production of slivovitz started in the middle of 18th century and as time went on, production of slivovitz was more and more extended. The company itself was found at the end of 19th century in 1894. The company received its current name in 1926 from Rudolf Jelínek, son of the founder of the company Zikmund Jelínek. In 1934 Rudolf Jelínek started a production of kosher spirits. In their production only such raw materials and procedures can be used, which are in accordance with rules of the orthodox Jewish faith. In 1934, Rudolf Jelínek managed to export these products on overseas market, what made the company famous all over the world. The company was nationalized in 1948 and became a part of the national enterprise Moravian spirits and vinegar in Brno. In the following years, it was included in many other national enterprises, but finally it became a part of the national enterprise Slovacké konzervárny in Uherské Hradiště in 1966. At that time, the majority of products were exported and production for the local market was very limited. Major changes occurred after 1989. The company became an independent business named Rudolf Jelínek, state enterprise. The company was subsequently privatized and became Rudolf Jelínek a.s. (rudolfjelínek 2005)

3.6 Organizational structure

Supreme body of the company is General meeting. Next body of the company is board of directors, chaired by Ing. Pavel Dvořáček who is also the general director of the company. Vice chairman of this body is Ing. Zdeněk Chromý. Activities of the Board of directors are inspected by Supervisory board. Organizational structure is formed according to functional organizational structure. The head of the company is general director, who is the superior to specialized managers, for example sales director, marketing director or financial director. Advantage of this structure is effective division of labour and high qualified employees. Disadvantage can be differences in requirements of individual superiors. (internal documents of Rudolf Jelínek a.s.)



Figure 4. Company bodies 1 (internal documents of Rudolf Jelínek a.s.)

3.7 Products

3.7.1 Slivovitz

Slivovitz is a typical spirit of plums and it is a flag ship of Rudolf Jelínek a.s. It is produced in several variants, such as classic white, gold and gold kosher (rudolfjelínek 2005)

3.7.2 Original Spirits

These spirits are unique, because they are produced in limited quantities, depending on seasonal fruit. Spirits are produced in the most modern distillery to preserve a unique taste

of particular fruit. There are strawberry, bilberry, raspberry, blackberry, morella or Moravian apple spirits offered. (ibid 2005)

3.7.3 Plum vodka and vodka

Production of plum vodka confirms Rudolf Jelínek as a specialist on products of plums. This product is the most popular flavoured vodka on the Czech market. (ibid 2005)

3.7.4 Gold Cock whisky

This whiskey is made of Moravian barley, malt and crystal clear spring water. Unique taste of whiskey is achieved by repeated distillation and maturation in oak barrels. Three-year-old and twelve-year-old whiskey is made. Rudolf Jelínek a.s. bought Gold Cock whiskey trademark and its original prescription in 2005 from Marila Invest a.s. (ibid 2005)

3.7.5 Fruit Brandy

Production of fruit brandies has had very long tradition in the Walachian region. Together with slivovitz, fruit brandies they are the most typical for trademark Rudolf Jelínek. Above all, apricot, cherry, apple or pear brandy are produced. (ibid 2005)

3.7.6 Other products

Rudolf Jelínek a.s offers also liquers and herb liquers, which are part of wide range of products. These products are of very good quality and are very popular on the home market. Other popular products are pine brandy and gin. These liquers are made of red or black juniper. Offer of products is complemented also with absinth or wine brandy (ibid 2005)

3.8 Environmental management systems

The company management decided to implement EMS because the corporate philosophy includes effort to responsible and ecological behavior. It concerns with an environmental protection. This behavior improves the image of the company in public eyes; it means that the relation with the public is better. Implementation of environmental management system also increases the competitiveness of the company at the market. Business partners demand their suppliers to have certifications, so ownership of that certificate maintain the business partnership at excellent level and gives Rudolf Jelínek a.s. the opportunity to establish contacts with other potential customers. Within environmental management system, it was decided to upgrade, or, in case that it is not possible anymore, to replace old technologies and equipment. Increase the ecological awareness of workers by the training leads to reducing energy consumption and production of wastes. (internal documents of Rudolf Jelínek a.s.)

4 INTEGRATED CULTIVATION

Integrated cultivation is production of high quality fruit by applying processes friendly to the environment. Orchard ecosystem and its living organisms have to be protected and diversity of plant and animal species present in the fruit orchards and their surroundings need to be assured. In integrated cultivation are almost entirely used natural predators to limit the number of pests. Integrated cultivation is also focused on protecting health of cultivators, who work with chemicals and fertilizers. The most important thing for the cultivation is the soil and integrated cultivation is very careful not only to soil, but it is even very suitable for minimizing water pollution. (Ludvík 2011)

4.1 SISPO

This acronym stands for the Svaz pro integrované systémy pěstování ovoce, in English it means Association for Integrated Fruit Cultivation. SISPO associates professional cultivators specialized in this system, who are able to apply its principles to production and they demonstrate their effort to protect the environment and to produce the product of good quality, which will their customers appreciate. The SISPO defines rights and obligations of members and the association itself. All technological processes used by certificated members of the SISPO have to meet their specified directions. In the Czech republic these directions are published by SISPO every two years. If directions are followed, product of a company can be accepted as a product of integrated cultivation and may be marked with a trademark. (ibid 2011)

The applicant shall meet at least these required management practices:

- do not carry out simultaneous cultivation of fruit in the conventional system and integrated cultivation
- do not set chemical plant protection products
- use allowed biological plant protection products
- ensure soil sampling and sampling of fruit for the analysis of selected chemicals
- the value of controlled chemical substances may not exceed the limits established by Ministry of Agriculture, or by special legislation

(ibid 2011)

4.1.1 Obligations of SISPO

SISPO has to collect information on cultivation methods, their principles and regulatory mechanisms of integrated cultivation. It is also necessary to conduct a survey among customers, collect information about satisfaction with the particular product marked with SISPO trademark and analyze them. As the results of the analysis suggestions to improve the whole system are given. When regulations are changed, all members of the association have to be informed, either by web sites, media or special training. SISPO is obliged to allow all growers, who have signed up to association and managed to fulfill their conditions, to stamp their product with the trade mark. The association is also obliged to take away the trade mark to already awarded producers who do not meet requirements anymore. (ibid 2011)

4.1.2 Obligations of members

Members have an obligation to observe directions, standards and regulatory mechanisms stipulated by SISPO and, of course, legislative authorities. Workers responsible for integrated cultivation in member companies have to participate in special training organized by SISPO at least once a year. Members of the association have to also represent its philosophy on an appropriate level. It means to produce high quality fruit with environmental friendly approach and protect human health, fauna and flora. (ibid 2011)

4.1.3 Rights of SISPO

SISPO can control, if registered members of the association observe directions and binding regulatory mechanisms. When registered members break conditions necessary for owning trade mark, right of the association is to take a trade mark away. (ibid 2011)

4.1.4 Rights of members

Members of the association can use a trademark for their fruit, when they meet all conditions necessary for its using. They can also participate in promotional and educational activities of SISPO. When a member company faces to unusual problem, it is possible to apply for solution, which is suggested by the association. (ibid 2011)

4.2 Integrated Cultivation at Rudolf Jelínek a.s.

A corporate philosophy of Rudolf Jelínek a.s. includes a promotion of environment and effort to produce a high quality, wholesome product. That is why the company started with the integrated cultivation. In 2008, Rudolf Jelínek obtained a SISPO trademark. Together with the trade mark came also duties, such as monitoring of diseases and pests, keeping records of fertilizers and weather, using biological protection of fruit trees, analyzing soil, leaves and fruits and adhering stringent period of protection. (own research at Rudolf Jelínek a.s.)

4.2.1 Těchlov orchard

For integrated cultivation Těchlov orchard is used. This orchard covers an area of 43,77 ha. It is divided into four parts. The reason for the division of the area is that monitoring and keeping records is more effective and easier. Because one of the requirements of integrated cultivation is the protection of natural organisms and places for their living in orchard and its surroundings, which cannot be effected by a pollution, it is strongly recommended to keep an evidence of areas in orchard and its surroundings, which are not used for agricultural production. These areas are highlighted on a map of orchard included in documentation of territories registered in integrated cultivation system. On these areas pesticides, artificial fertilizers or excessive fertilization cannot be used. In the picture below, non-agricultural areas of Těchlov orchard are highlighted in green. (ibid)

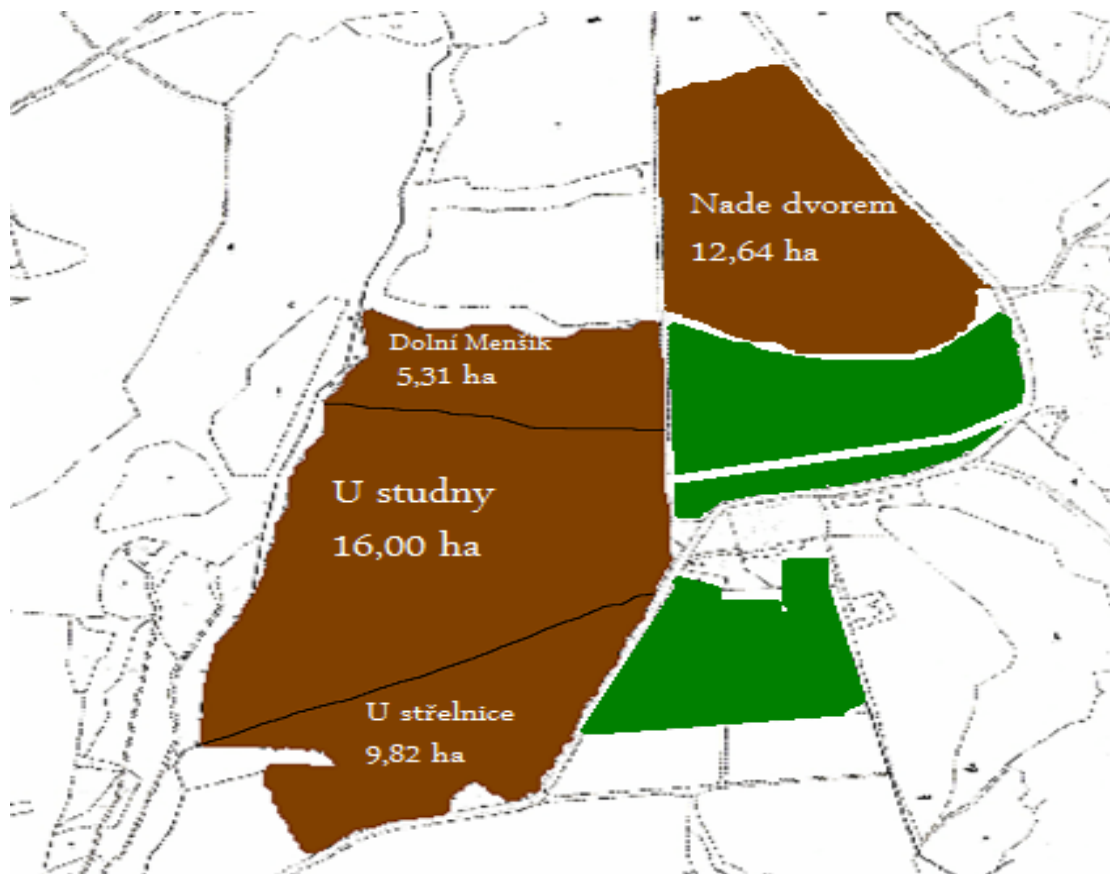


Figure 5. Map of Těchlov orchard 1 (internal documents of Rudolf Jelínek a.s)

4.2.2 System of planting

Planting system preferred by cultivators in Těchlov is planting fruit trees into rows. It is necessary to ensure enough space for trees for the whole period of their estimated lifetime. Trees should also be approximately the same size to ensure safer and more effective fertilizing. Varieties of trees should be chosen according to their plant diseases and animal pests' resistance. (ibid)

4.2.3 Economic benefit of monitoring of pests

Monitoring of pests is very useful in order to determine right application of pesticides, which are used to kill plant and animal pests. Monitoring in integrated cultivation is also economically advantageous in comparison to conventional agriculture. Typical method is monitoring of number of Plum fruit sawfly. These little flies are very harmful to plums, causing its later necrosis. For monitoring sticky boards are used to capture flies. Then it is possible to determine, according to the number of caught flies at a certain area, where to

apply protective pesticides and in what quantity. As you can see on the picture below, monitoring helped to determine the exact area which needs to be protected. (ibid)

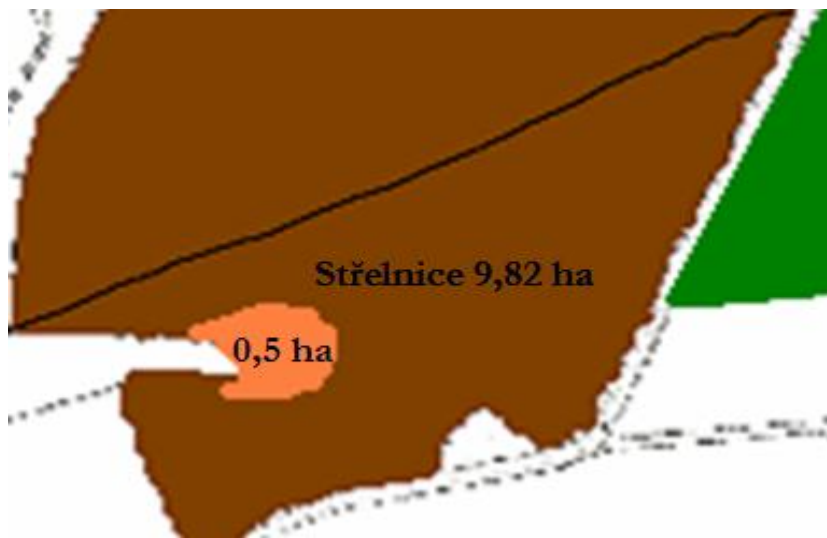


Figure 6. Střelnice area 1 (internal documents of Rudolf Jelínek a.s)

If the monitoring had not been done before, pesticide intended for extirpate Plum sawfly, called Sanmite, would have been applied all over the area, it means 9,82 ha, instead of only 0,5 ha. Counting with consumption of 0,375 l of Sanmite to 0,5 ha area costs CZK774, consumption of Sanmite to whole Střelnice area would be 7,365 l and costs would be much higher, up to CZK 15 208. Thanks to the monitoring it is possible to save CZK 14 434. This proves real economic benefit of integrated cultivation in comparison to conventional agriculture. (ibid)

4.2.4 Fertilizing

Like the application of pesticides, even fertilization must be preceded by monitoring, because there are given restrictions on using fertilizer. Companies included in integrated cultivation cannot use supportive products whenever they want. Collected information is analyzed to find out which of the nutrients necessary for good soil fertility are missing. Fertilizers are applied only in particular areas of orchards, where the required amount of important nutrients is insufficient, in order to avoid unnecessary glut of soil nutrients in the whole area. This method is not only friendly to the environment, because it protects natural soil ecosystem, but the economic benefit is visible too. Necessary amount of fertilizer is limited with the size of the area with insufficient number of nutrients. It means that costs for purchasing of fertilizer are limited as well, in dependence on small amount of its consumption. (ibid)

4.2.5 Donations

Although an integrated cultivation is to some extent more advantageous in some particular areas, in most of cases operating costs of integrated cultivation, in comparison to conventional production in agriculture, are much higher. This situation is caused mainly because of the system of requirements. The main reason is that a great number of highly qualified workers is needed, especially those focused on keeping records, monitoring and analyzing. A key role in the integrated cultivation system plays the personality of the operations manager and the owner of the farm, and his ability to take responsibility for the health and the environment is also vital. Motivation and ultimately a willingness to take certain risks associated with this partnership with nature is needed. Such an approach must of course be appreciated, especially by the European Union. Rudolf Jelínek a.s. is now bound in five years commitment, started in 2007. The commitment extends to the principles of integrated production for this period. In this period, Rudolf Jelínek a.s. gets donations of EUR 435/ha in its orchard every year. Amount of obtained CZK every year depends of course on the actual exchange rate between EUR and CZK. (ibid)

5 STILLAGE

The term stillage means distillation waste after distilling ethanol from fermented fruit fermentum. Distilling companies threaten the environment by producing fruit stillages, which are very dangerous waste able to influence the quality of surface or underground water. Stillages produced by Rudolf Jelínek a.s. are transported to sewage disposal plant in Zlín-Malenovice. Because the prices of the fuel are continuously increasing together with fee for disposal of stillages, costs on its liquidation climb into millions of crowns per year. That is why Rudolf Jelínek would like to find a more ecological and costs effective way to its processing. There is a project demanding access to European Union funds suggested. Rudolf Jelínek a.s. produces thousands of pounds of pits yearly, which have to be carried to the landfill. This is not economic favorable, as this process is very expensive. However, as mentioned few lines above, there is a project of burning pits. It considers the fact, that the big advantage of pits is their heating power. Considering the amount of produced pits, it can be predicted that this number would be sufficient to use it as a heating material for the whole area for at least half of the heating season. Benefits resulting from this fact are rather obvious. From the economic point of view, company would be able to save a lot of money, as this kind of fuel would be at no cost. By these means, company actually contributes to the fight for preserving of nonrenewable sources of energy which Rudolf Jelínek a.s. uses as a heating fuels. According to my research, the only downside of this project is its dependence on European Union funds. However, this kind of heating can be adapted only in the premises using specific kind of heating system. Without the money from the funds, Rudolf Jelínek a.s. cannot afford to implement these high cost changes. For this reason, return of investment of this project would not be economic sufficient for the company. (own research at Rudolf Jelínek a.s.)

5.1 Stillage utilization in agriculture

Stillages can be used as a food for livestock. The big disadvantage is that stillages degrade rapidly because of high water content and residues of yeast. Transporting a large amount of stillages containing lot of water is not very economic effective. Better way how to use stillages as a food for livestock is to dry them. From economic point of view it is much more favorable. Another solution is to use stillage as a fertilizer in agriculture areas. The problem is that the production of stillages is the most intensive in winter, when a soil is frozen, so its usage is limited. (own research at Rudolf Jelínek a.s.)

CONCLUSION

The introduction of an environmental management system at Rudolf Jelínek a.s contributed to the modernization of production and thus the modernization of production processes. Personnel had to be trained according to directives of environmental management system in all levels of the company, from the manufacturing sector to top management. This led to more effective utilization of all resources and energies during the manufacturing process. Over the past five years, costs of material and energy consumption have increased by 6%. This is with regard to increasing energy prices in the Czech Republic and the rapid increase in production volume excellent value. The implementing of integrated cultivation of plums is considered to be the result of environmental management system launching. The integrated cultivation is the interface between the conventional cultivation, which has no ecological principles and fully ecological cultivation, amenable to very strict restriction of legislative bodies. This kind of cultivation is undoubtedly more expensive and places higher demands on the knowledge of staff and their time spent in the orchard in comparison with conventional one, while the production of the fruit remains on the same level. On the other hand, higher costs are compensated with grants from European Union. Additional economic benefit can be seen on the obtaining of trademark confirming the quality and wholesomeness of the produced fruit. This trademark, given by Association for Integrated Fruit Cultivation called SISPO, is significant marketing tool, because according to purchasers of products produced by companies with the same scope of the business as Rudolf Jelínek a.s., it is considered to be important evidence of quality. Moreover, some of these purchasers demand their suppliers to have this prestigious trademark in the first place. This gives Rudolf Jelínek a.s a competitive advantage in comparison with other competitive companies at the market, which have not obtained this trademark. By the end of this thesis, suggestion of stillages processing is outlined. This suggestion has obvious economic benefit, because after its implementation the company would be able to reduce operating costs and by this means, it is possible to save non-renewable energy sources as well. The only disadvantage of this suggestion is its implementation expensiveness. Regarding ecologic aspects, stillages can be used in process of biogas production. Unfortunately, there is no sufficient amount of stillages at Rudolf Jelínek a.s. necessary for effective biogas production. The company transports its stillages to sewerage plant in Zlín-Malenovice. This solution is expensive, however nowadays it seems to be the most suitable way of stillages disposal.

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FIGURE LIST

| | |
|---|----|
| Figure 1. Model of a process-based quality management system..... | 12 |
| Figure 2. EMS model for ISO 14001..... | 19 |
| Figure 3. Subsidiaries scheme..... | 26 |
| Figure 4. Company bodies..... | 27 |
| Figure 5. Map of Těchlov orchard..... | 33 |
| Figure 6. Střelnice area..... | 34 |

APPENDICIES

P I Weather station measurement records

P II Monitoring of pests

APPENDIX P I: WEATHER STATION MEASUREMENT RECORDS

| Year | Month | Day | Temperature (°C) | Humidity (%) | Wind Speed (km/h) | Relative Humidity (%) |
|------|-------|-----|------------------|--------------|-------------------|-----------------------|
| 2011 | 3 | 1 | -11,6 | 2,4 | 75 | 21 ⁰⁰ |
| 2011 | 3 | 2 | -11,8 | 2,6 | 73 | 21 ⁰⁰ |
| 2011 | 3 | 3 | -9,9 | 3,3 | 80 | 21 ⁰⁰ |
| 2011 | 3 | 4 | -0,1 | 3,1 | 70 | 21 ⁰⁰ |
| 2011 | 3 | 5 | -3,4 | 1,0 | 74 | 21 ⁰⁰ |
| 2011 | 3 | 6 | -10,0 | 3,3 | 68 | 21 ⁰⁰ |
| 2011 | 3 | 7 | -10,8 | 3,3 | 64 | 21 ⁰⁰ |
| 2011 | 3 | 8 | -11,6 | 2,4 | 72 | 21 ⁰⁰ |
| 2011 | 3 | 9 | -8,4 | 0,0 | 74 | 21 ⁰⁰ |
| 2011 | 3 | 10 | 0,0 | 5,3 | 80 | 21 ⁰⁰ |
| 2011 | 3 | 11 | -2,8 | 6,3 | 70 | 21 ⁰⁰ |
| 2011 | 3 | 12 | -4,8 | 1,0 | 42 | 21 ⁰⁰ |
| 2011 | 3 | 13 | -6,9 | 2,9 | 68 | 21 ⁰⁰ |
| 2011 | 3 | 14 | -5,2 | -0,9 | 70 | 21 ⁰⁰ |
| 2011 | 3 | 15 | -2,6 | 2,2 | 72 | 21 ⁰⁰ |
| 2011 | 3 | 16 | -3,4 | 2,1 | 70 | 21 ⁰⁰ |
| 2011 | 3 | 17 | -0,8 | 1,9 | 74 | 21 ⁰⁰ |
| 2011 | 3 | 18 | 0,0 | 2,2 | 68 | 21 ⁰⁰ |
| 2011 | 3 | 19 | -1,6 | 4,8 | 71 | 21 ⁰⁰ |
| 2011 | 3 | 20 | -5,7 | 6,6 | 40 | 21 ⁰⁰ |
| 2011 | 3 | 21 | -5,7 | 6,5 | 42 | 21 ⁰⁰ |
| 2011 | 3 | 22 | -2,1 | 5,2 | 68 | 21 ⁰⁰ |
| 2011 | 3 | 23 | -0,8 | 2,6 | 70 | 21 ⁰⁰ |
| 2011 | 3 | 24 | -9,0 | 6,6 | 68 | 21 ⁰⁰ |
| 2011 | 3 | 25 | 2,1 | 7,6 | 74 | 21 ⁰⁰ |
| 2011 | 3 | 26 | 2,0 | 9,0 | 76 | 21 ⁰⁰ |
| 2011 | 3 | 27 | 2,5 | 15,5 | 78 | 21 ⁰⁰ |
| 2011 | 3 | 28 | 3,9 | 8,8 | 80 | 21 ⁰⁰ |
| 2011 | 3 | 29 | 2,2 | 6,5 | 76 | 21 ⁰⁰ |
| 2011 | 3 | 30 | 0,2 | 13,7 | 77 | 21 ⁰⁰ |
| 2011 | 3 | 31 | 4,5 | 15,9 | 80 | 21 ⁰⁰ |

APPENDIX P II: MONITORING OF PESTS

KONTROLA ŠKŮDCŮ

| Datum | Pozemek | Fenofáze | Škůdce | Metoda | Množství škůdce |
|-----------|-----------|----------|---------------------------------|----------|-----------------------|
| 13.2.2007 | 9603/2(A) | 00 | PANONICHUS SSP. | VIŽUÁLNÍ | 5 ES NAD 10 VAŠÍČE |
| 13.2.2007 | 9603/2(A) | 00 | PARTHENO- CARNIUM CORNI | VIŽUÁLNÍ | 43 NMF |
| 13.2.2007 | 9603/2(A) | 00 | OPEDOPHETA BRUMATA | VIŽUÁLNÍ | 1 VAŠÍČE |
| 13.2.2007 | 9603/2(A) | 00 | POUTERVAČE | VIŽUÁLNÍ | 5 ES |
| 13.2.2007 | 9603/2(A) | 00 | OSTRUHÁČE ŽELEZOVÝ | VIŽUÁLNÍ | 2 VAŠÍČE |
| 19.2.2007 | 9603/2(B) | 00 | PANONICHUS SSP. | VIŽUÁLNÍ | 2 ES NAD 10 VAŠÍČE |
| 19.2.2007 | 9603/2(B) | 00 | PARTHENO- CARNIUM CORNI | VIŽUÁLNÍ | 4 NMF |
| 19.2.2007 | 9603/2(B) | 00 | POUTERVAČE | VIŽUÁLNÍ | 3 ES |
| 19.2.2007 | 9603/2(B) | 00 | OSTRUHÁČE ŽELEZOVÝ | VIŽUÁLNÍ | 1 ES-VAŠÍČE |
| 19.2.2007 | 9603/2(C) | 00 | PANONICHUS SSP. | VIŽUÁLNÍ | 1 ES NAD 10 VAŠÍČE |
| 19.2.2007 | 9603/2(C) | 00 | PARTHENO- LECARNIUM CORNI | VIŽUÁLNÍ | 57 NMF |
| 19.2.2007 | 9603/2(C) | 00 | POUTERVAČE | VIŽUÁLNÍ | 4 ES |
| 19.2.2007 | 9603/2(C) | 00 | CYDIA SSP. | VIŽUÁLNÍ | 1 ES |
| 19.2.2007 | 9603/2(C) | 00 | OSTRUHÁČE ŽELEZOVÝ | VIŽUÁLNÍ | 1 VAŠÍČE |
| 20.2.2007 | 9603/6(A) | 00 | PANONICHUS SSP. | VIŽUÁLNÍ | 5 ES NAD 10 VAŠÍČE |
| 20.2.2007 | 9603/6(A) | 00 | PARTHENO- CARNIUM CORNI | VIŽUÁLNÍ | 4 NMF |
| 20.2.2007 | 9603/6(A) | 00 | CYDIA SSP. | VIŽUÁLNÍ | 2 ES |
| 20.2.2007 | 9603/6(A) | 00 | POUTERVAČE | VIŽUÁLNÍ | 2 ES |
| 20.2.2007 | 9603/6(A) | 00 | OSTRUHÁČE ŽELEZOVÝ | VIŽUÁLNÍ | 1 VAŠÍČE |